

The contexts of knowing: natural history of a globally distributed team

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Summary

The focus of this paper is cognitive convergence in a globally distributed team (GDT), defined as the process by which cognitive structures of distributed team members gradually become more similar over time. To explore the convergence process, we employed a longitudinal, ethnographic research strategy that allowed us to follow a naturally occurring GDT over a 14-month period, producing a rich case study portraying factors and processes that influence convergence. Confirming previous studies, we find that increases in shared cognition alone are not sufficient to account for performance gains on a GDT. Rather, it may be necessary not only to increase the sharing of cognition, but also to reverse a pattern of increasing divergence that can result from rejection of key knowledge domains. We also found that several factors influence the process of cognitive convergence beyond direct knowledge sharing. These include: separate but parallel or similar learning experiences in a common context; the surfacing of hidden knowledge at remote sites by third-party mediators or knowledge brokers; and shifts in agent self-interest that motivate collaboration and trigger the negotiation of task interdependence. Also relevant to cognitive convergence on a GDT is the geographical distribution pattern of people and resources on the ground, and the different ways in which leaders exploit the historical, cultural and linguistic dimensions of such distribution to further their own political agendas. Several propositions related to these observations are suggested. We conclude that GDTs can be effective in bringing together divergent points of view to yield new organizational capabilities, but such benefits require that leaders and members recognize early and explicitly the existence and validity of their differences. Copyright © 2004 John Wiley & Sons, Ltd.

Introduction

Two general questions have prompted the inquiry reported in this paper. First, we are interested in the efficacy of globally distributed teams (GDTs) as vehicles for knowledge sharing in global

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corporations. A second research question explores the proposition that knowledge sharing on global teams yields performance improvement. For purposes of this paper, a *globally distributed team* is defined as an interdependent work group comprised of culturally diverse members based in two or more nations who share a collective responsibility for making or implementing decisions related to a firm's global strategy (Cohen & Mankin, 1999). Organizations that are global in nature respond to the shift from production to knowledge-intensive work, and the need for greater flexibility to access knowledge wherever it might be located (Bell & Kozlowski, 2002).

Our first research question begins from the observation that globally distributed work often utilizes a team format versus another type of small group arrangement specifically because of the need to bring together knowledge from disparate sources. Teams differ from other types of small groups in that they are interdependent by definition (Mohrman, 1999), and it is expected (or hoped) that an effective team will create conditions that encourage both the sharing of knowledge among members, and the creation of new knowledge. Thus, pay-offs from access to distributed knowledge enabled by global teams depend on the team's capacity to bring together and integrate divergent sources and ways of knowing (Venkatraman & Henderson, 1998; Mohrman, 1999). Yet, worldwide distribution creates conditions that are not optimal for the sharing of knowledge in organizations. Knowledge sharing takes place through group processes, including communication, face-to-face interaction, and active collaboration (Straus & Olivera, 2000). But physical and temporal distance, cultural and organizational boundaries, and technologically mediated communication present obstacles to these processes, making them less effective and efficient (De Sanctis & Monge, 1999; Cramton, 2001). The factors and processes that influence a GDT's capacity to surmount these obstacles are of great interest, both for theoretical and pragmatic purposes.

Our second area of inquiry focuses on the relationship between shared cognition and performance on GDTs. Knowledge sharing among members of a team takes place as individuals interact around a common goal and coordinate work activity. Through knowledge sharing, the cognitive structures of individual group members become more similar—a process we call *cognitive convergence*. Theoretically speaking, a convergence of individual cognitions enabled by knowledge sharing should improve team performance through an enhancement of capabilities that support organizational effectiveness and efficiency (e.g., an alignment of expectations that permits more rapid coordination; see Mohammed & Dumville, 2001). Yet, research findings regarding the relationship of shared cognition and performance are equivocal. In some cases, shared cognition is associated with higher performance, and in other cases it is not (see, for example, Cannon-Bowers, Salas, & Converse, 1993; Gibson, 2001). These equivocal results have emerged primarily from research conducted with collocated work groups; we know very little about the performance effects of cognitive convergence in globally distributed teams, even though it is often assumed that such effects will be advantageous in GDTs.

Two sets of focal research questions that have guided our inquiry may be summarized as follows: (1) Is the globally distributed team an effective vehicle for knowledge sharing in an organization; what factors influence the process of knowledge sharing in a GDT? (2) Does cognitive convergence among members of a globally distributed team influence the team's performance; what factors influence the relationship between cognitive convergence and performance in a GDT?

To explore these questions, we employed a longitudinal, ethnographic research strategy that allowed us to follow in detail over a 14-month period processes and factors related to knowledge sharing and performance in a GDT. The resulting ethnographic case study yields a 'thick description' (Geertz, 1973) that is empirically revealing with respect to our two questions of interest. This study also addresses a lacuna in the literature. Past research on distributed work groups and shared cognition typically has employed short-term laboratory experiments with artificial groups (e.g., Hightower & Sayeed, 1996; Straus, 1996; Ocker, Fjermestad, Hiltz, & Johnson, 1998), and/or groups that are based

in a single nation (Robey, Khoo, & Powers, 1999; DeSanctis et al., 2000). As a result, it is difficult to generalize from the existing literature to naturally occurring teams that are culturally diverse and globally distributed (Maznevski & Chudoba, 2000). Even the emerging research on cognition in global/virtual teams continues the tradition of examining controlled or experimental groups (e.g., Jarvenpaa, Knoll, & Leidner, 1998; Jarvenpaa & Leidner, 1998; Cramton, 2001). There are very few *field* studies of globally distributed teams with culturally diverse members. Maznevsky and Chudoba (2000) and Sole and Edmondson (2002) are exceptions, but the former does not focus on shared cognition. Consequently, we believe that this study is one of the first ethnographic accounts of knowledge sharing in a natural team that is both globally distributed and culturally diverse.

Our research reflects a classic ethnographic approach to organizational inquiry (i.e., an *n* of 1, or a 'case study;' see for discussion Hamel, 1993.). While it is not prudent to generalize to an entire population from a single case, it is possible to utilize ethnography to discover and conceptualize emerging phenomena where literature is sparse (i.e., induction), and/or to explore in greater depth the nature of key variables and relationships that are expected to be significant, given what is known in the literature (i.e., deduction, or a sort of replication logic, supported by comparison of case data to theory-driven propositions; see Yin, 1994). Such explorations can contribute to theory-building (e.g., Burawoy, 1979). Given the emergent quality of the phenomenon under investigation, we deliberately selected an inductive pathway guided by broad research questions rather than specific hypotheses, with the aim of generating propositions about the phenomenon in question as a key goal of the research process. We hope through this study to encourage other scholars to investigate new organizational forms via field methods that permit direct observation of emerging human patterns at the interface between cultural contexts. We also hope to contribute to building the theory of distributed cognition in organizations by identifying and refining key variables and relationships in models of cognition and performance.

Literature

A review of the general literatures on shared cognition and globally distributed work is beyond the scope of this paper. Here, we focus our attention on literature that is relevant to understanding the relationship between shared cognition and global distribution and the implications of this relationship for performance.

Conceptualizing knowledge

Two distinct yet interrelated conceptualizations (constructs) of mental phenomena are central to our discussion. The broadest of these constructs is *cognition*, which we define as sets of categories that guide perception and interpretation of stimuli from the world around (and within) an individual (Sackman, 1991). The other construct is *knowledge*, which is both an integral component of cognition and one of its key products.

Knowledge traditionally has been defined as that aspect of cognition whose accuracy or correctness has been validated externally (Mohammed & Dumville, 2001). Nonaka (1994) and Nonaka and Takeuchi (1995) elaborate upon this with the suggestion that knowledge is information that has been validated through *human action* (where information is a flow of messages that have meaning within a context). When an individual receives a message she might take various forms of action to determine its veracity (e.g., check with a trusted authority, perform a test or an informal experiment). Once

information is validated (or not) in this manner, it is transformed into knowledge through the ‘dynamic human process of justifying personal belief as part of an aspiration for the truth’ (Nonaka, 1994, p. 15). Such knowledge provides a foundation for commitment to a personal stance, point of view, or perspective. An individual ‘believes’ in the truth of her knowledge because *her own actions and experiences* have demonstrated its validity. This personal process of active validation is what gives rise to much of our tacit knowledge¹ and engenders its contextually embedded quality.

The relationship between belief and knowledge is noteworthy. Mohammed and Dumville (2001, p. 100) suggest a subjective form of cognition when they define belief structures as ‘desired states of nature that one prefers or expects;’ their implication is that belief is different from knowledge, with the latter being more objective. Yet, according to Nonaka and Takeuchi (1995), belief is not a special kind of cognitive structure that is separate from knowledge, but is an integral component of all human knowledge; all knowledge begins as belief that is yet to be validated (or not). The Western tradition views scientific methods of validation as superior, as producing knowledge that is objective and absolute, and other forms of validation (e.g., personal experience) as producing a different kind of cognition (such as beliefs) that is subjective and therefore unreliable. Yet all human knowledge, including that derived from modern science, is socially constructed and open to subjective influence (Latour & Woolgar, 1986/1979). What is ‘true’ must be validated within a particular context, according to the canons of the dominant cultural regime. The distinction between knowledge and belief becomes especially salient when knowledge crosses from one cultural regime into another, as it does in the case presented in this paper.

Finally, Aristotle’s distinction among three types of knowledge—episteme, techne, and phronesis—also has a bearing on our discussion (Aristotle, 1976; cf. Flyvbjerg, 2001). Two of these types—episteme and techne—are familiar to most of us.² The third type of knowledge has been largely forgotten in Western civilization. *Phronesis*, sometimes referred to as prudence or practical wisdom, concerns the making of choices between alternative actions in relation to certain values or interests (Flyvbjerg, 2001). Phronesis may be thought of as evaluative knowledge (or know-whether)—knowledge related to *choices about what is appropriate in a given situation* (i.e., whether this, or that), given a sense of order or priority among the ends we seek. As we will show, phronesis also is relevant to the process of knowledge sharing across cultural boundaries.

Shared knowledge and cognition in work groups

Straus and Olivera (2002) provide a useful review of the literature on knowledge acquisition (sharing and tacit–explicit conversion) in work groups. Such acquisition generally takes place through the basic group processes of communication, face-to-face interaction, and collaboration. The active processing of information sharing by group members during interaction leads to *cognitive elaboration*, a process by which new knowledge structures are created and existing structures are modified. Key mechanisms of cognitive elaboration are direct observation of and conversations with other group members. Especially important for the sharing of tacit knowledge is verbalization, including ‘thinking aloud, questioning one another, testing hypotheses, building on others’ ideas, providing remarks that cue others’ recall, and so forth’ (Straus & Olivera, 2000, p. 260). Being able to observe other people performing

¹*Tacit knowledge* is embedded without awareness in the human organism, both in mind and body; it has not been codified, and so it might be difficult for the bearer to articulate (e.g., expert knowledge; Polanyi, 1958; Flyvbjerg, 2001). Tacit knowledge can be contrasted with *explicit knowledge*, which has been formally codified, and thus is more readily available to be transferred to other settings and acquired by others. Tacit knowledge can be converted to explicit knowledge, and vice versa, and this dynamic is a key mechanism of innovation in organizations (Nonaka & Takeuchi, 1995), including (presumably) GDTs.

²*Episteme*, or scientific knowledge (also called declarative knowledge, or know-what), is considered to be universal and relatively context independent. *Techne*, known as craft knowledge or technical art (also called procedural knowledge, or know-how), is context dependent, but oriented toward the production of something pragmatic.

work also is positively associated with knowledge acquisition, not because of exposure to any 'correct' solution, but through exposure to problem solving, testing ideas, and resolving discrepancies—actions that build tacit and explicit knowledge.

If two or more individuals are to share and convert specific types of knowledge in a group setting, then the larger cognitive structures of these parties must be similar or overlap to some extent. Group processes that enable knowledge sharing (such as verbalization and observations of others' performance) require that the people involved perceive and interpret key contextual stimuli in more or less the same way. Without such commonalities people can not communicate effectively or learn from watching each other. An example is that individuals must use a common language if they are to discuss a problem, and a common language implies the sharing of a larger cognitive apparatus related to speech (i.e., they must know what words mean and their interpretations of their meanings must agree, or the exchange will be dysfunctional). Human communication involves several other forms of shared cognition as well, including common conventions concerning social roles and relationships, cooperative co-orientation and mutual perspective taking, and the collaborative co-determination of the purpose and meaning of communication (Higgins, 1999). All of this implies that effective knowledge sharing requires considerable coexisting intersubjectivity (i.e., common frames of meaning; Rogoff, 1990) beyond the specific knowledge domain itself.

The implication for GDTs is that knowledge acquisition and conversion do not take place in a cognitive vacuum. Team members need to enhance their intersubjectivity more generally in cognitive domains related to, or existing beyond, a specific field of knowledge (e.g., in related beliefs) in order to communicate and share knowledge effectively. We refer to this process (i.e., through which team members gradually enhance the degree of overlap or similarity among their cognitive structures) as *cognitive convergence*. Individuals who join together to form a work group or team must experience some degree of cognitive convergence, or else effective communication and coordination will not be possible. Even if group members worked together previously and know each other well, some additional convergence in understanding around the nature of a specific task and how it is to be approached is necessary (see Weick, 1979; D'Andrade, 1995).

Global distribution radically alters the conditions for shared cognition, and it challenges the assumption of cognitive convergence on a GDT. The unshared contexts of such teams mean that members are routinely responding to different contextual stimuli. An orientation to different stimuli pulls team members' attention in divergent directions and distracts them from mutual co-orientation needed for task performance (see, for example, Gibson & Cohen, 2003). It is more likely that team members will interpret stimuli by engaging in joint sense-making activity with *proximal* co-workers than with distant members who are scattered across other contexts. In addition, communication among distributed group members tends to be more effortful and costly. Temporal differences also make it more difficult to establish contact (Straus & Olivera, 2000). Therefore, team members communicate less frequently and with reduced elaboration, both of which inhibit group cohesion.

