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Communications Revolution and its Impact on Managing Organisations Effectively

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The last 40 years have seen advances in communications technology as well as changes in business communications.

It is difficult to pinpoint one particular technological development that launched the information age. John Naisbitt considered the launching of Sputnik in 1957 as the turning point, since Sputnik made global satellite communications possible. Others have advanced 1970 as the year, since that was the year in which the microchip was invented. Of course, many other technological innovations have taken place, including the computer, the microcomputer, computer networking and conferencing, electronic mail, on-line financial databases, transaction systems, television and VCR, audioconferencing, telephone advances including cellular phones, facsimile machines and so forth, and (lest we forget) the bleeper.

All of these advances are used in business today. Not only are existing businesses using the available technology, but entirely new industries have come into being. Sales information from the other side of the country (or the world) is reaching corporate headquarters more quickly and in ever-increasing amounts. Telemarketing companies, computer software firms, and laser printing service bureaux are but three examples of new industries brought about by the communications explosion.

However, the technology itself did not cause the rapid rise in business communications; in fact, it could be argued that business communications needs helped to spur the technological advances. For example, when Manufacturers Hanover Corporation first adopted computers in the 1960s, it did not do so because computers were the newest technological gadget; it adopted computers to meet a pressing business need, namely, to control an increase in paper work.

No matter what the cause, however, it is clear that business communications are very different from what they were 40 years ago. Don A. Dillman has identified 11 specific effects of the information age. These can be summarised into three main categories.

- The first effect has been on the *speed* of business communications. Information which once took days or weeks to travel from one place to another can now reach its destination in seconds. As we shall see, the speed of business communications also affects the rate of change in the business community.
- The second effect has been on the *distance* over which timely information can be transmitted. Not only can a Los Angeles corporate office receive useful data from a division in Hong Kong or Paris, but (perhaps more surprisingly!) that same Los Angeles corporate office can receive useful data from an entry-level office worker in Victorville. Miniaturisation of technologies has contributed to this.
- As the speed and the effective distance of business communications increase, this naturally leads to an increase in the *volume* of communications. Companies which were once starved of information are now smothered in it.

What implications do these effects of the communications explosion have on the effective management of organisations? This article will examine organisational management in the midst of the communications explosion, paying special attention to the problems and opportunities caused by the increased volume of communications. First, however, speed and distance issues will briefly be considered.

Speed and Distance of Communications

As mentioned above, information that would take days or weeks to travel by mail can now arrive in seconds via

satellite networks or other methods. Calculations are also nearly instantaneous; spreadsheet models allow managers to calculate several "what-if" scenarios very quickly.

At the same time as the transmission speed of messages is increasing, these messages are arriving from throughout the entire company as well as throughout the world. One important consequence of this is that a group of people do not have to be in the same location to reach a solution to a problem. For example, in the final days of the Iranian hostage crisis, US President Carter was receiving instantaneous information from bankers, diplomats and military officials in New York, London, West Germany, Algiers, Iran, and elsewhere. Despite the fact that the Americans and Iranians were not talking to each other, the situation was resolved by the use of these multiple information sources throughout the world.

A person with a modem can "dial up" and solve a problem □

Because information can be received from anywhere, the requirement that a business must be located in a particular location is lessened considerably. For some businesses, it is not necessary that the business be located near a business centre (such as New York), a natural resource (such as the Ohio River), or even an airport (such as LAX or Ontario). With only the proper computer equipment and a telephone, a stockbroker or writer could conduct business in New Mexico or Montana if he or she so desired.

Groups of people in different locations can come together and solve problems more easily using communications technology. For example, a person with a modem can "dial up" and solve a problem on a computer thousands of miles away, or several people on an on-line network such as Compuserve can "discuss" a problem. In an article in *Rural Sociology,* Don Dillman wondered what the future of rural life would be. When someone in a rural setting is interacting (via the technology) with people thousands of miles away, Dillman postulated that these "geographically unbounded interactions" would play a more important role in the person's actions.

