ATM manufacturer Diebold has an atypical C-Suite of executives, and CEO Andy Mattes cannot pop into many of his managers’ offices to confer over coffee in the company’s Canton, Ohio headquarters. This is because Mattes replaced 60 percent of Diebold’s top executives with experts who live in all corners of the United States. To turn around the company that recently had weathered an internal bribery scandal and the effects of slipping sales and profits, Mattes knew he had to expand Diebold’s services and software business so that he could offer banks more products than just ATM hardware. Mattes needed software experts, but those with the talent didn’t want to relocate to the small city of Canton. To solve this problem, Mattes dropped the company’s rule that executives had to live and work on site and instead lured top experts by offering them full-time virtual executive positions. By doing this, the company has a “who’s who of the technology industry”: Diebold’s chief strategist lives and works from 2,100 miles away in San Jose, California, the chief marketing officer lives in Boston, and the head of software works from his home office in Dallas, Texas. Most Diebold executives who work virtually spend a couple days per month in Canton and spend the rest of their time traveling to meet with customers and scattered staff members. Mattes talks daily to his direct reports by Skype and visits with them face-to-face either when they are traveling and can cross paths or during their visits to headquarters. Says Mattes, “As long as they live near an airport, where they work isn’t nearly as important as what they can contribute.”

Because team members cannot always be in the same place at the same time, teams of managers armed with laptops, virtual meeting software, email, voice mail, videoconferencing, interactive databases, and frequent-flyer memberships are charged with conducting business in the global arena. Virtual teams are expected to harness the knowledge of company employees efficiently regardless of their location, thereby enabling organizations to respond faster to increased competition. Information technology brings together teams of people who

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otherwise would not be able to interact. Information technology offers the potential to improve information access and information-processing capability as well as the ability for members to participate without regard to temporal and spatial impediments.

However, not all virtual teamwork proceeds seamlessly. Distance is a formidable obstacle despite information technology and jet travel. Remote offices fight for influence with corporate headquarters. Telephone conferences find distant members struggling to get onto the same page, literally and figuratively. Group members at sites separated by even a few kilometers begin to talk in the language of “us” and “them.” Thus, there is considerable debate among managers as to whether technology fosters or hinders teamwork in the workplace at the global and even local level.

This chapter examines virtual teams and the impact of information technology on teamwork. We first describe a simple model of social interaction called the place–time model. Using this framework, we evaluate how various modes of communication affect team interaction. The model focuses on where teams work (same or different physical location) and the time they work (synchronously or asynchronously). Then we examine how information technology affects human behavior and identify considerations that managers must wrestle with when attempting to bring together groups of people who are not in the same place. We move to a discussion about virtual and hybrid teams, making the point that whenever teams must work together in a non-face-to-face fashion, this constitutes a virtual team. We describe strategies to help virtual teams do their work better.

PLACE–TIME MODEL OF SOCIAL INTERACTION

The place–time model considers teams in terms of their geographic location (together versus separated) and temporal relationship (interacting in real time versus asynchronously). For any team meeting, there are four possibilities as depicted in the place–time model in Exhibit 12-1. As might be suspected, communication and teamwork unfold differently face-to-face than they do via electronic media.

Richness is the potential information-carrying capacity of the communication medium. Face-to-face communication is relatively “rich,” and formal written messages,

<table>
<thead>
<tr>
<th>Same place</th>
<th>Different place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same time</td>
<td></td>
</tr>
<tr>
<td>Face-to-face</td>
<td>Telephone</td>
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<tr>
<td></td>
<td>Videoconference</td>
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<td></td>
<td>Skype</td>
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<tr>
<td>Different time</td>
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</tr>
<tr>
<td>Facebook</td>
<td>Text message</td>
</tr>
<tr>
<td>Single-text editing</td>
<td>E-mail</td>
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<tr>
<td>Dropbox</td>
<td>Voice mail</td>
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<tr>
<td>Shift work</td>
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</tbody>
</table>

Exhibit 12-1 Place–Time Model of Interaction

such as memos, are relatively “lean.”

Face-to-face communication conveys the richest information because it allows the simultaneous observation of several cues including body language, facial expression, and tone of voice, providing people with a greater awareness of context. In contrast, formal, numerical documentation conveys the least rich information providing few clues about the context. Groups are often constrained in their choice of communication medium.

**FACE-TO-FACE COMMUNICATION**

Face-to-face contact is crucial in the initiation of relationships and collaborations. People are more cooperative when interacting face-to-face than via other forms of communication. Without face-to-face communication, relationships between business people are often strained and contentious.

Face-to-face meetings are ideal when teams must wrestle with complex problems. For example, researchers need regular face-to-face contact to be confident that they accurately understand each other’s work, particularly if it involves innovative ideas. Confidence decays over time as researchers communicate through telephone and computer conferences; face-to-face contact is required to renew trust in their mutual comprehension. Face-to-face team meetings are particularly important when a group forms, when commitments to key decisions are needed, and when major conflicts must be resolved. Work groups form more slowly and perhaps never fully, when they don’t have face-to-face contact.

In most companies, the incidence and frequency of face-to-face communication is almost perfectly predicted by how closely people are located to one another. Employees who work in the same office or on the same floor communicate much more frequently than those on different floors or in different buildings. The likelihood of communication literally comes down to feet—even a few steps can have a huge impact. For example, communication frequency between R&D researchers drops off logarithmically after only 5 to 10 meters of distance between offices. In a study of molecular biologists, critical techniques for producing monoclonal antibodies were not reported in journals but were passed from scientist to scientist at the lab bench. People in adjacent offices communicate twice as often as those in other offices on the same floor including via email and telephone. A study of 207 U.S. companies in 11 industries revealed that company performance increased as the proportion of top management

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teams with offices in the same location increased. Physical distance also affects how members feel about their teams: People are more likely to assume that the behavior of a group is driven by common goals for physically distant groups, presumably because common goals would be the only means by which they are united.