Early social science research demonstrated that group members care more about each other when they are proximate, not distant (Festinger, Shachter, & Back, 1950; Zajonc, 1968), and that those who are spatially closest will be most influential in shaping their co-workers' understandings and actions (Allen, 1977). These findings emerged prior to the advent of virtual groups, and thus do not have a direct bearing on our subject, but they are suggestive of the types of social and psychological obstacles that might confront GDT members. More recent investigation of distributed groups has shown that an unshared context eliminates many opportunities for direct observation of colleagues' work activity, for co-orientation based on common physical objects, and for synchronization of routine activity around shared temporal rhythms (see, for example, Tyre & von Hippel, 1997). There also is less awareness across sites of temporal factors that are context-related, and there is little incentive to communicate about the context, creating more opportunities for miscommunication (Cramton, 2001).

Cultural diversity creates additional challenges. Basic concepts about the nature and meaning of work (e.g., what is 'good work', how should work be done) are different, and they sometimes even conflict (O'Hara Devereaux & Johansen, 1994; Snow, Lipnack, & Stamps, 1999). Members from different cultural backgrounds may demonstrate divergent preferences for social interaction norms, which can create difficulties in executing processes related to task integration (Maznevsky & Chudoba, 2000). Conflicts stemming from such differences are not the same as task-related conflicts, which can be worked out through dialogue; the former might reflect a fundamental clash of life philosophies and/or values that cannot easily be resolved, and that might generate affective conflict (see, for example, Hamada, 1995). Even when a common language is spoken, the interpretation of the underlying meaning of the words might be different, and these differences might remain unrecognized (Gluesing, unpublished, 1995; Gluesing, 1998). Linguistic fluency does not necessarily mean cultural fluency; subtle cues can be misread very easily, leading to serious misunderstanding and dysfunction. Further, when two individuals do not share a common social identity, each may see the other as a member of an 'out-group' with whom knowledge sharing can be risky (Mohrman, 1999; Straus & Olivera, 2000; Baba, 1999). This means that trust, which facilitates communication and collaboration and reduces transaction costs, may be in low supply on some distributed teams (see, for example, Jarvenpaa & Leidner, 1998), further inhibiting cognitive convergence. Given all of the difficulties related to shared cognition in a globally distributed setting, it is likely that global team members will seek opportunities to reduce their need for interaction (Straus & Olivera, 2000), especially if they have experienced affective conflict (which tends to produce mutual avoidance; see, for example, Jehn, 1995).

Shared cognition and performance

An important hypothesis that has emerged in the organizational literature concerns the connection between shared cognition and performance. It has been proposed that variance in performance, especially in teams, could be related to differences in the extent or degree of shared cognition (or, more specifically, knowledge) among organizational members (see Cannon-Bowers et al., 1993). There are several distinctive literatures in organizational theory that contribute to our understanding of the relationship between shared cognition and performance (Mohammed & Dumville, 2001). The literatures in question include those focused on mental models (Cannon-Bowers et al., 1993; Klimoski & Mohammed, 1994), information processing (Stasser & Titus, 1985), transactive memory (Wegner, 1987), group learning (Argote, Gruenfeld, & Naquin, 1999), and cognitive consensus (Brehmer, 1976). Over time, research in these areas has conceptualized shared cognition as similar, overlapping, compatible, or complementary knowledge or belief structures that represent features of the context such as task-specific knowledge, task-related knowledge, knowledge of team-mates, and attitudes/beliefs (Cannon-Bowers & Salas, 2001). The basic argument of these literatures is that shared or overlapping knowledge and/or belief structures support several capabilities that enhance organizational/team effectiveness and/or efficiency, including alignment of expectations that permit smoother and more rapid coordination of behavior (mental models), access to an expanded pool of information needed to solve problems and perform tasks (information processing and transactive memory), enhanced creation of new knowledge, thus enabling innovation (group learning), and faster agreement around problem definitions and strategic decisions (cognitive consensus; see, for discussion, Mohammed & Dumville, 2001).

The research reported in this paper follows the tradition of the cognitive consensus literature, which defines consensus as similarity among group members regarding the way in which key issues are defined or conceptualized. Cognitive convergence may be viewed as a process that enables consensus. The consensus literature highlights the important role of power and politics in the negotiation of

cognitive consensus and the implications of power for team performance (Walsh & Fahey, 1986). Power struggles among coalitions on a team can threaten common goals and interdependence, and they also generate distrust, which in turn may create barriers to the sharing of knowledge such as exclusionary behavior. If exclusion is systematically related to cognition (e.g., always excluding people with certain characteristics), there could be cognitive ‘blind spots’ that affect performance (Wooldridge & Floyd, 1989; Weisband, unpublished, 1989). Under such conditions, it has been postulated that divergent beliefs held by members of different coalitions may converge toward a consensus if that serves the parties’ mutual interests. At present, there is little empirical data that sheds light on the process by which group members negotiate to reach such a consensus (Mohammed & Dumville, 2001).

Shared cognition can only improve performance up to a point, after which too much similarity in knowledge structures may detract from performance (Cannon-Bowers et al., 1993). For example, if innovation and/or change are required, too much similarity in knowledge structures can limit creativity and adaptation. Too little diversity in cognition may lead to the potentially dangerous condition known as ‘groupthink’ (Janis, 1972), which can seriously jeopardize performance and even survival. In addition, differences in cognition may reflect specialization of knowledge that is needed to perform tasks. Therefore, optimal performance in a given situation often will require a delicate balance between cognitive convergence and divergence. As a result, shared cognition should be assessed along at least two dimensions—cognitive convergence and cognitive divergence—and examined as a function of the relationship between the two.

The importance of divergent knowledge is highlighted in the global transfer of technology, both within firms and between them. Technology transfer is relevant to our discussion, since GDTs (including the one in our case) often serve as the vehicles for such transfers across organizations and cultures (see Gluesing et al., 2003; Riopelle et al., 2003). Several decades of observation suggest that the cross-cultural transfer of technology requires a process of *recontextualization* in which the social and organizational knowledge components of technology³ are modified to enable an effective ‘fit’ between the technology and its new context, both internal and external to the firm (Brannen, Liker, & Fruin, 1999). The process of recontextualization is supported by the incorporation of context-specific knowledge that diverges from the knowledge initially embedded in the technology by its original designers (see, for example, Brannen et al., 1999). Without such an adjustment, the misalignment between technology and context can give rise to serious performance problems (as seen in the case study reported here).

Equivocal research findings

Despite the theoretical elegance of the arguments that link shared cognition to performance, empirical research has not demonstrated a consistent relationship between the extent or degree of cognitive similarity or overlap in a group and that group’s performance. A review of the literature related to mental models by Cannon-Bowers et al. (1993) found several empirical studies that provide support for the proposition that sharing and/or similarity of information or knowledge are related to effectiveness (see, for example, Hammond, 1965). A number of other studies did not support this proposition, however. For example, Adelman et al. (1986) manipulated the extent of overlap in team members’ mental models, but they were unable to demonstrate a positive relationship between the degree of overlap and

³All technology embeds knowledge, both from the natural and physical sciences (e.g., tools, equipment, and systems) and from the social and organizational sciences (e.g., work methods and practices, business strategies, also known as *social technology*; see Tornatzky & Fleischer, 1990). While many technologies rely primarily on either physical or social knowledge, even physical technologies involve some degree of social and organizational knowledge (i.e., for operations, maintenance, and repair; see, for example, Orr, 1990).

superior performance. Stout et al. (1990) also failed to find a significant relationship between measures of convergence in mental models and selected dimensions of team performance. Cannon-Bowers et al. (1993) interpreted this inconsistency as the result of problems in the definition of shared knowledge, with the implication that a necessary dimension of the construct had been omitted from consideration. Mohammed and Dumville (2001) postulate that the reason could relate to an overemphasis on shared or overlapping cognition, and an underemphasis on complementary or divergent knowledge that may be required for performance.

The literature on strategic decision-making has reported similar inconsistencies in studies of cognitive consensus and performance among top management teams. While many theorists emphasized the importance of gaining consensus around strategy, empirical research failed to find a consistent relationship between consensus in top management teams and organizational performance (see, for review, Dess & Origer, 1987). Ensley and Pearce (2001) also failed to find any direct relationship between shared strategic cognition and organizational performance. Wooldridge and Floyd (1989) suggest that inconsistency in results might relate to the role of unrecognized factors in the strategy process, including scope (who participates), content (what decision-makers agree about, especially means–ends relationships), and commitment (whether understanding is accompanied by a firm stance related to support of the strategy).

More recently, Gibson's (2001) investigation of simulated top management teams found that positive relationships between efficacy-related cognition and performance were less consistent at the group level than at the individual level. Several factors appeared to mediate the relationship between these variables, including task uncertainty, interdependence, and collectivist values. When task uncertainty was high and both interdependence and collectivism were low, efficacy-related cognition at the group level was not related to performance. This supports the notion that the cognition–performance link is mediated through other variables. Alternatively, it is possible that inconsistent results may have been found because both convergence and divergence were not considered simultaneously and in relation to one another.

Shared cognition and task interdependence

Several authors have noted that the degree of shared cognition required for performance is contingent on or mediated by the nature of a task, especially task interdependence⁴ and complexity. Varying levels of task interdependency are associated with other features such as the task environment and internal and external coupling, which together with interdependency characterize a task's level of complexity (Bell & Kozlowski, 2002). Variations in task interdependency and complexity, in turn, have implications for team coordination, communication, and intra-team processes (Kozlowski, Gully, Nason, & Smith, 1999). Conditions of high interdependency and complexity require more elaborate and precise interaction among team members, which in turn could require considerable sharing or overlap of cognition related to task and team.

Significantly, Levesque, Wilson, and Wholey (2001) discovered that team members' mental models about a task and one another's expertise do not necessarily become more similar over time, but, in fact, may diverge. A decline in shared mental models might be related to increasing role differentiation in a group over time, and to a subsequent decrease in interaction. This finding also reinforces the notion that the relationship between shared cognition and performance is mediated by variables such as task

⁴Workflow arrangements have been characterized in the literature as a continuum of interdependency, moving from pooled/additive (low interdependency), to sequential, reciprocal, and finally intensive (high interdependency; see Thompson, 1967; Van de Ven, Delbecq, & Koenig, 1976; Bell & Kozlowski, 2002).

interdependence and group interaction. If a group's task allows or requires members to develop specialized expertise so that they can work independently of one another and assemble the products of their labors via some other coordinating mechanism (i.e., not shared cognition), then there is a reduced need for knowledge sharing or mutual understanding, and we might expect cognitive divergence instead of convergence. This pattern of increasing task specialization and decreasing interdependence may be more common in temporary task teams where people simply do not have enough time to negotiate a common understanding but nevertheless have to get the work done (Goodman & Wilson, 2000). In such a setting, cognitive divergence may be more functional than convergence (see, for example, Myerson, Weick, & Kramer, 1996).

Organizational Context

The Contexts of Knowing

Company

Celestial Corporation (fictitious name) is a *Fortune* 500 firm that manufactures and sells products for consumer markets all over the world. Over its history, the company has usually enjoyed strong profits and has been widely admired for its excellence. Celestial is headquartered in the United States, and has large regional divisions in North America, Europe, Latin America, and Asia. About half of its employees are based in the United States, with another third in Europe and the remainder in other regions. The company's products are sold in retail establishments in over 100 countries. Celestial is thus dependent upon retailers' cooperation for its success. One of Celestial's largest retail customers is a traditional French-based firm called Voila (also fictitious), headquartered in Paris, with retail outlets worldwide. For each of its major global retailers, Celestial established a cross-functional team dedicated to strengthening and maintaining its customer relationship. Such teams typically were located in proximity to the customers' headquarters.

Global Restructuring

During the 1990s, Celestial experienced increasing pressure from rising global competition in its markets around the world. Threatened with declines in market share and profits for some of its major brands, the company engaged in rethinking its strategy. A key outcome of this process was a plan for global restructuring, called 'Global 2020.' This plan would transform the firm's traditional geographical and functional structures to make them fully global with respect to product manufacturing, marketing, and services. One component of the plan involved the globalization of Celestial's major customer relationship teams, including the Voila-dedicated team. This team would be transformed from one that was essentially Franco-centric to one that was global both in terms of the composition and location of the core team, and its scope of responsibility. The creation of a globally distributed team to serve Voila was made possible by the rapid evolution of telecommunications technologies during the late 1990s, and the increasing availability and/or falling cost of communication tools such as videoconferencing, electronic meeting systems, knowledge repositories, workflow tools, and a suite of other options. To address escalating cost pressures, Global 2020 envisioned a downsizing of 15 000 employees over the next 6 years, and by 2003 the company had indeed eliminated about 8000 positions.

Economic Environment

During the late 1990s and early part of 2000, the economic picture in the United States was dominated by a technology boom fueled in part by the Y2K frenzy. Consumer markets in the United States and Europe were strong, while Asia was experiencing the effects of a long-term recession. Older line companies such as Celestial were challenged by the rhetoric of a 'new economy' that in some ways was threatening to their established way of doing business. This external environment inspired the appointment of a CEO at Celestial who espoused internal revolution and culture change. Making 'breakthrough' was encouraged, while business as usual was frowned upon.

Time

Data for the reported study was gathered between mid 1999 and late 2000.

Data and Methodology

Our focus is on a globally distributed team (GDT) based in a *Fortune* 500 corporation headquartered in the United States, with manufacturing and sales operations around the world. This team was one of six global/virtual teams that were studied longitudinally between 1993 and 2001 using a combination of qualitative and quantitative methods. The focal team was studied for 14 months in the 1999–2000 time frame. This focal team's primary goal was to create and execute marketing strategy for one of the corporation's major global customers and, in so doing, to improve the business relationship with that customer such that, in the long run, sales and profits for both companies would be improved. The multifunctional team had 20 members distributed across seven locations, including Paris (nine members), Brussels (five), the U.S. headquarters (two), Caracas (one), Hong Kong (one), Thailand (one), and Tokyo (one). With respect to nationality, eight members were French, five were American, four were Belgian, and one each were English, German, and Italian. Functional roles on the team included customer business development, customer relations, merchandising, regional sales management, finance, information technology, logistics, marketing, and organizational development/human resources. Table 1 provides detailed information on the geographic distribution of functional roles and nationalities.