There are problems, however. As one company is receiving information quickly from distant places, so are its competitors. Businesses must act much more quickly because the entire economy is faster paced. If decision making is subject to endless analyses and committee meetings, these decisions cannot be made quickly enough. Companies must reorganise or retrain their people to make quicker decisions to keep up with competition.

There is another problem. What if the information travels speedily indeed — but to the wrong place? If an organisation is not prepared to deal with a particular volume of information, or if the information is not distributed properly, the speed benefits of the technology are of no use whatsoever. Naisbitt and others have pointed out that a rigid hierarchical structure will slow down the information flow and that the organisation of the future must be flexible. Whether the organisation should be decentralised or not is an issue to be examined later.

There is yet another problem. As businesses become more dependent on information from geographically distant places, the possibility of information being suppressed increases. It is easier for a subordinate to suppress information if he or she is thousands of miles away rather than being just down the hall. Therefore, tighter personal controls are necessary, and methods of managing people in different geographical locations are required.

As information from distant locations becomes more critical, it becomes more and more important to know where the information is located. Especially in decentralised organisations, the information is scattered throughout the company. Therefore, some type of information management is required to keep track of it all.

There is undeniably an increased volume of business communications □

We have seen that information is arriving more quickly and from more locations than before, and that people in a number of locations can now solve problems without being at the same place. At the same time, however, decisions must be made more quickly to keep pace with the faster economy; sometimes the company's procedures — and even its structure — must be reorganised to permit faster decision making and more intelligent information management.

Volume of Communications

There is undeniably an increased volume of business communications. Two of the reasons for this have already been discussed — the speed at which communications can travel and the greater effective distances over which they can travel quickly. A third reason is that there are just more people communicating; the percentage of Americans working in information jobs increased from 17 per cent in 1950 to over 60 per cent in the 1980s.

More Accurate Information

Because of the technology advances, we can gather much more accurate information than we could previously.

For example, grocery stores can use checkout scanners to tabulate exactly how many products of a certain type were sold in a particular store on a particular day. (For example, how many bags of potato chips (crisps) were sold in the Ontario Alpha Beta on Super Bowl Sunday?) Because this information is more exact than that obtained previously, store managers can lower inventory, boost turnover, and more carefully match their product selection to the tastes of their consumers.

Another important use is in production facilities, where personnel can now track errors per hour, downtime on particular equipment, machine speed, and worker productivity. This not only enables managers to discover the particular sources of problems, but also can allow managers to fix problems before they get out of hand.

It has already been mentioned above that decisions must be made more quickly in order to keep up with competitors. In order to make intelligent decisions, accurate information is required. As companies receive more accurate data, analytical tools (such as spreadsheets) can yield the information required to make the decision.

Decentralisation, Centralisation, or Both?

In some of the literature on this issue, it has been asserted that the communications revolution requires that companies completely decentralise. Although there are certain cases in which decentralisation of a particular company function is desirable, centralisation of other functions is often beneficial to overall company control. The technology itself is organisationally neutral; the existence of a computer or a telephone does not mandate that a company should decentralise or centralise. Decentralisation or centralisation or both occur when managers choose to use the technology in various ways.

Take Esmark as an example. During the early 1970s, Esmark's diverse holdings were reorganised into one thousand profit centres. The head of each of these profit centres was given considerable operating authority as well as responsibility. At the same time, however, Esmark initiated tight, centralised financial controls on the entire company.

Almost 20 years after Manufacturers Hanover Corporation brought its first mainframes into its offices, it used the latest technology to reorganise into five business sectors, each responsible for its own return on assets. Its goal in this decentralisation was to support a corporate reorganisation which gave each of the five sectors maximum operational control. However, previous decentralisation had caused problems in the effective interchange of corporate data, so several functions were centralised, including telecommunications, standard hardware and operating software methodologies, and information policy (data ownership and sharing). MHC was not only considering the needs of the individual units; it also had to consider the needs of the corporation as a whole.