What information do people derive from face-to-face contact that makes it so important for interaction and productivity? First, face-to-face communication is easier and therefore, more likely to occur than other forms of communication. Simply stated, most people need a reason to walk up the stairs or make a phone call. They underestimate how much information they get from chance encounters, which never happen in any mode but face-to-face. Second, people primarily rely on nonverbal signals to help them conduct social interactions. One estimate is 93 percent of the meaning of messages is contained in the nonverbal part of communication, such as voice intonation. For example, it is possible to predict which executives will win a business competition solely on the basis of the nonverbal social signals that they send (e.g., tone of voice, gesticulation, and proximity to others). Studies of “thin slices” of behavior reveal that when people form an impression of someone or make judgments of others’ likeability, personality, sexual orientation, performance as teachers, socioeconomic status, psychopathology, and a host of other things, they do so within mere seconds. Moreover, the judgments that people make in these microseconds predict their evaluations of that person weeks and even months later.

Perhaps this is why business executives endure the inconveniences of travel across thousands of miles and several time zones so that they can have face-to-face contact with others, even if it is only for a short period. The emphasis on the human factor is not just old-fashioned business superstition. Important behavioral, cognitive, and emotional processes are set into motion when people meet face-to-face. Unless people are specially trained however, they don’t know what exactly it is about face-to-face interaction that facilitates teamwork—they just know that things go more smoothly.

Face-to-face interaction allows people to develop rapport—the feeling of being “in sync” or “on the same wavelength” with another person. Rapport is a powerful determinant of trust. The degree of rapport determines the efficiency and the quality of progress toward goal achievement and whether the goal is ever achieved.

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Nonverbal behavior (body orientation, gesture, eye contact, and nodding) and paraverbal behavior (speech fluency, use of “uh-huhs,” etc.) are key to building rapport. When our conversation partner sits at a greater distance, with an indirect body orientation, backward lean, crossed arms, and low eye contact, we feel less rapport than when the same person sits with a forward lean, an open body posture, nods, and maintains steady eye contact. Nonverbal and paraverbal cues affect the way people work and the quality of their work as a team.

Face-to-face communication however, is not the best modality for all teamwork. As a clear case in point, we saw in our discussion of creativity and brainstorming (see Chapter 9) that face-to-face brainstorming is less productive compared with other, less rich forms of interaction.

Same Time, Different Place

In the same-time, different-place mode, people communicate in real time but are not physically in the same place. The most common means is via cell phone. In telephone conversations, people lack facial cues; but in videoconferencing, they see social cues, such as pauses, mutual gaze, and posture. Yet at the same time, electronic interaction such as brainstorming in groups, increases team productivity.

NR Marketing Group runs both traditional and virtual offices, with its employees working all over the United States. Team members meet at a retreat and then are encouraged to maintain the social connections they forged there. In “virtual water cooler” style, employees launched a group texting thread to share jokes, news, and funny stories. The team also gathers in a virtual Google Hangout each week to discuss both work and life issues.16 In a direct comparison of face-to-face (FTF) versus computer-mediated communication (CMC) groups, group identity (i.e., cohesion and “we-feeling”) was consistently lower in CMC groups, especially when they underwent membership change (i.e., reorganization).17 Similarly, in a comparison of FTF, desktop videoconference, and text-based chat teamwork, the constructive interaction score (e.g., supportive and instructive communication versus aggressive behavior) was higher in FTF groups than in videoconference and chat teams.18 Teams working in richer communication media however, did not achieve higher task performance than those communicating through less rich media.

What are the major ways in which physically distant group members suffer because of their geographic separation? There are several effects of physical separation of the team, some of which might not be immediately obvious.

Loss of Informal Communication

Virtual distance refers to the feelings of separation engendered by communicating by email, text, audioconferencing, and so on.19 Probably the effect felt most is the inability to chat informally in the hall, inside offices,

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and by the water cooler. The impromptu and casual conversations that employees have in the lounge or by the coffee machine are often where the most difficult problems are solved and important interpersonal issues are addressed. Beyond a very short distance, people miss the spontaneous exchanges that occur outside of formal meetings. Remote group members feel excluded from key conversations that occur over lunch and in the hall. Spontaneous communication plays a pivotal role in mitigating conflict in distributed teams. Not surprisingly, distributed teams experience more relationship and task conflict than do co-located teams. Companies often try to be creative about virtual teamwork. At Dell, virtual team members can join hundreds of “Chatter Groups” depending on recreational interests and political bent. Each group has developed its own virtual traditions and culture. For example, every holiday season, the Human Resources group puts on a #HRLove shout-out, in which the HR team publicly lauds and honors other team members with the hashtag, HRLove.

**DISCONNECTED FEEDBACK** Another negative impact of physical separation is feedback; greater distance tends to block the corrective feedback loops provided by chance encounters. One manager contrasted how employees who worked in his home office related to his decisions compared with employees 15 kilometers away. Engineers in the home office would drop by and catch him in the hall or at lunch. “I heard you were planning to change project X,” they would say. “Let me tell you why that would be stupid.” The manager would listen to their points, clarify some details, and all would part better informed. In contrast, employees at the remote site would greet his weekly visits with formally prepared objections, which took much longer to discuss and rarely were resolved as completely as the more informal hallway discussions. In short, groups working remotely do not get the coincidental chances to detect and correct problems on a casual basis. Geographic sites promote an informal, spontaneous group identity, reinforced by close physical proximity and the dense communication it promotes. Those working in an office all tend to have friends in nearby companies or groups, hear the same industry rumors, and share similar beliefs about technological trends. Thus, any distance—whether it is 12 miles or 12,000 miles—is problematic in this regard.

