Network Patterns and Analysis: Underused Sources to Improve Communication Effectiveness

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ABSTRACT

Communications flow in four directions—downward, upward, horizontally, and diagonally. Organizational communication also flows through a formal network. The five most common networks are the chain, Y, wheel, circle, and all-channel. Besides network patterns, another method to help school administrators analyze communication flows and patterns is network analysis. In network analysis, communication flows and patterns are analyzed between units and across hierarchical positions. Network analysis uses survey sociometry to identify cliques and certain specialized roles of the members in the communication structure of real-life organizations. Also existing in organizations is an informal communication network—the grapevine—that can serve as another important source of information to school administrators.

Communication Networks

Organizational communication can be transmitted in a number of directions: downward, upward, horizontally, diagonally, and through the grapevine. These communications can be formal or informal; in either case, the actual pattern and flow of communication connecting senders and receivers are called communication networks. Because this system contains all the communication of the organization, these networks have a pervasive influence on the behavior of individuals functioning within them.

Network Patterns

Network patterns are derived from laboratory experiments in which the structure of the groupings can be manipulated by the experimenter (Hollingshead, 2012). Figure 1 depicts five of the more frequently used networks (wheel, chain, Y, circle, and all-channel). The major difference among the networks is the degree to which they are centralized or decentralized (Ramos, 2012). Each network pattern is discussed in turn.
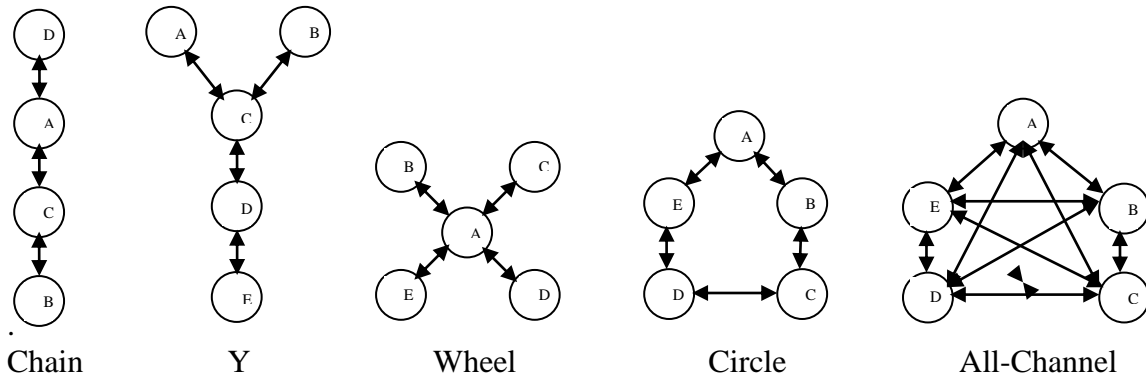
| Chain | Y | Wheel | Circle | All-Channel |

Figure 1. Common communication networks.

The *wheel network*, a two-level hierarchy, is the most structured and centralized of the patterns because each member can communicate with only one other person. For example, a superintendent of schools and those who are his immediate subordinates (assistant superintendent for business, instruction, personnel, and assistant to the superintendent), probably form a wheel network. The superintendent is A, and his assistant superintendents are B, C, D, and E, respectively. The four subordinates send information to the superintendent, and the superintendent sends that information back to them, usually in the form of decisions.

The *chain network* ranks next highest in centralization. Only two people communicate with one another, and they in turn have only one person to whom they communicate. Information is generally sent through such a network in relay fashion. A typical chain network would be one in which a teacher (B) reports to the department head (C), who in turn reports to the principal (A), who reports to the superintendent (D). Another example is the grapevine through which information passes throughout a school building or district between different departments and organizational levels.

The *Y network* is similar to the chain except that two members fall outside the chain. In the Y network, for example, members A and B can send information to C, but they can receive information from no one. C and D can exchange information; E can receive information from D but cannot send any information. For example, two assistant principals, (A and B) report to the principal (C). The principal, in turn, reports to the assistant superintendent (D), who reports to the superintendent (E).

