SOME PROPOSALS CONCERNING JAPAN'S TELECOMMUNICATIONS POLICY†

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I. *Why Reform is Necessary in Information and Communication Policy*

Recent developments as well as potential developments in innovations relating to information and communications technologies are quite remarkable. As time passes these innovations will shake the foundations of industrial society in many profound and far reaching ways and will most likely go on to alter the very framework of society. During the 1980's, whether we like it or not, we are going to have to accept the consequences of these innovations.

In industrial terms, the so-called microcomputer revolution is rapidly accelerating the processes of energy and power conservation. At the same time, this revolution is altering the ways in which we think about machinery and is providing a new technological basis for the small-scale production of numerous types of goods which respond to the diverse needs of today. For example, one type of information-oriented industry can be observed in a manufacturing industry such as the steel industry which uses computer control to manufacture products in a variety of ways. Moreover, machine tools, upon which all industries are based, are almost all becoming numerically controlled by built-in microcomputers. Such tools have reached the point where they are being used even by small- and medium- sized enterprises. At the same time, the integration of machinery and communications equipment, as well as computers equipment is altering our sense of distance in economic society, and is changing the ways in which we organize firms and conduct business.

In social terms as well, these technological innovations have the potential to completely change existing modes of operation in a variety of fields including medicine, education, transportation, and postal services. Reform of the public sector is going to be an important policy issue throughout the 1980's and information and communications technology will most likely represent one influential policy tool which remains to meet future demands for qualitative improvements in public sector efficiency and in the range of services provided. Such technology will also be of key importance in coping with energy resource constraints. That is to say, taking into consideration the enormous quantities of energy necessary for transportation, it is inevitable that economic society will move in the direction of a relative reduction in the movement of goods and services as well as people. Such a reduction by itself would bring

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† From section 1 to 3 is based on the recommendation of the Forum of Policy Innovation, the chief author of which is K. Imai. (The Forum of Policy Innovation (*Seisaku kōsō forum*), "A data communication policy for creating a viable and pluralistic information society (in Japanese)).

Section 4 is the translation of K. Imai, "*Data tsushin ni kyōsō genri dōnyu o*," *Tōyō Keizai*, Aug. 1981.

about stagnant society on the verge of becoming a closed economy. In contrast, it will be necessary for us to forge close ties of mutual dependence between regions by means of increasingly active exchanges of information based on communications technology. Fortunately, once communications equipment is installed, communications activities themselves do not require such large amounts of energy. In order to overcome problems of limited energy resources, Japanese society will have to move in the direction of utilizing inexhaustible information resources and thereby alter its economic infrastructure from one based on transportation to one based on communication.

In addition, in terms of family and individual lifestyles, computers and communications are gradually changing our lives. There are already many people in Japan who are using the banks' on-line "cash card" systems to conveniently conduct their savings transactions. The use of microcomputers in the home, a youth-oriented phenomenon, may bring one supposed fruit of the information-oriented society into home life sooner than expected. There will be immeasurable benefits if encyclopedic data banks become generally available at a low cost and this would naturally alter present teaching and studying methods. Accompanying the above-mentioned transition from a transportation society to a communications society, will also be changes in both working hours and the content of work itself in numerous occupations. These changes will have an impact on people's lifestyles and on urban housing problems as well and will probably contribute positively to the solution of those problems.

Needless to say, the consequences of these technological innovations will have both good and bad aspects. That is, for many of the good aspects mentioned above there are also some bad aspects such as the privacy problem as well as the danger of an increasingly managed society symbolized by that problem. While we by no means intend to argue optimistically by emphasizing only the good aspects, the clear fact of the matter is that the foundations of economic society are steadily changing along with the introduction of technological innovation related to information and communications. Moreover, in considering the issues of the future, in the last half of the 1980's there are sure to be changes which go beyond what we can imagine now.

In this paper we are not attempting to argue in terms of futurology. What we would like to insist is that the new waves of social and economic change mentioned above are already clearly visible in fundamental technical and economic trends. It is necessary to calmly accept this fact and think about what kind of systems we ought to have in the future. The technological basis of economic society has already gone beyond such processes as massification, concentration, and standardization and is now beginning to center on such processes as demassification, decentralization, and diversification. Therefore, a new framework for an economic society which can cope with these processes is being sought.

In the following proposals we attempt to deal with the problems associated with this sort of framework. The proposals provide a new basis for Japan's firms and industries to cope with the waves of innovation discussed above and to build up a foundation for development heading to the twenty-first century. While new systems of industrial activity are being called for in a number of fields such as information, energy, urban planning, and distribution, for our first set of proposals of this type we have chosen to deal with issues relating to the use of telecommunications lines in information systems. Although these appear to be highly technical issues they are actually at the core of those issues relating to the use of information and communications innovations which will greatly influence our lives in the ways discussed

above. What is more, we believe that the new framework itself is so important that it will determine the real nature of Japan's industrial society in the future.

In order to face up to both the good and the bad aspects of the coming information-oriented society, the decision-making process regarding what kind of information systems to promote must reflect the opinions of the greatest possible number of people and give priority to the preferences of those who will actually be using those systems. We have serious doubts about the current "technology first" approach to the adoption of information systems which is being promoted by government bureaucrats. Mistakes like those which led to pollution and environmental problems in the development of chemicals and heavy industry must not be repeated, since the bad aspects of information developments have the potential to seriously upset the foundations of our social lives and social relations. For this reason as well, a decentralized framework must be established which can take into consideration the judgements of a great number of people.

Current information and communications policy does not appear to be heading in that sort of direction. In fact, we would have to say that the present system relating to the use of data communications lines is greatly constraining private sector activities. At this point, let us turn to providing somewhat more concrete examples of what kind of problems exist.

1.1 *Limitations on the Use of Data Communications Lines Relating to "Outside Party Use," "Line Sharing," and "Interconnection"*

In the past, communications lines were used primarily for telephone communications. Recently, however, since the same lines are able to be used for the transmission of computer data, there has been a rapid increase in so-called "on-line" use which links computers and users by way of communications lines. The consequences now extend to every corner of our lives. This type of data communication basically occurs in the following three forms: (1) the establishment of private communications lines, (2) the use of common carrier communications lines furnished by Nippon Telegraph and Telephone Public Corporation (NTT)[1], (3) the use of NTT's leased communications lines (including "interconnection" which uses public communication lines). The overwhelming majority of our nation's data communications line use takes the third form of leased lines which are called "specific communication lines." However, while there are no problems in the use of these specific communications lines (leased lines) for purely internal use by firms, in the case of inter-firm use, or in cases where firms allow use by outside parties or attempt to use common carrier lines for "interconnections," the current system is extremely restrictive. That is to say, neither "outside party use" nor "line sharing" are permitted except under specific circumstances. "Outside party use" refers to cases where some party other than the contracting party uses NTT's leased lines. Similarly, "line sharing" refers to cases where more than two companies jointly contract for the use of one line. In effect, a licensing system has been adopted. Moreover, even in cases where "line sharing" or "outside party use" happen to be permitted, acting as an intermediary for information without altering the content is strictly prohibited. In general this is known as "message switching." Since it involves the transmission of information

[1] The explanation given here concerns domestic communications. In the case of international communications, the communications lines of Kokusai Denshin Denwa Co., Ltd. (KDD) are utilized.

just as it is, it is essentially the same as switching services for telephone communications. It is forbidden on the grounds that if it were permitted it would be granting users the right to operate a service identical to a common carrier service of NTT.

