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# Principles for Effective Virtual Teamwork

ORGANIZATIONS TODAY OFTEN ESTABLISH OPERATIONS and strategic alliances across the globe, making virtual teamwork critical to their success.<sup>5</sup> Many government and military organizations face new challenges, such as combating terrorism, that are better tackled by nimble, well-informed teams than by large hierarchical bureaucracies. In the wake of global expansion and outsourcing, other organizations seek to cut the cost and hassle of bringing team members to a single location. Virtual teams are becoming ubiquitous (Figure 1). Intel Corporation recently conducted a study which revealed that approximately two-thirds of their employees collaborated with team members located at different sites and in different regions. Therefore, it is important to understand how to make virtual teams effective.

Virtual teams face new challenges that make them more difficult to manage than traditional face-to-face teams (see Table 1). For example, approximately half of the employees in the study above worked with team members whose work processes and collaboration technologies differed from their own. Virtual teams

may struggle to establish cohesive relationships necessary for achieving their objectives. Virtual team members also face competing demands for their attention from their virtual team and from their immediate workplace, and from the practical challenges of assimilating new technologies into their daily routines.

Over the past decade of working with virtual teams, we have derived a set of principles for effective virtual teamwork (Table 2). These principles are derived from field experience with hundreds of virtual teams in government, military and business organizations and from extensive laboratory studies. Two assumptions underlie these principles. First, we assume that the collaboration is interpersonal which implies that the virtual team consists of a well-defined group of individuals brought together to produce a specific deliverable such as a software specification, a strategic plan, or a budget proposal. This is referred to as “closed” collaboration by Pisano and Verganti<sup>7</sup> and is distinguished from community-based collaboration which is open to the public. Second, we assume that the technology employed by the virtual teams is reliable and secure. Technological glitches will cripple the productivity of even the most knowledgeable and motivated virtual teams. Our principles are intended to help designers, managers, and virtual team members improve the effectiveness of their virtual teams.

## Principles for Effective Virtual Teamwork

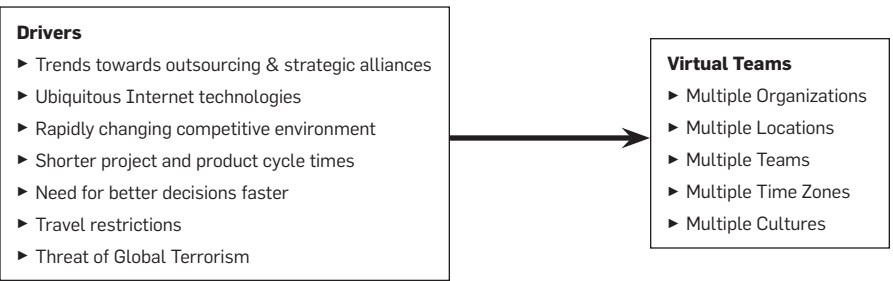
**Principle 1: Realign reward structures for virtual teams.** Virtual teams often have fewer motivators, both perceived and real, to perform than those that commonly exist in face-to-face teams. Virtual teamwork often lacks the face-time and appreciation that comes with working at the office late and arriving early the next morning, and can consequently garner fewer supportive comments from superiors and be perceived as less valuable in performance reviews. With fewer nonverbal cues, vir-

tual teamwork may also engender less social comparison among team members and make it more difficult for the enthusiasm of one member to inspire others. Absent explicit cues about how their own goals can be attained by helping the team succeed, they can easily get lost in the myriad of other every-day demands like impromptu meetings with colleagues, endless email messages, and other crises-of-the-day. The adage, “out of sight, out of mind,” prevails.

We worked with a virtual team of operational planners for crisis response who were accustomed to periodically traveling to a common venue to conduct their work. Their leader wanted them to collaborate virtually day-to-day so that they would be experienced in doing so when a crisis broke. However, multiple attempts failed because team members did not log into their virtual workspace and contribute. Subsequent interviews revealed that none of the team members believed that there was any individual benefit to working online, and the needs of their local colleagues were pressing. We implemented a new work process whereby organizational leaders received the team’s deliverables via the online system. Thus, good performance in the virtual team directly enhanced career prospects because people throughout the organization used and valued their individual contributions. After that, the virtual team thrived. Thus, successful leaders of virtual teams will find ways to make virtual work consistent with the team members pursuit of their individual goals, often by routinely evaluating and rewarding performance in virtual teams.

