PRINCIPLES OF HIGH-PERFORMANCE VIRTUAL TEAMS

PART ONE

Working Collaboratively

To begin the path toward high-performance virtual teams requires an understanding and appreciation of the fundamental principles of effective virtual teams and collaboration and the environments that enable it. The chapters on the topic of working collaboratively describe the how and why of organizing, creativity, trust, sensemaking, culture, leadership, and other facets related to working virtually. Chapter One looks at the fundamental problem of virtual teams, crossing boundaries, and discusses a wide array of boundaries that create barriers separating team members, including geography, time, discipline, company, and culture. The creative potential of a virtual team depends on how well members can share their knowledge across those boundaries. When well done, the sharing creates opportunities for leveraging the knowledge of individuals and creating new perspectives and solutions. Chapter Two extends the theme of achieving synergies across boundaries by presenting ten fundamental principles for enabling the team to achieve high levels of performance over time. The principles are accompanied by practical steps that can be taken to create the conditions for excellence.

chapter
ONE

A Framework for Working Across Boundaries

Michael Beyerlein, Jill Nemiro,
Susan Beyerlein

90% of team failures are caused by support system problems.

S. Mohrman, S. Cohen, and A. Mohrman (1995)

80% of the value of using teams comes from between the teams.

S. D. Jones and D. J. Schilling (2000)

Mohrman, Cohen, and Mohrman (1995) and Jones and Schilling (2000) independently claim that individuals who collaborate in teams do not always achieve their goals. In fact, there are many causes of poor performance (Jones & Schilling, 2000). Often mediocrity is taken for granted, as many teams have little awareness or understanding of what constitutes optimal performance. Consequently

there is no investment in improving the effectiveness of the commonly agreed on critical success factors needed for team success—elements such as team structure and process, team skills, shared understanding, and the varied support systems that provide facilitative organization contexts for team activities.

This handbook addresses a number of these requirements; however, this chapter focuses specifically on those that are crucial for virtual teams that operate by necessity across the boundaries of time, space, and culture without the benefits of real-time face-to-face interaction. This chapter provides a framework of key principles that addresses the challenges in working and collaborating successfully across boundaries. Practical suggestions and tools are included to assist virtual teams in assessing their current level of effectiveness on each of these dimensions and developing strategies for using this information to improve their boundary-spanning efforts.

THREE CHARACTERISTICS OF COLLABORATION

Before discussing this framework specific to virtual teams, it is important to examine the nature of collaboration in general and provide a rationale for investing in it. Collaboration, as formally defined, has three main characteristics. Katzenbach and Smith (1993) in their popular book, *The Wisdom of Teams,* provided six necessary ingredients to effective teamwork, including urgency of purpose and shared goals. By extension, collaboration (an operationalization of the popular understanding of teamwork ushered into our consciousness by Katzenbach and Smith and others) occurs when individuals work together toward a shared goal, completing the work is dependent on relationships with a purpose, and individuals working together in purposeful ways toward a shared goal are committed to one another's success.

Achieving each of these characteristics of collaboration takes sustained commitment on the part of team members. First, ownership of shared goals does not happen without intentional and effortful communication among members. In other words, absence of or lukewarm efforts toward mutual understanding for whatever reasons may leave members grappling individually with different work goals and, as a result, experiencing loss of that concerted power to act that comes

with consensus decision making and a shared and energizing vision of what can be achieved. Instead team members may unwittingly find themselves with competing frames of reference, differing purposes, confusion about what needs to be done and how it can best be accomplished, interpersonal misunderstandings, and ultimately performance decrements that belie why they came together in the first place. Thus, there is a clear business case for doing the hard work of communicating from the outset in order to reach shared understanding and agreement on process and outcome goals, as well as strategies and tactics for accomplishing them before getting too mired in the work of the team.

In a somewhat different vein, in the mid- to late twentieth century, before widespread engagement in virtual teaming, work in teams (or groups, as they were called then) often focused on leveraging social relationships among members as a success factor rather than simply attending to the stated purposes of the work (that is, the task case for working together). Paying attention to group dynamics in addition to performance targets, without the advantage of the rich body of knowledge on team effectiveness available today, tended to dilute team efforts toward product quality (team success) rather than strengthen them. However, by definition, *relationships with a purpose* in team settings refers to members who are highly committed to working together to achieve outcomes they believe they cannot achieve alone. This idea, of course, goes back to the cave dwellers, and it can be argued in numerous epochs and echelons since then that there is tangible value in this belief because it promotes survival and in team settings contributes to cohesion (that is, "we are all in this together and for a good reason") and thus momentum toward purposeful, collaborative (and, ideally, financially rewarding) action.

Third, a by-product of working together for a shared purpose is often a commitment to one another's success rather than a singular focus on taking care of oneself at the expense of others—the latter a sure-fire formula for poor team performance. Commitment to others' success tends to be a function not only of familiarity (that is, time spent on task and in informal gatherings outside work, which tend to break down cultural barriers and increase interpersonal comfort levels; see Chapter Twenty-Eight), but also of awareness among team members that "another's success is my success," captured in the now somewhat trite TEAM acronym found on posters: "Together We Achieve More." Taken together, these three characteristics of collaboration send the message that no on can go it alone,

as in traditional Western approaches to work and life; rather, one's success (or lack thereof) is intimately tied to the efforts of one's fellow teammates and perhaps soberly captured by the notion from the midcentury European Gestalt tradition that we perceive the whole as different from the sum of its parts (Wulf, 1996). We would prefer to say *greater* as the phrase has been restated in popular lore in that, indeed, collaborative efforts represent a significant investment of time and energy and should therefore pay significant dividends, but this is not always the case. Furthermore, in virtual team settings, distance complicates the equation with cultural differences and other constraints that potentially separate members, making the investment of all members all the more critical.