Tandem Computer Company, which is extremely decentralised in some aspects, nevertheless has eight computer systems measuring production controls, cost standards, quality controls, and reporting systems.

One (anonymous) passenger elevator company in fact used the technology to replace decentralised units with centralised ones. Customer complaints about service had to go from the decentralised service units through four reporting levels to reach top management; often the complaints did not make it all the way. (As mentioned earlier, subordinates are sometimes known to suppress unflattering information.) The elevator company decided to use the technology to centralise and monitor its service operations.

Corporations can receive information from around the world

As we have seen earlier, a completely decentralised organisation can often decrease the speed and accuracy of information rather than increase it. Naisbitt tooks pains to state that he was not advocating "that companies will become huge corporate networks, abandoning formal controls". A company will probably need to analyse its situation, as Manufacturers Hanover Corporation and others have done, and then determine exactly what should be centralised and what should be decentralised.

More important than the centralisation versus decentralisation issue, however, is that the company should be flexible. Since the reasons for centralising or decentralising a particular function may change over time, it is important that the organisation should be able to change over time as well.

Data Reorganisation

We have already mentioned how people can use the new technologies to interact with each other. The same can happen with data. Corporations can receive information from around the world — from foreign election results to United Nations votes to last week's purchase figures — and use this information as a whole to come to better

decisions. As more information is available and the use of networks (physical and personal) increases, cross-disciplinary solutions to problems become more likely to occur.

Sometimes data can yield new information just by being reorganised. A 1987 *Harvard Business Review* article cited an (anonymous, but "prominent") insurance company that reorganised its computer files; originally filed by policy number, they were refiled by customer number, allowing sales agents to evaluate a customer's total insurance holdings and make recommendations accordingly.

"Too Much" Information?

Despite the benefits of greater communications networks, there are many cases in which a manager is overwhelmed by information. Former US President Jimmy Carter states, "...because so many people were involved in the process, I personally expended far more effort in choosing a chairman for the National Endowment for the Arts than I did in choosing a replacement for Cy Vance as Secretary of State or James Schlesinger as Secretary of Energy";

When John Sculley joined Apple Computer, he was immediately forced to decree that he would accept no memo longer than a page. Sculley attributed the problem to technology itself: "Because every employee had a computer on his desk, business memos, proposals, status reports, and technical documents all took on a stream-of-consciousness style". Sculley also stated: "...the quantity of information in the world is doubling every three to four years. We will either cope with it or it will overwhelm us".

An effective communicator must get his or her point across □

Spoken communications suffer the same problems as written ones. Because business people are bombarded by so many messages daily, one author has postulated that an effective communicator must get his or her point across in 30 seconds or less.

However, the problem is not one of "too much" information; it is a problem of dealing with the information we have. In earlier years, business managers did not have to deal with as much information as they do now; current managers are having to invent ways to deal with the information crunch.

The technology itself is suggesting ways to handle the information load. A few small optical disks, weighing less than a pound, can be used to store the 20,000 pounds of paper (and filing cabinets) which documents the training, support, and maintenance for a single naval ship. Expert systems, artificial intelligence, intelligent network software, and hypermedia are software solutions which, now and in the future, will help us to wade through the information.

Other solutions to the information overload can be found in good old-fashioned planning. For example, when Esmark reorganised in the early 1970s, chairman Robert Reneker appointed several managers under him; the operations managers would report to Reneker's assistants rather than Reneker, leaving Reneker free from routine decision making.

Planning is also effective today. Introducing new technology into a company without planning for and anticipating its use is bound to cause problems. Managers who are concerned only with the technology need to step back and plan for its use.

Organisational Change

As new technology (such as a computer or a scanner) is introduced into an organisation, the new technology will sometimes have an effect on the organisation itself and the positions within that organisation.

Maybe the new technology will perform the tasks formerly performed by a job incumbent. For example, if your computer screen shows that a particular customer has a bad credit record, a credit checker no longer needs to pore through old records in file cabinets or make a seat-of-the-pants guess as to whether the customer is a credit risk.