**Principle 2: Find new ways to focus attention on task.** Virtual teams often lack the methods necessary to focus attention to enable them to establish and maintain a shared understanding about the nature of their task. Face-to-face teams may adjourn to a conference room to eliminate distraction and use whiteboards and hand gestures to call attention to the topic under consideration. In face-to-face environments, leaders can see when attention is drifting and immediately bring the team back on track. Several tools and features commonly found in shared workspace applications allow virtual teams to focus together on concepts, objects, and activities as they work towards identifying shared mean-

**Figure 1. Emergence of Virtual Teams**



**Table 1. Challenges Facing Virtual Teamwork**

- ▶ Loss of many non-verbal cues
- ▶ Reduced mechanisms for informal conversation
- ▶ Reduced opportunities to build friendships
- ▶ Time zone differences
- ▶ Complicated, unreliable technology
- ▶ Building consensus at a distance
- ▶ Establishing shared meaning at a distance
- ▶ Different work processes
- ▶ Different cultures

**Table 2. Principles for Effective Virtual Teamwork**

1. Realign reward structures for virtual teams.
2. Find new ways to focus attention on task.
3. Design activities that cause people to get to know each other.
4. Build a virtual presence.
5. Agree on standards and terminology.
6. Leverage anonymity when appropriate.
7. Be more explicit.
8. Train teams to self-facilitate.
9. Embed collaboration technology into everyday work.

ings, possibilities, and implications. Virtual teams can use such tools to serve as the equivalent of a whiteboard in a face-to-face meeting, providing them with a focal point to conduct their work. However, this technology also offers additional distractions as members may choose to view Web browsers, email, and instant messaging that are unrelated to the task at hand.

We have used a few methods for focusing attention in virtual team environment. One is to use shared windows that allow the leader to control what appears on other people’s screens from a distance. We often use application-sharing combined with a voice link for authors who need to view, discuss, and revise a manuscript. Because the changes are shared instantly, attention stays focused on the current version and effort is not wasted attempting to reconcile inconsistencies caused by multiple authors working from differ-

ent versions. Many real-time collaboration systems now provide application sharing. Another method we use frequently is a roll-call response protocol whereby each member of the team is asked to give an oral response to a question or problem. This motivates members to be attentive knowing that they will be required to state publicly their opinions and insights.

**Principle 3: Design activities that cause people to get to know each other.** One often cited shortcoming of virtual teams is that it is difficult to build meaningful relationships.<sup>9</sup> In face-to-face teams, team building often evolves naturally as people share meals together and discuss common interests in informal hallway meetings. However, leaders of virtual teams must design explicit activities to promote team building. Toward this end, we often initiate a virtual project with a virtual synchronous kick-off meeting.

There are many things that can be accomplished in a kick-off meeting, but for virtual teams, there are three goals in particular that seem to be important. The first is to assure that everybody on the team can make the technology work successfully. It is fairly common for people to abandon their virtual team without notice after an initial failed attempt to access a new virtual workspace. A second goal is to establish explicit deliverables for all team members, with accountability at a scheduled future virtual, synchronous meeting. If explicit deliverables and a known date of accountability are established, team members tend to develop and fulfill their commitments to the team. A third goal is team building. To do this in virtual settings we usually have people introduce themselves and share something about themselves that they are proud of or might surprise others. We have also conducted humorous ice-breaker activities. For example, each person presents three facts about themselves and the other members must guess which of those facts is untrue.

However, for some tasks, we find virtual team building is still inadequate and we therefore still find it useful to bring people together face-to-face. This seems to be particularly important when teams must reach agreement on mutually acceptable commitments and allocations of effort and scarce resources. Face-to-face interaction also solidifies relationships and sustains the team through long periods of virtual interaction. Thus, it is often beneficial to work in some face-to-face meetings throughout the duration of a virtual team.