**LOSS OF INFORMAL MODELING** Another impact of information technology is the loss of informal modeling and observational learning. Casual observation is invaluable for monitoring and mentoring performance, especially for one-on-one team coaching. The inability of remote employees to observe successful project managers is a barrier to effective coaching of task and interpersonal skills.

**OUT-OF-THE-LOOP EMPLOYEES** Distant employees tend to be left out of discussions or forgotten altogether. In a sense, they are out of sight, out of mind. The default behavior is to ignore the person on the speakerphone. This is especially magnified when the person or group on the phone has less status.

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22Armstrong & Cole, “Managing distances and differences in geographically distributed workgroups.”
Time differences amplify the effects of physical distance. Distributed group members face the challenge of finding each other at the same time when they live in different time zones. Time differences sometimes highlight cultural differences; however, teams can try to overcome these cultural barriers. Company teams, one based in the United States and one based in Italy, celebrated a project milestone in their weekly videoconference by sharing foods on the video screen. U.S. team members sent images of bagels and coffee at 9 a.m. Eastern standard time; Italian team members sent images of champagne and cookies at 3 p.m. in their time zone.

Conflicts are expressed, recognized, and addressed more quickly if group members work in close proximity. A manager can spot a problem, nip it in the bud, and solve the problem quickly. In geographically separated groups, issues are more likely to just get dropped and go unresolved, contributing to a slow buildup in aggravation. People complain to their coworkers, reinforcing local perceptions of events, but do not complain to the distant leaders until feelings reach extremely high levels.

Although there are many disadvantages of working at a distance, it is not always a liability for teams. The formality of a scheduled phone meeting compels each party to prepare for the meeting and to address the issues more efficiently. In addition, distance can reduce micromanagement. Some managers hinder their employees’ performance by monitoring them too closely and demanding frequent updates. Edmondson provides four tactics to help people reframe their purpose on their team:23

1. Tell yourself that the project is different from anything you’ve done before and it presents a challenging and exciting opportunity to try out a new approach and learn.
2. See yourself as vitally important to a successful outcome and to achieve the goal, you need the willing participation of others.
3. Tell yourself that others are vitally important to a successful outcome and might bring key pieces of the puzzle that you don’t anticipate.
4. Communicate with others on the team as you would if the above three statements were true.

**Different Time, Same Place**

In the different-time, same-place mode, team members interact asynchronously but share the same work space. An example might be shift workers who pick up the task left for them by the previous shift or collaborators working on the same electronic document. After one partner finishes working on the document, it goes to the other partner, who further edits and develops it.

Although people might not realize it, they rely a lot on their physical environment for important information and cues. People use other team members as information storage, retrieval, and processing devices. The same is true for the physical environment. A Post-it note on the back of a chair or a report placed in a certain bin can symbolize an entire procedural system (e.g., how to make a three-way conference call). Just as people become information dependent on other people, they can also become information dependent on aspects of the physical environment in order to do their work. At the extreme, this type of dependence can be a limitation for groups that find it

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impossible to work outside the idiosyncratic confines of their work space. Information and work space dependence can have negative impacts on the productivity and motivation of a team. For example during site visits at one company, software development teams observed and interacted with their distant colleagues in their colleagues’ context, thus gaining a deeper understanding of their behavior within the physical context of the work.24 As they interacted, teams reviewed their collaborative practices, which further facilitated trust. After team members returned to their home site, some of the new collaborative practices carried over to their work with other distant colleagues.

The productivity of any team, and organizational effectiveness in general, is a joint function of the technical and the social system.25 The structure of a group, both internally and externally, and the technology the group works with are products of an active adaptation process, in which the technology is shaped by the organization or its subunits, as well as being a factor in shaping the organization. For example, consider the introduction of a new technology, CT scanners, in two hospitals.26 The introduction of the CT scanners increased uncertainty and upset the distribution of expertise and the division of labor in both hospital units.

Different Place, Different Time

In the different-place, different-time mode, people communicate asynchronously in different places. About 39 percent of full-time employees work remotely, and 15 percent of those work solely from home. To keep in touch, remote employees at Automattic use chat apps and an internal blog called P2 to keep a blog record. Asynchronously distributed team members at software company Help Scout assign a senior team members to serve as orientation guides for new employees, contacting them every few days to answer questions, share unwritten work rules, and give them a run-down about who to contact for what work needs they might have.27

Skim Effect

The skim effect is the tendency for most people to skim email messages and respond to only one element.28

Egocentrism

People’s ability to convey in writing their desired meaning is much worse than they think, as is their ability to decipher other people’s messages. When

asked to communicate tones such as sarcasm and sincerity via email, people believe that they convey the correct tone, when in fact their messages often are misunderstood. People perform at chance level in terms of their ability detect a serious versus sarcastic tone in an email. This is true also for detecting sadness and anger, and it does not matter how well people know each other; friends do not perform more accurately in detecting meaning of emails than do stranger pairs.

**LOST IN TRANSLATION** Communicating via email strips the message “of the paralinguistic and nonverbal cues that enable us to communicate these sorts of subtle emotions and tones.” People are still able to send and receive emotional messages in text through the process of emotional contagion. In one investigation, a team member textually communicated anger or happiness in a virtual team and either typed a “resolute” or “flexible” message. The task facing the virtual team involved a negotiation with a performance-based reward. Even when the communication was only text based, emotional contagion occurred. What was particularly problematic was when the emotion did not match the behavior. Thus, a happy tone combined with a resolute message or an angry tone combined with flexibility led to greater negative emotion in the team.

