

Making Communication Work

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Effective communication among individuals and groups is critical to the execution of complex business processes. It is the vehicle of leadership and vision, coordination and control, the transfer of knowledge, and the realization of creativity.

More specifically, in such knowledge-intensive and innovation-oriented corporate functions as **R&D**, engineering, manufacturing, marketing, and finance, communication plays three critical roles: it carries specific technical knowledge, it delivers information about time and resources for coordination, and it triggers creative decision-making and problem-solving.

When communication works well, it captures organizational learning and supports adaptation to new environmental conditions, facilitating revitalization and change. When it works badly, the organization's key processes become chaotic or stagnant. The challenge is to match communication patterns effectively with the organization's goals, technology, structure, and tasks.

The developing science of organizational communication has evolved from a „soft“ and „touchy-feely“ social science into a body of practical knowhow for business management – an executive tool-kit for organizational diagnosis, design, and change. In this article, we set forth some of the fundamental laws and guidelines that have emerged from this science.

1. Communication Must Fit the Task at Hand

Organizational tasks can be measured in terms of their complexity or variety and their analyzability, or lack of novelty. Designing a mechanical gear, for example, is much less complex than integrating the space shuttle. In the latter project, the variety of components and subsystems, the types of technologies involved, and the interdependencies and interactions to be anticipated, predicted, and controlled are mind-boggling. Similarly designing a mechanical gear is a far more analyzable task – i.e., it involves much less novelty or uncertainty – than searching for a new compound that is flexible, light, or electrically insular. While highly complex tasks require order and coordination, highly novel tasks need creativity and state-of-the-art knowledge.

Classifying tasks in terms of their variety and their analyzability (an approach originally developed by Charles Perrow of Yale University), can shed useful light on their communication needs. For example, we can classify the various organizational trades and professions of the past and present into four types (Exhibit 1). The routine jobs of assembly line workers, as caricatured in Chaplin's „Modern Times,“ involve mindless repetition of activities in which human judgment and thought are superfluous and what matters is menial agility. Here variety is very low and analyzability is high. At the other extreme are the nonroutine tasks of research scientists and management consultants, who must understand and analyze novel phenomena, using technical/professional knowledge that is rapidly changing. Here, variety is overwhelming and every problem is an intricate puzzle.

Exhibit 1

Matching Communication and Tasks

| | <i>Low analyzability</i> | <i>High analyzability</i> |
|---------------------|---|--|
| <i>High variety</i> | <ul style="list-style-type: none"> • Situation: nonroutine <i>Many ambiguities, unclear events</i> • Communication <i>Define questions, seek answers, gather objective data and exchange opinions</i> | <ul style="list-style-type: none"> • Situation: engineering <i>Many well-defined problems</i> • Communication <i>Ask many questions, seek explicit answers, gather new quantitative data</i> |
| <i>Low variety</i> | <ul style="list-style-type: none"> • Situation: craft <i>Occasional ambiguous, unclear events</i> • Communication <i>Define questions, develop common understanding, gather opinions</i> | <ul style="list-style-type: none"> • Situation: routine <i>Clear, well-defined events</i> • Communication <i>Need few answers, gather routine objective data</i> |

Craft activities present a different profile. Diamond polishing, painting, or making movies involve a narrow set of tasks for which underlying knowledge is tacit. The craftsman „just knows“ how to perform the necessary tasks. The work has low variety but also low analyzability. In contrast, engineers (who in this terminology include R&D and product development professionals, systems analysts, accountants, and technicians) are able to deal with a broad set of assignments (high variety) with well-developed and broadly applicable knowledge of causes and effects (high analyzability). While the former is „art,“ the latter is „science.“ Mastering the former requires lengthy apprenticeship, while mastering the latter requires a formal, codified learning process.

The variety and analyzability of tasks have profound implications for the relevant communication patterns. Nonroutine tasks, such as research or management consulting, must focus on defining the questions and seeking the opinions of experts. For these cognitively difficult tasks, we need face-to-face communication and the creative spark. Routine tasks, on the other hand, can be performed effectively with only low amounts of specific information. Here, information needs can be satisfied through briefs and standard operating procedures. Engineering tasks, meanwhile, can be effectively performed by seeking specific answers to many questions, while crafts tasks require qualitative information for a few types of problems.

2. The Network is Part of the Message

For communication to have value, information must not only fit the task at hand, but be conveyed to the right people at the right time. Through communication engineering, a comparatively new body of knowledge, experts can measure an organization's communication patterns and structure, diagnose communication effectiveness in fitting tasks, identify mismatches and gaps, and implement changes to correct deficiencies. Often, the act of measuring or „mapping“ the communication structure reveals very interesting information about connectivity, Generality, centralization, and the „not-invented-here“ syndrome.