**Principle 4. Build a virtual presence.** Unlike face-to-face teams, people working synchronously at a distance tend to forget who is at the other end of the wire, particularly when the team is working across more than two sites. We became aware of this while working on a critical planning process with a team spread across Arizona, California, and Hawaii. Teams used conference phones and a suite of collaboration software tools. During one keyboard-intensive activity, an animated oral discussion broke out among participants in San Diego. After sometime the San Diego site became silent and the other sites assumed that those in San Diego had returned to

working on-line. It turned out that they had gone to lunch; they had forgotten that the other sites were there.

Subsequent study revealed that it only takes about 10 minutes for some virtual team members to forget with whom they are working, something that never happens with face-to-face teams. It is therefore important to establish and maintain virtual presence – reminders of who is participating. There are a variety of simple, yet effective ways to address this issue. For example, when teams work across multiple sites, a moderator can keep a written roster of current participants (leaders are as likely to forget as others). Every few minutes or so the moderator can ask role-call questions such as, “What do you think about that in San Diego? Does that make sense to you folks in Honolulu...” This reminds all participants who is participating and gives every site a chance to contribute.

Many collaboration technologies include useful mechanisms for establishing virtual presence. Some display a roster of currently active participants. Others display an image of a virtual workspace with an icon representing each current participant. Still others give audible or text-based cues each time a participant joins or leaves a session.

Asynchronous teams (different-time, different-place) experience a variation of the virtual presence problem. Team members frequently have no way of knowing when others have made contributions to the joint effort. Lacking such cues, they may get the sense that the project is languishing and stop contributing themselves. The simple expedients of using a system with an RSS feed, or having each team member send e-mail to the others each time they contribute to the team effort creates an asynchronous virtual presence. Participants regard the project as alive and active, and therefore continue to make effort toward the team goal.

**Principle 5: Agree on standards and terminology.** Virtual team members often cross organizational and functional boundaries, resulting in team members that are more diverse than typical face-to-face teams which may reside in a single organization. Although this diversity is valuable, it can result in conflicting expectations in terms of work

processes, including language, metrics, and behavioral norms.

For example, we once worked with a distributed group of 32 stakeholders who were negotiating the requirements for a large online bookstore. Progress broke down over the term, “affiliate.” Stakeholders could not agree on what rights and privileges affiliates should have. It turned out that among the 32 stakeholders there were five different meanings for the term, “affiliate.” The team agreed to use a different term for each of those five meanings, and agreed that nobody would use the term, “affiliate” for the rest of the project, to minimize confusion. Because incidents like this are common, we recommend that virtual teams maintain online glossaries of their agreed terminology.

An extreme example of the problems with inconsistent standards occurred in 1999 when NASA lost a \$125 million space probe due to team members using different units of measurement (English system versus the metric system). In any kind of virtual interactions, however, standards and explicit definitions of terms need to be agreed upon throughout the life of a project. This is an ongoing process, as teams face new tasks and challenges, there are likely to be new standards and terminologies required for the work process. Thus, this principle needs to be continually revisited throughout the life of the team.

**Principle 6: Leverage anonymity when appropriate.**

Anonymity can be a useful tool for encouraging open and frank communication. Research has shown that anonymous discussions tend to elicit more critical analysis of the topic under consideration,<sup>8</sup> and reduce politically-based decision making.<sup>4</sup> Whereas face-to-face teams are identified by default, virtual teams are anonymous by default. Face-to-face teams must use technology, such as voting ballots or electronic meeting systems, to create anonymity, and virtual teams must use technology, such as comment identification tags or video conferencing, to create identity. Therefore, different types of interventions will be required to use anonymity effectively in a virtual team than in a face-to-face team.

There are certain phases in teamwork when members are most productive if they contribute anonymously.

Anonymity is most useful during divergent activities (when people are trying to brainstorm many new ideas) and during the first phase of idea evaluation (when people are recording opinions, as with an electronic polling tool). For example, we once helped mediate a labor negotiation to avert a strike at a transportation company. Any suggestion made by management was immediately rejected as exploitative by labor. Any suggestion from labor was rejected out of hand by management. We helped resolve the problem by having management and labor representatives contribute alternatives anonymously online, and by having all participants evaluate the alternatives online. Thus, ideas could not be rejected based on their source, and rather had to be considered on their merits. When electronic polls revealed that eighty percent of participants supported a suggestion, it could not be construed as a plot by one side to gain the upper hand on the other, and so the impasse was broken.