The *circle network*, a three-level hierarchy, is very different from the wheel, chain, and Y networks. It is symbolic of horizontal and decentralized communication. The circle gives every member equal communication opportunities. Each member can communicate with persons to their right and left. Members have identical restrictions, but the circle is a less restricted condition than the wheel, chain, or Y networks. For example, the circle network has more two-way channels open for problem solving (i.e., five) than the four channels of the aforementioned networks. In the circle network, everyone becomes a decision maker.

The *all-channel network* is an extension of the circle network. By connecting everyone in the circle network, the result is a star, or all-channel network. The star network permits each member to communicate freely with all other persons(decentralized

communication). The star network has no central position, and no communication restrictions are placed on any member. A committee in which no member either formally or informally assumes a leadership position is a good example of a star network.

Effectiveness of different networks. The importance of a communication network lies in its potential effects on such variables as speed, accuracy, morale, leadership, stability, organization, and flexibility. Studies in communication networks show that the network effectiveness depends on situational factors (Kim, 2012). For example, centralized networks are more effective in accomplishing simple tasks, whereas decentralized patterns are more effective on complex tasks (Schultz, 2011). In addition, the overall morale of members of decentralized networks is higher than those of centralized networks. This finding makes sense in view of the research indicating that employees are most satisfied with their jobs when they have participated in decision making about them (Pullali, 2012). Moreover, research shows that a member's position in the network can affect personal satisfaction. Members in more central positions in the network tend to be more satisfied (Bonito, 2012).

Network Analysis

Besides network patterns, another method to help school administrators analyze communication flows and patterns is network analysis. In network analysis, communication flows and patterns are analyzed between units and across hierarchical positions. Network analysis uses survey sociometry to identify cliques and certain specialized roles of members in the communication structure (Hollingshead, 2012).

To illustrate, consider the communication network for a hypothetical school district. Figure 2 presents a formal organizational chart showing the hierarchical positions occupied by twenty-two people in three divisions of the school district.
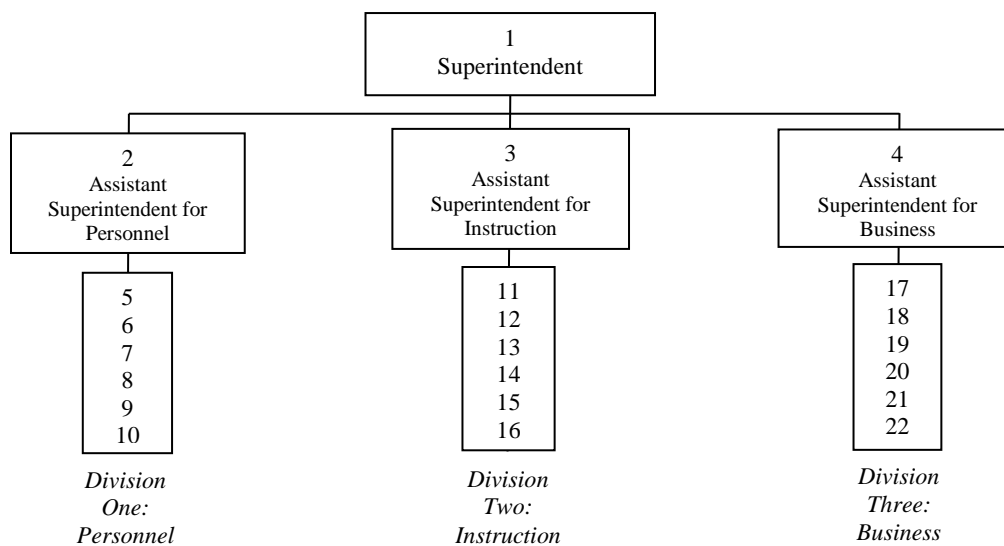

Figure 2. Formal organizational chart of a hypothetical school district.