While at first glance these restrictions do not appear to be severe obstacles, they are in fact impeding at a fundamental level the effective use of computers, the linking of computers and communications, and the development of data banks. For example, the distribution of goods and services is a field in which the linking of computers and communications is thought to be bringing about great changes in Japan's economic society, but its development is fettered by restrictions on "joint use" and by the prohibition of "message switching." In other words, rationalization of the distribution of goods and services can not occur by means of using "line sharing" computers to link wholesalers to retailers or producers and warehouses to transportation companies. This is due to the fact that there is a restriction which limits "line sharing" among producers, producers and wholesalers, and wholesalers and retailers to the case of firms which have continuous business relations. Also, even supposing that such "line sharing" were to be permitted case be case, coded purchase orders would still not be able to be transmitted just as they are since "message switching" is forbidden. This is equivalent to prohibiting the full utilization of the capabilities of computers and communications. Moreover, in contrast to the case of large banks which are not restricted from establishing computer networks to link one branch to another, groups of firms are not permitted to attempt to use such leased lines due to restrictions on "line sharing" and "outside party use." In spite of the fact that the way in which both types of networks use the communications lines is completely identical, such networks are permitted when the firm's internal organization calls for branches, but are not permitted when the firm's external organization calls for subcontracting. Thus it appears that NTT is determining what kind of industrial organization we will have.

As is clear both from the above examples and from the fact that the basic feature of the recent technological advances is that they create networks which span from one type of industry to another, restrictions on "outside party use" and "line sharing" are great hindrances to the creation of new inter-industry systems and the reorganization of Japan's industry to make use of those advances. The situation is the same even when it comes to social systems such as medical information systems. Moreover, we would have to say that these types of restrictions are hampering any new development of Japan's industrial society towards a decentralized economy. This can be seen in many recent examples of firms which are colliding with the "outside party use" restrictions when they try to form separate companies in order to separate operations divisions from research divisions.

1.2 *Barriers to Entry due to Complete Monopoly*

Based on actual practices in the United States, the following types of data-communications can be identified: 1) telephone lines, 2) microwaves, 3) value added networks, 4) satellite communications, and 5) digital communications. As we will discuss later, in each of these fields competition has been introduced in the United States. However, in the case of Japan, all of them are monopolized by either NTT or Kokusai Denshin Denwa Co., Ltd. (KDD) and participation by the private sector is basically not recognized. We will discuss

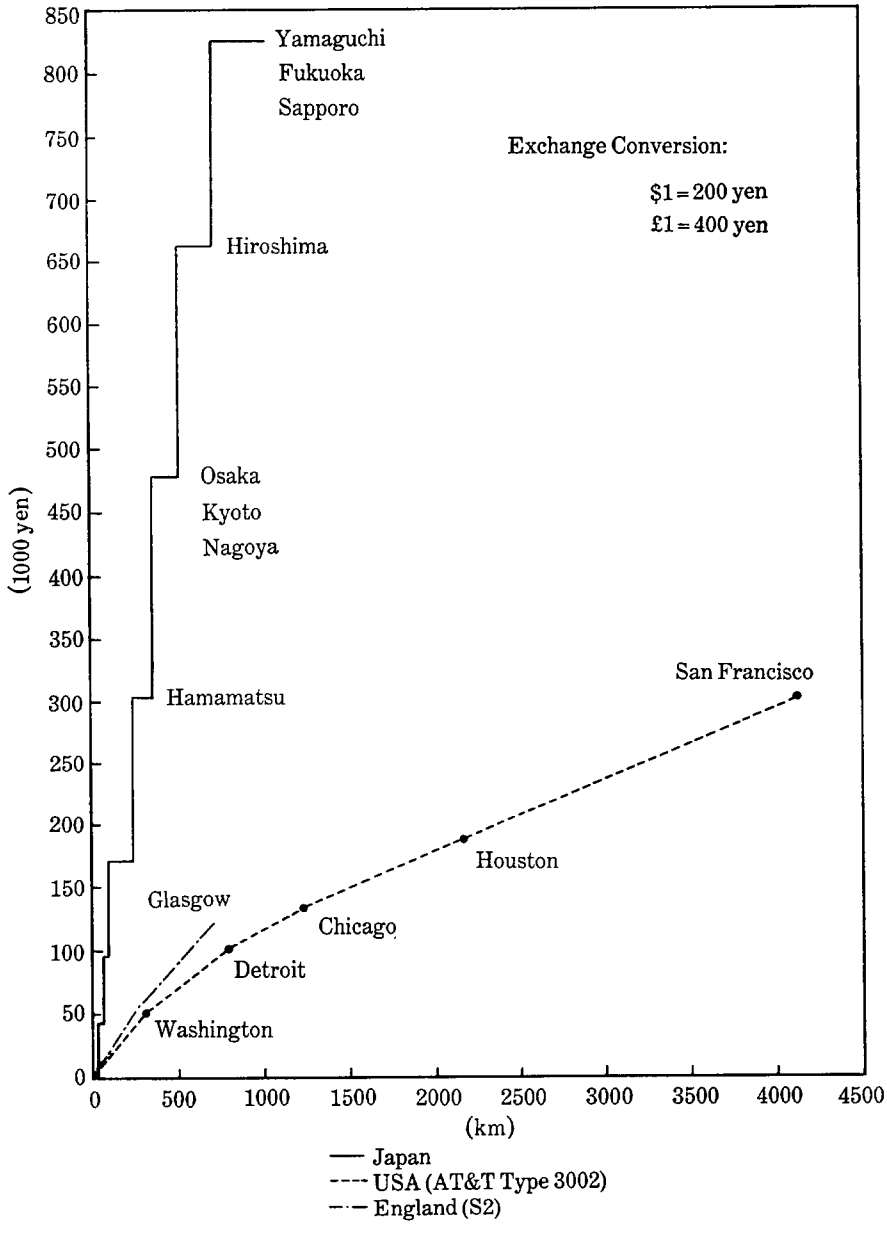
later the fact there is no economic basis for granting this type of nearly complete monopoly. However, even granting some progress along these lines, users will not be guaranteed satisfactory service as long as the basic monopoly of NTT continues in such a way that entry by value added network businesses is not permitted at all. The term value added network, usually abbreviated VAN, dose not refer to services which simply provide the wires for communications lines but rather refers to other cost-lowering services such as those which store information and transmit it when it is needed or those which search for and correct transmission errors. A firm which resells, so to speak, the use of communications lines by adding these new services is called a VAN firm and we shall follow this terminology below. In the United States VAN firms have made a positive contribution by stimulating the demand for data communications and by lowering communications rates. In Japan, however, since firms like these are not allowed to operate, even if monopoly status were to be granted in some basic fields, it would be impossible for a computer communications industry to develop in a way which could make good use of the private sector's resourcefulness and its ability to provide customized services. If value added networks are permitted in the private sector, it will probably be possible for numerous diversified services to develop such as the linking of extremely different types of computers and terminals or the roundabout relaying of signals during times of peak use or damaged lines. In particular, now that the use of computers has come to be of central importance in business, the demand for emergency support systems is strong. However, in order to provide such services twenty-four hours a day at a low cost it will be necessary for value added networks to be established in the private sector. It is only natural that highly specialized and diversified services are demanded in a field such as the value added network field, and the provision of such services would be quite suitable for the private sector. In Japan's case in particular, we would like to emphasize the fact that we are in a situation of mounting tension based on the fact that computer users' knowledge and desired applications go beyond what is permitted by existing legal practice. Even if the public corporations do go ahead with the operation of value added services based on the new digital communications network (DDX), it is important that the nature of the services to be added be determined not only by the public corporations but also through the utilization of the inventiveness and knowledge of the private sector. We must not forget that inventiveness at the workplace is what supports the competitiveness of Japanese firms.

1.3 *The Adverse Consequences of Regional Rate Differentials*

Japan's communications line rate differentials based on distance are surprisingly high. Such differentials are remarkable in comparison to those abroad, with maximum rates being 12 times greater than minimum rates in the case of public phones and actually 105 times greater in the case of specific communications lines (see Figure 1). The average level of rates as well is 6 to 7 times greater than that of the United States. One revolutionary aspect of recent developments in communications technology is the utilization of packet switching technologies[2] which transmit data after it has been broken down into small packets which

[2] The information which is put into packets is first stored in the computer's memory. The computer then decides which transmission route will be the most efficient and sends the transmission along open transmission routes. By using various routes and transmitting packets out of order, transmission loads can be spread throughout the entire transmission network, so that transmission costs end up being almost completely unrelated to distance.