On the other hand, the complexity of the equipment may require additional skills not previously required of the position. Consider the clerk who formerly opened letters sent via the postal service. When this clerk is given a fax machine or an account on a national computer network, he or she has to master a whole new way of receiving information from customers.

Maybe the information itself is more complex or requires faster decision-making capabilities. A manager who is used to leisurely receiving scanty information from a few divisional offices may find himself or herself reading detailed field reports with information from the previous day. A manager receiving such information will need to know which information is essential, which is not, and what to do with the essential information.

The way in which an organisation adapts itself to cope with the new information depends on the organisation itself. As a family is constrained by its own history, so is an organisation.

Let us review how the amount of information can impact on the organisation. Information can now be more detailed, providing data which were not previously available. The larger amount of information can be used to control organisational operations more precisely. Data can be reorganised to yield more useful combinations of information. At the same time, however, the information flow must be controlled, either through technological or managerial means, so that the data do not overwhelm the users.

Conclusion

The analysis of the effect of the communications revolution on organisations has yielded several conclusions:

- Managers will still need to be adept at planning, organising, and controlling. The use of the communications technology must be intelligently planned. The company itself must sometimes be reorganised to receive maximum benefit from the technology. Finally, the activities of the information gatherers must be controlled in some fashion.
- While the speed of modern communications forces faster decision making, it allows for more timely and accurate information.
- The removal of distance constraints lets people in separate geographic locations solve problems together. However, management of those people who supply critical information is even more important.
- The larger amount of information can be an opportunity, rather than a problem if handled correctly. Increased control, as well as new ways to look at data, are two benefits of the increased amount of information. However, this information must be controlled in some way so that it can be used intelligently.

In a sense, the "communications revolution" began when the first person spoke to another person; and it will continue long after fax machines, satellites, and microchips are forgotten. If business is to succeed, it will need to keep pace not only with the technological improvements themselves, but also with ways of dealing with these new opportunities.

Bibliography

Barley, S.R., "Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments", *Administrative Science Quarterly*, Vol. 31, 1986, pp. 78-108.

Bruns, Jr., W.J. and McFarlan, F.W., "Information Technology Puts Power in Control Systems", *Harvard Business Review*, Vol. 65 No. 5, 1987, pp. 89-94.

Business Week, Esmark Spawns a Thousand Profit Centers", Vol. 2342, 1974, pp. 48-9.

Carter, J., *Keeping Faith*, Bantam Books, Toronto, 1982.

Cleveland, H., "The Twilight of Hierarchy: Speculations on the Global Information Society", *Public Administration Review*, Vol. 45, 1985, pp. 185-95.

Denton, J., "DP: Critical Factors to Success", *Accountancy*, Vol. 103 No. 1135, 1988, p. 143.

Dillman, D.A., "The Social Impacts of Information Technologies in Rural North America", *Rural Sociology*, Vol. 50, 1985, pp. 1-25.

Donnelly, Jr., J.H., Gibson, J.L. and Ivancevich, J.M., *Fundamental of Management*, Business Publications, Plano, Texas, 1987.

Frank, M.O., *How to Get Your Point across in 30 Seconds — or Less*, Simon & Schuster, New York, 1986.

La Belle, A. and Nyce, H.E., "Whither the IT Organization?", *Sloan Management Review*, Vol. 28 No. 4, 1987, pp. 75-85.

Naisbitt, J., *Megatrends*, Warner Books, New York, 1982.

Porter, A., "Work in the New Information Age", *The Futurist*, Vol. 20 No. 5, 1986, pp. 9-14.

Raymond, H.A., "Management in the Third Wave", *The Futurise*, Vol. 20 No. 5, 1986, pp. 15-17.

Rice, R.E., "Computer-mediated Communication and Organizational Innovation, *Journal of Communications*, Vol. 37 No. 4, 1987, pp. 65-94.

Sculley, J. with J.A. Byrne, *Odyssey*, Harper & Row, New York, 1987.

Toffler, A., *The Third Wave*, William Morrow and Company, New York, 1980.

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