The numbers within the boxes represent individuals in the school district. Person 1 at the top of the hierarchy is the superintendent of schools. The three people immediately below him are the assistant superintendents of the three divisions: personnel, instruction, and business. The remaining individuals are employees in each division. This chart represents the formal structure of communications within the school district.

Through network analysis, Figure 3 shows a communication network and contrasts it with the school district's formal structure (Figure 2). As Figure 3 shows, Person 1, (the superintendent) frequently communicates with Persons 2, 3, and 4, the assistant superintendents for personnel, instruction, and business, respectively.   His communications with other lower-level members are less frequent or nonexistent. Figure 3 also identifies cliques in the communication network of the twenty-two members on the basis of intercommunication patterns among them. The lines indicate patterned communication contacts. Some communication contracts are two way (↔), and some are one-way (→). Two-way arrows connect Persons 1 and 4, 1 and 2, 1 and 3, and 2 and 4, while one-way communications exist between Persons 2, 3, 4, and 17, and so on.
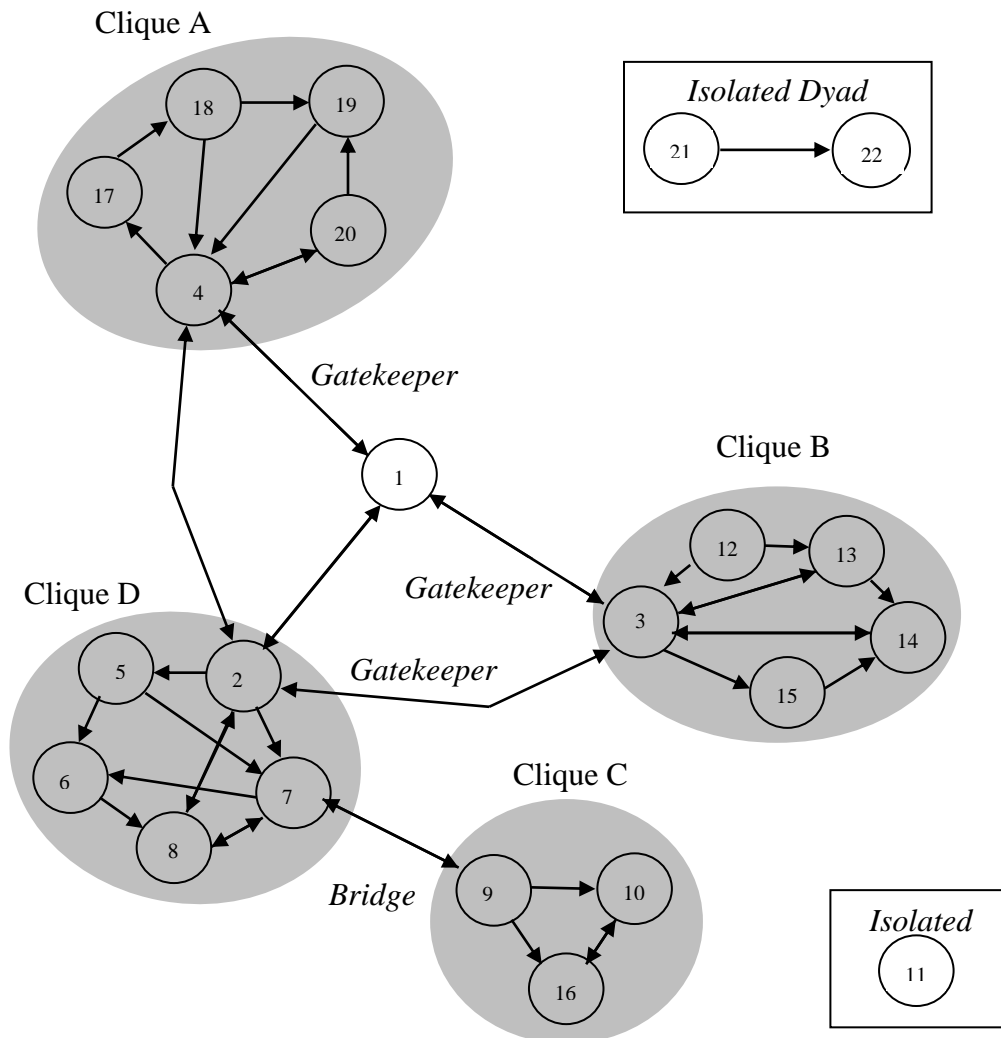

Figure 3. Communication network of a hypothetical school district.