- The frequency of communication among and within various groups reflects their connectivity, which is a vital aspect of group effectiveness. Project groups whose members communicate an average of less than once a week are functioning more like a collection of individual contributors than a team working on a common task, with shared goals.
- Communication patterns can reveal the relative centrality of individuals and departments in the overall organizational network. Individuals and groups that possess critical information, expertise, or knowledge are unlikely to be very useful unless they achieve a reasonable degree of centrality. If an internal consulting function – such as quality assurance, competitive information, or industrial design – that does not achieve adequate centrality its role, structure, or task should be reconsidered.
- Similarly, the degree of centralization of each project and department can be identified by measuring the proportion of internal communication monopolized by the project's leaders or manager. It should be noted that varying degrees of centralization are appropriate to various tasks. For complex projects that are low in novelty, high centralization achieves coordination and order. In contrast, research projects that are high in novelty require low centralization for a free flow of ideas.
- Teams that rarely communicate with sources of information external to themselves may be suffering from the „not-invented-here“ syndrome. This all-too-familiar pathology is marked by insularity, decreased creativity, and stagnation. It besets many teams they have been working together more than three years (on average). Avoiding the not-invented-here syndrome is especially critical for teams whose work consists of creative problem-solving, particularly in state-of-the-art technologies.

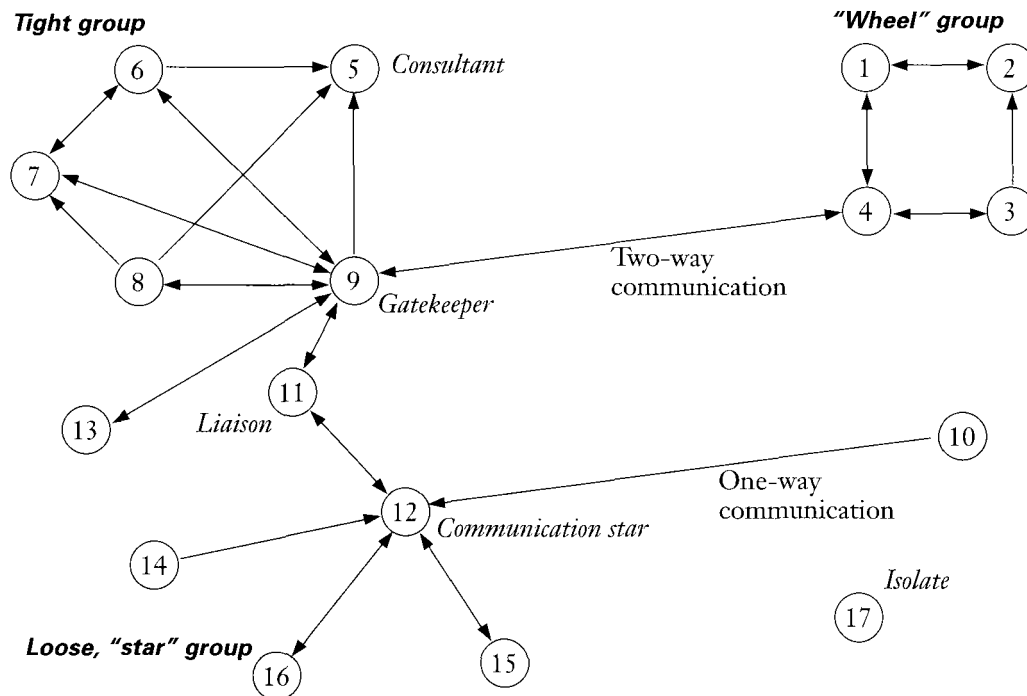
Exhibit 2 shows three typical communication network structures. The members of the „tight“ communication group (members 5-9) communicate with each other quite regularly. This is an example of high connectivity: group members' tasks are well coordinated, goals are shared, and, in most cases, the team climate spurs collaboration. On the other hand, because the group is connected to its environment via a single member, it might develop the not-invented-here syndrome.

In contrast, members of the „loose“ communication group keep in touch only with the „communication star“ of this team, member 12. This star team (members 12, 14, 15, and 16) is centralized; the main source of information is a single member of the network, and information reaches all team members very fast, possibly in a joint meeting.

The „wheel“ group (members 1-4) are laterally connected with each other. This gives them an advantage over the loose group, in that they can verify the information they receive, but it takes more time for external information to reach all of them than it does in the loose „star“ group.

