TELECOMMUNICATION NETWORKS: Their Impact on Communication Flows and Organizational Structures (Including Religious Institutions)

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Overview

Most communication theorists and practitioners are aware of communication/computer networks and some implications of their use. The rapid spread and increased capacity of the personal computer (PC) fostered the growth and development of networks, both external and internal – the *inter*net and the *intra*net. The amazing ease and practicality of electronic mail (E-mail) spurred the surprising growth of the Internet and the World Wide Web. Despite some exaggerated claims about Internet applications, its ease of use was facilitated by technological breakthroughs like standard protocols (so computers could talk to one another) and a universal system of creating addresses for Web sites (URLs).

We are still sorting out the implications of all this. This paper proposes that the cultural repercussions have been broader and deeper than we realize. A theoretical model is proposed to reflect on the impact of dialogic communication on organizational structures and communication flows. These dynamics are examined in three case studies:

1. telecommunications pilot projects funded in the U.S. to provide links for public service agencies at the grassroots level;
2. European Union telecommunications planning; and
3. strategic planning among church leaders as religious institutions struggle to adapt (theologically and administratively) to an interconnected world.

The author's research or policy planning has played a role in each of the three case study projects. The chapter concludes with some recommendations and comments on the need for further study.

Deep Conceptual Impacts of Interactive Networks

Dr. Lynn Andrea Stein, associate professor of computer science at the Massachusetts Institute of Technology, claims "a change must occur in our mental construct about computers." She tells her students and colleagues:

> … a new framework is needed for thinking about the role of computers in the world. Think of them not merely as a bunch of processors performing sequential tasks, but as a set of interactive, concurrently functioning entities. In other words don't think of 'computation' as just calculation. Think of computation as a community. (*Harvard University Gazette*, May 28, 1998)

Stein's research spans areas like cognitive robotics and human-computer interaction and collaboration. She sees clearly there is a deeper layer of change underway – as interactive networks change humans and their organizational life.

And just as we are beginning to cope with the implications of machine/human interface, the next wave of computing is nearly at hand. The *New York Times* (December 28, 1998) details a "post-PC" world of hand-held information devices. These units, linking easily to network server-computers around the globe, would bypass the personal computer, linking many billions of users by means of low-cost communication devices.

When I was studying with the communication scholar Ithiel de Sola Pool at M.I.T. I was struck by the implications of his book entitled *The Social Impact of the Telephone* (Pool, 1977). It was not difficult to infer from the Pool work that additional links such as satellites, fax machines, cellular telephones and computer networks would have similar social and

organizational implications. And the history of the telephone showed clearly that when people are linked they will use these tools aggressively to communicate and form communities. This includes communication links that are one-to-one as well as group-conferencing networks.

In a doctoral dissertation seminar with Harvard scholar Chris Argyris, I began the task of applying his organizational theory to the telecommunications sector. The result was my study of U.S. direct broadcast satellite (DBS) policy development, utilizing a model of "cooperative interaction" (Plude, 1981). After interviews with satellite experts throughout the U.S., I formed a type of network by conducting two rounds of a policy Delphi study among technical experts and policymakers – allowing them to interact with one another's ideas. This research was used by members of the Federal Communication Commission (FCC) in clarifying various policy options in the emerging DBS sector.

A few years later the communication scholar Everett Rogers declared that the *interactivity* of modern communication and computer technologies indicated that communication studies required a whole new epistemology (Rogers, 1986).

Another major influence on my own thinking about the deep significance of dialogic networks came in a statement by Clifford Christians that "a new media structure is morally legitimate to the degree it achieves maximum democratic participation" (Christians, 1984).

A Theoretical Model

I continued my research, taught doctoral students at the Syracuse University Newhouse School of Public Communications, and worked further with U.S. policymakers in the U.S. Congress and the National Telecommunications and Information Administration (NTIA).

My Harvard model of "cooperative interaction" evolved into a broader (and somewhat more complex) telecommunications framework for analysis (see Figure 1). The model demonstrates how communication technology alters organizational structures and communication patterns or flows. It proposes that collaborative mechanisms assist in managing, and reacting to, technological change. The model includes barriers – those who ignore or cannot accept technological change, along with barriers to the acceptance of collaboration as a strategic planning tool.

The model conceives of three cylinders on a rod. The continual spinning of the rod is due to the rapid churn of change. The cylinders represent **technology mechanisms** [A], **organizational structures** [B] and **communication patterns** [C].

The driving cylinder is technological, but as it spins on the rod of rapid change, the other two are forced to spin (change) also.