Since the initial goal of our investigation was to explore the process by which cognitive convergence unfolds on a GDT over time, it was necessary to adopt a range of methods that would permit us to follow the activities of the teams longitudinally. We relied upon multiple methods of data gathering, including direct observation of face-to-face meetings and videoconferences of the full GDT or its subgroups; listening in on teleconferences; interviewing individual team members (both face-to-face and virtually, using video and audio technology); collecting team documents (charters, presentations, surveys, reports); being included in e-mail distribution lists, which permitted collection of some e-mail communication; and participant observation (i.e., we worked actively on one of the GDT's subgroups dedicated to global communication processes). Interviews focused on the ethnohistory of the team; the team's purpose, leadership, structure, communication patterns, and use of technology; and changes in any of these dimensions that took place.⁵ A key informant (insider) on the GDT helped us maintain contact over time by providing information on dates, times, and logistics for team meetings and

⁵Whenever possible, we tape recorded meetings and teleconferences to provide a verbatim transcript of the dialogue. In a few cases, tape recording of certain meetings was not permitted due to the sensitive nature of information under discussion. In these cases, two researchers or one researcher and one key informant took verbatim field notes. These notes were then combined into a single typed transcript of the proceedings.

Table 1. Global team member composition

Team origin	Nationality	Location	Role
Original	French	Paris	Regional manager (Europe) ^a
Original	French	Caracas	Regional manager (Latin America) ^b
Original	French	Paris	Merchandising
Original	French	Paris	Information technology
Original	English	Paris	Customer relations
New global	American	U.S. HQ	Team leader
New global	American	Tokyo	Product family management
New global	American	U.S. HQ	Organizational development
New global	American	Paris	Marketing
New global	American	Thailand	Regional manager (South Asia)
New global	French	Hong Kong	Regional manager (North Asia)
New global	French	Paris	Logistics
New global	Belgian	Paris	Finance
Merger	French	Paris	Customer business development
Merger	Italian	Brussels	Human resources
Merger	Belgian	Brussels	Finance
Merger	French	Paris	Information technology
Merger	German	Brussels	Logistics
Merger	Belgian	Brussels	Marketing
Merger	Belgian	Brussels	Customer relations

^aThis role was assigned to the former French team leader, Henri Couture.

^bOn the original team, this individual was co-located in Paris; he was assigned to Caracas when the global team was reconstituted.

teleconferences. This individual also provided information about what was happening in the team context and about what transpired at meetings when we were not present.⁶

Data analysis

Data presented in this paper reflects a global level of analysis (DeSanctis & Poole, 1994); that is, it focuses on the team as a whole and its ethnohistory as viewed from the team members' perspectives.⁷ Drawing on multiple sources of data, we constructed a narrative ethnohistory, the backbone of which is a time line running from the period surrounding the team's formation, up through the present. The data is configured around this backbone in a way that recounts the story of the GDT over time, as reflected in team members' accounts, supplemented by our own observations. We also integrate multiple forms of additional data (see, for discussion of the ethnohistorical mapping method, Baba, 1988). Included in the case study is an assessment of contextual factors that shaped the team's historical evolution. The goal of the global analysis is to understand objective changes over time (e.g., what happened each month in terms of team membership changes, technology deployment or implementation, primary tasks, critical incidents such as conflicts or crises), as well as changes in subjective states (e.g., what

⁶To counterbalance the degree of influence that the key informant (an American) had upon our data and analysis, we included a Francophone (JG) as a member of the research team, and systematically interviewed other members of the global team, including French members. In addition, one member of our research team (MB) spent 18 months working with Celestial in business units around the world, and in so doing gained a deeper understanding of the business context.

⁷We also analyzed data at the micro level, with a focus on team member interactions within specific settings, such as a teleconference or face-to-face meeting. Codes for interaction dynamics were constructed, drawing from the published literature (e.g., Bales' interaction codes; Bales & Strodtbeck, 1951), supplemented by our own observation and analysis of interactions during meetings. We do not present detailed results of micro-level coding here, since this data is most meaningful in the context of cross-team comparisons, which are beyond the scope of this paper.

was the emotional climate at different times, and what were perceptions of team members' interactions and attitudes toward technology). The global level of analysis helped to identify and reconstruct events that were not directly observable by our research team, and it facilitated validation of the data with members of the GDT.

In this qualitative study we assume that individuals are capable of verbally articulating their perceptions, interpretations, and what is known explicitly relative to the phenomena under inquiry (e.g., she can verbally indicate whether or not she understands something, and what that understanding is). Tacit knowledge is more difficult to articulate, but it can be inferred from behavior (see, for example, Orr, 1990). We assume that we can draw inferences from our observation of behavior regarding the extent to which cognition (i.e., understanding) and knowledge are shared in a group. For example, we can record and analyze interview texts and conversations to identify descriptive statements that reveal interpretations of meaning, and we can compare these across individuals or with a given standard. We can also observe behavioral interactions to identify agreement or lack of agreement regarding the interpretation of specific language, behavior, events and/or situations.

Natural History of a Globally Distributed Team

Here we present a narrative history of the globally distributed team from its inception in early 1999 to the departure of our research group from the field late in 2000. The chronology interweaves several streams of events, each of which relates to a distinctive set of contextual factors in different parts of the world. Each section of the narrative relates to one of the contexts, with the intertwining of contexts becoming apparent as we move gradually forward in time. The last context discussed is that of the global team itself, where each of the other contexts is fully manifested. Note that certain details (e.g., names) have been changed to protect the identity of the organizations.⁸

The American corporate context

The setting for this case study is a global reorganization at Celestial Corporation, an American-based *Fortune* 500 firm with manufacturing and sales operations around the world. Launched in the late 1990s, this reorganization (called 'Global 2020') established a fully global structure for product development and manufacture, product delivery, and internal services. The reorganization changed relationships between people and units on a worldwide basis, and was considered to be aggressive and ambitious. It was anticipated that 15 000 jobs would be cut worldwide over a 6-year timeframe.

One aspect of the globalization plan was formation of a few select global teams to manage relationships with Celestial's largest global retail customers. Each team would be responsible for creating and executing strategy that would lead to improvements in business results worldwide with respect to a particular retailer. This responsibility included work related to daily interaction with retail customers and long-range efforts aimed at improving the overall business relationship.

Traditionally, the relationship between Celestial and its largest retail customers had been characterized by zero-sum dynamics; if you win, I lose. The two parties would negotiate the wholesale price of goods, the range of goods selected for sale, the terms of retail offering to consumers, and other matters of trade. Antagonism sometimes developed during these negotiations as a result of haggling over

⁸The gender of one person in this case has been disguised at the request of that individual.

terms, and that occasionally led to a breakdown in the trade relationship. In the case of Celestial's largest France-based global customer, Group Voila, tension became acute. One individual commented: 'Voila couldn't stand Celestial.' This comment pertains to the relationship between the two corporate entities, not the individuals involved in the negotiations.

Towards the end of the 1990s, the relationship between Celestial and Voila became so strained that the French retailer threatened to cut off purchases of Celestial goods. Celestial deployed a special study team to investigate the matter, led by James Morris, a Celestial executive based at corporate headquarters. This executive's experience included several international assignments, and a very successful term as leader of another Celestial customer team for the North American retail firm Americart. During the mid 1990s, when Americart faced bankruptcy, Morris's team helped turn around the situation by implementing with the customer a new merchandising methodology known as Product Family Management (PFM).

PFM is an innovative system of management practices that creates a strategic business plan around specific families of products (e.g., food). PFM is grounded in detailed research about shoppers' purchases, practices, and preferences. A multifunctional team of experts from the manufacturer and the retailer leads the research and planning effort. Based on research data, the team designs and implements a store-level plan to offer product groups in ways that increase the volume of shoppers' purchases and their profitability. PFM requires close collaboration between the manufacturer and retailer, as well as cooperation across different functions inside both companies. Marketing, logistics, information technology, finance, production, and other functions must coordinate and collaborate effectively to successfully plan and execute the strategy.

The PFM approach improved business results for both Celestial and Americart (i.e., higher sales and profits for both), and also improved the firms' relationship. Previous to Morris's tenure as head of Celestial's Americart customer team, the relationship between these two firms also had been highly strained and antagonistic. The introduction of PFM required Morris to reorganize not only the customer relationship, but also the internal relations on his own customer team. These changes caused a prolonged period of turmoil at Celestial, as traditional functional leaders and reporting lines were transformed into flatter, multifunctional teams that included customer representatives.

Study of the situation at Voila convinced Morris that PFM was the solution for improving relationships with that retailer as well. In 1998, his recommendations for reorganizing the work of Celestial's Voila customer team were approved by Celestial's corporate leadership, and Morris was named head of Celestial's new global customer team for Voila. The primary goals of the global team were to work with Voila's corporate headquarters to set the terms and conditions of trade on a global basis, to solve problems related to the global supply of products to Voila, and to improve the overall business relationship between Celestial and Voila such that, over the long run, both firms would experience improvements in sales and profits. The principal strategy to reach the latter goal would be implementation of PFM at Voila.

By late 1998/early 1999 Morris was recruiting new talent onto the Paris-based customer team. One person he approached was an internal consultant, Cathleen Drummond, who had previously worked with him at Americart and was highly skilled at implementing PFM. She was now in charge of paper products in Asia, with an office based in Tokyo. Morris planned to have Drummond lead the PFM work at Voila. Morris also recruited a talented member of the organizational development group at corporate headquarters, who had a wealth of experience leading organizational change at Celestial. This individual, Geraldine (Gerry) Hanover, would serve as facilitator of global team meetings, and the consultant on human and organizational aspects of the change to PFM. Gerry and an academic colleague had conducted a detailed case study of PFM at Americart the year before, and it was thought that knowledge from this case could be transferred to the Voila situation. Gerry also had a thick binder of operating procedures documenting the working knowledge gained from Americart's experience.

The French customer context

The new global team was not established in an historical or cultural vacuum. There had existed previously a Celestial Voila multifunctional customer team of about 10 members, based in Paris, near the Voila headquarters. This team was comprised primarily of French nationals (plus one English member) who focused on selling products to Voila, conducting business in the French language exclusively. The team leader (Henri Couture) concentrated his efforts on the Voila headquarters, with regional managers directing sales activity in local areas outside France where Voila had stores. This Paris-based team, which had established a very good working relationship with Voila executives and others in Paris, had responsibility for negotiating the terms and conditions of sale with Voila, but this group did not create or execute global strategy. Over the years, the Parisian team had become familiar with several key individuals at Voila, and of customer operations in Paris and across Europe.

James Morris's new global customer team was built upon the foundation of the original team in Paris. Four of the original French nationals (including their team leader), plus the English member, continued to be members of the new global team. One of the original French members became the regional manager for Latin America. To this core, Morris gradually added eight new members (including himself). Five of these new members were Americans. One American was stationed in Paris, one became a regional manager in South Asia, while three others would remain at their home locations and commute to Paris only for meetings (Morris, Drummond, and Hanover). Also added to the new team were one Belgian in finance, one French national in logistics (both stationed in Paris), and one additional French national who became regional manager for North Asia. All of the regional managers were relocated to regional offices, and only visited Paris occasionally.⁹ Cathleen Drummond would continue to work out of her office in Tokyo, and essentially hold two jobs. The reward for her double duty would be a promotion to director level. Both Morris and Hanover had personal reasons for not relocating to Paris, but remaining at Celestial's U.S. headquarters (even though the new team's charter called for the team leader to collocate in Paris).

Table 1 shows the composition of the newly constituted global team and their geographical locations. The new team was larger than the original team, with 13 members. Like the original team, it continued to have a collocated group of French nationals (six) in Paris (plus one English and one American member), for a total of eight located near the customer's headquarters. In addition, the team's membership now included an extended global network of non-collocated regional managers (one each in Latin America (French), North Asia (French) and South Asia (American)). In addition, there were two Americans based at the U.S. headquarters, plus Drummond in Tokyo. In general, then, the French members primarily were clustered in Paris, while the Americans primarily were distributed over four locations on three continents. The new global team would conduct quarterly face-to-face meetings in Paris, and hold weekly meetings facilitated by audio, video, and data conferencing. Team meetings would be conducted in English.

An important difference between the original team and the new globally distributed team was the fact that the former did business following the French model, while Morris expected the latter to follow the American business model. The French tend to rely on long-term, personal relationships and networks for the conduct of daily business, and generally respect the organizational hierarchy for purposes of communication and coordination (Hall & Hall, 1990; Platt, 1996). On the other hand, some observers of American corporate practices have noted that U.S. businesspeople tend to be action-oriented and thus focused pragmatically on getting the job done; the organizational hierarchy may be more or less salient, depending upon corporate culture and the conditions at hand (Stewart &

⁹An exception was the regional manager for Europe. This position was given to Henri Couture, the original French team leader, and it was based in Paris.

Bennett, 1991; see also Carroll, 1988). Previously, members of the original team in Paris relied on their French team leader's personal contacts within Voila to carry out many business tasks. This individual, Henri Couture, had married into an 'old money' French family. Because of the close intertwining of business and social relations in France, Couture had developed many personal relationships with other elite French business leaders, including executives at Voila. In fact, he had attended school with some of the Voila executives. The French nationals on the Celestial customer team gained a sense of security and strength from Couture's personal contacts with Voila, which assured they would continue to get business done, even if things were not so good at the corporate level.