Exhibit 2

Three Typical Communication Networks



3. Gatekeepers Play a Key Role

The gatekeeper (member 9 in Exhibit 2) is a special case of a communication star. He or she communicates significantly more than the average team member, and much of his or her communication is with the external environment. The role of the communication gatekeeper in technology-intensive organizations has been identified by Thomas Allen and his students at the Sloan School of Management. This role, like other „boundary-spanning“ roles that connect the organization to the external environment, exists in many domains, including marketing and manufacturing. It is critical to the success of R&D and product development projects. In effect, the gatekeeper creates a technology/ knowledge transfer „highway,“ or (to use computer jargon) a data-“bus.“

Generally, as diagrammed in Exhibit 3, the various gatekeepers in an organization are connected to each other, and each member of the gatekeepers' network is connected to the external world through colleagues, readership of technical literature, and participation in conferences. Interestingly enough, in addition to their informal communication role, gatekeepers are excellent technical contributors. Typically, they are first- or second-tier managers and have been in the organization at least 5 years. Because this role does not lend itself to formal nomination, managers need to identify these individuals and use them well. For instance, because gatekeepers excel in „networking“ at conferences and trade-shows, an astute manager would send them to such events more often than their colleagues.

Additional communication roles include the liaison (member 11 in Exhibit 2), who connects two or more groups; the consultant (member 5), who responds to questions and inquiries initiated by members through a one-way communication; and the isolate (member 17), who does not communicate with anyone even once a week. The latter is not as rare as one might assume. In most cases, this isolation is a function of physical distance, newness to the organization, or involvement in a task as an individual contributor. Still, in most cases, such isolation is a sign of a problem to be dealt with.

4. Proximity Matters

Many studies have shown that, other things being equal, frequency of communication is a function of physical proximity (Exhibit 4). In general, as people are located farther apart, the probability that they will engage in a meaningful, face-to-face, technical conversation at least weekly „decays“ very sharply; after 50 yards, this probability is less than 5 percent. Naturally, organizational and task bonds, such as membership on the same project team or, to a lesser extent, in the same department, can counteract the lack of physical proximity even doubling or tripling the probability of communication. Nonetheless, to increase the probability of informal and

formal interactions, it can be extremely valuable to pay close attention to the physical layout of facilities, including the number of floors, the connections between floors, and the location of common areas and facilities, such as coffee machines, bulletin boards, bathrooms, and cafeterias.

Exhibit 3

Communication Gatekeepers

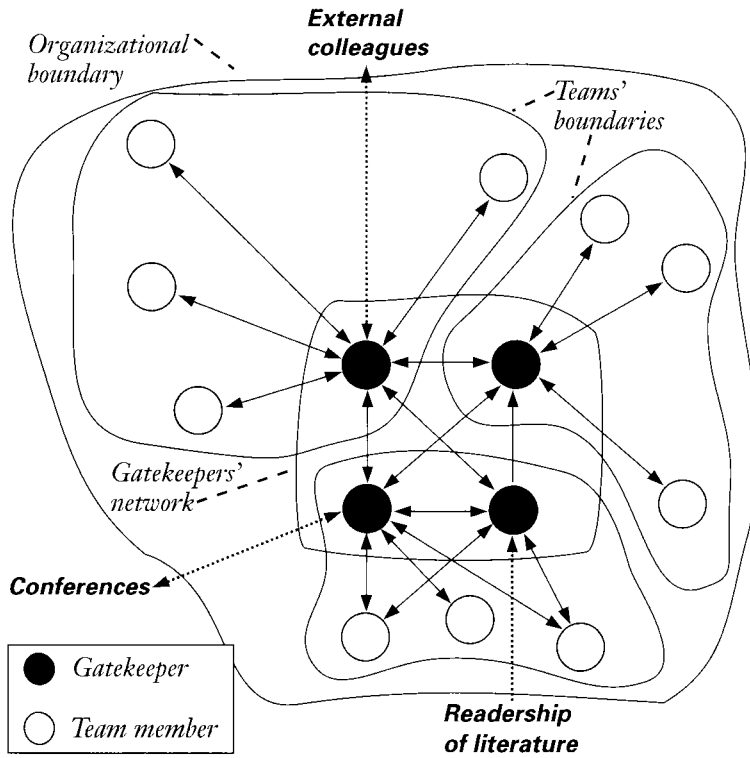
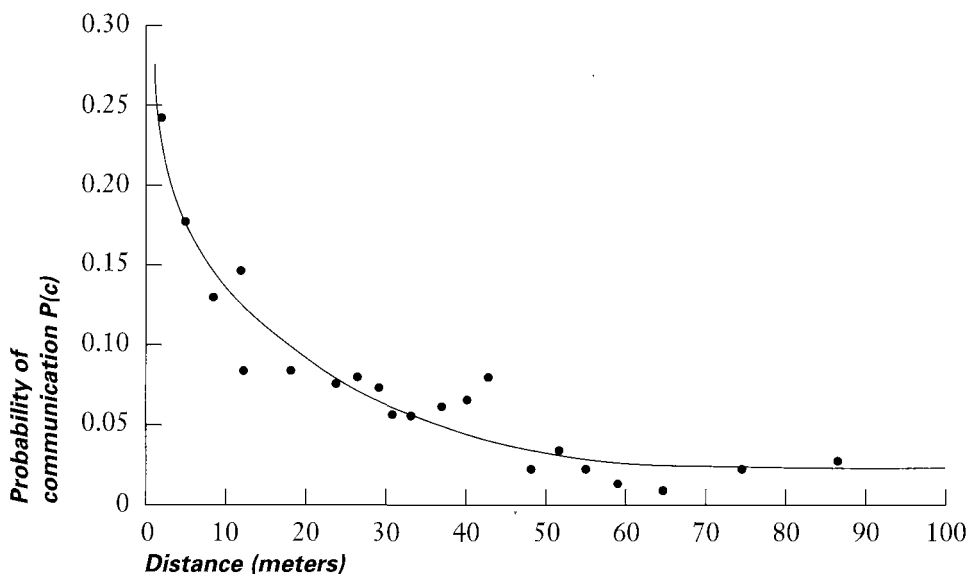