There are four cliques in the school district: A, B, C, and D. "A clique is a subsystem whose elements interact with each other relatively more frequently than with other members of the communication system" (Rogers & Rogers, 1976, p. 130). Clique A is composed of Persons 4, 17, 18, 19, 20; Clique B is composed of Persons 3, 12, 13, 14, and 15; and so on. Most clique members in a network are usually relatively close to each other in the formal hierarchy of the organization. However, a school district's actual communication network can be very different from the pattern of communication established by its formal organizational structure. Four main communication roles have emerged in network analysis: gatekeepers, liaisons, bridges, and isolates (Belussi, 2012).

Person 1, the superintendent, is dependent on Persons 2, 3, and 4, the three assistant superintendents, for access to communication flows. The three assistant superintendents are also *gatekeepers*, having the capacity to control information moving in either direction between the superintendent and the rest of the school district. Person 1 also serves as a *liaison* (an individual who interpersonally connects two or more cliques within the system without himself belonging to any clique who connects Clique A, Clique B, and Clique D. If this liaison were removed from the network, it would be a much less interconnected system. Person 7 is a *bridge*, a person who is a member of one communication clique and links it, via a communication dyad, with another clique. Thus, Person 7 is a member of Clique D and communicates with Person 9, who is a member of Clique C. Person 11 is an *isolate* (an individual who has few communication contacts with the rest of the system) and is virtually cut off from communication. Person 21 has an in-group relationship in an isolated dyad with Person 22.

Patrick Forsyth and Wayne Hoy (1978) studied communication isolates in five secondary schools. Results indicated that communication isolates tend to be separated from perceived control, the school's control structure, respected colleagues, and sometimes friends. A subsequent study of communication isolates in elementary schools reports similar findings except that isolation from friends was not related to isolation from formal authority (Zielinski & Hoy, 1983). In another study of communication networks in one high school and five elementary schools, using sociometry and frequency surveys of communication, results indicate more frequent communication contacts in elementary schools as compared with high schools. According to this study, three factors affect horizontal communication patterns in schools: level and size of school, specialization, and proximity (Charters, 1967). More recent studies reported by Hollingshead (2012) support the earlier findings of Charters.

In sum, I have identified and described individuals who have potential influence on the informal communication network and their roles in interpersonal communication in school districts. School administrators entering a school district would be well advised to establish good interpersonal relationships with gatekeepers, liaisons, and bridges. Furthermore, it is vital to be cognizant of the potentially destructive effect of isolates, who often become alienated and exhibit detrimental behaviors dysfunctional to the school district. Knowledge of communication networks can serve as useful interpersonal communication sources. More important, such knowledge can determine the success or failure of a school administrator on the job.

An Informal Network: The Grapevine

Every school district needs formal channels of communication to organize, control, and coordinate activity within the organization (Haslett, 2012). Coexisting with the formal channels is an informal communication network, commonly referred to as the grapevine. The *grapevine* is simply the informal communication network among people in an organization (Shockley-Zalabak, 2012). Grapevines are present and highly active in virtually every school district. They flow in all directions—up, down, or horizontally—in unpredictable patterns and are not fixed by any formal organizational chart.

The grapevine serves as an emotional outlet for staff members' fears and anxieties; helps satisfy a natural desire for people to talk about their job, their institution, and their colleagues; gives staff a sense of belonging and a way of gaining social acceptance and recognition; and helps school administrators to learn how staff members feel about policies and programs (Keyton, 2011).