CROSSING BOUNDARIES

Attempting collaborative work arrangements in today's world is an incredibly complex and challenging endeavor. Team members are often distributed across company sites around the globe. The geographical spread of facilities and people brings with it enormous diversity, cultural and otherwise, including a host of different perspectives, languages, goals, doctrines for getting the work done ("this is how we do things around here"), trade and governmental sanctions, permitting venues, management styles, natural resource and supply chain infrastructures, legal channels to effective business practice, attitudes toward worker board participation, and many other potentially divisive features, including perhaps too frequent political upheavals and terrorist acts in host countries. Virtual teams may have the advantage of avoiding the ground skirmishes, but nonetheless, like their brick-and-mortar cohorts, face many of the same challenges at a relentless twenty-four-hour workday pace.

Taking an organizational perspective, Mankin and Cohen (2004) have captured the complexity of these contexts for doing business collaboratively with six continua:

From	To
Simple	Complex problems
Well defined	High task uncertainty
Two people	Multiple people
Lots in common	Diverse perspectives

Common goals	Different goals
Face-to-face	Virtual

Moving from left to right on each of these dimensions creates circumstances that generally make collaboration more difficult. This handbook addresses the complexity of the face-to-face/virtual continuum, which, by virtue of its nature, holds or contains the tensions of the other five. Thus, problems such as the following are likely to emerge in both traditional face-to-face and virtual work settings:

- Product development that is too slow
- Reinventing the wheel from one situation to another
- Stifled creativity
- Stress that takes its toll
- Team performance that falls below expectations

Therefore, why is collaboration so difficult? In virtual settings, the answer seems to be a function of the boundaries that need to be spanned in order for effective sharing, idea generation, and use of knowledge to take place. A boundary is, by definition, a delimiter, a condition that defines and identifies who is in and who is out. Boundaries separate the system from its surroundings, control in-flow and out-flow, protect the team (or seem to), require management (for example, specifying who owns the boundary and has the ability to manage it), create a division between units, and represent limits of known or recognizable quantity, area, and scope. The term *boundary spanner* in management circles refers to the legitimate and necessary role of the manager in communicating beyond the unit borders with upper management or other outside policy holders and stakeholders for the purpose of ensuring the unit's survival through positive press, brokering needed resources, and involvement in a host of other activities on the unit's behalf.

Throughout history, a boundary has been considered an organization design tool; a fence to keep members and nonmembers (nonhuman intruders as well) in or out in all levels and types of organizations; a social construction of class warfare, entitlement, or good breeding; fodder for turf battles all the way from neighborhoods to nation-states; unspoken rules for staying in one's place or politely circumventing uncomfortable or politically incorrect topics of discourse

or conversation; uniforms and other visible signs of authority; government and corporate regimes that prohibit free access and management of its citizens' rightful inheritance (for example, the airwaves); the center aisle in Washington and other great capitals of the world where elected officials strive to reach across in bipartisan fashion; and finally, the delimiters in one's own mind that keep individuals from stretching themselves and achieving more. These are all boundary conditions of enormous scope and significance that have an impact on human life, sometimes without our awareness and often without our consent. This is not an exhaustive list but perhaps an interesting one concerning how individuals may bounce up against any subset of these boundary conditions in their daily lives as others not mentioned. Some are of one's own making, and others are thrust on individuals as members of the societies (defined very broadly) they inhabit.

In transgressing boundaries, one (or one's behavior) is sometimes labeled out-of-bounds. In traditional organizational societies, including the family, this often results in sanctions of varying severity or duration, for example, docking of pay, grounding (as in teenagers), or a disapproving look. However, by its very nature, collaboration always involves crossing boundaries. This first requires recognizing the various delimiters as borders, borderlands, walls, membership requirements, or limitations. Boundaries limit the flow of essential inputs and outputs such as people, information, materials, ideas, and energy. Individuals who exist on the boundary (that is, at the margins of the organization or society) are usually those best suited in temperament and interest to comment on the status quo, often a high-risk activity in itself, or take the practical actions necessary to step into foreign territory and create something new. In other words, for teams to leverage local resources, boundaries have to be opened up so flow is permitted, valued, and supported. It takes courageous individuals to do this.

In recent decades, crossing disciplinary boundaries has created new sciences such as biochemistry and information genomics; traversing boundaries between product and service groups has created integrated solutions for taking care of customers, thus expanding customer bases worldwide; crossing company boundaries has created rich opportunities for knowledge and technology transfer as well as more formal collaborations such as joint ventures and strategic alliances. Each of these boundary crossings has likely involved individuals who are fully committed to doing the hard work of communicating with one another other, risking venturing into uncharted territory and all the ambiguity this entails, sharing their

tangible product and process knowledge and skill as well as the very human desire to be involved in creative work for the sake of new possibilities, and turning these assets into successful shared outcomes that can later provide the impetus for further innovation.

On a more practical note, members of virtual teams can benefit by identifying the boundaries that may limit their progress toward successful boundary crossings. The following boundary conditions may impede the attempts of virtual team members to collaborate on projects:

Individual Boundaries

- Gender
- Age
- Discipline
- Identity (who are we?)
- Ethnic background
- Personal (differing tastes or preferences)
- Native language
- Preverbal (unable to articulate hunches)
- Theoretical framework
- Ethical
- Historical (differing experience with virtual teams)
- Individual (assumptions, values, biases, goals, styles, and so on)

Technical Boundaries

- Differing technological systems (such as differing computer systems)
- Technical language

Spatial/Geographic/Environmental Boundaries

- Time (different time zones)
- Geography (distance, political environment)
- Country (such as restrictions in sharing technical knowledge with defense implications)

- Economic
- Culture (differing country value systems)

