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Silent Actors: Communication Networks for Development

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BACKGROUND

In retrospect, the telephone may have been more crucial to social and economic development during the past 100 years than many had observed and expected. There now seems to be a growing consensus that telephony has had long-run consequences too important to be overlooked.

The mechanisms linking telecommunications to social and economic development, however, are still not clear. Because of the matter's complexity, there are different lines of reasoning regarding the impact of telecommunications on development with regard to both the past and future.

Two main lines can be identified:

1. Some see a new communications technology as almost automatically bound to produce new communication linkages between previously unconnected places and individuals. According to this view, the existence of new linkages promotes social and economic development, irrespective of other measures taken.[1]
2. Others point out that without close "fitness" to already existing structures, a new communication network will not long survive, and its development effects will be poor. In short, and according to the view of most telecommunication administrations, the telephone of the 1880s (as well as the new media of the 1980s) is supposed to have no independent, active role in the development processes; other factors are the leading ones.

THE SCOPE OF THE DISCUSSION

We shall focus here on feasibility problems and the mechanisms linking telecommunications to social and economic development.[2] This includes questions such as:

1. Under what circumstances can new communication networks, linking previously disconnected groups, work and survive long enough to have a lasting impact on social and economic development?
2. Are there unfulfilled needs for communication to which telecommunications can make unique contributions, or can they bridge critical gaps in existing networks?
3. If the answers to the first two questions are positive, what are the consequences for further research, including field trials of new technology?

A FRAMEWORK FOR DISCUSSION

I begin with a point made by Professor Pool in a recent book. He notes that a few critical linkages might connect groups much larger than the actual communicators; thereby, the potential network available to an individual or an organization is enlarged.[3] My question is: what happens if the crucial link is disconnected due to some outside circumstance? To use the title concept of this paper, will "silent actors" inherent in the network be activated to keep the original network alive, or are the two subsets of communicators to become disconnected forever? Is planned action needed to restore the original network, or do communication networks have the capacity for "self-repairing" so that the original, or even more viable, combinations are created?

Such questions are not impossible to answer, as long as the discussion is confined to small group behavior studied under controllable conditions. These have been fairly well studied, and similarly, in the case of mass communication, statistical distributions can be observed.

When it comes to intermediate cases, however (such as government or business organizations that contain thousands of employees in different locations), the dynamics of the linkage pattern are still mostly unknown. Further analysis of interorganizational networks is an important task in itself, and also be-

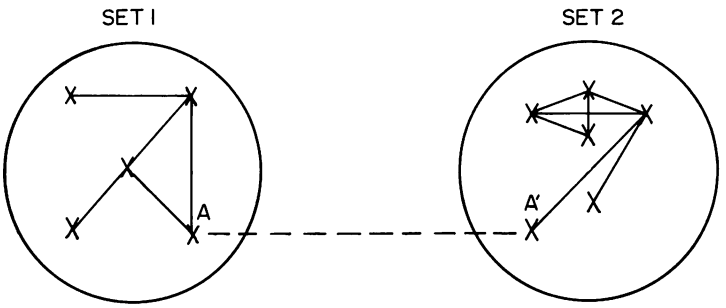

Figure 1
If link AA' exists, everyone in the population is linked.

cause the elucidation of organizational networks might help us to understand communications at large. Public and private organizations also have a heavy impact on information flows that connect individuals outside the organizations themselves.

EMPIRICAL STUDIES

In his contribution, "Comparing the Telephone with Face-to-Face Contact," Alex Reid reviews the substantive British research comparing different media in the laboratory. He points out that telephone contact differs from traditional face-to-face contact in two ways. First, it transcends distance; second, it transmits only audio information. Laboratory experiments permit singling out these factors, or testing them in different combinations.

By contrast, the field studies discussed here depict large-scale networks, where the telephone and face-to-face communication are used side by side, or sequentially. A communication process between two organizations (or regions) may begin in any medium. During the process, however, a switch may take place between media. Often this happens in combination with a switch of the actual communicators as the message is passed upwards, downwards, or sideways in the organizations (or regions) involved. Thus, a communication process normally has a history in which persons not presently participating may still have had a heavy influence on the design of the networks at large, as well as on the choice of media at a specific point in time. Once

one has passed the background information, additional narrow media may be more profitably used for a while.