The [A] cylinder of **technology mechanism** spins on the rapid-change rod. Three key components are emerging in this technology-change area. The first result is *interactive (two-way) tools* such as the telephone, fax, computer, and the Internet and World Wide Web. Secondly, *technological innovation* is occurring at an unprecedented rate. Thirdly we see here the creation of an information/economic elite, where *information technology becomes power* for individuals, institutions, and nations.

The rapid spin or change, visualized by the cylinder of technology, forces emerging changes in cylinders [B] and [C]. However there is a barrier intervening: many individuals and institutions delay integrating the technological change, or they do not understand the full impact of technology.

The [B] cylinder, representing **organizational structures**, spins from the impact of the technology mechanisms. One result is the *assault on bureaucratic structures* which served as a key organizational "system" of the industrial-age. Another impact is *the breakdown of walls within organizations*, resulting in what many people call "borderless arenas." An example of this, in fact, is the emergence of a global economy and the assault on the autonomy of the nation-state – the identifiable organizational structure that worked well before technological change flowed right through these "borders." Thirdly, we see a growing emphasis on *operational teams, task force units, and corporate partnerships*.

Operationally organizational structures are flattening somewhat and they are more fluid because of the new information flows facilitated by interactive technologies.

Technological interactivity also forces change in **communication patterns** [C]. *Dialogic networks* are emerging. The Internet and the World Wide Web are the most visible examples, but millions of individuals are "plugged in to" various social and organizational networks. (The human family is, perhaps, the most basic example). I have called these *easy participatory links*. This growth of networking results in an easy *integration of ideas*, called "shared minds" by one writer. These interactive information flows link individuals, corporations, institutions – even economies, as financial resources flow easily and rapidly without respect for bureaucratic structures or national borders.

The model proposes that rapid change in technologies, organizations, and communication flows can be handled best if individuals, institutions and nations collaborate systematically. Even in a competitive environment we see the need to *institutionalize* collaborative mechanisms – making them *a social habit*, which is one way to define an institution. The cooperative, interdependent method assists society in handling rapid technological change and absorbing the

high cost of developing and adapting to new technologies. In addition, collaborative mechanisms are facilitated by the use of modern interactive technological tools. These principles are demonstrated in the case studies below.

The model gives specific examples of how collaborative mechanisms (**Interactive Strategic Alliances**, or **ISAs**) can enrich technologies [A], organizations [B] and communication flows [C]. When collaborative mechanisms are institutionalized, the technology-mechanism changes can lead to ***shared access to technological power.*** This is only one result in the technology arena; many more could be cited. Collaboration can lead to a sense of ***shared responsibility in governance*** within organizational structures [cylinder B]. And a sense of interdependence or collaboration in communication patterns encourages ***participative forums***, rather than traditional top-down communication flows [C].

Many other benefits flow from systematic collaboration in a technological culture, but these three examples indicate how the model works. My own insertion of collaboration as a strategy is based on much research in the fields of game theory and systems theory (Axelrod, 1984; Raiffa, 1982), along with my policy study and experience in European and U.S. telecommunications strategic planning projects. Several specific case study examples are explored below.

Deeper Implications for Pyramid/Hierarchical Institutions

Recent decades have witnessed a revolution in the corporate sector globally; the business world has decentralized operations, formed international partnerships, and institutionalized teams and task-force groups. Much of this re-structuring was driven by rapid technological change and global economic competition. However, the organizational re-cycling

was also *facilitated* – made possible -- by networked communication structures.

The not-for-profit (public agency) sector has also experienced the impact of technological change and the resulting alteration of organizational structures and communication flows.

Organizations such as government bureaucracies and religious groups tend to be "top-down" institutionally, both in organizational and communication styles. Pyramid organizational structures and complex management charts reflect this top-down communication flow. It has been a unique challenge to re-conceptualize this not-for-profit culture.

I have experienced this personally as I serve as consultant with senior officials in the U.S. Catholic Church. Most of these officials are aware of the major technological, organizational, and communication shifts. However, even when they see the need to adapt and they want to do so, they are unsure about how to implement the change. They are uncomfortable because things are not as "linear" and controllable when communication networks facilitate what appears to be "chaos out there." Where does authority reside? How is leadership re-defined?

One study that addresses these issues very creatively has been summarized in the book *The Age of the Network* (Jessica Lipnack and Jeffrey Stamp, 1994). After working extensively with corporate groups in the U.S., Lipnack and Stamp speak of moving "from the pyramid to the pizza" (see Figure 2). This cross-sectional networked organization approach enables hierarchy, bureaucracy and network to fit together organizationally. They say simply: "The difference, of course, comes in the use of links. Vertical, one-way connections constrict information flow, while two-way hub and spoke communications provide control *and* coordination opportunities. To convert a wheel to a network, just add

links…"

Lipnack and Stamps summarize the historical development of organizational structures quite simply. When humanity was nomadic, small-group organization sufficed. An agricultural culture required hierarchy, but small groups continued to function. The industrial-age culture and economy discovered the value of bureaucracy. This was added to organizational patterns, along with the small groups and hierarchy. (A new organizational structure tends to be *added to* previous forms; it does not replace them.)