When anyone on the Celestial Voila team needed to meet with a Voila manager, Couture would call the appropriate person at Voila and set up the appointment. This was virtually the only way to access Voila's management; other members of the Celestial customer team lacked contacts with Voila's top managers. Even James Morris (who was Couture's boss) had to go through Couture to get an appointment at Voila. James Morris, like most Celestial executives, had no connections to the French elite, and did not speak French. It was well known that Voila managers preferred speaking French over English, making it very difficult to establish contacts on one's own if one did not speak French (or have pre-existing personal ties). Thus, Morris was dependent on Couture.

When Morris was appointed global team leader, the Voila business in France was doing well, accounting for 70–80 per cent of Celestial's Voila business worldwide. No one in Paris thought that the system was 'broken' or needed a fix. The three key Americans, however, shared a very American belief that good results can always be bettered. Gerry Hanover described Morris's stance:

Jim Morris is a person who is very experienced. He's pulled together multi-resource customer teams to meet the needs of the customer as they're known today and as they should be approached in the future. His approach places a lot of focus on breakthrough. Why don't I call him a pioneer, somebody who is not quite satisfied with the status quo.

Morris had big ideas for changing the way business got done with Voila, and he saw PFM as the vehicle for doing so. Morris wanted what, in the French view, were radical changes in the behavior of the Celestial global customer team members, and in the relationship with the customer. Voila was a traditional French firm, with a bureaucratic structure and functionally compartmentalized activities. But PFM required Voila to enter into a close partnership with Celestial that many in Voila's leadership believed was inappropriate (and potentially unethical). Voila believed that all suppliers should be treated equally, held at arm's length (especially Americans), and not given special privileges. Further, suppliers were not always held in high esteem in retail organizations, making close partnership difficult, as one French team member explained:

I could give you some stories about people (suppliers) visiting customers here in France, and not being physically hurt, but being really sent back, kicked back out of the offices of retailers, and I mean this is really true... in general, the French retailer is rude, and doesn't have any respect for suppliers... there is a kind of relationship that American people will have great difficulty understanding.

Another change required by PFM involved day-to-day customer interface. Just as Henri Couture controlled access to Voila's top management, each functional manager on the Celestial customer team had a more or less exclusive relationship with his or her functional counterpart at Voila. The quality of these relationships, resting upon carefully nurtured personal interactions, was the basis for Celestial employees' knowledge of the customer, and created a deep sense of self-worth. PFM would alter this interface, making contact with the customer more diffuse and multifunctional. A Celestial team with multiple functions would work across all of the same functions at Voila, opening the possibility that people from one function at Celestial would be working with people from a different function at Voila.

Such an arrangement was viewed as threatening by functional heads at Voila, since it would weaken their power and authority.

Leadership of the PMF effort posed another threat. As a PFM expert with eight years experience implementing the new technique, Cathleen Drummond would become prominent in directing the multifunctional team. In the past, only Henri Couture held the director title, and he was accustomed to being the undisputed authority. Having two directors on the team seemed to him like a loss of face, and potentially status and power as well. The Americans had not considered this to be an issue at the time Drummond was promoted. Yet, it is no wonder Couture was uncomfortable, given Drummond's explicitly stated goal. In her words:

We're trying to shift, I should say, it's my goal, and I think Jim is trying to do this too, and Gerry, to shift the team to a place where the main agenda we have with Voila is driven by the work that we do, not the relationships. Not because relationships aren't important, they're hugely important, it's just because more people can play if it's the work that [establishes] your value and your relationships. Because then, everybody can play, everybody can take the keys and go do work . . .

Drummond wanted to shift the focus of interaction between the two firms from 80 per cent relationship/20 per cent work (which she believed the original distribution to be) to 40 per cent relationship/60 per cent work. She believed this shift would enable women and minorities to play a stronger role on the team, since they could bring knowledge, skills, and experiences to the table even if they did not always have the advantage of elite social relationships to rely upon. It was Drummond's strong belief that, ultimately, such changes would strengthen business results.

At first, Couture responded to the arrival of the Americans on what formerly had been his 'turf' by simultaneously threatening to leave Celestial and attempting to negotiate an enhanced position for himself. Initial discussions with Morris succeeded in creating new responsibilities for the former French team leader as director of European operations for Celestial's work with Voila. It was even hinted that Couture might ultimately succeed his boss as overall global team leader. Ultimately, however, the speed with which changes were taking place, and their magnitude, overwhelmed his efforts to seize a key role for himself, and ultimately led him to resign from Celestial later on.

Interactions between Celestial's French and American people also reflected the long-standing macro-level tensions between France and the United States around American 'cultural imperialism'. American corporations have a long history of introducing not only U.S.-born products and services to France, but also organizational innovations such as management-by-objectives and cross-functional teams (and with these more and more English language terms). Some French people are less than enthusiastic about the 'invasion' of U.S. concepts, material artifacts, and language, expressing a national resistance to what they saw as a further incursion upon French culture. The introduction of PFM and other American ways of doing business were viewed by some as an instance of American (and English language) domination, as this French team member suggests:

. . . there is still . . . and this is probably coming from history, probably from the time where the goal here was empowering France . . . probably France is one of the countries where you still feel some kind of, I wouldn't call it anti-American but, still some kind of feeling that they are important, as important as the U.S., when you come from a cultural point of view, and they don't understand why the French is not a language that is recognized around the whole globe.

The Asian customer context

During the late 1990s, the economic recession in Asia, together with increasing competition, pressured the Voila organization in Hong Kong. The Voila leader in Hong Kong, Jacques Clement, called in an

American consulting firm to help re-engineer business processes to enable cost savings. The consultants told Clement about actions taken by Americart retailers several years earlier to turn around their financial difficulties, one of which was to work more closely with Celestial and to institute PFM with Celestial's help. (Recall that it was Jim Morris who led this work for Celestial.) Clement, intrigued by this information, met with Morris in the United States to learn more about Celestial's role in Americart's turn-around. As a result, Clement decided to run a small-scale test of PFM in the baby care product group. Although this test did not privilege Celestial, it did halt the decline in Voila profits in Hong Kong. This success renewed the debate within Voila regarding collaboration with suppliers, and whether such action violated Voila's sense of propriety. Clement asked the American consulting firm to incorporate PFM principles into their re-engineering work. He called this effort *Nourriture Excellente*.

Subsequently, Clement visited Americart's U.S. headquarters to meet with an executive there (David Hyde) who had been instrumental in implementing PFM. The two executives must have made a strong impression on one another, because soon after they met Hyde left Americart and went to work for Voila in France as their chief merchandising officer. Part of Hyde's agreement on joining Voila was that he and Clement would undertake a full test of PFM in Hong Kong, complete with Celestial partnership. This agreement was made with top executives at Voila, who wanted to see whether PFM really could deliver the kind of results Hyde promised, once implemented in a Voila retail store (but not in Paris, given the resistance of middle managers there).

David Hyde's arrival at Voila changed the situation for Celestial significantly. Morris no longer needed to access Voila through his French subordinate, Henri Couture. He could simply call Hyde, a fellow American with whom he had worked closely in the past. The two Americans became partners in an effort to change the way Voila related to Celestial, using PFM as the primary driver. Celestial would provide full support to the pilot, including help from an information technology expert (for shopper data analysis), and from Cathleen Drummond who would personally lead the PFM pilot, while maintaining her former position in Tokyo. Clement acted as local sponsor for the project.

The objective of the pilot, from Celestial's standpoint, was to demonstrate with hard business results the power of PFM. Only then would the Voila executives engage Celestial in a corporate-level partnership to implement PFM in Voila stores around the world, including those in France (or, at least, that is what Morris believed). Much was at stake for Morris and company, yet success was not ensured. There was no proven 'Voila approach' to PFM as Celestial conceptualized it. The details of PFM at any given retailer were contingent on that specific customer's merchandising structures and practices; implementation would vary dependent upon these context-specific factors. Thus, an understanding gained from the implementation of PFM at Americart could not be transferred intact to Group Voila because the two firms were organized differently. Rather, PFM had to be 'reinvented' in a French context, based on understanding the French customer's organization and consumers. Since Celestial had implemented PFM in the United States only, no one really knew exactly what to do or how to do it in a way that would ensure Voila buy-in. Drummond explains:

... we had no Voila approach per se; they weren't doing this work (at Voila) ... This is fundamentally work you have in your head and you know how to do. I had stuff I'd done at Americart, and so you know, to the degree that I could, if it was stuff I created for Americart, then I could doctor it up and use it for Voila. It was essentially helping them take this approach ... to try to get learning for David Hyde if he was going to be the champion for this work with the Voila Executive Committee ... He wanted to have some kind of general idea of, you know, am I going to have to turn the organization upside down to get this done, or can I just tweak it a little ... to get results, you have to learn enough about the organization, so ... I had a chance to learn about Voila.

David Hyde decided to keep the pilot 'off the radar screen' of resistant parties in Paris by providing his Parisian subordinates very little information about it. The effect was an American-based

communication network, in which Hyde maintained close contact with Morris, who was in constant communication with Drummond and Hanover. This network did not share much, if any, information with Voila middle managers in Paris. The middle managers, in turn, became uneasy about the pilot, and some of them started to champion an alternative to PFM—Nourriture Excellente (created for Jacques Clement in Hong Kong, combining elements of PFM with re-engineering methods). Some managers at Voila were convinced that Nourriture Excellente represented a less threatening ‘French way’ to get the same benefits promised by PFM. Nourriture Excellente shared one key component with PFM—exposing Voila buyers to research on consumer shopping patterns, enabling better buying decisions. Shifting to multifunctional teams or manufacturer–retailer partnerships was not required. With an alternative method to champion, Voila managers stiffened their resistance to the PFM pilot in Hong Kong, and promoted Nourriture Excellente as the way to go. Since French members of the Celestial global customer team relied heavily upon good working relationships with their Voila counterparts, they could hardly ignore such suggestions. As a result, the Celestial team in Paris was not supportive of the pilot in Hong Kong, as Drummond explains:

... [in Hong Kong] we had no organization, we had no infrastructure, we had no data, we had nobody who knew how to do the work except for me. We could not draw upon the global team here [in Paris] because what we thought we could draw upon turned out to be very dysfunctional. People here were not trying to support, and didn’t necessarily want, did not understand why this test was good for them. So we were pretty isolated in Hong Kong.

Yet, anxiety among French global team members mounted as they realized that the Hong Kong pilot might represent the future for Celestial. One team member commented:

... there was huge angst (on the team in Paris) about non-French people doing anything that would be considered breakthrough or doing anything that would be considered important with this French company [i.e., Voila].

This anxiety explains the seemingly contradictory reaction of Celestial’s French team members upon receiving information about the PFM pilot. Unlike Hyde, Morris did not try to hide the pilot from his team members. On the contrary, face-to-face and virtual meetings of the global customer team always included an agenda item on the latest developments in Hong Kong, even showing video clips of changes being made in the store display to boost sales. These reports invariably were greeted with polite questions, mild congratulations, and, once, applause. In these meetings, there was never a hint that French team members were anxious.

As a result of Morris’s efforts to enlighten his team, the French national members were learning about PFM. Everyone had access to the detailed case study of PFM as it had been implemented at Americart. This case was available on a Celestial website, and many of the French Celestial global team members had read it. The case study described PFM and its objectives, how it was implemented, its consequences for Americart, and the changes it required on the customer team and at the customer interface. Also, a second case study describing in detail the Hong Kong pilot was under preparation by Drummond, and was discussed at global team meetings. French team members gave input to this case during its creation. This case would support a first ever presentation by Celestial to new Voila store managers at Insead. In addition, the French nationals attended seminars presenting some of the product family ideas, and they also received informal reports from their French team-mate who was the regional manager for North Asia. Yet, as much as team members discussed PFM and compared it to Nourriture Excellente (and they did discuss it at every team meeting, and sometimes spent entire afternoons talking about it), there were lingering doubts about whether they all had the same idea in mind. One French team member commented:

I have a quite good understanding of what PFM means. I've been taught what PFM means. But the thing I don't know is, if what I'm thinking is PFM is the same that Cathleen for example is thinking of PFM?

Gerry Hanover agreed that people were learning and understanding, but that their ideas had not been fully integrated:

... as we're now learning, and people have commented, we've all been doing [PFM] in the way we understand it. In a vacuum. And so, it's not as holistic as it will be when we link our thinking together... [The vacuum relates] to people's mind-sets, as well as our internal behaviors that might have us think that the enemy is the person we're competing with in thinking power in the company.

Since team members in Paris did not participate actively in the Hong Kong pilot, their understanding of PFM probably did not advance as far as it might have if they were involved 'hands on' through direct observation and practice. Thus, it is likely that Drummond's expert knowledge of PFM differed from that of her Parisian team-mates. But it is also clear that the Parisians' knowledge was increasing.

The merger context

Anxiety regarding the PFM pilot test in Hong Kong might not have been so pronounced if not for another unanticipated turn of events: the merger of Voila and its major rival, Jardin. Jardin was a large French retail organization with globally distributed stores, similar to Voila. Celestial also sold goods through Jardin's stores, meaning that Celestial had Jardin customer teams operating in countries where Jardin stores were located. Celestial also had a Jardin Global Customer Team based in Brussels. The merger announcement meant that Celestial's Voila and Jardin globally distributed customer teams needed to merge too, and many of Celestial's teams did so immediately, including the two global teams serving the corporate customer (i.e., many local teams serving these two customers also merged). James Morris was designated leader of the merged Global Customer Team.

In all, seven new members were added to Morris's global team as a result of the merger, bringing the total number to 20. Two of these new members were French, based in Paris, bringing the total number of Parisian French on the team to eight. The other five were Belgian (three), Italian, and German, and all were based in Brussels. (See Table 1 for roles, nationalities, and locations of the new team members.) The merged global team now had a core of about 10 people in Paris (eight French), a smaller cluster of five in Brussels (Europeans of various nationalities), and a global network of five other French and Americans, all located singly with the exception of Morris and Hanover, who were collocated at the American headquarters.