The problem of conveying mood and tone via email communication is a challenge for teams. Because it is easy to send a message and social norms are not present when sending email, people often take more risks. Furthermore, there is virtually no competition to attain and hold the floor, so people are at liberty to send frequent and long messages. Some people receive several hundred electronic messages each day, but volume is no excuse for responding in a sloppy fashion. Responding with misspellings and hastily written text can lead the recipient to form a negative dispositional impression of the sender, even if there is a perfectly valid reason for the typos. A study examined how technical language violation (i.e., spelling and grammatical errors) as well as deviations from etiquette norms (i.e., short messages lacking a conversational tone) negatively affected the recipients’ impressions of the email senders’ conscientiousness. Unfortunately, when the sender was from a different culture, even perfectly valid extenuating circumstances did not deter receivers from forming negative impressions.

**EMAIL AND PRODUCTIVITY** The purpose of email and other types of computer-mediated communication is to increase productivity and efficiency. But does it work? Email remains the most pervasive form of business communication. In 2014, more than 108.7 billion emails—many unnecessary—were sent and received per day. By 2018, business

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email will account for an estimated 139.4 billion emails sent and received per day.\textsuperscript{33} In another investigation, 13 information technology employees agreed to completely ignore emails for five days. Those who continued to read email had elevated heart rates more constantly, while the “vacationers” had more natural, variable heart rates. The email vacationers were less stressed and felt more productive.\textsuperscript{34} Electric parts distributor Van Meter launched a 10-year study to measure employee engagement and policy implementation to improve the work–life balance for their 400-plus employees. Integral to the effort are email “boundary” policies with no company emails or phone calls before 7:00 a.m. or after 5:00 p.m. on weekdays. Based on the positive results of the policy, all employee email is shut down while they are on vacation. Lee Mallon, managing director of IT consulting firm Rarely Impossible, announced that his company was ceasing use of email internally. Employees were relieved. “My team communicates much better; now issues get solved right away,” said Mallon, who estimates that his company has saved about 20 percent of its workday time by eliminating email.\textsuperscript{35}

**COMMUNICATION TECHNOLOGY AND HEALTH** Excessive use of information technology might lead to psychological and somatic problems. A study of 4,100 people in Sweden revealed that those who never turn off their smartphones and computers are prone to sleeping disorders, depression, and mental illness.\textsuperscript{36} And, medical professionals attribute excessive preoccupation with information technology devices to an alarming increase in accidents of children age 5 and under; in short, parents are no longer monitoring their children because they are checking their email.\textsuperscript{37} Another study found a relationship between people’s stress levels and the number of times the smartphone was checked for messages. Participants reporting the highest amount of stress experienced phantom vibrations from their phones, when in fact there had been no message alerts. The study established the existence of a new stress cycle associated with their digital connectivity—devices that originally had benefited people by managing their workload began to exert a different pressure to keep abreast of their expanded virtual lives. The more stressed people became, the more compulsively they checked their digital device.\textsuperscript{38}

**COHESION AND TRUST** Taking a call or checking email while in face-to-face conversation with another person erodes trust and leads to lower perceived professionalism.\textsuperscript{39} The mere sight of technology might plummet people into negative moods. In one study, people engaged in a 10-minute conversation with another person about an interesting event in their lives. When a mobile phone was placed on the table between them (but

\begin{itemize}
\item \textsuperscript{35}Rayasam, R. (2015, March 25). The end of the inbox: Companies that banned email. BBC. bbc.com
\item \textsuperscript{37}Worthen, B. (2012, September 29). The perils of texting while parenting. The Wall Street Journal. online. wsj.com
\item \textsuperscript{38}Turn off your smart phone to beat stress. (2012, December 1). The British Psychological Society. bps.org.uk
\end{itemize}
not actually used), people felt less close, less connected, and had less rewarding
carations than when a spiral notebook was on the table. 40

**INFORMATION TECHNOLOGY AND SOCIAL BEHAVIOR**

Information technology has extremely powerful effects on social behavior.41 Many peo-
ples are surprised at how they behave when communicating virtually. What are the key
things to expect when interacting with teammates via information technology?

**REDUCED STATUS DIFFERENCES: THE WEAK GET STRONG EFFECT**

In face-to-face interactions, people do not contribute to conversation equally. One per-
son or one clique usually dominates the discussion. People with higher status tend to
talk more, even if they are not experts about the subject. Not surprisingly, managers
speak more than subordinates, and men speak more than women.

An odd thing happens however, on the way to the information technology forum:
Traditional static cues are missing and dynamic cues have distinctly less impact. Tra-
ditional, static cues, such as position and title, are not as obvious on email. It often
is impossible to tell whether you are communicating with a president or clerk. In most
networks, when people send email the only signs of position and personal attributes are
names and addresses. Addresses often are shortened and might be difficult to
comprehend. Even when they can be deciphered, addresses identify the organization
but likely not the sender’s subunit, job title, social importance, or level in the organization.
Dynamic status cues such as dress, mannerisms, age, and gender are also missing in
email. The absence of such cues has a dramatic effect on social behavior: Status
differences are reduced. This means that high-status members (e.g., leaders) are less
likely to dominate discussions in computer-mediated conversation (CMC) groups than
in face-to-face (FTF) groups;42 and a dominant member is less likely to emerge in CMC
groups than in FTF groups.43