FIG 1. A COMPARISON OF DATA COMMUNICATION LINE RATES IN JAPAN, THE UNITED STATES, AND ENGLAND



Source: Electronic communication Users' Cooperative Association, "Users' White Paper," (in Japanese), April 1979.

are identified with sender and receiver numbers. The result is that data communications costs have come to be almost independent of distance. Therefore, it should be possible to establish communications line rates which are basically not dependent on distance. Even in a nation as enormous as the United States, the data communications rates of Telenet, Inc. are already uniform throughout the country and bear no relation to distance.

Establishing data communications rates which are uniform throughout the country is an extremely important policy issue if one considers the fact that the elimination of information differentials represents the key to the promotion of industrial development in the regions and actually opening up the way to the so-called "age of the regions." As we mentioned earlier, due to constrainted energy resources we have to transform exchanges between regions from ones based on transportation systems to ones based on communications systems. Considering this fact, communications rates which are not based on distance are of revolutionary significance in terms of the encouragement of regional decentralization. However, at present there are extreme regional differences in leased communications line rates, even though in the case of the common carrier in certain areas the above mentioned packet exchange technology has become available (in the form of NTT's new digital communications network) and regional rate differentials have been reduced. Nevertheless, unless there is a reform of rate differentials for specific communications lines which are fundamental to all data communications, it is only natural that NTT be criticized for having adopted an arbitrary rate policy for the purpose of expanding the demand for its own communications network. Moreover, it will serve no purpose if long-distance rate differentials are revised by raising short-distance rates. On the contrary, judging from figures based on international comparisons, due to the consequences of technological innovation it should be possible to eliminate long-distance rate differentials by reducing rate levels. In addition, if the private sector is allowed free use of the communications system, it is possible that by lowering rates, the public corporations' revenues will increase due to the large price elasticity of demand. Only under the creation of such circumstances will the people of the nation put to good use the consequences of technological innovation.

In the above, we have illustrated rather sketchily how the existing system for the utilization of communications lines is restricting the economic activities of the private sector. In more concrete terms, the "Users' White paper" released last year persuasively points out some of the adverse consequences of the current system. However, what we are attempting to consider here are neither those type of so-called complaints nor the pragmatic measures necessary for dealing with such complaints.

In what ways will the infrastructure of an information system centered around communications lines be created? How will a framework of firm behavior which will form information networks be established? We will consider these broader and rather long-range issues since we think that they are so crucial that they will determine the future course of Japan's industrial society. Even though the economic society of Japan is not about to change fundamentally, in many small ways there are continual changes occuring which taken together are bringing about a reorganization of that economic society. The technology of information systems will act as a catalyst for the creation of new organizational connections. It is, so to speak, creating the nervous system of economic society and its own subtle workings will become the major source of economic vitality in the future and will support activities which will connect one industry to another. Who will be the agents who control that complicated

network? This is the basic issue of the framework which we are discussing. Needless to say, as citizens we must be the agents who will go on to form industrial society in the future and we must utilize the inventiveness of as many people as possible.

The problem of communications lines is basically one of how we will go about creating this kind of information network, or in other words, how we will go about creating an information-oriented society in Japan. To consider this problem will require hearing opinions from a wide spectrum of viewpoints. But above all, we are going to have to break away rapidly from the framework of telephone-oriented communications policy inherited from the Meiji days.

Furthermore, the problem of communications lines is also intimately related to the fundamental problem of what kind of boundary we are going to establish in the future between the public sector and the private sector in Japan's economy. An inquiry into this problem ought to be made from the point of view of the so-called reconstruction of our nation's finances. In particular, in cases where it appears that public enterprises are oppressively restricting the activities of private enterprises such business practices will require radical surgery. One example of such an issue in terms of the capital markets is the problem of the postal savings system. Another typical example is the data communications problem which we are considering here.

II. *Basic Considerations of Information and Communications Policy*

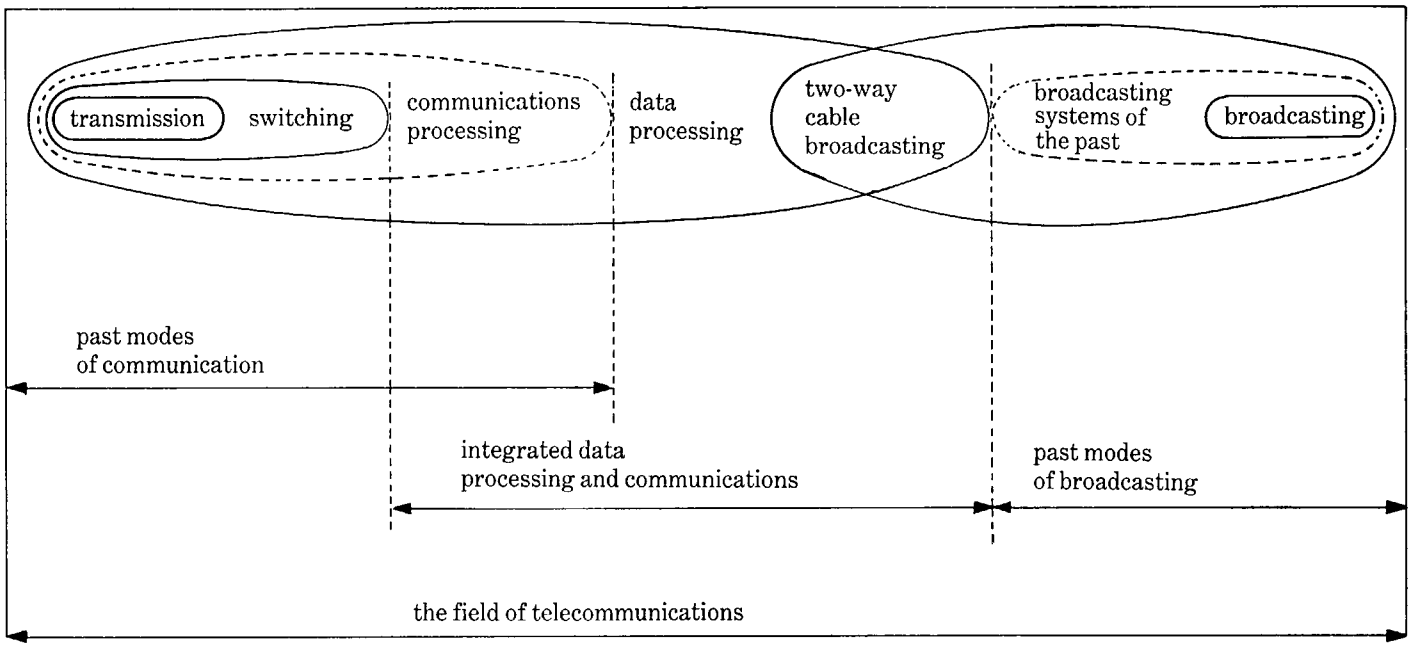
Information and communications policy will affect the basic framework of the coming information-oriented society with respect to such issues as public access to information and the protection of privacy. Let us, however, put off a discussion of such issues until later, and begin with a consideration of the industrial aspects of information and communications policy.

2.1 *Various Aspects of Information and Communications*

The basic reason that a new framework is being sought for information and communications policy lies in the fact that, due to recent revolutionary progress in information processing and communications technology, various functions of information processing, communications, and broadcasting are being integrated. Thus, what were previously thought of as separate services are being unified and it has become quite difficult to establish clear boundaries between the various fields. A rough diagram of how the various fields are being integrated is provided in Figure 2.