To observe the "silent actors" which affect the viability of the networks, large-scale and repeated field studies are needed. A first attempt was made in Sweden in 1965. A pilot study covering all headquarters employees of a relocating Stockholm company was launched on a before and after basis. Data was collected four months before and eight months after the actual relocation from Stockholm to Eskilstuna, a small city 120 kilometers away. Follow-up studies were done in 1969 and 1974 to observe long-run adaption to the new location. Self-completed diaries were used to cover all communication with outside sources (oral, telephone, and written) during two six-day stretches in each of the observation periods. Also included was the communication between headquarters and fourteen plants in different locations in Sweden. The results indicated a substantial reshuffling of contact from higher to lower echelons but a surprisingly low degree of substitution of face-to-face by telephone contacts despite a travel time to Stockholm of more than two hours in each direction. Thus, the ratio of face-to-face to telephone contacts has been quite stable, both in the short run and in the ten-year period after the relocation.[4]

Some years later, more extensive studies covering hundreds of organizations were launched in Sweden and the United Kingdom. In Sweden, close to a hundred production and service companies of varying scale were covered by another diary study. Data from more than 10,000 telephone calls (longer than two minutes) and 3,000 face-to-face meetings was collected covering about twenty different dimensions for each contact event: e.g., length of meeting, number of participants, degree of advance planning, frequency of earlier contact, scope of information, and degree of feedback. The composition of groups (proportion of new vs. established participants) was of specific interest, as were a number of questions on travel.

To supplement the contact data, other kinds of data were collected regarding the characteristics of the individual participants and their companies. For individual employees, data was collected on education, age, number of years with the firm and in present position, function, and salary level. Structures of employment and production within the firm were studied for a

Table 1
The Structure of Contact Events in Four Studies

	% of events						
	KOMM 68		London 69		GOV. LOC. 70–72	KOMM 71	
	Face-to-Face	Telephone	Face-to-Face	Telephone	Face-to-Face	Face-to-Face	Telephone
Time Spent							
2–10 minutes	14	52	19	87	4	18	83
10–30 minutes	29	17	29	12	16	21	16
30–60 minutes	19	1	19	1	16	13	1
1–2 hours	19	0	18	0	25	19	0
2 hours or more	19	0	15	0	39	29	0
Number of participants							
2	42	98	55	—	30	42	95
3–5	46	2	31	—	32	39	5
6–10	8	0	9	—	16	13	0
More than 10	4	0	5	—	22	5	0
Planning time							
None	25	86	17	83	20	23	86
Same day	20	6	13	9	10	15	6
Day before	19	5	12	4	6	12	4
2–7 days	23	2	31	2	21	25	3
1 week or more	13	1	27	2	43	25	1

Contact frequency, minutes								
Never before	20	14	25	11	28	24	19	
One or more occasions	33	31	38	34	39	31	32	
Once a month	21	22	13	14	12	21	23	
Once a week	18	23	10	23	11	16	19	
Daily	8	10	14	18	3	8	6	
Direction								
Gave information	27	38	20	29	25	22	46	
Received information	25	41	15	38	18	21	34	
Mutual exchange of information	48	21	65	23	56	57	21	
Range of discussion								
One limited question	38	71	57	87	56	47	78	
Several limited questions	40	21	35	15	36	36	20	
General broad information	22	8	8	1	8	17	2	
Region								
Greater Stockholm	85	76				69	53	
Center of Sweden	9					16	27	
South of Sweden		22				6	11	
North of Sweden						5	9	
Foreign country	6	2				5	1	
Traveling time								
Less than 10 minutes	32		27		—	13		
10–30 minutes	49		48		—	37		
30 minutes to 1 hour	10		11		—	21		
1–2 hours	4		8		—	11		
More than 2 hours	5		6		—	18		

Table 1 (continued)

	% of events						
	KOMM 68		London 69		GOV. LOC. 70–72	KOMM 71	
	Face-to-Face	Telephone	Face-to-Face	Telephone	Face-to-Face	Face-to-Face	Telephone
Transportation							
Walking	19		22		—	—	
Car	69		56		—	—	
Bus, underground	12		17		—	—	
Train	3		4		—	—	
Aeroplane	0		1		—	—	
Total number of observations	2,169	8,184	1,544	5,266	929	20,243	98,743

three-year period. This background data included investment, turnover, value added, and R&D efforts, as well as measures of R&D progress. The purpose of this extensive data collection was to establish linkages between the study of communication behavior on the level of organization and other aspects of behavior. (A first report of the results can be found in Thorngren [1970]; another report will follow upon a repeat study to be carried out in 1978, ten years after the primary data collection.)