Instead, decision making occurs on the basis of task expertise, rather than status.44
People who are in weak positions in face-to-face encounters become more powerful
because status cues are harder to discern in non-face-to-face interactions.45 In this sense,
email acts as an equalizer because it is difficult for high-status people to dominate discus-
sions. For example, when a group of executives meet face-to-face, the men in these groups

computer-mediated and face-to-face decision-making groups. *Human-Computer Interaction*, 6(2), 119–146.
process and outcome in face-to-face versus computerized conferences. *Human Communication Research*, 13(2),
225–252.
Monica, CA: RAND Corp.
45Sproull & Kiesler, *Connections*. 
are five times more likely than the women to make the first decision proposal. When the same groups meet via computer, women make the first proposal as often as do men.46

**Equalization of Participation**

The greater anonymity associated with virtual interaction reduces inhibitions and increases the likelihood that all members will contribute to the discussion.47 When interacting via email, people respond more openly and conform less to social norms and other people. They focus more on the content of the task and less on the direction of high-status opinion leaders. Computer-mediated communication is more democratic and less hierarchical with bad news conveyed upward to superiors with less delay.48 CMC however, does not appear to reduce gender differences. Specifically, one study examined whether disguising individual and gender identity during group interaction would lead to more equal participation of men and women and the disappearance of gender differences (compared with face-to-face groups).49 Surprisingly, gender differences in dominance were greatest when people were unable to individuate each other. At the same time, there is less awareness of the needs of the group or its members.50 With more rudeness and less inhibition, conflicts in CMC are sharper and escalate more quickly. Consensus about complex, nontechnical issues are more difficult to reach.51

**Increased Time to Make Decisions**

CMC groups have more difficulty reaching consensus than FTF groups.52 The difficulty may be attributable in part to the diversity of opinions generated in CMC interaction. CMC groups take 4 to 10 times longer to reach a decision than face-to-face groups, with the greater differential occurring under no time constraints.53 It takes longer to write than it does to speak; hence, communicating via information technology is slower. It takes four times as long for a three-person group to make a decision in a real-time computer conference as in a face-to-face meeting.54 It takes as much as 10 times as long


48Sproull & Kiesler, *Connections*.


51Hiltz, Johnson, & Turoff, “Experiments in-group decision making.”


in a four-person computer-conference group that lacks time restrictions. This is especially true when the technology is new.

**INFORMATION SUPPRESSION**

Members of FTF teams engage in more communication than CMC teams. The lower frequency of communication in CMC groups is known as information suppression. CMC groups may compensate for information suppression by sending more task-oriented messages as a proportion of their total messages, generating more diverse opinions or decision recommendations, and having information more readily accessible. In one investigation, 64 four-person teams worked for three hours on a computer simulation interacting either face-to-face or via a computer-mediated network. Members of FTF teams were better informed and made recommendations that were more predictive of the correct team decision, but leaders of CMC teams were better at differentiating team members on the quality of their decisions (i.e., greater accountability).

**RISK TAKING**

People intuitively perform cost-benefit analyses when considering different courses of action and consequently do not treat gains commensurately with losses. However, electronic interaction affects risk-taking behavior. Consider the following choices:

- **A.** Return of $20,000 over 2 years.
- **B.** Fifty percent chance of gaining $40,000; 50 percent of gaining nothing.

Option A is the safer investment; option B is riskier. However, these two options are mathematically identical meaning that in an objective sense, people should not favor one option over the other. When posed with these choices, most managers are risk averse, meaning that they select the option that has the sure payoff as opposed to holding out for the chance to win big (or, equally as likely, not win at all). However, consider what happens when the following choice is proposed:

- **D.** Sure loss of $20,000 over 2 years.
- **E.** Fifty percent chance of losing $40,000; 50 percent of losing nothing.

Most managers are risk seeking and choose option D. Why? According to the framing effect, people are risk averse for gains and risk seeking for losses. This can

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55 Dubrovsky, Keisler, & Sethna, “The equalization phenomenon.”


lead to self-contradictory, quirky behavior. By manipulating the reference point, a person’s fiscal policy choices can change.

We saw in Chapter 7 that groups tend to make riskier decisions than do individuals in the same situation. Paradoxically, groups that make decisions via electronic communication are risk seeking for both gains and losses. CMC groups make riskier decisions and exhibit greater polarization of judgment than FTF groups. For example, in FTF groups, members’ decision recommendations tended to conform to the prior recommendations of other members. In CMC groups, the last decision recommendations were as divergent from the group’s final decision as were the first. Furthermore, executives are just as confident about their decisions whether they are made through electronic communication or FTF communication.

**Disinhibition and the Negativity Effect**

When social context cues are missing or weak, people feel distant from others and somewhat anonymous. They are less concerned about making a good appearance and humor tends to fall apart or to be misinterpreted. Additionally, the expression of negative emotion is no longer minimized because factors that keep people from acting out negative emotions are not in place when they communicate via information technology. In the absence of social norms that prescribe the expression of positive emotion, people are more likely to express negative emotion. CMC lowers inhibition and thus leads to greater expression of personal opinions, including the use of personal insults and profanity—the flaming effect. When people communicate via email, they are more likely to confront others negatively. Conventional behavior, such as politeness rituals and acknowledgment of others’ views, decreases; rude, impulsive behavior, such as flaming, increases. People are eight times more likely to flame in electronic discussions than in face-to-face discussions.

**Task Performance and Decision Quality**

Are people more effective when they communicate via information technology? Studies analyzing the quality of group decisions have found either no differences between the two communication modes or differences in favor of FTF groups. When the decision outcomes depend heavily on information exchange, FTF groups have an advantage over CMC groups, but when other factors contribute to decision quality, CMC groups may be better able to compensate for less information exchange.