In terms of the classification scheme given under the diagram, the only services which existed in the past were common carrier communications services such as telecommunications networks which transmitted and relayed information provided by users, and droadcasting services such as the radio and television networks which provided a one-way flow of information to a large number for unspecified users. It was with these types of services in mind that the existing legal framework was created. However, data-communications-

FIG. 2 THE DIVERSIFICATION OF TELECOMMUNICATIONS



A Classification of Telecommunications Services

- Common Carrier Services
  - telegram, telephone, cable telephone
  - DDX, etc.
  - scientific and technical computing services
- Data Communications Services
  - inventory management services, etc.
  - ticket reservations, stock price information
  - data banking, etc.
- Broadcasting Services
  - broadcasting, CATV
  - cable music broadcasting, etc.

related services such as sales and inventory management, ticket reservations, and stock price information have come to play an important role due to the appearance of data-communications technology which integrates computers and communications equipment. Moreover, in the field of broadcasting a well, broadcasting systems such as CATV have appeared which will make possible two-way communications including telephone functions.

Telecommunications can basically be calssified into three categories: common carrier networks, data-communications networks and broadcasting networks. However, the boundaries of these categories have come to overlap one another. The most serious problem in this regard is that newly developed data-communications network services are being dealt with according to the framework of the Public Telecommunications Law of the past and are being regulated just as if they were extensions of telephone services, despite the fact that the new services are of a fundamentally different nature than telephone-oriented common carrier services of the past. In addition, as in the case of CATV mentioned above, new services related to broadcasting are being developed which link broadcasting and two-way communications technology. In spite of this, under the existing legal system it is not clear whether such services should be treated as either broadcasting or communications, nor is there any provision for a concept uniting the two fields. For these reasons it is necessary to have a new framework which is responsive to technological change.

2.2 *Monopoly and Competition in Data Communications*

Given the changing situation outlined above, on what basis should economic activity in the telecommunications field be regulated? Let us consider the matter from an economic point of view.

In the past, the economic basis for permitting the existence of a monopoly in the field of telecommunications was known as the "theory of natural monopoly." This theory maintains that due to special (and natural) technical conditions monopoly is more efficient than competition since in this industry telephone wires have to be strung individually to each user. However, with the advent of the new technologies mentioned above, it has now become unreasonable to extend this line of reasoning to data communications and to telecommunications in general. During the early period of development of the telephone industry there may have been some basis for viewing monopoly as being efficient due to the existence of economies of scale. However, now that substitute technologies such as microwave and satellite communications have been introduced this kind of justification for monopoly has become doubtful.[3] Moreover, in the case of data communications as well, no such justification for monopoly appears to exist.

Let us elaborate. In the first place, there are a number of problems with the very concept of natural monopoly which will be discussed later and recent economic analysis concerning public utilities has been attempting to reformulate the concept. Even if we ignore such

[3] Leonard Waveman's empirical research investigates economies of scale in telecommunications in the following situations: (1) point-to-point communications, (2) network communications, (3) composite cases such as data communications, and interconnections. The results make it clear that as far as intercity communications are concerned, the justification for permitting monopoly on the basis of economies of scale is lost. See Leonard Waveman, "The Regulation of Intercity Telecommunications," Almarin Phillips, ed., *Promoting Competition in Regulated Markets*, The Brookings Institution, 1975.

issues for the moment, we can still say that if we continue to grant public utility status regardless of changes in the technological basis for natural monopoly we are inviting the unnecessary protection of firms and industries, a result that is contrary to the true intent of regulations. This has been made clear by a great deal of empirical research based on economic analysis. In the United States, on the basis of such considerations positive attempts have been made at deregulation and liberalization which are succeeding in lowering rates and qualitatively improving services. Given the new conditions which now exist in telecommunications it is a mistake to apply the theory of natural monopolies to the entire field.

In the second place, another justification for monopoly in telecommunications is that from a purely technical point of view unified management is necessary for purposes of so-called "technical uniformity." However, emphasizing this point is inappropriate under present technological conditions. "Technical uniformity" refers to those economies of scale which would result from building a network of technology based on a consistent technical concept. We wish to call attention to the fact that even if we suppose from a purely technical point of view that such economies of scale exist, from an economic point of view if one considers the merits of concentration versus decentralization there are increasing advantages to decentralized processes. Under such processes systems which are technically different (e.g. different computer systems) as well as interface technology which links a variety of different technologies will develop. To insist upon "technical uniformity" in spite of such considerations amounts to advocating out-of-date "technology first" theory aimed at creating large-scale systems. We must note that such thinking is opposed to the basic direction of current efforts to create socially optimal information and communications systems which make good use of the special features of decentralized information-related technologies.[4] Our fundamental contention concerning this point is that, if it is technically feasible, we ought to aim at creating an economic and social system utilizing information-related technology which moves not in the direction of further uniformity and concentration but rather in the direction of as much pluralism and decentralization as possible.

Thirdly, another justification which supports permitting a monopoly in electronic communications is the so-called "cream skimming theory" which maintains that if free entry is allowed in this field, the common carriers will be left with providing unprofitable services since the new entrants will selectively provide only profitable services to regions with a large number of users or high demand density. That is, just as cream is skimmed from the top of fresh milk, new entrants will skim off only the best part of demand for themselves, leaving the common carriers with what will necessarily be the high cost segment. However, this justification is also unfounded. Even granting that such a claim might be true for telephone communication, the situation in the case of data communications is completely different. In data communications the problems lie in the content of services. If higher quality services than those now available are provided those services will come to create new demand.

In addition, to include telephone communication in a discussion of cream skimming theory is most likely mistaken. Data communications need to be considered as services which are complementary to telephone and telegraph communications. In any case, what

[4] There is also an argument for technical uniformity as a means for dealing with emergency situations. However, since the police communications system is already technically uniform, the issue of emergency situations probably should be considered in terms of providing exclusive communications lines for police use. In terms of managing defense or earthquake emergencies, the provision of exclusive line use is an urgent matter.

we are arguing for is an overall expansion of the quality and capabilities of communications services as well as a reduction of costs brought about by a general expansion of demand. To put forward cream skimming theory as a justification for supporting monopoly is unreasonable in this context.[5]

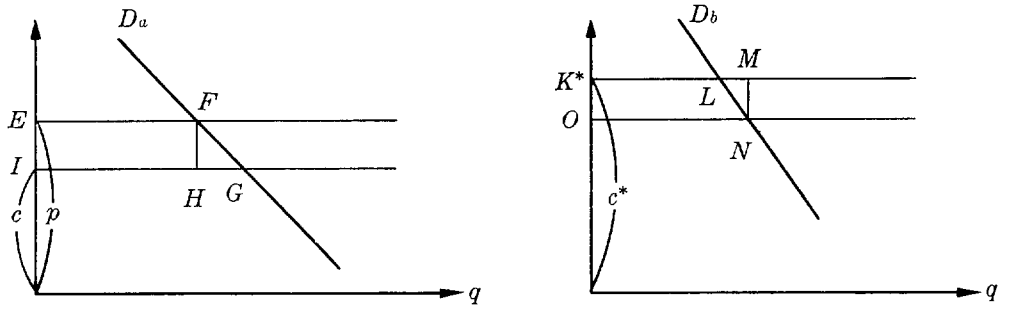
2.3 *Changing Our Attitudes: What We Should Learn from the Experience of the United States*

As is clear from the above discussion there is little economic justification for granting monopoly status to the telecommunications industry as a whole. Even if we realistically suppose that the traditional monopoly in telephone and telegraph communications continues, we will still have to decide on appropriate competitive or monopolistic market structures in a case-by-case manner for the wide range of telecommunications services which will most likely flourish along with future technological innovation in such service fields as common carrier communications, data communications, and broadcasting. In addition, if the government does engage in regulatory activities it will be necessary to investigate what kind of regulatory methods are desirable.