Task-related Boundaries

- Task (different understanding of what is to be done)
- Skills (consider differing skill levels)
- Project (such as assignment to multiple projects that compete for one's time)
- Resources (for example, some members have plentiful and some have scarce support and resources)

Organizational Boundaries

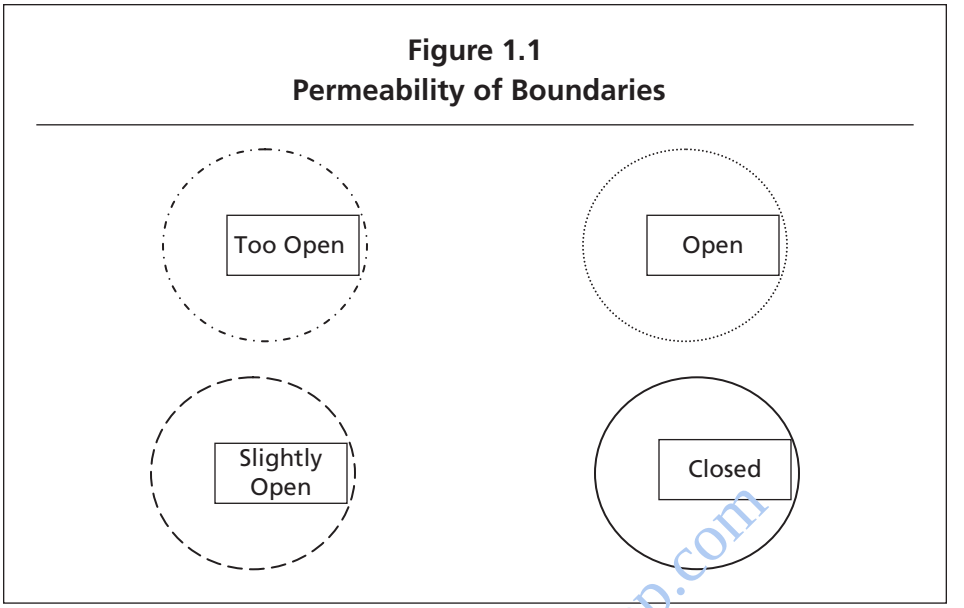
- Culture (differing company value systems)
- Departmental (differing local politics)
- Company (restrictions in sharing proprietary knowledge)
- Control or authority (who is leading what?)
- Hierarchical (status differences)
- Institutional (competitors, regulators, supply chain)
- Political (whom do I trust?), organizational (vertical and horizontal)

Although this list is somewhat exhaustive, it is not intended to be overwhelming. Rather, treat the items as a checklist to identify the top three, four, or five boundaries that one's virtual team needs to explicitly address. Questions to facilitate team member discussion include the following:

- How is this boundary affecting the team's ability to work together to achieve its goals?
- Is something extra needed to make crossing each of these boundaries easier?
- What can be done to reduce the barriers represented by this boundary condition?

Figure 1.1 illustrates boundary permeability as a reality that affects the ability of virtual teams (and brick-and-mortar units) to span boundary limits and form new configurations. *Permeability* is defined as the degree to which matter (using the biological paradigm at the cell level) can pass through the cell (or unit) walls

Figure 1.1
Permeability of Boundaries

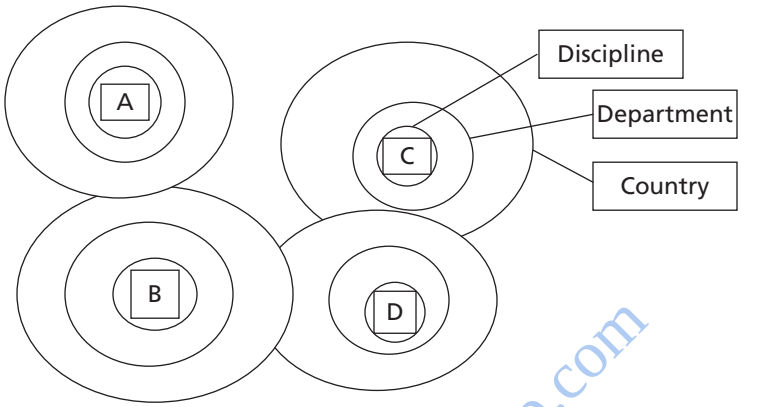


and is represented as a continuum of four conditions: too open, open, slightly open, or closed. For example, an organization can control membership by adding or deleting requirements that applicants must meet—minimal requirements may allow too many to join whereas excessive requirements may prevent good candidates from joining.

It is important to note that there is no optimal condition. Boundaries ideally fluctuate in degree of openness depending on the level of permeability needed by particular task requirements. In fact, it is useful to think of permeability as a condition that can be actively managed for success rather than a stable constraint. Figure 1.2 illustrates the early stages of a four-member team that is embedded in separate discipline, department, and country silos but is beginning to build a shared culture through learning about the members' differing work contexts.

Managing boundaries is an inherently complex process with a number of discrete operations. One can recognize, maintain, close, open, cross, reform, change, destroy, or merge boundaries. The choice of operation and the effectiveness of action determine whether the boundary will be managed in a way that promotes excellence or mediocre performance. The most suppressive boundaries are those that are not recognized, are invisible, or are taken for granted. There is a tendency to assume that one's own local conditions apply to all other members on the team

Figure 1.2
Four Team Members Inside Silos:
Beginning to Build a Shared Culture



and therefore that there are no boundaries that need attention. This tendency, known as silo thinking, is in fact another boundary.

Traditional functional organizations tend to encourage silo thinking. Individuals are placed in separate departments with discrete tasks that require little cross-boundary communication. Silo thinking is also characterized by the attitude that one's department or team (one's silo) is superior to other units. Silo thinking tightens boundaries that restrict teamwork and productivity, thereby placing unnecessary restrictions on work and resources flow and knowledge sharing. Silo thinking leads to mistrust and conflict between teams, and as a result, opportunities for creativity, learning, and collaboration are missed.