Unfortunately, after Celestial's Voila and Jardin global teams merged, the European Union (EU) determined that additional time would be required to review the proposed merger from a regulatory standpoint. In fact, the formal merger was not approved by the EU until January 2000. This meant that for at least 3 months the newly merged Celestial Voila–Jardin global team could not operate as it would normally. Celestial global teams are responsible for understanding the goals and strategies of their customers, and building work plans that maximize sales and minimize problems in the exchange relationship. During the period of merger limbo, however, it was not possible to do any of this, since the future direction of the merged company was not clear. In the meantime, there were proprietary restrictions on information that could be shared between the companies while they were still separate legal entities. This created an awkward situation in which it was not clear exactly who at Celestial should be speaking to whom at the customer companies about what. Productive activity on the team in Paris thus ground to a near-halt.

To make matters more difficult, the merger of Celestial's global teams created a single merged team with double the number of people necessary. Each function (e.g., finance, information technology, marketing, logistics) now had two people: one from Celestial's Voila global team, and one from Celestial's Jardin global team (see Table 1). It was not at all clear whether two people were really needed for each function, especially since the customer's organization and direction were up in the air. The 'double heads' situation made many global team members nervous, since it could turn out that any one of them (except for Morris, Drummond, and Hanover, who held unique roles) might be deemed redundant and eventually asked to leave the team. Members of the merged team were eager to know whether or not they would have a permanent place on the team. Their concerns were heightened by the enforced idleness caused by the premature merger of the two global teams; team members worried that their failure to generate work products during this period would reflect negatively on them as individuals. These questions were especially urgent and anxiety-producing within the Celestial 'Global 2020' context, where 15 000 jobs were scheduled to be eliminated. People without a firm assignment under these circumstances might find out they had no job.

Jim Morris's response to European team members' worries about the merger was to advise them to work things out among themselves. He directed each team member to get together with his or her functional counterpart (i.e., from the 'other' customer team) and decide what functional work needed to be done over the near and intermediate terms, and, by implication, who would remain on the team. This laissez-faire direction was not a problem for people in functions such as information technology (IT), where there was so much work to do that they easily justified two people. In other areas of the team, however, things were less simple. In some areas, there probably would not be enough work to go around, so one person had to leave. It was not always clear who this should be, or where the person departing would go.

Some team members were very uncomfortable and unhappy with this state of affairs, and later described the situation as 'horrible', 'miserable', or 'a disaster'. One member commented that he and his counterparts felt as if they had been thrown into a bag, shaken, and left to see who would crawl out. For some individuals, this was a competitive situation that created anxiety and detracted from the possibility of collaboration across the team. Yet, these reactions were not communicated openly, either in virtual or in face-to-face settings, but were shared only behind closed doors. A French team member said:

... people were very concerned [about the merger], but they would never 'put their mouths on the table.' They were not doing that in meetings, they were doing it personally, in person-to-person conversations.

Meanwhile, Jim Morris was not in Paris often enough to help. He visited Paris for face-to-face meetings once every 2 or 3 months, and the rest of the time he was at headquarters in America or visiting regional markets. Jim Morris's absence drew this comment from one team member who worked in Paris:

... Jim has been remote. You know, the fact that he's not here, in fact, he hasn't been with anyone, he's by himself, has been a huge problem for us. And, ultimately, when the team was going through turmoil trying to figure out how to deal with this new customer, trying to figure out how we're going to organize ourselves, you had double faces on every function ... Not having a team leader present either as father figure, guide, counsel, authority, all the parts that our team leader needs to take ... none of this was happening ... The fact of him never being here meant that he never really got to know the people. And he doesn't know about that yet. He never met them personally, I don't know if he really understood exactly the work they were doing. And, if you don't know personally the work we're doing, I mean you really don't understand.

Morris's knowledge of the situation also was limited by interaction dynamics during team meetings, which were formal and tightly controlled. Both Morris and Hanover expressed a sense of urgency regarding the limited time available for face-to-face and virtual meetings. Agendas often were rushed, with no time for protracted discussion. The team usually tried to cover a dozen or more agenda items in 2–3 hours, and Hanover carefully steered the discussion so that they could get through everything 'in time'. There was little diversion from the agenda, and little or nothing on the agenda that dealt squarely with the issues underlying French fears (e.g., the impending downsizing, the merger, and uncertainty regarding their own futures). People in French organizations may tend to expect 'open space' in meetings that encourages expression and exploration of people's ideas and responses (Hall & Hall, 1990). Due to the American's tight control over the agenda, however, the underlying issues were not acknowledged or addressed. In fact, the Americans believed (erroneously) that everyone was in agreement throughout much of the case, although Hanover later acknowledged that the time crunch prevented her from determining whether or not agreement had been reached.

This entire situation undermined the legitimacy of Jim Morris's authority in the minds of some team members. In a French organization, the top manager typically is expected to provide guidance to his subordinates, and does not leave them to work things out on their own. Further, here was the American Morris inviting the Americans Gerry Hanover and Cathleen Drummond to join the team when it was not clear whether all of the French people would have jobs. Meanwhile, Henri Couture was on site through it all. Couture did little to discourage the French team members from continuing to look to him as the legitimate team leader.

The global team context

Much to the surprise of the Americans, Voila's top executives did not respond favorably to the unveiling of the PFM pilot's results in Hong Kong, even though the pilot was a clear financial success. The reasons for their displeasure were unclear to the Americans, which is not surprising since the two groups rarely communicated directly. Some said that the test was not acceptable because, according to the French, it didn't teach Voila anything not already known. Others felt that the test was not acceptable because it was not conducted in France. Whatever the reason, the interest of the Voila executives in PFM waned, providing an opening for the Voila middle managers in Paris to push ahead with their plan to adopt Nourriture Excellente. They induced Henri Couture (just before he departed the scene) to sign an annual agreement with Voila that committed Celestial to collaborating with Voila on Nourriture Excellente.

The Americans (especially Morris, Drummond and Hyde), on the other hand, continued to be dead set against Nourriture Excellente, since they felt it did not go far enough in rethinking what is offered at a retail store. Open arguments broke out between the Parisian French and more scattered American members of the Celestial global customer team regarding what is 'real Product Family Management', and which of the two projects had the greatest potential for improving business results and being accepted by the customer. Each side tried to 'kill' the other side's project, using their contacts within the customer organization. David Hyde indicated his interest in 'killing' Nourriture Excellente at Voila, while Henri Couture reported that his contacts would 'kill' PFM in Hong Kong. There were also rumors that David Hyde was about to be fired because he was 'too American'. Both sides believed that they had superior knowledge of how to lead innovative business development with the customer. Cathleen Drummond had her 8 years of experience with PFM to draw upon, and Morris had led the Celestial–Americart team during implementation of PFM at that retailer. But the French team members in Paris claimed to have equally valuable knowledge of the Voila organization and the French consumer.

Everyone on the global team was feeling pressure to resolve the dispute over these competing projects before the next face-to-face meeting, to be held the following month. James Morris ordered the

French nationals in Paris to work with Drummond to figure out how to link their two projects together, and he gave team members a short deadline for reaching an agreement. The key parties arranged a face-to-face meeting in Paris to negotiate a resolution to their differences. The meeting was explicitly organized as a means to share knowledge and use shared knowledge to make a decision. Some of the 'non-aligned' parties (e.g., Belgians, other Europeans) were brought into the meeting to act as neutral observers and mediators. Drummond explains:

... the idea in December was, let's increase people's knowledge of both projects. And then maybe we can figure out a solution. So I talked about the Hong Kong work and Jim, who had been there, talked about the Hong Kong work, and then Henri who was still here talked about the Nourriture Excellente work... So the theory was, OK you get a number of people in the room who aren't aligned, who are not very close to either one of the projects, and if they hear about both projects, they'll help to facilitate a common understanding of what we're going to do about it. And it didn't work that way, because other dynamics in the team fell into it... [the other non-aligned] people didn't have ownership in either one of the projects, and they didn't have the knowledge to know which one was really better, so they couldn't use their intellectual capability, which they would have been happy to do...

This meeting demonstrated that there was no clearly superior approach, but there were two factions, each with power sufficient to result in a stalemate. Due to 'baggage on the table' (as Drummond put it), this meeting did not result in a 'solution', but participants did agree on an approach that might work in the long run. They agreed to continue both projects and attempt to merge them over time, and in the meanwhile to change the name of the Hong Kong project from PFM to Nourriture Excellente. Since Nourriture Excellente was a relatively new concept, it was believed that Celestial could influence or shape it to be more like PFM, but under the French name. It was agreed that Drummond would relate this plan to David Hyde and convince him not to kill Nourriture Excellente. At this point, no one knew for certain how the two projects would be merged in operational terms.

Early the next month, two members of the Celestial team (both marketing managers, one the sole American in Paris and the other a Belgian from Brussels) flew to Hong Kong to learn more about the PFM pilot. They were to develop a first-hand understanding of PFM, and transfer what they learned to the Nourriture Excellente project as it unfolded in Paris. In Hong Kong, these two joined Cathleen Drummond and the French regional manager for North Asia. This quartet worked on a plan that would allow PFM to be gradually incorporated into Nourriture Excellente, based on what all of them together knew about both projects. They also carried out their part of the agreement, and tried to persuade David Hyde not to kill Nourriture Excellente.

To report on progress, the foursome in Hong Kong requested a videoconference with their colleagues in Paris. The Belgian team member would lead the Hong Kong side of the call to avoid the impression that Drummond was dominating the interaction. On the Parisian side, the call was led by the young French successor-elect to Henri Couture (previously a member of the original team, assigned to the role of regional manager for Latin American). All of the key French team members were present (including Couture, who had not yet left Celestial). Gerry Hanover in the United States had difficulty establishing her video connection, as did the French, so the videoconference started 20 minutes late.

The video facility in Hong Kong was crowded and hot. It was in a room about the size of a closet, with a stationary camera and space for only one person to be seen on the monitor. It was difficult for the people in Hong Kong to see who was at the other end of the connection in Paris—only one face could be seen on each monitor, one in Paris and one in Hong Kong. (Gerry Hanover was plugged into the videoconference from the United States, but no one could see her.) The people in Hong Kong could not see that Henri Couture was in the video room in Paris, nor could those in Paris see Drummond, who became increasingly upset as the proceedings unfolded.

The call started with the people in Hong Kong asking their French colleagues to provide an update. Hong Kong learned that their French team-mates had revealed the plan to merge the two projects to the Voila middle managers. Not surprisingly, the Voila middle managers were dead set against the plan. They wanted PFM to end, and to proceed with Nourriture Excellente alone. In fact, they wanted to do a major market test of the hybrid method. This news set off a negative reaction in Hong Kong (the following conversation is reconstructed from interviews). ‘Why did you tell Voila about our plan? You knew they wouldn’t be receptive!’ demanded the Belgian marketer. Then, ‘We already considered the idea of doing a test of Nourriture Excellente, and rejected it!’ The French call leader tried to mediate: ‘Hold on, you don’t understand. Henri had a wonderful opportunity here, it was an opportunistic approach to dealing with the customer, working on Nourriture Excellente. Would you suggest that we not do that? And do you really think that the French organization doesn’t know what it’s doing? They’ve been working with this for a long time. Of course, they have lots of knowledge and if we can pull this together, we’ll be better off.’ Then Drummond came in, angry: ‘How could you have held these meetings with the customer and not involve me? I am the global director for this work!’ This was met by a contemptuous denial on the part of the young Frenchman leading the call in Paris, who viewed the comment as ‘pulling rank’: ‘You can’t even speak French so how can you expect to work with the customer? The customer doesn’t want to do PFM with you, so we don’t have a choice.’ Then, the French regional manager for North Asia broke in and attacked: ‘How dare you? How can you criticize when you don’t even know what it is? You guys need to come here and see for yourselves!’ The so-called ‘videoconference from hell’ drew to a close as Drummond left the videoconference room visibly distraught and on the verge of tears, determined to resign from the Celestial Corporation.

People remaining in the videoconference suddenly realized that something had gone terribly wrong, something that could damage their company and their own careers. Everyone understood how reputations are built and destroyed at Celestial, and, realizing they were in danger, became very interested in repairing the damage. Gerry Hanover quickly made arrangements to talk on the phone with each individual privately, and then to get the group back together to resolve differences. Over the next week, Hanover spent most of her time in telephonic ‘shuttle diplomacy’ that gained her access to the points of view of each participant, which she then shared with the others one-on-one. The anxieties and tensions that had been buried below the surface emerged as a result of this process, so that team members came to recognize the pressures and anxieties facing their colleagues.

A number of issues surfaced from this exchange. First, there was uncertainty and confusion over the nature of the work to be done and roles on the team. The globalization of the team, plus the merger, had brought several new people into the team setting, many of whom had potentially overlapping roles. It was difficult to resolve this issue while Voila was in merger limbo, since no one knew what the future customer organization would look like. As a result, the nature of the work that was to be done was unclear and unstable, as one of the Americans based in Paris explains:

At each of our team meetings, we would go through a redefinition of what the work was going to be . . . And we’d leave the meeting with a joint sense of future and promise and all the rest, because we thought we had a good idea what the work was going to be. And for whatever reason, you know, it would change again. And you know, people’s morale, I think there was a drop rate down to say probably nothing. And then we would have another meeting again, and we would redefine what the work was going to be . . . So each time the work would change, this co-work in the team would change and because of that, a constant state of flux . . . people’s understanding of what they, of what their role was going to be, how they were going to contribute, how to interact with each other, who is responsible for what, you know, the principles for how a team is going to run, projects, changed every seven or eight weeks.

It also became clear that much of the conflict during the videoconference stemmed from unresolved tensions around who was going to have power with the customer. Indeed, the two competing projects symbolized two very different ways of relating to the customer: one following the French tradition, the other, American. Drummond pointed out, for example, that Couture's successor had been introduced to the key Voila managers through a series of dinners arranged by Couture. Drummond, on the other hand, had not even been invited to meet the customer, much less go to a 'power dinner.' Thus, it seemed to her that some individuals had privileged access to the customer, and in the French tradition they certainly did. The PFM approach encouraged power sharing, while the traditional approach maintained exclusive hierarchical rights to this power.