Anonymity is not a panacea. Once ideas have been generated and evaluated, identified interactions are more effective as the team seeks to make sense of their ideas and evaluations. Anonymity is usually not useful when participants are negotiating the details of their mutual commitments, but it can sometimes work magic when a polarized team needs to find common ground. Thus, anonymity is a useful tool that must be wielded with care and intelligence.

**Principle 7: Be more explicit.** Lacking certain non-verbal cues, virtual teams have few means at their disposal to resolve ambiguity. Virtual team members must therefore define their work processes in far more detail, and communicate concepts far more explicitly than members of face-to-face teams. Virtual team leaders must communicate directions in painstaking detail. We find it useful to develop written scripts for certain virtual team tasks. We now employ reusable scripts for a variety of virtual tasks such as requirements negotiation, risk and control self-assessment, and joint authoring of proposals.<sup>2</sup> Even experienced virtual team leaders struggle when delivering instructions extemporaneously, especially on tasks where the team uses new processes or technologies.

Every virtual interaction, whether via email, or a sophisticated group support system, should begin with a clear statement of purposes, expectations, and deliverables to avoid miscommunication. We often see this issue manifest when senders of email expect a response, but the receiver did not have the impression that a response was required, and therefore never answered. When concepts and understandings are not precisely communicated, teams experience difficulty progressing towards their goal.

**Principle 8: Train teams to self-facilitate.** Facilitators are often used by virtual teams to help them appropriately apply technology in pursuit of their goals. Facilitators are valuable for their knowledge of both technology and group dynamics. However, facilitators are scarce, expensive, and in constant demand. Virtual teams frequently lose their facilitators part way through a project. They are well advised, therefore, to insist that their facilitator train them to conduct their processes for themselves. Ideally, virtual teams can self-facilitate effective work processes independent of outside expertise.


Another aspect of human facilitation is the practical difficulties organizations encounter in staffing and expensing these positions. Facilitators are often needed on an ad hoc basis and are used by virtual teams throughout an organization. Thus, while managers of various organizational departments may value the facilitator, they might also prefer that the expense of the facilitator does not affect their internal departmental budgets. Further, because facilitators are given exposure as problem-solvers throughout an organization, good ones are often promoted within a year or two. This can lead to facilitators changing during a virtual project, which may result in a loss of knowledge about the dynamics of a virtual team. We have seen these situations manifest in a number of organizations, which ultimately led to the abandonment of facilitator-driven virtual teamwork technology.<sup>2</sup>

**Principle 9: Embed collaboration technology into everyday work.** Users avoid technology when it requires extra work, separate from their ordinary work pro-

cesses. Knowledge management initiatives may fail, for example, if users must work late to write new case files after their regular work is done.<sup>3</sup> We have encountered similar experiences with collaborative technology for virtual teams. Technologies that require special rooms for participants, like video conferencing rooms, are often viewed as too much work to be worthwhile. Systems that require participants to download special computer installations are based on the faulty assumptions that participants use the same computer from day-to-day or that they have the user privileges to do so. Ideally, tools that support virtual teamwork should be embedded in the current work practices and systems (e.g., email, Web browsers) already in use by team members. Small computer cameras, desktop messaging, discussion and voting tools, for example, can be made a part of daily work. Team members then use the same tools with virtual teams as they do with local colleagues. Virtual work should be an instance of a person's regular work, not a separate, disjoint activity.

## Conclusion

Virtual teamwork is different than face-to-face teamwork in many ways so it takes overt and explicit effort to design new work processes to make it successful. The biggest challenges for virtual team members are competing demands for attention, ambiguity of remote communication, establishment of personal relationships, and the need for accessible, stable, and user-friendly technology.

The principles presented here are drawn from our experience with virtual teams across numerous organizations and are the result of many successes and failures. The principles are intended to help designers, managers, and virtual team members improve the effectiveness of their virtual team. Although these principles emerged from experience with interpersonal collaboration, principles 5, 6, 7, and 9 are also useful for promoting shared understanding and facilitating communication among community-based collaboration. We hope that others will benefit from our principles and expand on the list to enhance the future success of virtual teams. 

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