A FRAMEWORK FOR EDUCATING TEAM MEMBERS

One way that virtual teams can get past silo thinking is to create a framework for educating team members in working across boundaries based on the following principles:

Principle 1: Map out collaborative work structures and processes.

Principle 2: Craft a supportive culture.

Principle 3: Develop continuously evolving knowledge-sharing and management systems.

Principle 4: Define new roles for leaders.

Principle 5: Align and sustain support systems.

Each of these principles is discussed in detail in the sections that follow.

Principle 1: Map Out Collaborative Work Structures and Processes

Changing business conditions due to the impact of globalization have stimulated the invention of new forms of organization. Forms appearing in the past two decades include the team-based, flat, empowering, entirely virtual (no physical facilities), entirely outsourced, shamrock, networked, and old standbys such as joint venture, matrix, hybrid, and decentralized designs. Each of these and other forms are actually experiments in organizing that are being conducted on the business playing field around the world. Some of these experiments succeed, and some fail. When they succeed, copycats rush in to duplicate what the pioneers have created—for example, Dell's tailored assembly, Wal-Mart's supply chain management, and Nike's networked organization. The goal in each case is to create a sustainable competitive advantage through organizing elements of the business for high performance. Each of the forms of organization possesses some common features, including the need to span boundaries of one kind or another to create added value.

Organizational design options vary on at least four continua:

- Formal versus informal, which determines paths of communication
- Centralized versus decentralized, which determines the influence of local members
- Control versus autonomy, which determines the degree of empowerment among employees
- Silos versus links, which determines how work is handed off as task domains move downstream toward the end user

Within any of these organizational forms, the core characteristics of collaborative work design are the same: people have to depend on each other, share

information freely, and coordinate their efforts toward common goals. Organizing these collaborative units often means focusing on the factors that affect performance from within the team. However, performance in the larger work unit depends on integration across teams and work groups. In this process, the area between teams is often ignored. Mechanisms for integration across teams include:

1. Starpoints: members with specific responsibility for management tasks (such as safety)
2. Boundary workers: members with responsibility for linking across teams
3. Integration teams: groups of members from diverse teams who meet to coordinate cross-team activities
4. Liaisons: nonmembers who work to link a variety of teams or levels in the organization

Each of the four deliberately functions as a transboundary mechanism. Thus, the potential for information flow is enhanced across units, and with it the likelihood of decision making and implementation improvements to the overall linked system.

There are a variety of ways to organize members directly involved in boundary-spanning activities. Collaborative structures include different types of teams (for example, work, project, management, or parallel), communities of practice, and learning networks. Teams vary on a number of dimensions including:

- Temporary or permanent
- Single function or multifunctional
- Inside one organization or across several work units
- Colocated or distributed membership

For example, one team may be relatively permanent, representing a single function inside the factory floor with colocated members in daily attendance, whereas another team may be temporary, with multifunctional members spread across several organizations and distributed around the globe (thus inhabiting various time zones). Many of the structural and process principles of effectiveness for these two examples are the same. However, the sheer number and comparative intractability of the boundaries in the second virtual team example suggest quantum differences in barriers to high performance.

Geographically dispersed virtual teams must rely on technology improvements in electronic communication. The members may never meet each other face-to-face in spite of the obvious value of such experience. Being in far-flung locations means members report to their own local managers, have a different set of colocated peers, dine at their own preferred eating establishments without their coworkers, and often have to deal with the frustrations of asynchronous communication.

Virtual teams can accomplish their tasks through two different types of work processes: the modular and iterative work design approaches (Nemiro, 1997, 2004). These are not mutually exclusive. In fact, many virtual teams frequently use the compartmentalized or modular approach to accomplish work, but in order to avoid isolation and the loss of human exchange, they also rely on the iterative process as well.

In the modular process, team members meet initially to decide on the need, task, or project to be pursued. Then the work is parceled out or distributed among team members, usually based on an individual team member's expertise or interest. Team members then go off to work on their pieces of the pie, sometimes by themselves, sometimes with one or two other members of the team. After the work is completed, the efforts are presented to the team for feedback before finalization and implementation. Revisions are done as needed. The entire team then assesses the work outcomes, which in reality represent a compilation of all the individual pieces.

In the iterative process, virtual team members engage in back-and-forth development cycles. Members work a little, present those results to the team, get feedback, work a little more, present those results, get more feedback, and so on until the project is finished. Electronic communication allows team members to exchange ideas and different versions of the work in a comfortable fashion. Elements of the work are bounced back and forth and built on one another with ease.

Two questions provide discussion starters for virtual teams to assess their level of understanding and application of Principle 1: Mapping Out Collaborative Work Structures and Processes:

- Does the organization's design support collaboration?
- Is the team's current design optimal for guiding the team toward successful collaborative results?

For each question, team members should realistically answer yes or no. If the answer is yes, team members need to brainstorm, considering and recording actions that would lead to further growth. If the answer is no, discussion among the team members should consider and record actions that would lead to further improvement in this area.

Principle 2: Craft a Supportive Culture

Each member of the organization is unique in important ways and similar to coworkers in others. A key uniqueness is the perspective he or she brings to the team. Each looks at the job and the organization through a particular lens consisting of ways of seeing, thinking, deciding, relating, and so forth that have been learned and absorbed over many years of life. Much of one's perspective and behavior patterns develops from exposure to surrounding cultures, including the ways of thinking and working in one's native country, one's training including the assumptions and polarities of the chosen field of study, formative experiences, and the accepted ways of getting things done in one's places of employment.