Since the 1971 revision of the Public Telecommunications Law there has been a partial liberalization of data communications and an improved application of the law. Thus, there has naturally been some inclination toward the partial introduction of competition. However,

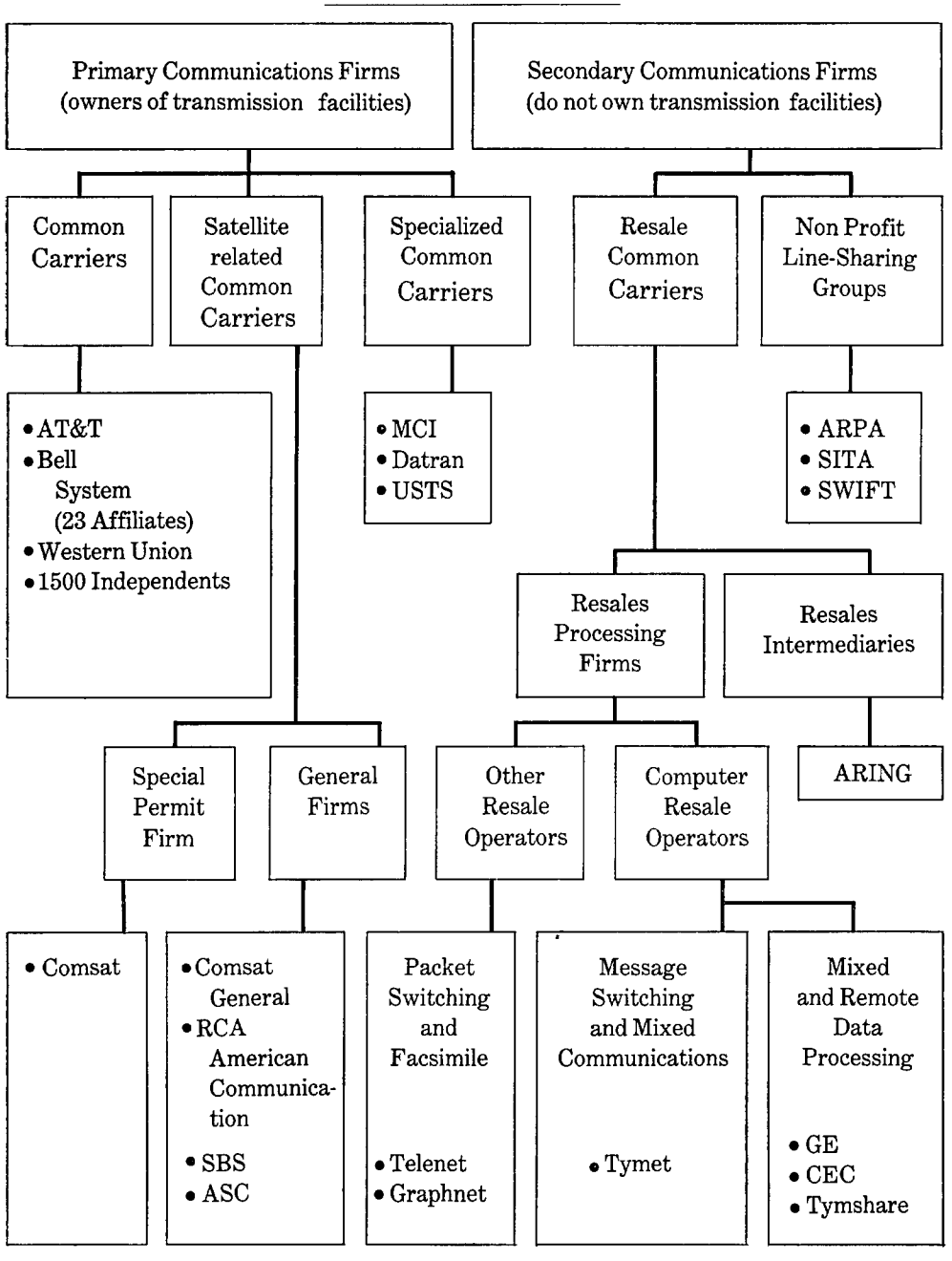
[5] Generally speaking policies which keep rates low in low demand areas through subsidies which are internal to the firm are not economically desirable. Consider the following graphs:

High Demand Area (a) Low Demand Area (b)



Let us suppose that there exists a high demand area (a) and a low demand area (b) whose respective demand curves and cost curves are shown in the above graph. The average level of costs, c, in the high demand area is lower than the average level of costs, c^*, in the low demand area. In this case, in order to equalize the price level in both areas it is necessary for the profit *EFHI* of area (a) to be used as an internal subsidy which covers the losses *KMNO* of area (b). Suppose, however, that we lower the price of area (a) to level c and use the resultant increase in consumer surplus *EFGI* to compensate area (b) for a loss in its consumer surplus which results from raising its price to level c^*. Total consumer surplus would increase by the sum of triangles *FGH* and *LMN* (since *EFHI=KMNO*). Therefore ,the economic welfare of both areas is increased if the price in the high demand area in lowered to the level of average costs with, for instance, a usage tax being used to draw off some of the resulting increase in consumer surplus in order to compensate the low demand area for its loss.

CHART 1. A CLASSIFICATION OF TELECOMMUNICATIONS FIRMS IN THE UNITED STATES



Japan has yet to break away fundamentally from the telephone and telegraph-oriented monopoly concepts of the past. Instead of permitting competition in a patchwork fashion, what we need to do is to change our attitudes so that they will be responsive to new realities. Currently, however, the position which has been adopted has been one of trying to protect the existing monopolies by getting by with minimal introduction of competition. Consequently, NTT's attitude has been to be very particular about the border between communications and data processing and to forbid communications relaying which does not involve changing the message content. In other words, NTT has made "message switching" its own sacred territory and refuses to allow the least bit of encroachment onto that territory.

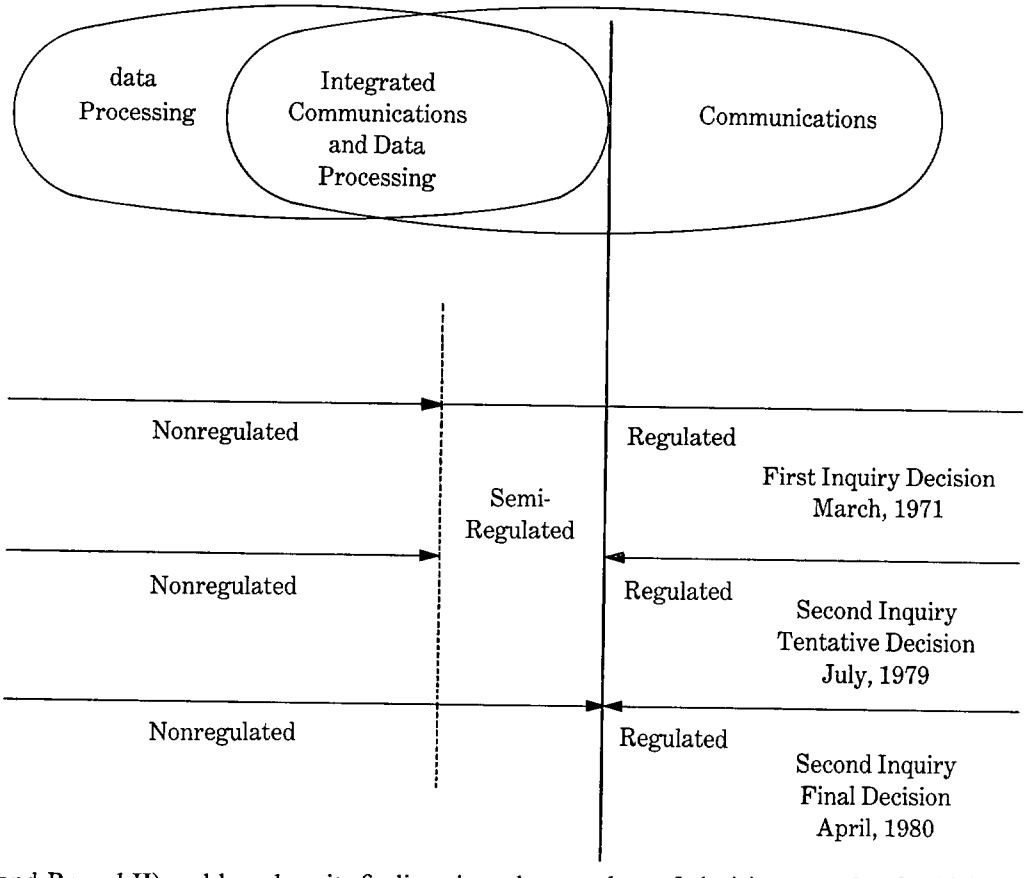
With respect to this "border dispute," there are many things we ought to learn from the experience of the United States. Unfortunately, in the field of information and communications policy Japan is still far behind the United States. While it is said that NTT's technical level is the best in the world, there has been no framework established which allows economic society to utilize that expertise on a broad scale. Consequently the development of a software-oriented information industry has been slowed down.

