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## COMMUNICATIONS' PLACE IN THE ORGANIZATION

### A Report from Corporate IS Management

Communications channels--from mobile phones to value-added networks to corporate-owned communications lines--are vital to business. Organizations must redesign their corporate structures to readily and effectively handle internal information flows and link with external customers and suppliers. A survey reveals how leading US corporations define responsibilities and specializations in this area and examines some management approaches to adopting communications technologies.

Very few studies have been conducted that examine how organizations implement communications technology. This article reports the results of a survey on how corporations use communications and how this use affects the corporate structure. In particular, the survey examined how corporations reorganize to leverage the benefits of communications technology.

### THE SURVEY'S PARTICIPANTS

The survey was conducted by means of a questionnaire mailed to CIOs responsible for managing information technologies in their organizations. The 154 responding corporations were differentiated by volume of net sales and line of business. The demographics of the survey's participants are shown in Exhibit 1. Because of the corporate size (59% reported net sales between \$500 million and \$1 billion), the mix of industries, and the managerial level of the respondents of the study sample, the results provide in-sights into how industry leaders are implementing communications technologies in their organizations.

### COMMUNICATIONS SPECIALIZATION

For the purposes of this survey, 15 categories of communications technologies were established. The technologies, whether hardware- or software-based, offer potential for person-to-person, person-to-machine, or machine-to-machine communication. The categories of technologies are listed and defined in Exhibit 2.

Certain commercially available versions of any of these communications technologies require special skills, experience, and training to effectively evaluate and implement. The majority of the responding corporations (63%) reported retaining communications specialists on staff for this purpose. According to these respondents, an average of 45 people were employed in a communications unit, of which an average of 26 were viewed as specialists. (Three of the organizations surveyed were identified as communications companies and were not considered in the computation of these averages.)

An increasingly common technology found in many organizations, regardless of size and industry, is the local area network. Users or IS personnel often cannot effectively evaluate various LANs for corporate implementation because their knowledge of the vendor's design approach for the network software (e.g., the algorithms associated with such implementations as token ring or bus) or their training in alternative software packages is inadequate. In other words, experience with specific network software, in addition to education and training, may be required for making effective decisions and efficiently implementing LAN technology in selected business units.

Little doubt exists on the part of the survey's respondent sample that LAN technology warrants in-house specialists. The lengthy learning cycles required for effective implementation of other communications technologies may preclude in-house development. For example, value-added networks (VANs) through common carriers require specialized equipment. Because VAN facilities are dispersed across wide areas and employ diverse supporting technologies, no internal corporate communications network specialist can maintain an expert level of knowledge. Reliance on external vendors is mandatory. The relative importance of the technologies cited in Exhibit 2 as well as the requisite expertise required by each was noted by the IS managers surveyed. They reported retaining at least one type of specialist in their organizations (see Exhibit 3).

The continual advancement and maintenance of LANs throughout the corporation appears to support investing in specialists who understand the technology, with 84% of the survey sample reporting internal staff for their local area networks. In addition, the majority of corporations (73%) now maintain a specialist for voice and data integration.

As expected, most organizations (87%) report having at least one PBX specialist on staff. Telephone systems have been synonymous with electronic communications for decades, but as companies attempt to increase market share at the expense of competitors, there is continuing pressure to maintain internal expertise to evaluate PBX services and operate private systems with links to commercial phone networks.

Communications products are so important that the majority of organizations (56%) also staff a vendor-relations specialist. Because virtually all communications capabilities and services are developed by commercial vendors for most organizations, vendor-relations specialists serve a host of functions, including notifying vendors of problems with purchased systems needing updates and fixes or scanning the market for new systems that better meet the needs of the company. Upcoming enhancements or modifications to existing communications products in the company inventory can be identified so that business units can plan to absorb them when they become available and appropriate. Beta site and benchmark testing opportunities may not be uncovered without such specialists.