Another problem was a question in the minds of some team members regarding Drummond's role on the team. Many in Paris viewed her not as a 'real team member', but peripheral to the team, doing work on the other side of the world that involved virtually no one based in Paris. For her to suddenly claim that she needed to be involved in meetings with the customer in Paris seemed unreasonable. Drummond's legitimacy was questionable, especially because she had been added to the team during a period when some French team members either did not have a role, or still did not know what their role would be.

A major insight gained in the post-video discussions was that Voila was not ready for PFM. Of course, the French knew this all along and it was clear from the Voila middle managers' behavior, but the Americans would not accept it. The Americans believed that by proving the business superiority of PFM through hard results, they could virtually 'force' the French to agree. However, after all they had experienced, the Americans finally came to realize that the Voila managers simply were not at a point where they could accept such a radical departure from the status quo, regardless of business results. The Americans learned that they needed to slow down. Gerry Hanover comments:

... the other thing we discovered, and this is a big one, is we are way too fast. We've gotta walk before we can run, and the customer's not ready. We all know this, but it's not gonna get done by the top telling the top to do it. We've gotta get plans, and details, and engage a lot of people. And so, you know, this takes some of the pressure off rushing through these high-intensity phone calls, and thinking we agree, but not having time to check the agreement.

From her individual conversations with each party, Gerry Hanover was able to construct a holistic explanation for what happened. The explanation showed the role that each person had played in the incident, drawing attention to the responsibility that each had for repairing the damage and moving forward. In her own words, Gerry explains the process:

... it was piecing together the fabric, and the people know the answers, when you get it all together, you know what the overlap is, and playing that back to people about what the other one was saying, and to the credit of all of these people, they are principle-based, and they were talking to each other within a couple of days, and they were over it.

Chastened by their crisis and having a better understanding of the forces shaping their difficulties, the French and American groups came back together, first in an audio conference format (video was discontinued), and later face-to-face in Paris where they worked in earnest on a plan to connect the competing projects. The French and Americans now were able to work out a substantive agreement, with concrete activities and goals, for merging their two approaches under a new name—*Produits Exemplaires*—a negotiated term that brought together elements from both the French and American perspectives (*produits* is the French word for products, as in Product Family Management, while *exemplaires* is close to *excellente*, as in Nourriture Excellente). The joint French–American team agreed to conduct three projects under this new title. One project was called 'Changing Attitudes', and its objective was to improve the support and understanding of Voila people for *Produits Exemplaires*. Two people were named as co-leaders of this project: Couture's successor and Cathleen

Drummond, a first in Franco-American teamwork. The other two projects under Produits Exemplaïres were focused on the food product family, something that Voila was very keen to do. There would be two components, each on opposite ends of a continuum: one called 'Ready to Eat' and the other called 'Gourmet Cuisine' (symbolically reflecting the distance between American and French dining customs). There was laughing and joking all around when these projects were presented to the whole team at a face-to-face meeting. One French team member said: 'A second passion of Cathleen is cooking!' To which she replied 'Eating, forget cooking, it isn't necessary!' This brought on more laughter.

On reflection, a number of team members believed that the 'videoconference from hell' was a positive development, as comments from a French and an American participant attest:

... we had our famous videoconference ... from my point of view, it's a great thing that this happened. Because everybody was like rrrrr ... Everybody exploded, and then, you know we started trying to build something instead of destroying. So I think it is the best thing that happened on the team ... We are starting to get a team spirit, people joking, people talking to each other, and people get to know each other ... everybody has the feeling of wanting to find a common—common work, to do a common something. And we're very happy that this is happening, and I mean it's incredible the progress we have been doing in a month. (French team member)

... everything since then has been pretty much of a steady, you know, march upwards. It drove a very healthy round of meetings and discussions, thinking, good thinking from a lot of people ... And everyone's pretty happy with how that streams in. So the videoconference was the epiphany, it really is what drove this final work around what the team's gonna do and how it's gonna do it ... I think people really like each other. People have very positive feelings, which I think gets a lot of respect for each other on the team. (American team member)

Ironically, business results for Voila and Celestial had been strong during the entire period described above. After the Voila–Jardin merger was finalized, however, business results began to decline, largely as a result of problems experienced during implementation of the corporate merger (which finally was approved by the EU). Voila lost interest in any new project with Celestial until sales volume and profits improved. The Celestial team turned its attention fully to the problem of boosting immediate business results. This was a traditional area of work for everyone on the team, an area in which all of the team members had excellent track records. Everyone on this team was steeped in deep knowledge of the core business function of selling and marketing (that is why they had been selected as team members), and their shared knowledge in this domain was associated with high emotional energy, since lower sales meant fewer rewards. Shared knowledge had been shaped by many years of interacting with the larger corporate context of Celestial, which was heavily results-oriented all over the world, not only in the United States. As a consequence, the team members began to collaborate intensely, engaging in detailed discussions of core business issues, and using teleconferences as means to identify problems and create solutions that required cooperation across the team.

From this point on, the content and style of the team's virtual meetings changed from largely passive information sharing on a wide range of topics to an intense and exclusive focus on business results. Interaction dynamics reflected collaborative give-and-take, a higher content of problem-solving dialogue, and creativity. For example, during one virtual meeting, the team members invented, as a solution to an internal funding problem they were facing, a new template that would display comparative global spending data to senior management. In a lengthy discussion on how to assemble quickly the data for this template, someone on the team suggested that they use the team website as a means to share ideas and coordinate their activity. The website had been in place from the beginning, but had never been utilized as a team resource previously, primarily because the team as a whole had not been collaborative up until now. But things were changing:

... why don't we use one of the tools in the team space to have that discussion on ideas we can use? Would that not be a good way to do that? The chat room part of it, let's go ahead, let's dedicate the chat room, and then we can see other ideas and we can do some virtual brainstorming, OK?

'Excellent!' was the reply.

The team also displayed several forms of behavioral convergence. For example, Gerry Hanover read a book called *Mind Your Manners* (Mole, 1995), and as a result came to the realization that Celestial often tried to force-fit processes and methods from its American headquarters on to organizations and people in Europe, and that this may not be the best way to achieve performance gains. The team discussed this issue at a face-to-face meeting, the first time such a topic ever surfaced on a team agenda, and considered organizational approaches that would feel more natural to European members of the team. Another form of collaboration was the team decision to send subgroups that combined people from different locations to important meetings with the customer, specifically to encourage a shared understanding of situations and problems across sites. Probably the most significant form of convergence, however, was the decision to relocate Cathleen Drummond and her family to Paris, and to identify a new team facilitator who also would relocate to Paris. Finally, the global team charter was being fulfilled.

As our research team prepared to depart the field in November 2000, we said farewell to a team whose members were working together actively across time and space to develop plans for boosting business results with their French customer. Collaboration was a hard-earned achievement, based on team members' shared experiences:

... we have strength because we have been through a lot of pain, through a lot of frustration, up and down, and now we are ... [in] a period that allows you to start building, to start to have trust, and that is very important, to operate efficiently as one team ... (French team member)

Discussion

We now present an analysis of the case data as they relate to our two sets of research questions: (1) Is the globally distributed team an effective vehicle for knowledge sharing in an organization; what factors influence the process of knowledge sharing in a GDT? (2) Does cognitive convergence among members of a globally distributed team influence the team's performance; what factors influence the relationship between cognitive convergence and performance in a GDT? Responses to these questions generate propositions that may be used to inform future research.

The global team as a vehicle for knowledge sharing

Evidence of successful efforts to share and/or acquire declarative and procedural knowledge about PFM and its context were evident throughout the case. For example, team members read the documentation about PFM at Americart and attended seminars on PFM-related topics, special team meetings were devoted to discussing the Voila context for PFM, and the Hong Kong pilot was conducted in a Voila store. We conclude that both French and American team members acquired relevant knowledge, utilizing the global team as a vehicle to support this effort. Yet, despite the evidence of bidirectional knowledge exchange, there also were barriers to sharing within the team. For example, most of the Celestial French were excluded from the pilot, and thereby played a passive role in its development

and implementation, and certain aspects of the context surrounding it were not shared openly. These barriers suggest that the full requirements for knowledge sharing as described by Straus and Olivera (2000) were not met (e.g., observing others at work, and conversations that include problem solving, testing ideas, and resolving discrepancies), and that the knowledge sharing process was imperfect. As a result, significant cognitive differences persisted between the two parties (e.g., disagreement over whether or not the U.S. version of PFM was appropriate at Voila). Thus, while knowledge was shared within the team, there were continuing barriers to knowledge sharing, and resulting cognitive divergence ultimately led to affective conflict.

Factors influencing knowledge sharing: cognitive structures

We postulate that the physical and social interaction barriers to knowledge sharing observed in the case were not the cause but rather were a symptom of a deeper underlying divide within the team. This divide is rooted in two types of distinctive yet interrelated cognitive structures.

1. French and American culturally grounded beliefs about business models and practices contradicted and rejected certain aspects of knowledge held by the 'Other.'
 - *French beliefs.* The traditional French concept of the organization as a centralized, hierarchically managed bureaucracy with information flow carefully controlled at the top (Crozier, 1964; Evans, 1998) was contradicted by the American vision of a flat, cross-functional, semi-autonomous work group required for PFM. The French viewed as foreign many of the implicit assumptions embedded in PFM that carried overtones of American culture and identity—assumptions about the value of egalitarianism, teamwork, diversity, and the need for change. The foreign nature of these concepts is illustrated by the fact that, traditionally, there was no French word for 'team' outside of the sporting context (Gluesing, unpublished, 1995).
 - *American beliefs.* In a French organization, knowledge about a customer is embedded in highly valued, long-term social relationships connecting particular individuals across organizations. The Americans heavily discounted these relationships, believing them to be barriers to better business results. Due to this belief, knowledge about Voila held by French team-mates (and integral to the very relations that Americans wanted to diminish) was not highly valued by the Americans and, as a result, this knowledge was not sought out or fully integrated into American plans for PFM.
2. French and American evaluations of the appropriateness of PFM in France (i.e., phronesis) and, consequently, their conclusions about how much modification was needed for the new context (i.e., the French and American approaches to recontextualization) differed.
 - *French evaluation.* The Voila management judged that too close a relationship with Celestial would not be good for Voila, regardless of any potential improvement in volumes and margins. It was considered important that Voila as a customer maintain an arm's-length relationship with suppliers, in order to minimize the possibility of ethically questionable deals being struck between business partners. As a result, Voila sought significant modifications of PFM, some of which stripped away key features that the Americans believed were definitional.
 - *American evaluation.* Americans judged that PFM could be made suitable for use in Voila by 'tweaking' the technical details; they believed that proof of this strategy could be found in strong business results emerging from the pilot. They didn't really understand that the suitability of PFM would not be determined solely on the basis of instrumental rationality, but that it would also be judged by other forms of value rationality (for example, the quality of the Americans' relationships with French people in Voila, which were practically non-existent).

The presence of the cognitive structures described above meant that it was not possible for one party to share declarative or procedural knowledge about PFM or the French customer context without also transmitting implicit theories of business organization and a set of values that alienated the other party. It was not that the two parties did not share knowledge related to these cognitive structures. They shared, but they also disagreed. Indeed, the more each side learned about the other's intentions, the less they seemed to like what they learned and the more they distanced themselves from each other. As a result, there was an overt rejection of some aspects of knowledge held by each party, based on judgments that such knowledge had little or no value. The French rejected a close, multifunctional partnership, and the Americans rejected long-term, individual relationships. These rejections implicitly carried with them a refusal of the declarative and procedural knowledge associated with multifunctional partnerships and long-term relationships.

As the parties learned more about each other and consciously rejected certain forms of knowledge held by the 'Other,' they also began consciously to distance themselves physically and operationally from one another. Examples of avoidance of the other party include the placement of the pilot test in Hong Kong, rather than Paris; the Americans' resistance to asking the French in Paris for help with the pilot; Jim Morris's absence from the GDT offices in Paris; and Henri Couture's failure to discuss with the Americans the agreement he signed with Voila. These avoidance behaviors actually appear to have created new barriers to knowledge sharing.

Key findings derived from these observations

Two general findings regarding factors that influence knowledge sharing on global teams can be derived from this inquiry.

First, much of our knowledge—whether represented as declarative, procedural, or evaluative—is cognitively connected to beliefs whose external validation is based upon personal experience, intersubjective agreement, and/or social construction (i.e., non-'scientific' validation). These connections are rooted in two realities: (1) the nature of knowledge (i.e., 'justified true *belief*;' Nonaka & Takeuchi, 1995, p. 21—emphasis added) and (2) the nature of cognitive structure (i.e., complex networks of associations among cognitive schema that reflect pathways of memory based on lived experience). Much of our knowledge begins as personal belief that is validated through culturally appropriate processes. What functions as knowledge in our daily lives actually is personal belief validated through the social construction of reality. Often what we think of as knowledge is thoroughly colored by personal belief that has not been validated through systematic data gathering and hypothesis testing, as was the case with American knowledge of PFM.

These observations challenge some of the extant literature, which has a tendency to separate knowledge and belief into discrete categories with the claim that knowledge is objective and belief is subjective (Mohammed & Dumville, 2001; Cannon-Bowers & Salas, 2001). Although these categories clearly exist on the extreme ends of a continuum, we argue that an absolute categorical separation of knowledge and belief is overly simplistic and does not do justice to the complexity of the subject. The separation of knowledge and belief, both theoretically and methodologically, is especially problematic in studies of globally distributed teams because (1) many organizational practices that are transferred globally reflect combinations of knowledge and belief that are not easily separated (e.g., PFM, MBO, TQM) and (2) the meanings of declarative and procedural knowledge shift when crossing cultural boundaries, so that things that appear objective or 'accurate' in one context may take on a subjective complexion or be considered 'wrong' in another. American culture especially is prone to representing business methods as reflective of universal knowledge (Stewart & Bennett, 1991), when it would be more accurate to view methods as cultural constructions containing both context-independent (episteme) and context-dependent (techne, phronesis) knowledge.