We ought to be quite concerned about dropping behind in a field which is at the so-called leading edge of technology for our future industrial society. In the United States, along with the development of competing communications methods such as microwave and satellite communications, policies have been adopted which pursue a certain amount of liberalization of telephone communications and promote as much free competition as is possible in data communications. For example, by permitting a firm called Microwave Communication Inc. (MCI) to begin operations in 1969, the Federal Communications Commission (FCC) paved the way for the creation of specialized common carriers such as United States Transmission Systems (USTS) and Southern Pacific Communications Co. (SPCC) which have been able to provide services at 10–40% lower prices than the usual common carriers. In addition, due to the enactment of the Communications Satellite Law of 1962 a private firm dealing in domestic satellite communications called COMSAT was established and was able to break into the market for special communications at much lower costs (see Chart 1). Moreover, the VAN firms referred to above have been permitted since about 1970 and have "resold" the use of existing communications lines by adding services which improve transmission quality and reliability. In so doing they have created a market which is already close to one hundred million dollars.

Naturally, even in the case of the United States, the introduction of competition has not necessarily been a smooth process. Since there are a unmber of introductions to that subject[6] we will not deal with it here except to mention that just as in the case of Japan there was strong resistance from the common carrier (AT & T) as well as a good deal of political maneuvering. What we ought to learn from this, however, is that in the long and drawn out policy formulation process a broad range of opinions were heard which ultimately enabled the United States to realize its stated communications policy goal of generally opening up the way for potential technical innovation and managerial innovation and promoting their realization. In other words, in order to investigate the problems of liberalization of data communications the FCC, as authorized by law, held a series of special inquiries (Round

[6] See, for example, Nippon Telegraph and Telephone Public Corporation, "The Data Communications Controversy: A Consideration of the 'Computer Inquiry' of the United States' FCC," *Telegraph and Telephone Management Monthly Report*, 1980, No. 7. (in Japanese)

FIG. 3. CHANGING REGULATION IN THE UNITED STATES



I and Round II) and based on its findings issued a number of decisions, each of which expanded the area of communications which is unregulated, as shown in Figure 3. It is clear that a fundamental tansition from monopoly to competition is occuring.

2.4 *The Decentralized Management and Utilization of Common Property Resources*

The type of development of communications policy in the United States which was discussed above is highly instructive but we are not claiming that it should be imitated. What would like to do is to go beyond a posture which simply insists on taking one direction or the other in the choice between monopoly and competition. Instead we wish to reorient our thinking towards a consideration of decentralized methods of managing and utilizing common property resources.

By common property resources we mean those resources, such as marine resources, which are communally owned and which must be managed from a unified point of view if

their continued use is to be ensured for the majority of the people. This is due to the fact that such resources can not be preserved if individuals utilize them as they please. If we let "communications resources" refer to telecommunications equipment (including light communications, etc.) as well as the technology and software necessary for such services, then such resources could be considered to be common property resources. In other words, even though such resources might be managed physically by NTT they are not owned by NTT. In a line of reasoning which has even appeared in a recent report of the Telecommunications Inquiry Committee,[7] such resources are a form of capital which is owned communally by the users. In addition, although the technology and software for utilizing the hardware resources have naturally been developed by NTT, users and related firms have also made contributions so that such resources are accumulated and preserved as communally owned know-how. Furthermore, communications resources which are accumulated in this way ought to be freely utilized in ways which fully employ the inventiveness of the users. However, if they are used self-indulgently then users will impede one another's activities so that the appropriate management of those resource becomes impossible. Thus, unified management becomes necessary in order to cope with such external diseconomies.

The foundations of information and communications policy lie in the unified management and decentralized utilization of communications resources which are common property resources in the above sense. This line of reasoning has already been explicitly developed in the economics of radio spectrum allocation. Therefore, once we adopt the concept of common property resources it will become possible to apply a common way of thinking to various aspects of common carrier communications, data processing, and broadcasting and to anticipate a uniformity of policy on certain key points.

By decentralized utilization of communications resources we mean a pattern of utilization which permits the entry of new firms who use communications resources to provide new services and thereby increase and improve that stock of resources, subject to the qualification that such entry does not bring about external diseconomies. By communications resources we mean to refer to not only physical equipment but also to the actual know-how which is useful in responding to users' needs. Such know-how is increasing in step with improvements in technology and software as can be seen in the case of recent packet-switching technology mentioned earlier. This situation is exactly the same as the case of radio spectrum resources which increased as a result of multiple use methods. Decentralized utilization is significant not only in terms of opening up numerous opportunities for utilization but also in terms of increasing the stock of resources itself. From this point of view it is very difficult to understand a policy position like Japan's which categorically forbids the entry of VAN firms, while such firms in the United States are actually adding to and increasing the stock of communications resources by selling high-quality communications services which make use of and enhance common carrier communications lines. Furthermore, once a great number of users begin to make effective use of information and communications resources, the efficiency of investment in such resources in general will begin to improve. For instance, in the case of data-banking, which is an area which will be highly influential in future economic society, investments will start to pay off when large numbers of users begin to effectively use such services in conjunction with computer and communications equipment. A so-called information-oriented society will flourish under attitudes which

[7] Report of the Telecommunications Inquiry Committee, January, 1978.

foster the accumulation of common property resources and the effective coordinated utilization of such resources. For that reason it is crucial that elaborate information and communications networks are allowed to be freely established and thus we wish to insist once again that restrictions such as those on "line sharing" and "outside party use" are hindering the widespread development of an information industry. In fact, such restrictions represent at least one reason why Japan is far behind even the European countries in developing a software industry and fundamental data bases.

The reason that such puzzling policy positions have developed is that the government authorities and NTT have been attempting to guarantee themselves as large as possible a share in certain communications service areas by adopting attitudes which aim at protecting NTT's monopoly status and avoiding as much as possible the intrusion of competition. Their attitude is, so to speak, to attempt to protect their own share of the pie without increasing its size. However, everything changes once an attitude of trying to increase the size of the pie by expanding the stock of communications resources is adopted. In such a case not only would NTT's accumulated technical skills and human resources be put to good use but its revenues as well could increase in the long run due to the creation of additional demand for communications services. What we are seeking is to change people's attitudes in order to move in a direction which could be beneficial to everyone.

How, then, should communications-related common property resources be managed and regulated? As we mentioned above, it is desirable that the utilization of such resources be as decentralized as possible. However, it will be necessary to have regulations which provide for the conservation of resources and which promote the entry of new firms in ways which are not accompanied by the appearance of congestion or external diseconomies. One basic concept for dealing with these problems is to permit undertakings on the basis of competitive bids. This type of thinking first appeared in reference to the above-mentioned criticism of natural monopoly theory and attempts to avoid some of the adverse consequences of current regulations which tend to protect monopolies. The idea is that permanent monopoly status not be granted to public utilities but rather that contracts be awarded on the basis of competitive bids with the stipulation that further bids be sought once a fixed period of time elapses. This proposal has been advanced chiefly by scholars associated with the University of Chicago. We believe that it would infeasible to adopt it just as it is due to a number of problems associated with such contracts (for example, problems in estimating asset values or problems in guaranteeing the fairness of contracts).[8] However, the concept of bidding itself should probably be made use of in some fashion and methods of regulation should be investigated in terms of that concept.