These differences are well represented metaphorically in John Godfrey Saxe's (1878) poem concerning the six blind men and the elephant. Each blind member of the group bumped into a different part of the elephant and in attempting to figure out what he had encountered formed a different impression, for example, the tusk experienced by one man as a spear, the leg by another as a tree, and the tail by a third as a rope. None of the men knew from prior experience what an elephant really was, and thus they failed to integrate their disparate views into a whole picture that would have been a better map of reality. Local cultures within an organization easily duplicate the blind men's problem with trying to make sense of the unknown. There are significant gaps between management, engineering, and production cultures. The members' backgrounds, languages, and goals differ to such an extent that Schein (1996) describes them as coming from different countries. Cross-functional teams must pay attention to such gaps in understanding and practice across functions, resulting from often unstated, dramatic differences in assumptions about what is important, in order to have any chance of high performance.

Culture is usually defined as a shared set of values, beliefs, and norms—in short, a shared language (unspoken) and perspective that helps diverse individuals within that environment work together in harmony. The identical people

working under different cultures, including units of the same organization, can act in very different ways. The differences can be useful when they are made explicit and part of the team's larger picture of the job; left unarticulated, they present barriers to concerted action. There are a number of ways for dealing with cultural barriers.

First, members must recognize the differences that cultures create in their approach to work and then talk about them. This is a common challenge for virtual teams and is discussed in more detail in other chapters in this book. The initial step is choosing an attitude of genuine interest and openness concerning differences and approaching the learning about one another's cultures with respect.

Second, changing the culture changes the way people act. In other words, a change in culture is a major change in work context that influences behavior. For example, changing from a culture of blame to one of collaboration gradually shifts most behaviors from finger pointing and self-protection toward seeking partnering opportunities and sharing openly.

Third, the team can take the steps to create its own culture. Team chartering, which is described in Chapter Nineteen, is a process for quickly creating a culture that involves all members, so that a shared approach to all aspects of the work exists. The new culture or subculture represents a set of agreements developed through formal activities and evolves through informal social experiments yielding ways to get along and get things done. It creates an informal infrastructure—a web of joint assumptions, beliefs, and values that support a dynamic social and intellectual network

A variety of traditional and contemporary work cultures that are found in today's organizations are outlined in Beyerlein and Harris (2004): collaborative, entrepreneurial, innovation, empowerment, command and control, laissez-faire, involvement, learning, and quality. These and other types of cultures either tend to evolve rather accidentally or their development is formally facilitated through major change initiatives. A large organization probably has pockets of subcultures that represent every variety. Some of these cultural options facilitate work on complex projects and virtual work, and some do not. The choice to deliberately build a facilitative and shared culture for the virtual team is an important one. It provides bridges across the cultural boundaries that separate the members and inhibit their ability to collaborate. Shared patterns of action aligned with beliefs and assumptions enable the team to achieve higher levels of performance.

Table 1.1
Cultures for High and Low Creativity

Culture Promoting High Creativity	Culture Promoting Low Creativity
Ideas/input valued	Ideas dismissed
Trust; high level of honesty	Mistrust
Constructive tension	Unconstructive tension
High level of challenge	Lack of challenge
Collaboration	Competition
Freedom	Lack of freedom
Supportive management	Status quo
Sufficient resources	Insufficient resources and time
Understand work styles	

Source: Adapted from Nemiro (2004).

Every member of the organization works daily across cultural boundaries with the team's goals in mind. Building bridges reduces the barriers and provides ways to truly capitalize on the diversity of the group.

One of the major goals of most virtual teams is the discovery of new methods, processes, and devices. Creativity is an important ingredient in making this happen. Table 1.1 contrasts the cultures that promote and inhibit creativity. In other words, when the team maps out the ideal culture for its work environment, it needs to emphasize the culture that best promotes creativity. Table 1.1 can be used as a checklist when the team works to create its own internal culture or as a diagnostic tool when creativity falls short of expectations.

The team and the organization can take a number of steps to create a shared culture so there is a uniform work environment of expectations and values (Trice & Beyer, 1993):

- Find or create common symbols, language, and rituals to co-create a new culture.
- Emphasize trust, nonjudgment, support of new ideas, integrity, and personal contribution as a measure of effectiveness.

- Establish shared processes for protecting the vitality and viability of the social network the group depends on.
- Share stories as examples of success and failure.
- Hold face-to-face meetings so interpersonal bonds can develop.
- Practice cultural immersion to get deeply involved with another point of view. These can range from informally visiting restaurants representing the ethnicity of team members to more formal job rotation assignments.
- Conduct formal team chartering. If it is for the whole organization, cascade it down from the top.
- Work patiently. Understand resistance to culture change because one's culture is part of one's identity.
- Change many elements, but maintain some continuity, respecting history and preserving the useful parts.
- Recognize the importance of implementation. Buy-in and change come only through involvement.
- Build the cultural competence of the members so that more sensitive and appreciative behaviors occur when engaging with new collaborators from other cultures.

Leaders have a role in making the cultural change work succeed. They can establish the formal conditions for a set of congruent behaviors, attitudes, and policies that enable effective interactions in a cross-cultural framework. Leaders should also remember that cultural differences have value as a source of unique points of view.

Here are two discussion questions for initial assessment of a virtual team's application of Principle 2: Crafting a Supportive Culture:

- Does the culture within your team or organization support collaboration?
- Does the culture within your team or organization support creativity?

For each question, team members should realistically answer yes or no. If the answer is yes, team members should brainstorm and record actions leading to further growth. If the answer is no, team members need to consider and record actions leading to further improvement in this area.

Principle 3: Develop Continuously Evolving Knowledge-Sharing and Management Systems

Sustainability of organizations in the twenty-first century depends on the development and use of knowledge as much as the human body depends on the flow of blood. Virtual teams and their environments should be designed to facilitate knowledge processes. Human, technical, and organizational factors need attention to optimize them.