Parallel data from other countries are already available. Dr. John Goddard of the London School of Economics launched his study of London offices in 1969 using the same diary; it has also been a standard tool for data collection in more recent studies. Some of the results from Goddard's study, "LONDON 69," are presented at the end of this chapter along with comparable data from other studies. (For a full presentation, see Goddard [1971 or 1973].)

Other studies include extensive investigations carried out before the dispersal of government offices in Sweden and the United Kingdom. The Swedish exercise, "KOMM 71," covered *all* employees (20,000 individuals) within thirty-four government offices in Stockholm; the British counterpart, "GOV. LOC. 70-72," also had a very wide coverage. There are minor differences in the two studies. The British study focused on meetings, and data collection extended over a longer time. The Swedish study was carried out in one shot to achieve cross-checking of communication between the agencies. However, as all four studies followed the same format, cross-national, cross-sectoral comparisons are feasible.

The four major studies discussed here, together with related studies in other European countries, represent a data base of more than 500,000 observations of contact events reported in twenty dimensions.

SOME EMPIRICAL RESULTS

Full presentation of the results cannot be made in this context; only an overview can be offered. The tables below report comparisons, dimension-by-dimension and separately, for telephone and face-to-face contacts. (For an example of more elaborate comparisons, see Collins [1972].)

On a general level, however, the most striking feature of the comparisons is not the obvious differences between face-to-face and telephone contacts (that coincide with the results from laboratory experiments), but the close relationships between different media that form part of a joint multimedia, multiperson network connecting large segments of society over long periods of time.

For example, even the crude data presented here contradict the notion that telephone contacts have a propensity to create new linkages. The percentage of new relations with someone previously uncontacted is markedly higher for face-to-face contacts, whereas telephones are for more regular contacts (monthly, weekly, daily). The proportion of occasional contacts is similar for the two media.

More interesting than such static descriptions of the communication process is the dynamic by which telephone contacts contribute to the variety and viability of the contact networks. In turn, these are enriched by elements of face-to-face meetings as part of the contact chain over time. Once one has the background information from earlier meetings, narrower channels (such as the telephone) become more powerful than they would be in isolation. Space permits only a few illustrations, highlighting the local nature of communication and the role of third parties as silent actors in the process over time.

COMMUNICATION IS LOCAL

Remembering that the data refer to large organizations (such as central government agencies and companies operating nationally and internationally), perhaps it is surprising to find that they are so heavily dependent on local communication networks. As much as one-third of the travels are less than ten minutes away, and two-thirds are within a thirty-minute radius. Because telephone contacts are basically with the same set of sources, they do not extend as far over space as might be expected. A more detailed analysis of production patterns has demonstrated that the local networks are not explainable by reference to routine contacts alone, but rather to complex, continuously renewed interactions with new sources in the near environment. Personal

meetings and telephone contacts are of a mutually reinforcing variety; viability of contact with a self-repairing capacity is difficult to achieve over long distances, at least with present telecommunications.

COMMUNICATION IS EXTENDED BY THIRD PARTIES OVER TIME

Quite often, the links between two organizations are not the obvious direct ones. Rather, a third (or fourth) party may act as the common denominator carrying the potential for occasional direct contacts. Most of the contacts that occur, as indicated by our data, are local. However, the existence of occasional long-distance communications among the few individuals who link the local subsets may be essential for the viability of the organization. The different bodies might not be aware of each other's existence but could still benefit from the existence of intermittent and normally silent actors. This is a process over time, where switching between different media and groups goes on in a Markov-type chain in which averaging smooths the inherent dynamics. However, the dependence over time might also be seen as the key to the obvious spatial dependence.

CONCLUSIONS FOR FUTURE FIELD TRIALS

Retrospectively, the data presented here might both delimit and extend our conclusions about the role of telecommunication. The capacity of telephony to transcend distance, create new linkages, and replace face-to-face meetings might have narrower margins than expected from laboratory experiments. On the other hand, the importance of telephony as part of a multimedia flow might be even more critical than expected, keeping other networks such as personal contact viable and extended over time and space. Telephony might even be crucial for the existence of other networks that have a more direct relation to development. Without repeated brief telephone contacts, the personal relationship that is exercised only occasionally might atrophy with time. At the same time, without personal contact as background, telephone networks do not develop.