The reason that we are insisting on such a system of competitive bidding is that a large number of firms in information-related industries are effectively insisting on the same thing by firmly demanding liberalized communications line use and freedom of entry into the telecommunications industry. In other words, those firms are insisting upon liberalized entry because they believe that by using their inventiveness they will be able to supply highly-specializ ed services at lower costs than NTT. On the other hand, the liberalization of telephone services has not been sought recently most likely due to the fact that given current technology it does not appear that the same services could be provided at a lower cost and due to a recognition that the monopolistic provision of those services by the common carriers is the most

[8] On this point see Ken-ichi Imai, *Modern Industrial Organization* (in Japanese), pp. 325-6.

efficient. Due to rapid changes in technology, however, there is the possibility that such liberalizations will be sought in the future. In such a case, if the common carriers continue to seek monopoly status, it will be up to them to provide proof that the monopolistic provision of telegraph and telephone services is most efficient for the national economy as a whole.

The regulatory authorities, on the other hand, should be investigating conditions in the various fields of telecommunications based on the above considerations and should permit that degree of freedom of entry which is necessary for most effectively utilizing communications resources. In addition, those regulations which are necessary in fields where monopoly status is granted should be enacted. Once we begin to adopt such ideas it should be possible to establish realistic case-by-case regulations which, as we will discuss below, would be based on whether the main purpose for communications line use is for communications or for data processing. This would not tend to limit the sphere of liberalized activities as is currently the case in strict deliberations concerning whether or not the above-mentioned message switching be allowed.

In order to deal with such concrete problems, however, we will have to investigate what sort of broader framework we should have concerning information and communications policy including questions of how we wish to go about making these types of judgements.

2.5 *A Broader Framework*

The scope of information and communications policy goes well beyond that of simple industrial policy. As we mentioned at the beginning, such policy will influence what kind of industrial society we will create in the future. It is clear that we have now reached the second stage in a process which is making our nation more information-oriented based on such developments as the microcomputer revolution. That is, it is probably fair to say that we have gone beyond the stage of discussing information developments in terms of futurology and have now entered a stage where industrial considerations are of real importance. Therefore, the issue of how we will create an information infrastructure has taken on crucial importance. In the future it will be necessary for people to create individualistic lifestyles on a new basis which will involve substituting the movement of information for movement which requires energy. It will also be necessary to use communications to forge close connections between cities and between regions and to reduce economic distances. The creation of cheap and readily available information networks will be important for meeting these goals.

We have presented the concept of common property resources here because we wished to emphasize a point of view which maintains that such a communications infrastructure will be accumulated as a stock of resources which include software resources. Since up to now discussions of information-oriented society have tended to focus on informations as a flow concept, even though such discussions were concerned with the industrialization of information they have still left us with rather vague and uncertain impressions. However, if we consider, for example, developments such as the 10 year plan established in Europe for creating "a data transmissions network which spans Europe at low prices not related to distance," then what we should be aiming at during the second phase of the development of the information industry becomes evident. This is nothing other than the creation of an efficient stock of information resources in the form of common property resources. Or

in other words, along with accumulating information itself as one type of resource we must go on to accumulate the computers and software which can utilize that information as well as the other communications resources which we discussed above.

The work of accumulating existing knowledge and information in Japan as an information stock which any citizen can make use of easily will be a fundamental construction project which will be of great importance to future industrial society. In addition such a project is related to our national security in the broad sense of the term. Concern has already been voiced in some quarters that a crisis involving a cut-off of information to an industrial society which has grown dependent on chiefly foreign data bases is not a purely speculative possibility. For these reasons it is necessary that we establish a new policy framework with haste. We have learned that the Ministry of Postal Services as well has begun to investigate the fundamental problems of communications policy and that investigation too should be hastened to the extent possible. If we consider the cumulative character of information stocks and also how remarkably far behind we already are in this area then the gap which would develop from wasting another two or three years could become enormous. Furthermore, if we consider both the broad social issues relating to the process of creating an information stock in the above sense and the fact that the formation of communications resources is of pivotal importance in that process, then it should naturally become clear that we ought not myopically promote "technology first" projects. Instead we are going to need a sense of balance in order to incorporate the opinions, inventiveness and wisdom of as many people as possible into the process. Such is the nature of the problems relating to the liberalization of communications lines.

Accordingly, in administrative terms as well, in order to promote policies based on these types of broad considerations we will have to break away from short-sighted bureaucratic infighting by the Ministry of Posts and Telecommunications and MITI. Although this may be easier said than done it is a problem which affects the very foundation of Japan's industrial society and which may determine the future course of that society. We are hopeful that some kind of breakthrough can be achieved and are seeking contributions to the debate from a wide range of viewpoints. In what follows we wish to summarize our ideas in the form of a series of proposals.

III. *Some Proposals*

Proposal 1: A Fundamental Law of Information and Communications Should Be Enacted

Our overall argument is that it is necessary to enact a "fundamental law" (*kihonhō*) in order to achieve consensus on the basic directions of an information-oriented society. This is not to say that we have no doubts concerning how much practical effect the so-called "fundamental laws" actually have. However in venturing into unexplored territory relating to information developments it is desirable to decide on the basic direction in which we wish to head by first enacting a fundamental law which might be thought of as a kind of constitution. About ten years ago there was a movement for enacting a fundamental information

law which had even achieved some consensus with the opposition parties, but it did not get enacted since it was seen at the time as being still a concern of the future. In order to clearly distinguish our proposal from that one and to emphasize the importance of communications problems as well it would be appropriate to name the fundamental law considered here "A Fundamental Law of Information and Communications."

As for the content of this fundamental law, the first thing which is to be done is to make clear the law's basic point of view on issues concerning the "protection of privacy" and "public access to information," issues which relate to the basic framework of an information-oriented society. Concerning the protection of privacy, there is to be a clear specification of the so-called principles of privacy such as, for instance, a specification of the purposes for gathering information or limitations on the use of such information. Concerning public access to information as well, there is to be a clear specification of principles such as those concerning open access to government data which is essential for constructing fundamental data bases.

Next should come a clear specification of a basic vision which maintains that Japan's energy-deficient economy can be built on the basis of enriching its stock of information, a process which is fundamental to information-oriented societies. In addition there is to be a declaration of principles of decentralized resource utilization and freedom of entry which would in effect be saying that we should make good use of the inventiveness and wisdom of individual citizens in order to utilize and increase the stock of information. Furthermore, in addition to a recognition of the principle of decentralized utilization, there is to be a clarification of principles of resource management which are based on notions of preserving those resources and avoiding external diseconomies.

It will also be specified that in order to promote information and communications policy it will be necessary to have an institution directly associated with the cabinet which can coordinate the operation of each Ministry.

Along with the enactment of the fundamental law discussed above, it will be necessary to enact separate laws dealing with issues such as public access to information and the protection of privacy. With respect to issues relating directly to communications it will be necessary to enact a new telecommunications law and to revise the broadcasting law. Although the issue of communications is currently being discussed in terms of the enactment of a data communications law, we believe that in place of such partial amendments it will be necessary to create a new telecommunications law which takes the form of a sweeping revision of the Public Telecommunications Law itself. New products require new packaging.

Proposal 2: Five Principles for a New Telecommunications Law

(1) The provision of telecommunications services should be based in principle on a mixture of both monopolistic and competitive elements and the issue of what kind of market structure is desirable in each branch of communications should be judged according to standards relating to the efficient utilization and conservation of communications resources.

(2) The operations of NTT should be based on managing the communications network in terms of its role as part of the nation's economic infrastructure. In cases where there is the fear that NTT will stifle private operations, the situation should be managed in such a way that the equipment, personnel, technology, and know-how in question be separated from

NTT and be transferred to the private operations. In addition, even in instances where such operations have to be left to the public corporations due to technical difficulties special permission for such operations should only be granted in cases were it can be proved that unfair pressure is not brought to bear on private operations through such measures as discriminatory pricing.

(3) As a rule there should be free entry of VAN firms which sell communications services that add a variety of functions to the use of NTT's communications lines. In addition, as a necessary result of principle (1), restrictions on communications line use such as those on "outside party use" and "line sharing" should not be established.