Given these benefits, it is not surprising that grapevines exist in almost all school organizations. Surprising is the fact that the information transmitted through the grapevine is accurate and relevant to the school district. About 80% of grapevine communications pertain to job-related topics rather than personal, vicious gossip. In addition, approximately 75% of the details passed through the grapevine are accurate. Moreover, five of every six important messages are carried by the grapevine rather than through formal communication channels (Newstrom, 2011). This has obvious implications for school administrators. It means tuning into the grapevine, understanding what it is saying, and knowing and using its sources. Thus school administrators can use the energy of the grapevine to supplement formal communication channels. Management by wandering around is an excellent way to use the grapevine in a nonthreatening way (Frase, 2003).

One of the negative features of the grapevine, the one that gives the grapevine its poor reputation, is rumor. A rumor is an unverified belief that is in general circulation (Modaff, 2012). Because the information cannot be verified, rumors are susceptible to severe distortion as they are passed from person to person within the organization. One way to minimize the spread of rumors is to improve other forms of communication. If school administrators provide information on issues relevant to subordinates, then damaging rumors are less likely to develop (Lunenburg & Ornstein, 2012).

Joseph Licata and Walter Hack (1980) examined grapevine structures among school administrators and report that grapevine linkages differed between elementary and secondary school principals. In elementary schools, where relationships are closer, principals tended to communicate informally; in high schools, where the structure is more formal, principals built the grapevine around professional survival and development.

Conclusion

Communications flow in four directions—downward, upward, horizontally, and diagonally. Organizational communication also flows through a formal network. The five most common networks are the chain, Y, wheel, circle, and all-channel. Besides network

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References

Belussi, F. (2012). *Managing networks of creativity*. New York, NY: Routledge.

Bonito, J. (2012). *Interaction and influence in small group decision making*. New York, NY: Routledge.

Charters, W. W. (1967). Stability and change in the communication structure of school facilities. *Educational Administration Quarterly, 3*, 15-38.

Forsyth, P. B., & Hoy, W. K. (1978). Isolation and alienation in educational organizations. *Educational Administration Quarterly, 14*, 80-96.

Frase, L. (2003). *School management by wandering around*. Lanham, MD: ScarecrowEducation.

Haslett, B. B. (2012). *Communicating and organizing*. New York, NY: Routledge.

Hollingshead, A. (2012). *Research methods for studying groups*. New York, NY: Routledge.

Keyton, J. (2011). *Communication and organizational culture: A key to understanding work experiences*. Thousand Oaks, CA: Sage.

Kim, J. (2012). *Situational theory of problem solving*. New York, NY: Routledge.

Licata, J. W., & Hack, W. G. (1980). School administrator grapevine structure. *Educational Administration Quarterly, 16*, 82-99.

Lunenburg, F. C., & Ornstein, A. O. (2012). *Educational administration: Concepts and practices*. Belmont, CA; Wadsworth/Cengage Learning.

Newstrom, J. W. (2011). *Human behavior at work*. New York, NY: McGraw-Hill.

Modaff, D. P. (2012). *Organizational communication: Foundations, challenges, and misunderstandings*. Boston, MA: Allyn & Bacon.

Pullali, S. (2012). *Organizational communication and job satisfaction among faculty*. Saarbrucken, Germany: Lambert Academic Publishing.

Ramos, P. P. (2012). *Network models for organizations*. New York, NY: Palgrave Macmillan.

Rogers, E. M. & Rogers, R. A. (1976). *Communication in organizations*. New York, NY: Free Press.

Schultz, P. J. (2011). *Communication theory*. Thousand Oaks, CA: Sage.

Shockley-Zalabak, P. (2012). *Fundamentals of organizational communication*. Upper Saddle River, NJ: Prentice Hall.

Zielinski, A. E., & Hoy, W. K. (1983). Isolation and alienation in elementary schools. *Educational Administration Quarterly, 19*, 27-45.