The communications industry continues to develop new applications that are based on numerous protocols and standards agreed on by various industries and organizations. Among these are the System Network Architecture (SNA), the Manufacturing Automation Protocol (MAP), and the open systems interconnection (OSI) model. These existing and developing standards are becoming vital to efficiently integrate information technologies within business. The acquisition of proprietary communications technology, without standard linkages to systems developed by other vendors, may impede companies from achieving integrative approaches to decision making in intensely competitive markets. Because the majority (53%) of the respondents maintain a standards specialist, it is apparent that the importance of standards is recognized by US corporations.

Of the sample organizations, 45% have teleconferencing specialists on staff. As transportation costs escalate, personnel levels stabilize or decline, and human resources expenses increase, demands for cost-effective ways to maintain real-time person-to-person communication will likely spur continued growth of this specialty in large organizations, such as those participating in this survey. These specialists identify and analyze the potential alternatives to current conferencing techniques.

Integrated services digital network (ISDN) technologies are beyond the testing stage in many large corporations. When the demand for integrated video, data, and voice communications is apparent and the communications platforms exist (or resources are available to create them), specialists in this area become essential. Almost one-third of the respondents reported their decision to adopt ISDN, with 30% of the sample indicating that an ISDN specialist is on staff. A specialist is virtually required for implementation of ISDN technology. Although some common carriers are locally leasing communications lines consistent with ISDN standards, the real benefits of ISDN will accrue with global implementation.

Another characteristic peculiar to communications technologies is their ability to significantly enhance interoffice communications in multinational corporations. Twenty-eight percent of the responding companies reported employing international postal, telephone, and telegraph specialists. Although the study did not investigate how extensive the corporations' international operations are, it is apparent that international communications regulations are important enough to warrant employing a specialist in many large companies. As the European Economic Community and other countries gain increasing communications sophistication, postal, telephone, and telegraph specialists will play a prominent role.

## **ORGANIZATIONAL STRUCTURE**

Communications has historically been separated from the IS organizational structure. Individuals whose assignment was to handle PBX systems were not considered part of the data processing community and often reported to an administrative cost control center. When communications predicated on computer technology were developed that either overlapped with or substituted for telephone systems, a movement began to organizationally integrate communications within IS.

Has the communications unit been incorporated into the IS department? Of the IS executives responding, 82% reported not only that a separate position for communications net-work-related activity exists in their organization but that the position exists within the IS department--a strong suggestion of an integrating trend. At this time, the position of communications manager is, on the average, approximately 1.5 levels below the highest-ranking IS position.

The titles associated with this senior communications position, as well as its proximity to the CIO, underscore the importance of this assignment. Of the position titles reported, 22% are at the vice-president level or higher, and an additional 65% are at the director or manager level. According to the survey's respondents, 57% report to the vice-president or senior vice-president of information systems, 26% report to the director of information systems, and 17% report to a manager or lower-level supervisor. These percentages are in a context in which 71% of the corporations surveyed employ 31 or fewer communications personnel and 35% employ 10 or fewer.

## **COMMUNICATIONS MANAGEMENT APPROACHES**

As with other information technologies, communications technology can be managed in different ways. Three primary management styles are local autonomy, coordinated management, and centralized management, which in this survey were defined as follows:

- λ **Local autonomy.** Business units take full responsibility for communications network planning and operations.
- λ **Coordinated management.** A central (i.e., corporate) group plays a strong staff role and sets the criteria for long-term planning and investment. This group can ensure that the standards set are followed by business units.
- λ **Centralized management.** A corporatwide set of shared utilities and a common delivery base are

created. A central group directs planning and operations. With this approach, standards must be followed.

### **Centralized Management Favored**

An especially important finding from this survey is apparent: only 4% of the participating corporations reported that local autonomy best classifies their management approach to communications networks. Because of the connectivity issues uniquely associated with communications technologies and the corresponding problems associated with islands of information (i.e., sites that are not linked or coordinated with other corporate business units), a now-common perspective exists that localized decision making for these technologies is inappropriate. Furthermore, management of the backbone network infrastructure requires a superordinate perspective.