These experts now identify the importance of networks to organizations, facilitated by new technological links. However, small groups, hierarchy, and bureaucracy still play a role. They speak of "turning hierarchy on its side" in the age of the network.

Even in networked structures, there are clearly times when decision-making must be done by "authority." They speak of a fire department as a good example: authority is shared for certain functions; however, there are times when there must be one major decision-maker (as a fire rages, for example).

These authors identify five key organizing principles for the 21st century:

- **unifying purpose** or common views, values and goals;
- **independence** for members as a prerequisite for interdependence;
- .**links within links** – omni-directional communication pathways;
- **multiple leaders**; networks are leader*ful*, not leader*less*; and
- .**integrated levels** (hierarchy and "lower-archy")

Case Studies

For several decades I have participated in telecommunications consulting and strategic planning in the U.S., in addition to a research project conducted among telecommunication officials in the European Union. I have selected three specific examples or case studies below to demonstrate, with practical examples, the ways in which my theoretical model functions.

U.S. Telecommunications Grass-roots Cooperatives

In the United States, the Federal Government wisely understood that under-served groups would need assistance in utilizing a national or international communications/computer network. They would need to be motivated, instructed, and financially supported, as they re-conceptualized themselves, organizationally, as linked to others in networks.

Within the U.S. Department of Commerce there is an agency called the National Telecommunications and Information Administration (NTIA). Within NTIA a project was funded by the U.S. Congress entitled the Telecommunications and Information Infrastructure Assistance Program" (TIIAP). Its web site is tiiap@ntia.doc.gov

Once a year, for a number of years, I spent several days in Washington as a member of the teams of educators, technical experts and community leaders from all over the U.S. who evaluated proposals for this supportive funding. This process helped organizations conceptualize and link themselves in creative and practical ways. Since its inception in 1994, TIIAP has awarded more than $100 million in federal funds to 332 grant applicants.

The government provided workshops and conferences for public agencies to assist them in their grant-proposal application preparation. There was a major effort to encourage groups to collaborate in their planning and programs. They could form consortia within the community,

or with like-minded groups around the nation. This emphasis on collaboration was virtually required for a proposal to be taken seriously.

A recent TIIAP newsletter reports on sample developments…

1. The TIIAP web site is now equipped with a search engine so applicants can look through its online data base for particular projects relevant to their interests. Key words can be used from the five application areas:

   a. community networking; b. education, culture and lifelong learning; c. health; d. public safety; or **e. public services**.

2. Agency staffers are sharing with applicants additional appropriate web sources they have found useful.

3. News from the field covers previously-funded projects such as:

   - a Nebraska project that facilitates internet links between children and the elderly;
   - a project that connects sign language users with interpreters, to aid some of the 20 million hearing-impaired Americans;
   - a consortium of 12 county Boards of Education linked to deliver instruction to home-based students;
   - a grant to demonstrate how video streaming technologies could provide video-based distance learning over the Internet.

Other typical TIIAP projects serve low-income communities, link individuals to medical resources; support economic development initiatives in poor rural areas, etc.

The TIIAP grant program is a good example of how nations can "seed" the conceptualization of networks that foster collaborative ventures and resource-sharing in a technology-driven age.

European Union Telecommunications Planning

While teaching for Syracuse University in its London program, I headed a

small research project designed to explore some of the collaborative mechanisms emerging in the telecommunications sector of the EU.

European Union staffers at its Brussels headquarters estimated that 12% of the gross national product of the EU would be in the telecommunications market sector and that 61% of their workforce will be information-sector workers. The fact that a telecommunications infrastructure is the key to economic development is not lost on emerging nations of central and eastern Europe.

As I traveled from nation to nation within the European Union and met with telecommunication ministers, the data showed clearly that collaborative mechanisms were being institutionalized, even though the telecommunications sector was a valued market and competitive arena for each nation.

For example, research and development costs in the telecommunications area were so staggering, EU nations realized they had to pool both resources and research data that had been guarded secretively in the past. This was termed "pre-competitive R & D." Once the research began to reach product stage, nations were free to market their telecommunication products and services competitively.

Another major collaborative effort that was clearly in the self-interest of various nations was the area of technical standards. It would be no good for a nation or a corporation to develop telecommunications goods and services that could not be "plugged in to" standardized equipment protocols. Otherwise, their market would end at their borders (Plude, Hongcharu, 1991).