A second general finding from our study is that evaluative knowledge (phronesis) may have a significant influence on the sharing and conversion of declarative (episteme) and procedural (techne) knowledge in a cross-cultural context. Phronesis (evaluative knowledge, or know-whether) reflects a judgment about choices, given certain interests. In this case, phronesis was represented in different evaluations about how best to recontextualize PFM. Each party created its own brand of phronesis, largely in isolation from the other, and the two brands struggled for superiority, based on differences in belief and self-interest. Yet each brand was flawed, in part because the parties rejected relevant domains of declarative and procedural knowledge that were necessary for a full understanding of the strategy and its context. Eventual collaboration between Americans and French to create a single unified phronesis produced better results than were realized when this schism existed. Collaboration required that all relevant knowledge of the strategy and its context—even that which initially had been rejected or had remained tacit or hidden—be brought to light and made explicit, and that available alternatives be openly considered. These observations reinforce the notion that teaming processes need to include ways and means to encourage the conversion from tacit to explicit knowledge on global teams.

These two findings suggest that in cross-cultural contexts the factors that are relevant to the sharing of knowledge in global work should be expanded to include evaluative knowledge, or phronesis, and the beliefs upon which it is founded. Evaluative knowledge may be just as significant to the process of knowledge sharing as declarative and procedural knowledge, and perhaps even more so, since phronesis appears to act in a manner analogous to a regulatory or control gene, determining whether other kinds of knowledge (structural genes) will be accepted (switched-on) or rejected (switched-off). In this case study the regulatory or control function of phronesis was apparent in the rejection of certain aspects of declarative and procedural knowledge based upon an evaluation that such knowledge was erroneous, obsolete, or irrelevant. The conscious rejection of knowledge was a prelude to avoidance behavior among members of the team, which in turn created new barriers to knowledge sharing. It may be that the construct *knowledge sharing* itself requires re-evaluation, since simple exposure to and comprehension of an 'Other's' knowledge (i.e., sharing) does not mean that the knowledge in question will be accepted as valid and integrated into a team member's cognitive structure. The process of sharing knowledge may lead to its rejection and to behavioral avoidance, with the result that cognitive structures actually diverge further. From these findings we derive the following propositions:

Proposition 1.1: Unacknowledged differences in evaluative knowledge and associated beliefs among members of a GDT may create barriers to the sharing and conversion of declarative and procedural knowledge (i.e., obstacles to cognitive convergence).

Proposition 1.2: Obstacles to cognitive convergence on a GDT may stimulate efforts to avoid interaction among individual team members.

Knowledge sharing and performance in a GDT

To address the question of the relationship between cognitive convergence and performance, we utilize criteria for team effectiveness developed by Hackman (1987, 1990, 2002) and Cohen and Bailey (1997). Although the GDT described in this case shares several characteristics with new types of groups defined as 'exocentric' (Goodman & Wilson, 2000), and it is thus not necessarily amenable to traditional team effectiveness measures, we argue that the traditional effectiveness criteria are appropriate in this study. First, team effectiveness has been one of the principal outcome variables used in the team mental models literature to assess the relationship between shared cognition and performance in a wide range of team types (Mohammed & Dumville, 2001). Second, team effectiveness is

appropriate as an indicator of performance in this case, since members of the GDT needed to achieve internal interdependence as a prerequisite to delivering short-term results (i.e., transferring PFM to Voila). Third, unlike some exocentric teams, the GDT in this case planned to remain together over the long term (and indeed, they are still functioning together at the date of this writing); thus, their internal interdependence was likely to influence their long-term goal of improving the business relationship with Voila.

According to Hackman (2002, p. 17), there are three criteria of team effectiveness:

(a) The productive output of the team . . . meets or exceeds the standards of quantity, quality and timeliness of the team's clients (and not based on the team's estimate of how well it thinks it did); (b) the social processes the team uses in carrying out the work enhance members' capabilities to work together interdependently in the future; and (c) the team's contributions to the well-being and growth of its members, allowing members to learn new things and to help their personal needs be satisfied.

Cohen and Bailey (1997) also identify three criteria of team effectiveness, including quantity and quality of outputs (e.g., customer satisfaction, innovation), member attitudes (e.g., job satisfaction, trust), and behavioral outcomes (e.g., turnover, absenteeism). Together, these indicators enable us to distinguish between cognitive convergence (an increase in shared understanding) and performance outcomes (team products, processes, and attitudinal and behavioral characteristics related to team-work, and learning).

In our case study there appear to be two distinct periods of performance in terms of team effectiveness criteria. The first period runs from Morris's construction of the global team through the point at which the Voila executives rejected the PFM pilot, resulting in the 'videoconference from hell'. The second period begins with the aftermath of the videoconference through the end of the case study. In the first period, using any of the criteria identified above, the team was not effective: outputs from the pilot were rejected by the customer; social processes (e.g., communication) resulted in the creation of warring factions and an incident of affective conflict that nearly caused the loss of the PFM expert; individual members' personal needs (e.g., job satisfaction and security) were not being met, and learning new things (e.g., about the French context) was impeded. Both attitudes and behaviors at the individual and group levels also suggested deficits in effectiveness (e.g., distrust of Morris, departure of Couture). Following the crisis, however, some of the effectiveness indicators began to turn around: collaborative work products were produced; social processes were altered to ensure sustainability (e.g., shuttle diplomacy was used; cultural factors were taken into account; Americans relocated to Paris); team members' personal needs were met (e.g., the PFM expert did not leave the company, but moved her family to Paris), new learning took place (e.g., Voila's lack of readiness to adopt PFM, French team members' anxieties), and several individuals expressed their satisfaction with the team's new directions. We conclude that team effectiveness began to improve in the second part of the case.¹⁰

During each of these performance periods there were distinctive patterns of cognitive convergence and divergence. In the first period, some degree of knowledge sharing and cognitive convergence was observed (as described previously), but there was also *increasing divergence* in some cognitive domains (e.g., how to modify PFM). After the video crisis, however, the pattern shifted to one of convergence in cognitive domains that had been divergent previously (e.g., everyone came to agree that

¹⁰The reversal of business results (global sales volume), from strong during the first part of the case when team effectiveness was declining, to weak in the second part of the case when effectiveness was improving, represents an ironic but spurious association. The team's effectiveness could only impact global sales volume over the long term; in the short term, the decline in sales was related to problems experienced as a result of the merger.

Voila was not ready for the American version of PFM); this led to a further increase in cognitive overlap. Thus, it appears that while there was cognitive convergence during both performance periods, an improvement in performance required that the *pattern of increasing divergence be reversed*, so that previously diverging areas also begin to converge.

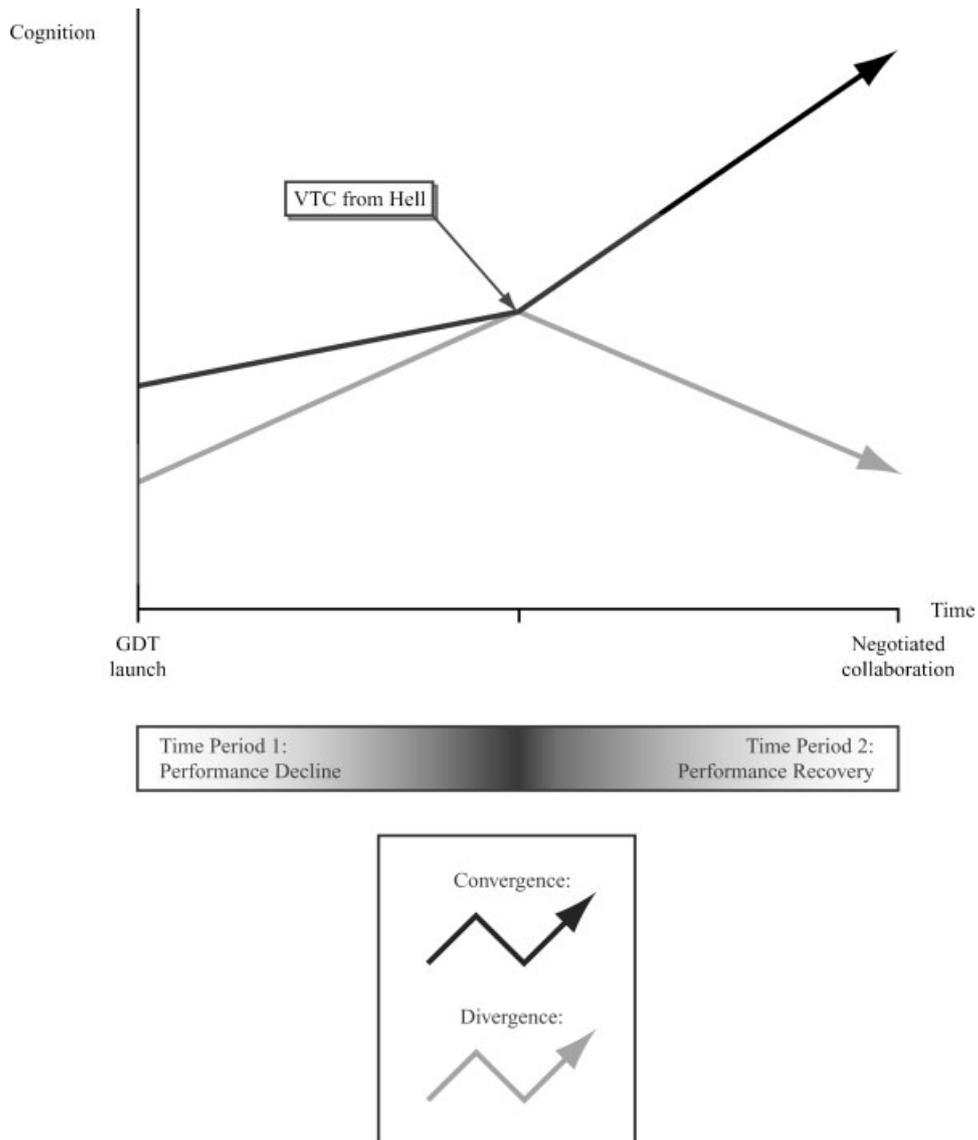


Figure 1. The relation of cognition and performance over time. Convergent (shared) cognition increased slowly during the first portion of the case (prior to the videoconference from hell). But divergent cognition also increased over this same period as team members disagreed about how to implement strategy. In the first time period, divergence led to affective conflict, and team effectiveness (performance) declined. Following the video crisis, convergence increased more rapidly as a result of tacit knowledge gained by both parties, while divergence decreased as team members negotiated a collaborative resolution of their differences. In this second time period, team effectiveness experienced a recovery. Thus, performance enhancement was associated with both increasing cognitive convergence and a reversal or decline in divergent cognition

This finding is consistent with results reported in the literature, which suggest that increases in shared cognition *alone* are not sufficient to explain performance improvement (here modeled as team effectiveness; Cannon-Bowers et al., 1993; Mohammed & Dumville, 2001). Patterns of cognitive convergence *and* divergence should be considered simultaneously. Further, as seen in the case, knowledge sharing alone may not be sufficient to alter patterns of cognitive divergence; other factors may be involved. We now examine what those factors might be.

Factors influencing the relation of shared cognition and performance

Several states/events occurred during and after the crisis on the team (or the point at which team effectiveness shifted from its lengthy decline to a marked trend toward improvement) that may represent factors influencing the relation of shared cognition and performance, or otherwise are missing from the cognition–performance equation.

Parallel or similar experiences in a common context

Knowledge sharing is often flawed on a GDT due to factors inherent in the nature of globally distributed work (e.g., physical distance, differences in culture). But there are other ways to gain a common understanding across divergent parties that do not rely on knowledge sharing alone. One of the most important of these is convergent or *common experiences* in a shared context (D'Andrade, 1995). Such experiences can support parallel learning processes that enable two groups to derive the same conclusion in a given situation, even though they did not draw this conclusion as a result of sharing knowledge with each other. In the present case, French and American members of the global team had two critical experiences that created new knowledge and resulted in a further convergence of their understandings toward a point at which improvements in team effectiveness became possible. First, the Americans learned that their approach to recontextualization did not work (i.e., Voila executives rejected the successful pilot), leaving them without clear next steps and thus open to alternatives. This *experience* taught the Americans something that their French colleagues already knew—the U.S. version of PFM was unacceptable to Voila regardless of business results—bringing the parties' viewpoints closer together. Second, both sides had *parallel experiences* demonstrating the self-defeating nature of factional conflict. The video crisis proved that their partisan struggle did not 'work' (i.e., it did not lead one side to be declared the winner, and instead made them all losers). Both parties learned this lesson simultaneously, not through knowledge sharing, but through parallel participation in a crisis experience that helped to create similar cognitive structures across the team. Recalling Nonaka (1994), both parties justified (or not) their beliefs toward the truth through their *own actions*, not by relying on one another's knowledge. An implication here is that convergent experience in a similar or parallel context could serve as a substitute for knowledge sharing, enabling cognitive convergence in cases where direct knowledge sharing is not possible.

The connection between common experience and performance has two interrelated aspects. First, common experiences may enable parallel learning processes, leading to convergence in cognitive domains that have been inaccessible previously (i.e., what had been stubbornly divergent finally converged—for example, the Americans admitted they could learn something about Voila from the French). Second, as a result of cognitive convergence in these domains, there can be an alteration in social processes—for example, the Americans gave more weight to the French point of view through more open discussion and debate in meetings, and a greater French role in decision-making. These changes in cognition and social processes led to enhanced team effectiveness (e.g., a willingness to continue working together, improved attitudes about working on the team, and the retention of the PFM expert). These observations give rise to the following propositions:

Proposition 2.1: Cognitive convergence among individuals on a GDT may be facilitated by separate but parallel or similar learning experiences in a common context.

Proposition 2.2: Convergence that is facilitated in this way contributes to further knowledge sharing and conversion on a GDT.