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61 McQuire, Keisler, & Siegel, “Group and computer-mediated discussion,” p. 358.
65 Dubrovsky, Keisler, & Sethna, “Equalization phenomenon.”
66 For a review, see Hedlund, Ilgen, & Hollenbeck, “Decision accuracy in computer mediated versus face-to-face decision making teams.”
67 Ibid.
TRUST AND RAPPORT

When people interact face-to-face, trust forms quickly, even on the basis of minimal similarity. The formation of trust among virtual team members however, is more difficult. One study examined the factors related to the development of trust among members of new product development teams.68 Some of the teams were co-located; others worked virtually. The formation of trust for virtual team members depended on their predisposition to trust, suggesting that an individual member’s propensity to trust has more influence on the group’s level of trust in virtual groups than in co-located teams. Members of virtual groups often are made aware of one another’s level of education, experience, and background before beginning a project, allowing the group to proactively assess each member’s competence before their virtual group interactions. When a team’s relationship is purely virtual, the basis for trust is mainly based on a valuation of each member’s cognitive abilities. Conversely, the means to assess affective dimensions of trust, such as benevolence and integrity, are more difficult to ascertain in virtual groups. For projects with a high degree of interdependence and when supporting the organizational, social, and psychological context of the project is important, assigning partners with a high propensity to trust, both in cognitive and affective dimensions, is beneficial for co-located teams.

VIRTUAL, HYBRID, AND TRADITIONAL TEAMS

Three factors distinguish virtual, hybrid and traditional teams: physical distance, technology support, and the percentage of time group members spend apart.69 As can be seen in Exhibit 12-2, traditional teams are physically close, spend much time together, and typically require low tech support for their teamwork. Purely virtual teams spend the majority of their time apart, with both their physical distances and their need for tech support varied. Hybrid teams represent the largest percentage of teams with more variation in their physical distance, time spent apart, and tech support.

Both virtual and hybrid teams might meet through conference calls, videoconferences, email, or other communications tools, such as application sharing. Teams might include employees only, or they might include outsiders, such as a customer’s employees. Virtual teams work well for global companies, but they also can benefit small companies operating from a single location, especially if decision makers are often at job sites or on the road. They can be short-lived or permanent, such as operational teams that run their companies virtually.

PREVALENCE

In our survey of team leaders, the majority of teams were hybrid (58 percent), followed by traditional (34 percent) and then purely virtual teams (8 percent).70 In 2015, 37


percent of U.S. workers telecommuted from home about two days per month; 9 percent of workers telecommuted more than 10 workdays in a typical month.\textsuperscript{71}

\textbf{ADVANTAGES}

A key question is whether virtual (and hybrid) teams offer advantages over traditional teams. Because virtual teams combine the best talents of people in companies, they allow better use of human resources. Moreover, because of their virtual nature, they can provide team members with a level of empowerment that more traditional teams do not enjoy.\textsuperscript{72}

\textsuperscript{71}Jones, J. (2015, August 19). In U.S., telecommuting for work climbs to 37\%. \textit{Gallup.} gallup.com

What about productivity? In 2015, 58 percent of Americans surveyed believed that remote workers were just as productive as those who work in a business office, and 16 percent believed that telecommuters were more productive than those who work in an office.\(^{73}\) Additionally, those who do not work in a conventional office report that they actually work longer hours and are happier employees.\(^{74}\)

If a company needs virtual teams, the biggest challenge for productivity is coordination of effort: how to get people to work together compatibly and productively, even though face-to-face contact is limited and communication is confined to phone, videoconference, and email.

**IDENTIFICATION**

Group identity is particularly important in virtual teams because it provides a method to enhance cohesion in the absence of face-to-face interaction. For these reasons, leaders of virtual teams should seek to build group identity early in the formation of virtual teams.\(^{75}\)

**LEADERSHIP**

Leading a virtual team requires a different set of skills from leading a traditional team. Instead of casual face-to-face discussions around the water cooler and real-time adjustments, virtual team leaders must be more proactive.\(^{76}\) Virtual teams might not benefit from autocratic, hierarchical leadership the way some traditional teams might. One investigation found that shared team leadership (as opposed to hierarchical leadership) was more strongly related to effective performance in a virtual team.\(^{77}\) Similarly, another investigation found that transformational (as opposed to transactional) leadership led to greater feedback positivity when groups used instant-messaging (but not in a “virtual world” condition). Greater feedback positivity was associated with discussion satisfaction, cohesion, efficacy, and time on task, but increased feedback positivity had negative effects on decision quality.\(^{78}\) An investigation about how personality affects leadership emergence in virtual teams revealed that agreeableness and conscientiousness were positively related to task- and person-leadership emergence, respectively.\(^{79}\)

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\(^{73}\)Jones, “In U.S., telecommuting for work climbs to 37%.”

\(^{74}\)Clark, J. (2010, February 4). Employees with flex time put in more hours. *Discovery News*. news.discovery.com


ATTENTION AND PROBLEM-SOLVING

A key challenge for any team is how much attention to devote to a problem or challenge. An investigation of online knowledge sharing among knowledge providers and problems in a global engineering firm revealed that attention allocation was driven by features of the knowledge provider–problem match, which effectively shifted the discussion from knowledge provider–seeker match.80

CONFLICT

Virtual teams, just like traditional teams, experience conflict. Conflict at an early stage can later influence conflict in the group. A longitudinal study compared three types of groups: face-to-face (FTF), videoconference (VC), and computer-mediated (CMC) groups working on a complex team task for one month. Task conflict at the early states of teamwork predicted relationship conflict at later stages of teamwork in FTF and VC groups but not in CMC groups.81 Apparently, the “leaner” communication in CMC groups benefited teams by preventing task conflict from escalating into relationship conflict. These results should not be interpreted that leaders and managers of virtual (CMC) teams have nothing to worry about. Indeed, an investigation of a large software company revealed that virtual teams had greater process conflict than did the co-located teams.82 Another investigation revealed that low- and high-hybrid teams were virtually indistinguishable in terms of task and relationship conflict, but high-hybrid teams reported considerably greater procedural conflict than did low-hybrid teams.83