Exhibit 4

Probability of Communication as a Function of Distance



Printed with permission of Thomas J. Allen adapted from data appearing in his book, *Managing the Flow of Technology*, MIT Press, 1984.

We know, for example, that vertical distance is harder to overcome than horizontal distance, and that having a direct view of adjacent areas increases the propensity to move across these boundaries. If an organization's marketing and R&D departments are located above each other and don't communicate as often as necessary, we would consider relocating the two groups to the same floor, installing broad, open stairways that permit a direct view of the next floor, or placing a coffee machine between the two departments. In addition, it can be useful to locate members of different departments together in shared neutral space.

5. Information Channels Vary in Richness

Channels of communication differ not only in the type and quantity of information they can carry, but in the „richness“ of the communication they support, i.e., their ability to change our level of understanding about a subject or a problem within a time interval. In order of decreasing richness, the channels are face-to-face meetings, telephone conversations, personal documents, impersonal documents, and numeric documents. An organization can design its communication system to encourage or discourage various information exchange mechanisms, such as group meetings and liaison roles, as it deems appropriate. It should pay close attention to its rules and procedures concerning use of travel, telephone, E-mail, and faxing, as these profoundly influence the choices organization members make about communication media, which, in turn, determine the effectiveness of organizational communication.

Of course, communication media and channels must conform to organizational technology (knowledge, tools, and techniques), interdepartmental relations, and the general business and market environment. They must also fit the task at hand with respect to its uncertainty and complexity; Exhibit 5 illustrates effective matches.

Exhibit 5

Matching Communication Media and Tasks

| | Low analyzability | High analyzability |
|---------------------|---|---|
| High variety | <ul style="list-style-type: none"> • Situation: nonroutine • Media and amount <i>Rich media to resolve unanalyzable issues, large amounts of information for many exceptions</i> • Communication mechanism <i>Frequent face-to-face, group meetings, unscheduled meetings, special studies and reports</i> | <ul style="list-style-type: none"> • Situation: engineering • Media and amount <i>Low richness, large amount of information</i> • Communication mechanism <i>Quantitative databases, statistical reports, few meetings</i> |
| Low variety | <ul style="list-style-type: none"> • Situation: craft • Media and amount <i>Rich media, small amount of information</i> • Communication mechanism <i>Define questions, develop common understanding, gather opinions</i> | <ul style="list-style-type: none"> • Situation: routine • Media and amount <i>Low richness, small amount of information</i> • Communication mechanism <i>Need few answers, gather routine objective data</i> |

Conclusion

Communication is both a cause and an outcome of organizational culture. In open, informal, „organic,“ and agile organizations, communication is quick and effective. The members themselves identify gaps and mismatches and correct them. The result is growth, commercial success, and high quality of organizational life. Intervention in the communication system is unnecessary.

Most organizations, however, develop bureaucratic „infrastructures“ as they grow and mature. Their sheer size and scope, compounded by the not-invented-here syndrome, push them toward a „mechanistic“ atmosphere in which communication is slow and ill-matched to organizational tasks. Often, projects are late and expensive, and their outcomes disappointing. Individual contributors and executives are stressed or „timed out.“ Learning and adaptation are slow and ineffective. Errors of commission and omission proliferate on both strategic and tactical levels.

Under these circumstances, state-of-the-art communication engineering, with its diagnostic methods and intervention techniques, becomes necessary to corporate survival. The organization must carefully and creatively apply the levers of physical layout, organizational structure, media choice, and communication-related information technologies such as E-mail, bulletin boards, interactive databases, videoconferencing, „groupware“ software, and CAD/CAM. It is high time modern corporations reaped the benefits of this academic knowledge to heighten their performance.

Professor Oscar Hauptman has been on the Harvard Business School faculty since 1986, teaching courses in production operations management and the management of technology.