A trend favoring coordinated over centralized approaches to communications network management is not discernible at this point. Forty-six percent of the corporations indicated that they would best classify their management approach as coordinated; 50% reported a centralized approach (as defined previously). These findings hint that local autonomy is inappropriate for initiating and maintaining cross-unit connectivity for a total organizational perspective. Because senior information management reported these perspectives, it's reasonable to expect a more global and integrative perspective than would be obtained in individual departments. Provided that specialists are becoming commonplace in the majority of corporations, network implementation and operation expertise below the corporate level may not be financially feasible. Connectivity also facilitates management in this context. That is, sophisticated communications diagnostics may be executed as easily from and by a headquarters unit. Expertise in appropriately applying technologies may be evident at local levels.

Another question may be critical to those companies contemplating more efficient and effective ways to manage communications technologies. What communications management approach best encourages the initial evaluation, adoption, and implementation of communications technologies? This survey required respondents to indicate whether the communications technologies named in Exhibit 2 were being formally evaluated or were being adopted or acquired, and if adopted, to indicate the extent to which the technologies were implemented. Analysis of variance, a statistical analysis technique to identify significant differences among groups, was applied to the responses to discern differences in technology initiation, adoption, and implementation by those organizations reporting one of the three management approaches. The analysis identified no significant difference in the number of communications technologies evaluated among corporations using different management approaches. That is, management perspective (as defined in the survey) did not significantly influence the corporation's interest in investigating new and useful communications technologies. Moreover, a similar finding is apparent for these corporations when adopting or acquiring these technologies: there were no significant differences in technology adoption among corporations employing different management approaches. Apparently, the management approach, at this point, does not significantly influence evaluation or adoption activities.

Regarding the actual implementation of communications technologies after they've been adopted, however, there is a significant difference in the depth of implementation (measured on a seven-point Likert scale ranging from Not Implemented to Extensively Implemented) among corporations that reported local autonomy, coordinated, or centralized IS management approaches. The survey's results indicate that from a communications management perspective, more centralized IS organizations foster greater implementation of these technologies.

Several factors can account for these findings. Because of the integrative characteristics of communications technologies, a central focus is needed to facilitate standards, which enable smoother transitions from standalone platforms to integrated networks. Because communications specialists usually reside in central IS units, their ability to apply narrow skills at various sites is enhanced. Standards, which are a serious consideration in this domain, can be investigated and administered much more effectively in a top-down fashion rather than vice versa.

### **CONCLUSION**

IS departments in US corporations have recognized the importance of communications technologies to such an extent that the communications function is now represented formally in the organization with both management and specialist positions. Whereas the communications function in the past was organizationally separate from the IS unit, the majority of corporations in this study report internal management of communications technology, reporting to the head of the IS function.

The services of specialists in any number of communications areas may be required because of a lack of training on the part of professionals in the field. In addition, such rapidly changing technologies require a dedicated effort to remain abreast of these changes. The supply of proficient personnel is also an issue. Finally, financial considerations may preclude employment of those who gain an economic premium for scarce knowledge and limited applicability.

The communications field certainly encompasses a variety of subspecialties (e.g., LANs, WANs, interorganizational links, VANs, and E-mail). Standardization initiatives such as the OSI model developed by the International Standards Organization should decrease the need for communications specialists in certain areas as vendors progressively comply. As hardware and software communications platforms increase in sophistication so that the front-end management interfaces are user-friendly, intensive training to deal with the complexities of such issues as protocols, hardware interfaces, carrier services and associated charges, and application system characteristics may not be needed. Vendor-relations specialists may still be appropriate, however.