GEOGRAPHIC FAULTLINES

In geographically dispersed teams, locations might activate faultlines that split a group into subgroups that impair team functioning. A study of 45 teams in 10 different countries revealed that geographic faultlines increased conflict and reduced trust.84 The study compared three configurations of geographic dispersion in six-person teams: fully dispersed teams (in which each person was in a unique location), partly dispersed teams (composed of three subgroups of two co-located people each), and partly dispersed teams composed of two subgroups of three co-located people each). The faultlines were more aggravated when teams were divided into two equally sized subgroups of co-located members and when the subgroups were homogenous in nationality. While it might seem paradoxical that team members would experience more conflict and less trust

when their teammates were of the same nationality, it was reasoned that homogeneous subgroups experience more rivalry.

**ENHANCING VIRTUAL TEAMWORK**

There are a variety of methods for enhancing the performance of virtual teamwork. Some of the strategies involve improvements in technology. Other strategies involve specific behaviors of the people involved (see Exhibit 12-3 for a description of the interventions managers can make in virtual teams during the four stages of forming, storming, norming, and performing). We first explore structural solutions and then focus on interpersonal solutions.

**TEAM FORMATION**

When managers of several large companies were asked whether talent or location should drive the formation of teams, the conclusion was that location challenges could be overcome more easily than talent shortages.\(^85\) It is important to make the boundaries clear: 90 percent of team members have disagreeing lists when asked to identify who is on their team.\(^86\) Just because someone is not physically present does not mean that they cannot feel they are part of larger mission or purpose. Companies should immerse virtual employees in the organization’s culture.\(^87\) For example, at Automattic Inc., 230 employees in more than 100 cities work remotely from home. Job applicants work on a trial project for a few weeks to make sure that the candidate is a good fit for the company culture, and after they are hired, all new employees work in customer service for three weeks to create a shared and unifying employee experience.\(^88\)

**TECHNOLOGY**

A variety of technologies support virtual teams, but the key is to not let the technology drive the entire virtual team. A key barrier to effective virtual teamwork is user adoption and technological and organizational challenges. The company, Under Armour abolished nearly all in-person meetings among its far-flung workforce, and instead adopted a workplace communications tool, Slack, in which users sign into “channels,” and conversations proceed in real time. Team members who stray off topic are “raccooned” or directed to other channels where specific breakout conversations can take place. Company meetings take place in an elastic virtual room.\(^89\)

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\(^87\)Mulhern, “Engaging virtual employees.”


Part 3 • Teams in Organizations

Asynchronous technology can create a tendency to “show and tell,” in which people engage in monologues. Avoid the monologue trap by inviting interaction and input from others. Ask particular people for input, rather than just saying, “What do you all think?”

One investigation of 47 technical and administration work teams in a multinational energy company revealed that larger teams were more likely to use technology to dominate one another rather than to collaborate.90 Moreover, such appropriation was negatively related to team outcomes. Additionally, teams with more sophisticated knowledge about technology were the most likely to dominate via appropriation.

There is etiquette to consider when planning a virtual meeting. A checklist to help plan virtual meetings can be found in Exhibit 12-4.

### SHARED MENTAL MODELS

Virtual teams are influenced by the type of technology used to communicate the development of shared mental models. Regardless of how teams communicate, whether by face-to-face meetings or via information technology, the team members need to have a common understanding about the task and how they will coordinate work.91 Networking and social capital also influence mental models. A study of virtual teams in high-tech organizations revealed that social capital, in particular boundary spanning and knowledge of social networks, was associated with greater knowledge sharing among professionals.92

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Boundary objects are documents and a shared vocabulary that allow people from different teams, organizations, and cultures to build a shared understanding. Boundary objects include tools, documents, models, discourse, and language, as well as processes, routines, and procedures. In this regard, boundary objects are similar to the transactive memory system discussed in Chapter 6. Boundary objects will be interpreted differently by the different communities, and it is the acknowledgment and discussion of these differences that enable a shared understanding to be formed.

For example, a field study of a Jamaican-Indian virtual team using software and project management tools as boundary objects revealed that under some circumstances, boundary objects facilitated collaboration, but at other times led to greater conflict. Specifically, when boundary objects were used during transitions that involved definitional control and redistribution of power and authority, knowledge sharing was hindered and negative stereotyping increased. Conversely, when boundary objects were used in relation to timelines and project meetings, morale was high and teams developed a shared identity.93

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Throughout the conversation, summarize progress and decisions and refer to the goal of the meeting. A study of 115 teams in 20 subsidiaries of a multinational organization revealed that responsiveness and knowledge management increased learning within the team and led to better performance and interpersonal relations.\textsuperscript{94}

**INITIAL FACE-TO-FACE EXPERIENCE**

Bringing together team members for short, face-to-face experiences is often used by companies who want to lay a groundwork of trust and communication for later virtual teamwork. It is much easier for people to work together if they have met face-to-face. Face-to-face contact humanizes people and creates expectations for team members to use in their subsequent long-distance work together. A study of 208 senior business students revealed that compared to the members who met face-to-face for an introductory meeting, those who met only electronically lagged significantly behind in terms of trust and collaboration.\textsuperscript{95} The introductory face-to-face meeting plays a large role in the development of trust and collaboration, especially when the context is competitive. The small marketing firm PR 20/20 landed tech giant HubSpot as a client through an initial face-to-face meeting at a conference after which PR 20/20 CEO Paul Roetzer followed up with in-person meetings.\textsuperscript{96}