Looking into future field trials, we need to find a working compromise between two opposing dangers in testing new systems:

1. One danger is defining the relevant network participants too narrowly, thereby excluding not only important user groups but also normally silent actors with whom potential contact is necessary for the long-run survival of the relationship. [5]
2. The opposite danger is beginning with a new communication system that is so weakly connected to the mainstream that the network meets premature death. As already mentioned, empirical field data might be needed to strike a correct balance; research in that direction is going on at an increasing scale at many European universities.

In the meantime, awaiting full elucidation of the complexities of contact networks, alternative delimitations and sensitivity analysis of the effect of different network borderlines might be a necessary precaution lest the silent actors remain silent forever.

NOTES

1. See, for example, Suzanne Keller's paper in this volume.
2. The concept of development is used here in a wide sense to include not only potential effects on income levels, employment, etc., but also potential effects on participation in decision processes, etc.
3. Figure source: Ithiel de Sola Pool and Wilbur Schramm, eds., *Handbook of Communication* (Chicago: Rand McNally, 1974).
4. See Thorngren (1976).
5. The introduction of loud speaking telephones (as well as the picturephone) are well-known examples of the danger of too narrowly conceived user groups. Use of the new equipment was expected to percolate from the top levels of the organization to the bottom, even though the lower echelons might have more need for free hands to find the papers the boss is requesting. Similarly, picturephones might be more useful in production and R&D than in top management. Processes started at the wrong end will not diffuse.

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Editor's Comment

To talk to others who are unseen and far away is an experience which, before the telephone, occurred only in mythology. Gods, devils, and angels talked from the sky across the world, but not mere mortals. The authors of the next three chapters ask how people behave when given the power of talking at any distance while being deprived of the power to see those with whom they talk.

The previous section on the telephone and the city and an earlier chapter by Suzanne Keller have already posed some of the same questions. Do people form noncontiguous communities when they can, or do they still communicate by telephone primarily with those they also frequently see face to face?

Bertil Thorngren marshals empirical evidence for the latter view; most telephone conversations, he finds, are with people located within easy visiting distance. In short, the telephone does not create a totally new set of relations; it is an additional channel for communicating with friends and coworkers—the same people one sees in person and occasionally sends notes to. It reinforces, Thorngren argues, existing networks of contacts, rather than creating socialized societies of telephone friends.

Alex Reid's paper suggests some reasons for this. His paper comprehensively reviews the literature on the differences between conversations and conferences with or without visual contact. Many laboratory and field studies have been done, in Britain, the USA, and elsewhere, of the differences between face-to-face and telephone conversations. The findings are consistent and sometimes surprising. For many purposes, nonvisual voice communication is just as good—perhaps better—than

face-to-face interaction; that is true, for example, where the purpose is exchange of information. However, in other circumstances, such as creating new relationships, people find personal meetings necessary.

But when the telephone rings, one does not know who is summoning. In earlier chapters Briggs, Perry, and Abler quoted turn-of-the-century British commentators on the social dilemmas that this posed. One may protect oneself, these commentators suggested, by having the servant answer. In today's democratic society most of us respond to the summons ourselves, at least at home, but one question dominates our mind until we learn "who is it?" Schegloff, in his paper, examines behavioral patterns in the brief first exchanges of greetings as the caller and respondent try to resolve that anxious question.

Etiquette books and phone company publicity once tried to urge people to answer the phone by an immediate self-identification, e.g., "the Smith residence." But with rare exceptions, which Schegloff analyzes, people declined to do that. They protect their identity until they know who is calling and prefer to be recognized rather than identify themselves. The result—a grammar of greetings that Schegloff records—is stylized, conventional, and different from that which prevails in any other realm of human discourse.

Concealing one's identity and gradually revealing it is, however, not a unique kind of human behavior, but it was not an everyday matter until the ring of the telephone. As Schegloff reminds us, one of the great themes of classic folklore is communication with one whose identity is hidden. When telephoned, we are gripped by dramatic excitement as we wait for the revelation, just as the audience watches with excitement for the true identity of Oedipus or Telephus to be revealed.

The game of guessing who said "hello" makes sense, however, only because so much telephone conversation is among close associates who know each other's voices well. The telephone may bridge distance, but it also reinforces the bonds of personal relationships.