Surfacing hidden truths through knowledge brokering

Shared cognition also may be created through the discovery and validation of knowledge that previously had been hidden from non-collocated actors. Such discoveries need not take place through direct knowledge sharing among initial parties, but may be made possible by mechanisms such as *knowledge brokering* (i.e., third party intervention that enables one party to access knowledge about a second party that previously had been hidden from view). As seen in the case, members of a global team may deliberately hide information from one another (e.g., Parisian discontent with the team leader), or some members may make assumptions about remote colleagues that simply are inaccurate due to a lack of information (e.g., everyone is in agreement with a decision). These realities can lead to flawed understandings that affect performance. In the present case, for example, the Americans' limited understanding of their French colleagues' subjective state (which was hidden from view for various reasons) led them to underestimate the seriousness of the split within the team. This hidden knowledge surfaced through a process of knowledge brokering—a mediator (i.e., Hanover, who was on the video call but did not participate in the conflict) accessed the hidden knowledge and shared it through one-on-one conversations.

Klein and Kleinhanns (2003, p. 396) and Sole and Edmondson (2002) also have reported incidents of knowledge mediation through a facilitator or another third party in distributed work situations. These cases suggest that members of globally distributed teams may often have difficulty accessing obscure knowledge in remote locations, leading to erroneous beliefs (divergence) that stymie team effectiveness. Brokers in the cases intervened in two different ways: by making tacit knowledge explicit inside the existing team, and by adding a new member locally who held knowledge of the remote context. Additional cases could reveal other forms of knowledge brokering. From these findings, we derive the following proposition:

Proposition 3.0: Knowledge that is hidden from remote GDT members may be surfaced by knowledge brokering mechanisms involving third party intervention.

Shifts in agent self-interest and the negotiation of task interdependence

The recontextualization of ambiguous tasks in a global context presents opportunities for agents (i.e., one empowered to act for another; Scott, 1998) to structure tasks in various ways that are aligned with their own interests, but not necessarily with the interests of those they represent. In our case, the agents were the global team members, who were empowered to act for Celestial. These agents' interests diverged along factional lines (and away from the interests of Celestial), with each faction manipulating a key task (i.e., the transfer of PFM) as a means of jockeying for power in competition with the other. The divergence of the agents' interests was shaped by multiple political agendas, including each factions' competing desires to control access to the customer, their leaders' quests for personal power and independence from one another, and the distant but still salient politics of globalization. We postulate that Franco-American tensions at the macro level exacerbated the divergence of interests, since it is through globalization that American business priorities and methods (e.g., PFM) pressure French organizations to undertake changes that are culturally discordant, while also signaling American business dominance, something that is particularly galling to the French.

In response to these political realities, the American and French agents took the path of restructuring the task to increase the degree of specialization required, thereby reducing their mutual interdependency

(e.g., Morris redefined the task as one that Drummond could direct more or less on her own; Couture resisted this power move by also redefining the task as one that would be done with Voila, but not the Americans). Such redefinitions reduced the need for social interaction across the two factions, allowing them to avoid one another, while also serving each faction's multiple political interests and agendas.

The two factions were locked in competitive combat until the 'videoconference from hell' changed the orientation of agent self-interest on the team. As team members experienced this near-disaster that could carry significant career penalties all around, their factional interests self-destructed and individual interests came to the fore, motivating parties to shift from seeking gains for their faction to preventing losses for themselves as individuals—perhaps a more compelling form of motivation. It was only when self-interest was released from factional allegiance that individuals became free to reorient their interests toward the global team as a whole and alter their mode of interaction to one that was more collaborative.

Paradoxically, agent self-interest had to shift down one level (faction to individual) before it could shift up two levels (individual to global team). This shift in self-interest, and the cognitive convergence that accompanied it, proved key to the agents' ability to negotiate a consensus around their task. Before the shift, all team members embraced the abstract goal (or end) of improving corporate relations with Voila (if only to end zero-sum bargaining). But they did not agree on the *means* that should be used to achieve this end. The crisis proved to the agents, through their own experiences, that *both the end and means of their task were interdependent*—in this case, the end was not possible without an interdependent means. For the first time, the team members embraced a fully shared goal with respect to strategy. This development opened the way for a virtuous cycle of increasing cognitive convergence, negotiation, and collaboration.

Negotiation itself represents a special kind of convergence or consensus. In negotiation, the parties 'redefine the terms of their interdependence' such that each is able to reach its goals more readily than they could have independently (see Walton & McKersie, 1965; Shapiro & Von Gilnow, 1999). The parties come together not because their viewpoints have become identical, but because they have found that an agreement suits their interests better than continuing opposition. Each party gave up something (factional supremacy) to get something more (career protection). In this process, the parties might draw nearer to each other cognitively (they understand one another's interests better), but they can also maintain their distinctive viewpoints, which could reflect a continuing difference between their interests. This is one way in which a balance between convergence and divergence is created through negotiation and the emergence of a consensus around task interdependence. From this discussion, we derive a proposition:

Proposition 4.1: The alignment of team members' self-interests may motivate interdependence and trigger negotiation processes that result in cognitive convergence.

The literature on shared cognition and performance generally does not recognize the potential for deliberate manipulation of task structures to suit self-interested agents. Rather, there is a sense of determinism, as if the nature of a task is fixed and, once established, has more or less inevitable consequences for team interaction and cognition. Yet, as described in the case, the means–end relationship embedded within a task can be a moving target, changing its configuration over the course of the narrative. Initially, the task goal (end) was interdependent, but the means was structured to be much less interdependent and more specialized (a form of structuration; see McGrath, 1984; DeSanctis & Poole, 1994). Later on, the means was restructured to be more interdependent, as a result of a negotiated consensus. What this suggests is that the degree of interdependence displayed by a given task may be internally complex, dynamic, and emergent, and, as a result, task interdependence may not always be a straightforward mediator of cognition and performance in a global team. Low task

interdependence may not mean that the need for shared cognition is low, but rather that power and agency are at work. We propose that tasks are especially vulnerable to manipulation by agents when analyzability is low (i.e., they are characterized by vague and poorly conceptualized problems; Perrow 1967) and technology (especially social technology, such as management methodology) is being transferred across cultural boundaries for the first time. When these conditions are in place, agents have a great deal of room to maneuver, since the new knowledge that is needed for recontextualization cannot always be predicted in advance. Agent manipulation should be expected in global team settings where one party is the 'donor' of technology to the other, and there are cross-cultural differences in the level of familiarity with a given technology.

The difficulty surrounding structuration of ambiguous tasks in a global context may be contrasted to the relative ease with which global team members collaborated around tasks designed to improve sales volume during the business downturn. These tasks were more highly analyzable and not recontextualized; the methodology for sales enhancement and measurement was globally standardized at Celestial, team members were all experts in the method, and there was little ambiguity around who did what. The meaning of these methods did not change in crossing a cultural boundary, but remained stable, with difficulties having been worked out long ago. This task also galvanized team members around a shared interest—team rewards that are linked to sales volume. A set of propositions may be derived from these observations:

Proposition 4.2: Tasks characterized by low analyzability, especially those associated with the cross-cultural transfer of technology, may give rise to a lack of consensus among GDT members about means–end relationships embedded in the task.

Proposition 4.3: A lack of consensus regarding such means–end relationships embedded within a task may motivate agents to deliberately restructure the task in order to reduce interdependence, with resulting barriers to cognitive convergence.

The foregoing discussion suggests that the role of task interdependence as a mediator of shared cognition and performance is a theoretical ideal that may be realized in practice, but that also may be subverted by agents. In the latter case, increasing task specialization may indeed lead to reduced interaction and convergence, but the performance effects realized from this configuration may be negative rather than positive, especially when team leaders and members do not agree on means–end relationships associated with a primary goal or task. When task ambiguity is high, power and agency may complicate the role of task interdependence and weaken its force as a mediating variable. A proposition may be drawn from these considerations:

Proposition 4.4: Increasing task specialization and related cognitive divergence may be associated with performance declines when there is a lack of consensus among GDT members on the means–end relationships embedded within a task.

The geopolitics of leader behavior on a GDT

Our discussion of task interdependence brings to light another set of factors that were influential in the process of cognitive convergence on a GDT. These factors are related to the geographical patterns of team members' distribution on the ground, and the way in which leaders exploit geography to further their own political agendas. The entire discussion below highlights the salience of external relations in shaping internal interactions and performance on a GDT (Ancona & Caldwell, 1992). Each of the two factions on the global team was bolstered by its proximity in space to two distinctive but roughly equivalent centers of power: one in Paris near the Voila headquarters and one in the United States

at the Celestial headquarters. In each case, the factional leader had strong historical and cultural ties to his respective power center, and these leaders used their power center affiliations to create what we call *power clusters*—concentrations and/or networks of people and resources tied together by linguistic, cultural, and historical ties—which the leaders manipulated in support of their own interests. Couture's power cluster was concentrated in Paris and included links to Voila; he mobilized Francophone allies within this cluster to advance his interest in maintaining authority. Morris's cluster was distributed across the U.S. HQ (Hanover), Asia (Drummond), and Paris (Hyde), and he likewise utilized his authority to establish and maintain linkages among these Anglophone colleagues as a means to overpower Couture and further his own agenda. That the factional struggle lasted as long and went as far as it did reflects the more-or-less equivalent balance of power between these clusters throughout much of the case. It is possible that the existence of two roughly equivalent power clusters within a global team establishes prime conditions for conflict over the short term, as each vies for dominance. A proposition related to these observations is as follows:

Proposition 5.1: The existence of two more-or-less equivalent power clusters on a GDT may lead to the formation of factions and conflict, which in turn may detract from interdependence and cognitive convergence among members.

Ultimately, Morris's power trumped Couture's, causing the latter to leave the team. Morris outranked Couture (he was the equivalent of a vice president), meaning that he was able to hand-pick team personnel, locate projects almost at will, and fly around the world to any location whenever he chose. Morris also spent a good deal of time at corporate headquarters, arguing his case before his superiors and peers, who backed him almost without question. These advantages, which Couture could not match, enabled Morris to establish and maintain a far-flung Anglophone communication network that spanned three continents. An apt metaphor might be a kind of colonization—from Celestial's U.S. headquarters, Morris was able to 'colonize' Voila strongholds in Asia and Paris with his own people, meaning that his power base was truly global, while Couture's was confined primarily to France. French 'colonization' was much weaker; the Francophones had regional manager outposts in North Asia (but this individual ultimately joined those supporting the PFM pilot) and in Latin America (but this individual ultimately rejoined the group in Paris as Couture's successor). Thus, while Morris's scope of influence was global, Couture's was largely place-bound. As a result of this growing imbalance, Couture felt that he was losing face, and so he withdrew. This did *not* mean that Morris's faction won over Couture's. What it did mean, however, is that the power struggle, which was driven by the two leaders' personal competition, lost steam, allowing team members to work things out among themselves. It is significant that the successful negotiation of a consensus on means–end interdependence took place largely in the absence of the two key leaders. Couture left the team (and the company) after the crisis, and Morris then stayed out of the way. The resulting reduction in competition between power holders whose personal struggle did so much to foster distrust on the team also may have facilitated the negotiation of task interdependence. Two propositions are:

Proposition 5.2: GDT leaders with globally networked power clusters may out-compete rivals whose power clusters are more locally bound.

Proposition 5.3: The ultimate emergence of a victor among rival GDT leaders will lessen pressure for factional allegiance and contribute to team interdependence and shared goals, which in turn will enhance cognitive convergence.

A related factor may be the historical process by which the team was formed, and the patterns of diversity that were reinforced as a result. This global team started out as a collocated Francophone group in Paris with a long-term leader. When the team was reconstituted along global lines, the core of this Francophone group (and its leader) remained in place. Over several months, a rival leader gradually added non-collocated members. Arguably, the new global team actually was comprised of two subteams: the original collocated group (mainly francophone) and a new layer of members (mainly anglophone) who were more globally distributed and owed their allegiance to a separate authority figure. This process of global team formation—reconstituting a long-standing collocated core by adding a distributed network on top of it—may create its own interaction dynamics that breed dissension and conflict. Conflict may be especially likely when the process of team development reinforces other pre-existing dimensions of diversity within the team (e.g., geographical location, language, culture), creating bright fault lines of correlated differences that are more likely to crack under pressure (Lau & Murnighan, 1998). A final proposition is:

Proposition 5.4: Creation of a GDT by adding a distributed group to a previously existing collocated core may contribute to the formation of factions, a lack of shared goals, and resulting barriers to convergence, especially under conditions in which these two subgroups are differentiated by culture, language, and leadership.

Conclusion

We set out to explore two issues concerning the relationship between cognition and performance: first, whether globally distributed teams are an effective organizational structure for knowledge sharing; and second, whether shared cognition improves global team performance. To these questions we respond with a qualified yes. Team members based in different cultures can bring together divergent bodies of knowledge whose integration yields new organizational capabilities, but only after they recognize both the existence and the validity of their differences. Shared cognition in a global team context means more than simply exchanging declarative and procedural knowledge. It means suspending our own judgment as we learn the cultural logic and rationality of others' divergent beliefs and values, while also allowing those others to call our own beliefs and values into question as they learn about us. The creative power of such inquiry, derived from open exploration of *all* of the knowledge we possess and its generative potential for recombination, provides a boundless source of organizational innovation.

As we are confronted increasingly with new forms of work organization that unite people from different cultures, our constructs and theoretical models need to evolve in a way that enables us to handle the added complexity (Goodman & Wilson, 2000). Our study suggests that we should take care not to be too culture-bound in our conceptualizations of cognition and knowledge going forward. As we have seen, different judgments of propriety (i.e., phronesis) were at the base of the difficulties experienced by the global team, yet these differences never appeared on a formal meeting agenda because they were not deemed sufficiently 'business relevant' (i.e., based on declarative or procedural knowledge). While scientific knowledge holds great power in our Occidental society, we are not alone in the world, and for much of the world science and technology are no more important, or perhaps even less important, than human values.

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