Schmoozing refers to contact between people that has the psychological effect of establishing a relationship with someone. Also referred to as a virtual handshake,\textsuperscript{97} this exchange of some basic personal information significantly expedites the operation of virtual teams. There are a variety of non-face-to-face schmoozing strategies, such as exchanging pictures or biographical information or engaging in a simple get-acquainted email exchange. Schmoozing increases liking and rapport and results in more profitable business deals than when people just get down to business.\textsuperscript{98} Perhaps the most attractive aspect of schmoozing is its relatively low cost and efficiency. Merely exchanging a few short emails can lead to better business relations. However, people should not expect others to schmooze naturally—at least at the outset of a business relationship. In fact, team members working remotely have a tendency to be highly task focused. A field study of 43 teams, 22 co-located, and 21 distributed from a large multinational company, revealed that virtual teams reported more task and interpersonal conflict than did co-located teams. However, the teams that engaged in spontaneous communication developed a stronger sense of shared group identity and mitigated conflict.\textsuperscript{99} In this study, spontaneous communication, such as schmoozing, referred to informal, unplanned interactions among team members.

In virtual teams, reputations are quickly formed and often create a self-fulfilling prophecy. The first 30 days are very important. One of the best ways to get a reputation

\textsuperscript{96}Duncan, K. (2014, October 27). 3 Benefits of meeting face-to-face. Entrepreneur. entrepreneur.com
\textsuperscript{99}Hinds & Mortensen, “Understanding conflict in geographically distributed teams.”
for being a “good” virtual team member is to be reliable. To be thought of as reliable, team members need to deliver what they promise. Many people overpromise and underdeliver; a far better approach is to undercommit and overdeliver. Consider three steps for building your own reliability capital: (1) Keep a written list of all the agreements, promises, and commitments you make. Check it frequently. (2) Ask your team to tell you one thing you can do to be more reliable in their eyes, and then do it. (3) Be available to support and respond to team members. When you are not available, follow up as soon as possible.100

OBJECTIVE SELF-AWARENESS

One senior vice president always puts a mirror in front of her/him during a conference call. The mirror allows this person to see how he/she looks to others. In one investigation, North Americans who were in front of a mirror were more self-critical and were less likely to cheat than were those not in front of a mirror.101

INTEGRITY

Virtual teamwork creates situations ripe for self-interested behavior, hidden agendas, and confusion. Without daily face-to-face opportunities to discuss situations and share concerns, people might start to question the integrity of some team members. It is important to demonstrate your integrity in your virtual team interactions. Consider these four steps to demonstrate integrity to your virtual team: (1) Be truthful and forthright without being obnoxious. This means providing others with honest feedback. (2) Avoid sarcasm, joking, and teasing in your distance interactions. Jokes can be misinterpreted and set the stage for evasive conversations. (3) Maintain confidences; don’t spread gossip or share confidential information. Tell people your standards. (4) Handle sensitive material appropriately.102

CAVE AND COMMONS FLEXIBILITY

Team members sometimes need to do individual (solo) work, and sometimes they need to interact directly with others. The cave-and-commons design allows teams to regulate their level of individual and group interaction. In general, members should go to their caves when status differences exist, people are being too polite and debate is needed, participation is uneven, and the work to be done is clear. Group members should find the commons when the group first forms, the overarching goal is not clear, trust is low, uncertainty is high, a crisis erupts, conflict needs to be resolved, and to give and receive feedback. Indeed, an investigation of performance appraisals revealed that people receiving feedback were most negative about electronic feedback versus feedback received on paper or via face-to-face.103


102Dinnocenzo, How to lead from a distance.

COACHING THE VIRTUAL TEAM

According to Wageman, process loss or threats to performance can take different forms for virtual teams from those of traditional teams.\(^{104}\) Wageman’s model of coaching the virtual team focuses on motivation, knowledge, and coordination interventions at three key time periods: team launch, natural breakpoints, and at the end of a performance period.\(^{105}\)

The launch of a virtual team should outline a goal and give a motivating purpose to shape the virtual team members’ motivations. In addition, the team should have a set of clear boundaries so that all members know who is on the team and why.

Both physical distance and asynchronous methods of communication may dampen employee effort. Withdrawal of effort by one member of the team however unintentional, might well lead to the withdrawal of effort by other members. Team members might make “untested attributions” about the level of commitment others have to the team, assuming that a given member’s (apparently) low effort reflects a low level of motivation. This withdrawal can spread to other members and affect the motivational norms of the group.

Members of virtual teams may have considerably less knowledge about the other members’ task-relevant knowledge and skills than do traditional teams. Leaders will know why certain members were selected for the virtual team, but members might not. Consider two types of information in teams: tacit knowledge and codified knowledge.\(^{106}\)

**Tacit knowledge** is hard to articulate and acquired through experience.\(^{107}\) In contrast, **codified knowledge** refers to knowledge that is transmittable in formal, symbolic language. For example, data from multiple hospitals learning to use a new technology revealed that when team performance relied on tacit knowledge, performance was more varied. Team members were unable to describe to other hospital sites precisely what they did to get the technology to work.

As a best practice, never conclude a virtual meeting without discussing the future. Think at least three months out, get commitments about what every team member will do, and schedule expectations regarding when they will deliver. Summarize the plan and follow up with an email or posting to which people can refer.

Chapter Capstone

Teams have been dealing with place and time issues for several decades. The traditional approach was to relocate employees; newer solutions are more varied, creative, often cheaper, and less permanent. Information technology can increase the productivity of teams, and a skilled manager knows when to use information technology, anticipates which obstacles are likely to crop up when using it, and understands how to address those obstacles.

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\(^{104}\)Wageman, “Virtual processes.”
\(^{105}\)Wageman, “Virtual processes.”