The formation of telecommunication corporate partnerships has been another example of collaborative structures, both in the U.S. and in Europe. Research shows that many of these

partnerships present difficulties due to varied corporate cultures, and some fail entirely. However, in a network age, leadership will face this challenge and learn to develop organizational and communication structures that will work.

Religious Institutions

The International Study Commission on Media, Religion, and Culture <**jmcommunications.com**> is a group of scholars and practitioners who have gathered to consider the shape and direction of both productive and reflective work in these three intersecting fields. It is part of the wider ongoing process of reflection and study which is being conducted currently by various organizations and individuals throughout the world.

The Commission is, itself, a network. Members come from many nations, but we communicate internally regularly by E-mail. Through a listserve it supports, the Commission links its members and others for regular on-line "conversations" on topics related to the three intersecting areas of media, religion and culture. Many in this on-line community are church officials; many are not.

The Study Commission is a forum for shared ideas, for re-conceptualizing (based on research data) just where human beings are currently doing their "meaning-making," as its Chair, Dr. Stewart Hoover, puts it. Many institutional religious groups can benefit from the work of the Commission as they, like corporations and nation-states, struggle with the force of technology and organizational change noted in my theoretical model.

A major challenge lies in leadership training. In a recent survey of U.S. Catholic bishops, 88% of them stated that they, themselves, need training in order

to cope with communication technologies. While network technologies can facilitate decentralized planning and organization, there is still (by habit) a tendency to try to meet these needs through centralized planning.

One example of leadership training comes to mind that could flow naturally from my theoretical model. One could fund a brief meeting of planners, including a number of bishops and communication experts – in order to "brainstorm" just what a helpful Leadership Training Workshop for bishops and other church leaders would look like. This planning session would be to get regional and local input so the Workshop would truly meet local needs.

Then a traveling Workshop "package" could be designed and the Workshop could be conducted by a team of two communication/church leaders at the local diocese, to save local leaders time and travel. Numerous teams could be available regionally, so cost is minimal. A Web site could facilitate continual communication among those who have experienced the workshop. Individuals could dialogue about problems and challenges; ideas and solutions could be shared, like the "shared minds" in my theoretical model.

Many religious institutions are faced with the challenge of re-thinking how their organizational patterns and communication flows are changing right under them. Many organizations planning "meetings" in church buildings (to which dwindling numbers come), may productively reflect that many "meetings" are now occurring at Web sites, on telephone links, and through E-mail messaging.

Another facet involves the integration of communication theory and practice with theological reflection. I have been working with a number of theologians and

communication scholars and practitioners for almost a decade to reflect upon and publish books and articles and conduct symposia, developing a new field of thought called **Communication Theology**. We argue that just as liberation theory influenced Liberation Theology and feminist theory, Feminist Theology, that over eighty years of systematic research in communication studies should affect how we do theology today (Granfield, 1994; Plude, 1994, 1995, 1996; Soukup, 1983, 1996).

Conclusions and Recommendations for Further Study

Few people are unaware of the impact of technology as we move into a new millennium. Not enough research and model-building is occurring, however, on the multi-layered impact upon organizational structures and communication flows. Not-for-profit sectors, including religious institutions, often do not have the resources (including the resource of time), to reflect thoughtfully on these ramifications.

In addition, the typically authoritative structures of most religious institutions inhibit them from "letting go" of central control in an increasingly decentralized, networked world. Much re-thinking of roles is required. Much re-education is needed as leaders must adapt to shared governance and re-conceptualize themselves as coordinators of teams.

Most church organizations are beginning to purchase computers and design networks. In almost every case there are major financial losses as technical decisions are made by people ill-equipped to make them.

Ironically technological and collaborative networks can help facilitate organizational management, but many leadership roles have not been re-conceptualized so there is an understanding of the dynamics at work.

Some of the areas that need further analysis include:

- Can networks foster community in a postmodern world?
- How can religious organizations adapt institutionally?
- How do people today (especially youth) do "meaning-making?"
- What are the theological implications of a mediated world?
- Can the underprivileged reap communication technology benefits?
- How can collaborative mechanisms be institutionalized?
- Can further "social network analysis" foster creativity for the task?

Collaboration as a strategic planning tool will provide bold new techniques for cooperative ventures – connected by multifaceted communication tools. Projects will be limited less by geography, enabling organizational personnel to communicate across town, across a country, or between continents.

There is also much room for collaborative effort between the top and the bottom as the struggle to empower people and increase efficiencies goes on. This challenge should keep us all busy in this new millennium!

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