Knowledge Sharing Nearly every virtual team is focused on the problem of effective knowledge sharing. Creating the team of geographically distributed members is often driven by the need to connect people with diverse knowledge sets. The same difficulties in sharing occur in face-to-face groups as well, but the virtual setting that relies heavily and sometimes exclusively on electronic communications faces more extreme challenges in this regard.

The most valuable resources in the team and in the organization for generating, sharing, and using knowledge are expertise and knowledge, innovation and creativity, time and speed, and trust. What exactly does one trust in? Trusting in other members' abilities, intentions, and dependability makes it possible to move forward with a complex knowledge-based project quickly. Without trust, resources are wasted, including the shared leadership capability on the team; the ideas, hunches, questions, and concerns that could be voiced; and the spin-off ideas that may seem irrelevant to dominant members on the team or to managers outside the team who do not grasp the broader context of the ideas.

One of the boundaries that impedes knowledge sharing is pride (also referred to as hubris or narcissism). Pride is often justified within a silo but not outside the local situation. For example, most people experience being the local expert on some topic, but as soon as they change environments, they find their mastery is only at a modest level. Few have won Nobel Prizes or other recognition of world-level mastery. Stepping across boundaries in sharing knowledge depends on some humility, and that is a precondition to learning from others. A story from Zen literature illustrates the problem.

A U.S. businessman went to Japan to meet with a Zen master to learn how to become more successful. They sat on opposite sides of a table with a tea service between them. The master picked up a cup and began to fill it with tea for the visitor. When the cup was full to the brim, the master continued to pour tea and

the cup ran over. The visitor said, "The cup is full. You can't get any more in." The Zen master said, "Yes, so is your mind. Until you empty it, I can add nothing more." Humility is a prerequisite to learning across boundaries.

This expertise scale (Wiig, 1994) can assist in self-assessment to determine where one stands on this dimension in relationship to others on the team:

Level 0: Totally unaware

Level 1: Amateurish (Beginner)

Level 2: Aware but relatively unskilled (Novice)

Level 3: Deeper understanding but narrowly skilled (Apprentice)

Level 4: Experienced and reliable (Proficient)

Level 5: Master of a particular area (Expert)

Level 6: Leader in the knowledge area: teacher or proficient and expert

Level 7: World-class expert, broad expertise, wide recognition

Each member of the team brings significant expertise in some areas but noticeably less knowledge in others. For example, on a cross-functional team with members from marketing, engineering, and manufacturing, the marketing member knows far more than the other members about how to generate public interest in a product but probably knows little about the engineering requirements and manufacturing processes compared to other members. Coordination of the diverse types of knowledge requires that team leadership be driven by expertise in a particular domain, not by voice volume and speaking frequency—a too common occurrence. The dominant member may not be the expert on needed content. Effective team process requires norms and practices that allow appropriate expertise to be shared and absorbed by the other members.

Knowledge Management The management of knowledge-intensive work begins with a conscious or unconscious decision about what knowledge means. The equating of knowledge with information seems to dominate popular conversations and publications but is considered a serious oversimplification by a growing number of experts. Knowledge as information that has a purpose or use is an improvement (Postman, 1999). Knowledge as the meaning that individuals and groups give to information is a richer construction. The key to the third

definition is that it depends on people, their interpretations, and their conversations, not on computers and paper forms of information storage. It is socially driven, not technology driven. Technology merely facilitates the storage and sharing of knowledge.

Quinn and Anderson (1996) have created four categories of knowledge: know-what, know-how, know-why, and care-why. There are other terms for the first two types of knowledge, but the important piece is how they differ. *Know-what* is information and can be stored fairly easily, whereas *know-how* is knowledge of procedures and processes that is context dependent and difficult to share. The former is explicit (easily made visible), and the latter is tacit (mostly invisible). Tacit knowledge is typically learned from experience and from following the example of others. The problem for virtual teams is that observing examples and models is far more difficult at a distance.

The value of knowledge increases with such things as its accessibility (Harrison, 1995), how frequently it is shared (Davenport & Prusak, 1998), the degree of dissemination (Dirksen, Huizing, & Smit, 2005), and wider accessibility and use (Antoniou, Reeve, & Stenning, 2000). Open sharing attaches added value to knowledge, which is often characterized as intellectual capital—the intangible assets of the organization. There is a growing understanding of the strategic importance of intellectual capital among practitioners in global industry. Whether deliberately or accidentally engineered, virtual teams are assembled to increase that capital and find ways to convert it to financial capital (Saint-Onge, 1996; Saint-Onge & Wallace, 2003).

Knowledge sharing is difficult under the best conditions, with time pressure, complexity, and social issues increasing the challenges on a daily basis. Knowledge management has emerged as one of the disciplines that attempts to manage these situations. In the broadest sense of the term, knowledge management involves building tacit knowledge into communities, building explicit knowledge into artifacts, and providing infrastructure to make both tacit and explicit knowledge readily available to those that depend on it.

This description of knowledge management means that the chief knowledge officer (CKO) should be paying attention to the processes and support systems that the organization's virtual teams rely on. The CKO can also work with other executives, such as those responsible for learning and organization development, research and development, and operations, to establish an environment where

knowledge sharing is rewarded, political self-interest is discouraged, technical barriers to the sharing process are minimized, face-to-face meetings are funded, and training is provided for increasing cultural competence.

One question can be used to begin assessment of a virtual team's competence with respect to Principle 3: Developing Continuously Evolving Knowledge-Sharing and Management Systems:

- Does the team have the necessary resources and tools to ensure successful collaborative results in terms of:

  Expertise and knowledge

  Communication tools

  Creative thinkers

  Time

Team members should realistically answer yes or no. If the answer is yes, they need to brainstorm and then consider and record actions that could lead to further growth. If the answer is no, team members should consider and record actions that would lead to still further improvement in this area.