(4) To promote the sound development of industries in the field of telecommunications public measures should be taken for dealing with telecommunications problems relating to damages and indemnities, and reliability guarantees. For such purposes safety and damage compensation standards should be established and provisions should be made for an insurance system and a system of third party judgement (such as the Marine Disasters Inquiry Agency).

(5) A deliberative committee with the power to make proposals should be established for investigating fundamental problems affecting telecommunications. Also, an organization directly affiliated with the Cabinet should be established for coordinating policies of all the Ministries.

Proposal 3: Organizational Reform

At this point in time, as we prepare to enter the second stage of information-oriented developments, we should attempt to seize the opportunity for making a breakthrough which would transform the foundations of the entire administrative system. In more concrete terms, what is needed is a decisive reform such as one which would unite certain divisions of the Ministry of Posts and Telecommunications and the Ministry of International Trade and Industry into a new agency called the Information and Communications Agency (hypothetical name).

Proposal 4: An Inquiry System

In order to make progress in information and communications policy it will be essential to have a broad range of citizens' deliberations regarding the above points. We firmly demand that the concerned authorities establish a special inquiry commission based on the inquiry system for communications policy in the United States which would deal with the problems we discussed above and which would give sufficient hearing to opinions from all segments of society.

IV. *A Critique of the Current Debates*

The analysis in preceding paragraphs are the essence of the proposal titled "A data communications policy for creating a viable and pluralistic information society (Dec. 1980)" made by the Forum of Policy Recommendation to which I belong.

Fortunately, as public concern over the problem became widespread, interested parties

quickly took actions to clarify their stands on the issue: The Telecommunications Policy Conference, a consultative organ of the Minister of Post and Telecommunications has been vigorously debating the issue. The Information Industry Subcommittee of MITI's Industrial Structure Study Committee submitted a report last June recommending the abolishment of regulations on data communications, excepting restrictions based on a negative-listing of specific items. Also, recently on July 26, Keidanren (Federation of Economic Organizations) announced its stand in its "Proposal on promoting the development of the information society." Furthermore, in its "Administrative survey report on data communications," the Administrative Management Agency submitted a major proposal, recommending the abolishment of current regulations on thre usage of the telecommunications line.

All debates and recommendations point to the need for liberalization. As they are reported in the press, the public gets the impression that complete reversal in the government's traditional policy on data communications is imminent.

Nonetheless, I am of the opinion that the situation does not justify optimism for liberalization because the final report submitted by the aforementioned Telecommunications Policy Conference on August 25, 1981, recommended a review of the existing policy that would specifically include regulation by means of a "licensing system." This strongly reflects the reluctance of the Ministry of Posts and Telecommunications to abandon its policy of controlling data communications by means of the "licensing system" it presently exercises.

As the resolution of the issue is now moving towards the drafting of a liberalization legislation, I wish to conclude this paper by clearly stating our stand on the issue of government regulation of data communications.

Under current circumstances, we are of the opinion that NTT should continue to monopolize telephone and telegraph. On data communications, we recognize the need for some form of government regulations; nonetheless, we firmly oppose any restrictive regulation, such as a system that would require licensing for any new participant in data-communications services.

The current debate is focused on the issue of liberalization of "third-party use" of the data-communications line. The government's position appears to be that information-service firms leasing data-communications line for "third-party use" must be placed under stringent administrative control and consequently the leasing of lines for such applications must be subject to government licensing. However, we question the validity of the licensing requirement. Requiring government permit for engaging in "third-party use" for information service is tantamount to making such service a government-controlled franchise, which would restrict the number of new participants for providing such service.

In principle, the government restricts new participants in a business for two reasons: When (1) it is a public utility or a quasi-public one, or (2) it is a drug store or one of similar nature, whose merchandise's quality standards must be strictly maintained by regulations in order to ensure public health and safety. In Japan, moreover, (3) another reason for restricting entry into a business prevails: That of protecting the existing medium- and small-sized businesses.

What valid reasons are there that justify the government to restrict the entry of a firm in a business making use of the data-communications line? It is certain in the first place that the business of data communications is dissimilar to the public telephone service, whose need for economy of scale requires it to be a public utility. If the government were to rule

that data communications is a form of public utility, then it would mean that data communications already being handled in-house by private corporations would have to be brought under government regulation. However, since they are not regulated, it would be anomalous and ridiculous for the government to impose a stringent "licensing system" on new firms specializing in providing information services for third parties by means of the data-communications line.

Moreover, the use of data-communications facilities dose not create external diseconomy, such as produced by the private use of radio frequencies for communications. Stringent conditions must be attached to the licensing of private usage of radio for communications because radio frequencies are a physically limited resource and their use is accompanied by social diseconomy, such as interferences against other uses of radio waves. Consequently, there exists no cogent reason for requiring stringent licensing for data communications, excepting a measure of mild control, as described later. The government may regard banks as a quasi-public utilities for the purpose of consumer protection but as we argued for the liberalization of banking, measures other than their designation as quasi-public utilities should be taken for protecting the consumer. It should be likewise in the case of data communications. Consumer protection should not be the *raison d' être* for requiring licensing for engaging in data communications. Furthermore, the case of (3), above, the protection of medium- and small-sized enterprises, has no relevance for requiring licensing of data communications.

Then, the only reason the government could offer for requiring licensing is the case of (2), above, the public policy for ensuring quality control. Because data communications is an advanced technology, the firm engaged in providing services utilizing it must be competent technologically. However, this is a requirement common to all firms engaged in data communications—not one limited to the firm engaged in providing "third-party services." Presently, there exists a "Regulation on technological standard for leasing special telecommunications lines," which is uniformly applied to all users. The need for establishing a technological standard for data communications is not a valid reason for requiring government licensing for entry in the business of data communications for third-party services. If licensing is required for strict maintenance of a technological standard, it should apply to all parties engaged in data communications and not limited to those engaged in providing third-party services. In other words, there exists no valid reason for requiring special licensing of those engaged in third-party services. A uniformly applied regulation would suffice for ensuring the quality of services provided by means of the data-communications technology.

As evident from the foregoing argument, there is no acceptable reason for requiring licensing for third-party services. If there were to be any special reason, it would be for preventing the concomitant offering of telephone and telegraph services along with data communications among a plural number of users. Since the same telecommunication line can be used simultaneously for combining both data communications and telephone services, the possibility is great that this may occur. Nonetheless, since our argument is premised on recognizing the public utilities' monopoly on telegraph and telephone services, we do not favor the gradual erosion of these services provided by the utilities. Consequently, with the clear understanding that the firm which seeks to commingle data communications with telegraph and telephone services would be subject to a special licensing requirement, the firm that would engage solely in third party data-communications should be required only to notify the government of its intention to commence service. Thus, we can find no valid

reason why licensing should be rquired of the firm seeking entry into third-party data communications.

The foregoing argument has oversimplified the issue in order to clarify the problem points. It is indeed true that the technology of telecommunications is a highly specialized one and a protocol for protecting privacy of communications is needed. However, this requirement applies to any kind of businesses in the information society, supported by a delicate network of interrelationships based on advanced technologies of telecommunications. Nonetheless, if the government is allowed to intervene with regulations in order to provide safeguards against every type of social problems, then administrative intervention in industrial activities will expand without limits to the detriment of the market economy's vitality. In recent years the U.S. government has been implementing a series of deregulations due to a mounting realization of the increasing negative impacts produced by past regulations on the economy. This policy aims, as much as feasible, at eliminating the vast amount of regulations presently hampering industrial activities, while reviewing the necessity for maintaining any control. In effect, the U.S. government's aim is to retain only the minimum of regulations required and abolish the rest. As is well known, in the United States the need for eliminating regulations in the field of telecommunications has been an issue, which is being resolved by their resolute abolishment.

We are not simplistically asserting that the U.S. policy on telecommunications is better. Nor are we advocating free competition. We seek to optimize the merits obtained by combining market competition with a system of telecommunications designed for increased efficiency. We are of the opinion that the principle of competition is compatible given the system characteristics of telecommunications technology; and we admit the need for certain regulations, while asserting that licensing is not justified.