A variety of IS management perspectives can be applied when organizations search for and adopt communications technologies. Although the management approach appears to make no difference in the evaluation and adoption of communications technologies, it does influence implementation. Communications are more closely linked with significant costs than with other information technologies. Costs entail both one-time and ongoing operational expenses as well as expenses linked with problems created by unmatched or poorly interfaced systems. Shelfware--software purchased but not implemented--is particularly onerous in this domain. Not only is the cost of the evaluation and adoption process more expensive because of the specialized expertise required, but the risks of improper or inadequate installation are inordinately high. What the corporations surveyed are doing can be useful for others: more centralized approaches yield more extensive implementation.

Whether organizational structures and practices continue to evolve as a result of communications technologies remains to be seen. This survey strongly suggests, however, that organizational evolution has taken place to accommodate these newer technologies more effectively.

## Recommended Reading

Keen, P.G.W. *Competing in Time: Using Telecommunications for Competitive Advantage*. Cambridge MA: Ballinger Publishing, 1988.

Donovan, J.J. "Beyond Chief Information Officer to Network Manager." *Harvard Business Review* (September-October 1988).

### **EXHIBIT 1** Demographics of Respondents

#### Net Sales

\$500 million-\$1 billion	(12%)
More Than \$1 Billion	(12%)
Less than \$50 Million	(10%)
\$50-4100 Million	(4%)
\$100-\$500 Million	(15%)

#### Industry

Finance	(32%)
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Publishing	(3%)
Petroleum	(3%)
Transportation	(7%)
Utilities	(6%)
Other	(7%)
Wholesale	(11%)
Manufacturing	(31%)

#### Respondent IS Levels

Senior Executive/CIO	(10%)
Vice-President IS/Telecommunications	(36%)
Director IS/Telecommunications	(18%)
Manager	(22%)
Other	(14%)

### **EXHIBIT 2** Communications Technologies

#### **Access to Commercial Data Bases**

The capability to log on to external data bases for a fee. Access to such services may help maintain and advance the competitive market position of a corporation.

#### **Corporate-Owned Communications Lines**

Corporate ownership of a communications medium (e.g., coaxial or fiber-optic cables).

#### **Electronic Mail (E-mail)**

Electronic messaging for asynchronous person-to-person communications.

#### **Facsimile (Fax)**

Technology that enables transmission of documents electronically.

#### **Integrated Services Digital Network (ISDN)**

An increasingly feasible communications approach, requiring specialized hardware and software, that enables concurrent transmission of video, data, and voice media. Currently being installed and operated on a regional and often trial basis by larger businesses.

#### **Intelligent/Mobile Phones**

Cellular and associated wireless communications technologies. Examples include executive mobile car phones, beepers, and service vehicle communications.

#### **Interorganizational Communications Links**

Bridging and conversion technologies that enable transmission and receipt of transactional data, functional information, and planning perspectives across organizational boundaries (e.g., with customers and suppliers).

## Local Area Networks (LANs)

Hardware and software installed to link individual and business-unit workstations within an office building, a plant or another worksite. Integration enables a variety of information flows, including migration of data files, spreadsheets, and E-mail, as well as common access to application and system software.

## Network Management Software

Systems software to operate and monitor network communications activities.

## Value-Added Networks (VANs)

Communication lines offered through common carriers that facilitate timely and accurate information flow. Value-added services include error checking, retransmission, and alternate routing in case of network node failure.

## Videoconferencing

Technologies that facilitate business seminars and meetings across physical distances. Conference participants may both view and talk with one another interactively, without being at the same location.

## Videotext

Integration of video and text and user intervention, for accessing multimedia information. Applied most often in educational and training environments.

## Voice/Data PBX

The traditional, internal telephone system used by industry to transfer transactional data across corporate sites and to support individual online communications.

## Voice-Oriented Systems

Technologies that facilitate asynchronous interpersonal communication (e.g., voice mail).

## Wide Area Networks (WANs)

Communications networks that link physically separated business units.

GRAPH: EXHIBIT 3 Communications Specialist Staffing

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