Principle 4: Define New Roles for Leaders

The leaders of the past controlled and commanded their followers. Communication flowed one way, from management down. Employees were motivated by fear and punishment. For virtual collaboration, or any other collaborative effort for that matter, the old way of leading no longer works. Virtual team leaders need to become "side-by-side" leaders (Romig, 2003) who encourage two-way communication and shared decision making. Accountability based on mutual respect and honest and caring feedback replaces fear as a form of motivation.

Collaborative leaders empower those they lead. Leadership is viewed as a process or system rather than a position, and it is shared and distributed throughout a collaborative work structure. Beyerlein and Harris (2004) offer a series of characteristics for collaborative leaders:

- Develop organizational context.
- Build teams or groups.

- Support individual development.
- Set direction.
- Actively support and model collaboration.
- Provide resources.
- Integrate the organization.
- Interface with the environment.
- Counsel and coach others.
- Communicate and provide information.
- Lead performance management.

Although there is no one best way to lead a virtual team, research (Nemiro, 1997, 2004) indicates five leadership structures that virtual teams use:

1. Permanent team leaders
2. Rotating team leaders (every team member is a leader at some point)
3. Managing partners who govern the overall operation of the team, combined with rotating project leaders who supervise specific projects or tasks
4. Facilitators or coordinators used by self-managed teams that need additional support in a specific area
5. Leaderless or self-led teams

Table 1.2 indicates when each of the leadership structures is most appropriate for use.

Virtual teams can ask themselves two questions to assess their application of Principle 4: Defining New Roles for Leaders:

- Are virtual team leaders and team members being supported in terms of developing the required characteristics for leading collaborative efforts?
- Is the team's chosen leadership structure optimal for guiding the team in its path toward successful collaborative results?

If yes is the answer, consider and record actions that could lead to further growth. If no is the answer, continue the discussion with searching for ways to further improve in this area.

Table 1.2
When to Use Different Types of Virtual Team Leadership Structures

Leadership Structure	When to Use
Permanent leader	High degree of role differentiation among members
	Members with different areas of expertise/knowledge
	Different areas of work task integrated by leader
	High level of interaction between leader and individual members
Rotating team leader	Members perform similar tasks
	Projects divided up based on client preference and type of projects members enjoy
	All members are equally able to lead
	All members know ins and outs of the business
	Meetings formally established
	High level of trust
	Some stable staff and procedures
Managing partners combined with rotating project leaders	Diverse business; multiple projects for different companies
	Members with different areas of expertise but can also support others
	High level of trust
	Comfortable with being leader or member
Facilitator or coordinator	Self-managing teams that need additional support
	Open and constant communication and information exchange
	Facilitators possess technical, interpersonal, and project and task management skills
Leaderless or self-led	Members with similar or equal status or rank
	Members with similar backgrounds and expertise levels
	Members choose to be part of a team that benefits them in some way and all are equally invested in the team's outcomes
	High level of trust

Source: Nemiro (2004).

Principle 5: Align and Sustain Support Systems

Team support systems provide the hard and soft infrastructure that is intended to support high levels of performance. This intention often fails. For successful support to occur, managers need to pay attention to alignment of the support systems and teams' needs. For example, if information is stored on computers but team members are not authorized to access it or do not have adequate equipment for access, the information cannot be used to enhance performance. Beyerlein and Harris (2004) have identified a set of support systems where lack of alignment can harm team performance. Leadership is a key support system and includes executive and senior managers whose decision making provides resources for the teams, direct supervisors and team facilitators who have frequent contact with the team, and formal team leaders and members who may temporarily assume leadership as an informal role. Individuals in each of these roles make decisions and model behaviors on a daily basis that either promote or inhibit team effectiveness. As a further complication facing virtual teams, members often report to multiple supervisors and managers—one for on-site work and one for virtual work—who issue conflicting orders. This is reminiscent of the traditional matrix structure with dual reporting to line and project bosses.

Performance can be managed in a number of ways. The systems that have emerged that appear to be best practices solutions include a number of approaches to guiding and rewarding behavior: participative goal setting, measurement and feedback of performance to allow opportunities for correcting processes, and reward and recognition of appropriate behaviors. These components of performance management must align with each other. However, in virtual teams, there is even greater challenge because the behaviors are typically invisible or intangible—thoughts, conversations, and cyberspace exchanges—so extra attention should be paid to these components and their alignment.

An array of team designs can be used to create tailored organizational responses to work challenges. For example, a temporary, multidisciplinary virtual team may be appropriate for dealing with an emergency when expertise is scattered across the company's sites, whereas a more permanent single function team may be a better fit for developing the design of an electronic subcomponent for a new product. The choice of organizing one way or another and the development work that needs to be invested represent support functions.

Financial tracking drives most high-level resource allocation decisions. However, the quality of the information provided by the tracking system to decision makers may not suffice for high performance (Chenhall, 2003). Thus, when the intangibles surrounding the performance of virtual teams are not captured by the tracking system, decisions about resources tend to provide less support, and teams may become malnourished.

The learning system includes formal training, job rotation, mentoring, coaching, workshops, conferences, and modeling. Formal classroom training is not enough. For virtual teams, online training systems are most convenient but not necessarily most effective. Learning is essential for creative knowledge work, as well as for developing the team's processes. Chief knowledge officers and chief learning officers are new executive roles for individuals who oversee the whole learning system. They need to be educated about the special needs of virtual teams.

Other support systems include work space and equipment. Without adequate and compatible hardware and software, team members cannot communicate well. Incompatible platforms create artificial handicaps to the team's process.

Change is constant, but decisions to introduce new change initiatives are not. Such initiatives may range from removing one member from a team and adding another (perhaps with the simplistic rationale that change is good) to reconfiguring the whole project or program or undergoing a merger that affects everyone. Treating change as a support system shifts the perspective on change decisions so that support of performance is emphasized. The executive role of the organizational development vice president is commonly associated with change systems, but all decision makers need a basic education in how to manage the process, as well as seek ways of aligning change initiatives with their existing virtual teams. One final major problem with virtual teams is inconsistency of support across sites. Alignment of those systems becomes a major source of performance improvement or decrement.

As a way to jump-start assessment of a virtual team's application of Principle 5: Aligning and Sustaining Support Systems, team members may examine each of their relevant support systems with the following questions in mind:

- What does the support system look like in the organization?
- How does the support system enhance collaboration?
- How does the support system undermine collaboration?

Using the Framework

Emerging from the above discussion, a series of themes can be generated around characteristics that do and do not support collaboration, for each relevant support system. From these themes, team members can brainstorm ideas for actions to improve each support system with regard to sustaining virtual team collaboration.

FINAL THOUGHTS

Virtual teams work across boundaries, sometimes a multitude of boundaries. The members connect through electronic means. Hurdles to high performance are multiplied by these conditions. Support for the teams is essential if the goal is high performance. The support requires continuous investment: investment in equipment, training, and leadership, for example. Without attention to a variety of methods for reducing hurdles and enhancing capabilities and competencies for crossing boundaries, the team will be stuck in silos and performance will suffer, especially when creative solutions to complex problems are the target.

REMINDERS

- Recognize that boundary crossing is a challenge that must be managed for virtual teams to achieve high performance levels.
- Recognize that team members have to learn how to connect with other members across the boundaries, and new competencies may need to be developed to facilitate this linking.
- Provide training that builds cultural competencies so the team processes will enable all members to feel ownership for the project and have a voice for sharing expertise.
- Recognize that the more complex the project is, the more the boundaries must be effectively navigated.
- Create integration mechanisms to link members with each other and with other parts of the organization so flow of information and decisions is facilitated.

- Match team design with the project so that the right people are involved in the right process.
- Align support systems with the team's needs, especially leadership, learning, and measurement.
- Model cultural competence at each opportunity so that the whole organization can build boundary-crossing capability.

References

Antoniou, I., Reeve, M., & Stenning, J. (2000). The information society as a complex system. *Journal of Universal Computer Science, 6*(3), 272–288.

Beyerlein, M., & Harris, C. L. (2004). *Guiding the journey to collaborative work systems: A strategic design workbook.* San Francisco: Jossey-Bass/Pfeiffer.

Chenhall, R. H. (2003). Management control systems design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting, Organizations and Society, 28,* 127–168.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School Press.

Dirksen, V., Huizing, A., & Smit, B. (2005). *A cultural critique of organizational change: Getting in touch with reality stream: Social networks.* Paper presented at the Fourth International Critical Management Studies Conference, Judge Institute of Management, University of Cambridge, Cambridge, UK. Retrieved March 11, 2007, from http://www.mngt.waikato.ac.nz/ejrot/cmsconference/2005/proceedings/socialnetworks/Dirksen.pdf.

Harrison, S. (1995, October). Anthropological perspectives: On the management of knowledge. *Anthropology Today, 11*(5), 10–14.

Jones, S. D., & Schilling, D. J. (2000). *Measuring team performance.* San Francisco: Jossey-Bass.

Katzenbach J., & Smith, D. (1993). *The wisdom of teams: Creating the high-performance organization.* Boston: Harvard Business School Press.

Mankin, D., & Cohen, S. (2004). *Business without boundaries.* San Francisco: Jossey-Bass.

Mohrman, S., Cohen, S., & Mohrman, A. (1995). *Designing team-based organizations: New forms of knowledge work.* San Francisco: Jossey-Bass.

Nemiro, J. (1997). *Creativity in virtual teams.* Unpublished doctoral dissertation, Claremont Graduate University.

Nemiro, J. (2004). *Creativity in virtual teams: Key components for success.* San Francisco: Jossey-Bass/Pfeiffer.

Postman, N. (1999). *Building a bridge to the enlightenment: How the past can improve our future.* New York: Knopf.

Quinn, J. B., & Anderson, P. (1996). Leveraging intellect. *Academy of Management Executive, 10*(3), 21–28.
Romig, D. (2003). Side-by-side leadership. In M. Beyerlein, C. McGee, G. Klein, J. Nemiro, & L. Broedling (Eds.), *The collaborative work systems fieldbook: Strategies, tools and techniques.* San Francisco: Jossey-Bass/Pfeiffer.
Saint-Onge, H. (1996). Tacit knowledge: The key to the strategic alignment of intellectual capital. *Strategy & Leadership, 24*(2), 10–14.
Saint-Onge, H., & Wallace, D. (2003). *Leveraging communities of practice for strategic advantage.* Boston: Butterworth-Heinemann.
Saxe, J. G. (1878). "The blind men and the elephant." Retrieved March 6, 2007, from http://www.noogenesis.com/pineapple/blind_men_elephant.html.
Schein, E. H. (1996). Three cultures of management: The key to organizational learning. *Sloan Management Review, 38*(1), 9–20.
Trice, H. M., & Beyer, J. M. (1993). *The culture of work organizations.* Upper Saddle River, NJ: Prentice Hall.
Wiig, K. (1994). *Knowledge management: The central management focus for intelligent-acting organizations.* Arlington, TX: Schema Press.
Wulf, R. (1996, November). *Gestalt dialogues: Newsletter for the Integrative Gestalt Centre.* Christchurch. Retrieved March 14, 2007, from http://www.gestalt.org/wulf.htm.