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Dearing, James

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By

James Dearing

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ABSTRACT

Japan's now famous government-led model of development is looked upon by many policymakers, particularly those in less developed countries, as a highly successful route to economic prosperity and social improvement. The present analysis suggests that in the area of telecommunications infrastructure planning, however, a number of escalating problems jeopardize the government's long-range plans for establishing one integrated, digital, nation wide information network.

A considerable amount of literature has been published about Japan's well-laid plans for becoming a post-industrial or "information" society. Japanese government ministries publish promotional materials while newspaper editorials speculate about the new Information Age. The foreign press has focused on privatization, deregulation and market access for foreign suppliers of telecommunications equipment and services. Japanese and nonJapanese scholars have analyzed these same issues, often in the context of INS (Integrated Network System), the government's official long-range plan for establishing one

integrated, digital, nation wide information network. Missing, however, have been critiques of the basic premise that INS will indeed be built as envisioned. The present analysis seeks to serve that function in light of indications that the now famous (or infamous) Japanese tradition of developmental coordination known as the "government-led model" may fail. It is hoped that such a critique will be of particular use to policymakers and academicians in less developed countries where the government-led model is often seen as a successful route to economic prosperity and social improvement.

DEVELOPMENTAL CONTEXT

Accolades from disenfranchised countries mixed with cries of foul play from less competitive developed countries have greeted Japan's rise as the world's third largest economic power. A zealous host of scholars have attempted to uncover the secrets of Japanese success (1). The result has been a new application of the general concept of a "government-led model" of economic development. The Japanese government-led model of economic development has been characterized by government coordination and direction of privately-owned industry through government assistance in finance, taxation and a steady transfer of technology from public R&D institutions to private companies (2). Versions of this model have often been adopted by less developed

countries entering the capitalistic world market. Japan's notable economic performance resulted in part from the continued use of such a development strategy after the country was in fact already "developed." The country's success spawned similar government-led models in Malaysia, Korea, Taiwan and Singapore, as well as debate and policy changes regarding government-university-private industry R&D coordination in Western Europe and the U.S.²

Two frameworks have been widely offered as explanations for Japanese success in applying a government-led model of development. First is the "consensus theory." This explanation suggests that Japanese success is rooted in cultural homogeneity; that is, consensus is easily attained due to a harmonious inclination when problem-solving. Such a harmony paradigm, dating from early American anthropological studies of Japanese behavior (3), is being increasingly refuted in a number of sociological case studies (4, 5). Conflict is a normal process in Japanese society just as it is in other societies.

The second framework for analyzing past Japanese development success is the "power concentration theory." This explanation suggests that success is a result of concentrated decision-making authority based in Japanese ministries, the Diet and large conglomerates (zaibatsu). Tied together by ministry interpersonal linkages, this power structure has designed and implemented the industrial policy responsible for Japan's large

public works projects (such as the mass transit network) and general economic development. It is suggested here that such a power concentration theory is a realistic basis for discussing Japan's government-led model of development with specific emphasis upon INS, the government's next large-scale public works project.

INTEGRATED NETWORK SYSTEM

The concept of INS was never modest. First proposed by Nippon Telegraph & Telephone Vice President Yasusada Kitahara in September of 1978, acknowledgement of the economically strategic importance of an advanced, integrated information network sprang from a pioneering johoka shakai (information society) study by Umesao in March of 1963 (6). Consequently, in the late 1960s bureaucratic planners from the Ministry of International Trade and Industry decided that information technologies were the future growth area to replace traditional heavy industries.³ Kitahara was a disciple of this line of thinking. He became a major proponent of placing a national emphasis on information industries. Following is a portion of Kitahara's preface in Information Network System (1983):

INS entails the development of a new comprehensive telecommunications network, made possible by the

integration of computer and telecommunications technologies... It seems certain that the development of this revolutionary new telecommunications system with tens of millions of terminals with the capability for independent accumulation of information, will bring about major structural changes in the present patterns of human communication... Thus, INS is bound to change radically everyone's ideas about the nature of communication and information, and the interrelationships between them. (7)

In contrast to ISDN telecommunications infrastructure plans in Europe or the United States, INS, as designed, promoted and begun by NTT has been characterized by proactive and coordinated development efforts. According to Borrus, "In essence, INS aims to put a digital, broadband infrastructure in place in anticipation of its uses, while simultaneously developing those uses through model programs and pilot projects targetted [sic] at business and residential users (8)." Since NTT has in place a dependable nation wide telephone-based network, the role for INS is one of replacing antiquated equipment, stimulating new services and integrating existing communication networks. Coaxial cable lines are scheduled to be replaced with optical fibers. Cross-bar and analog switches will be replaced with digital switches and repeaters. Private companies are being encouraged to introduce new terminal equipment and software.

The crucial task for achieving economies of scale in

transmission is integration. INS will integrate NTT's wireline and radio network (PSTN), telegram and telex network, digital data network (DDX), and the digital facsimile network all with the public telephone network (9). Total cost over the next 15 years has been estimated as high as \$130 billion U.S. dollars (10).

In September of 1984, NTT began an experimental, small-scale INS in the Mitaka-Musashino area of Tokyo to test acceptance of various technologies and services. With over 600 individuals and private companies participating, the experiment also served to showcase the INS concept to consumers, the media and private companies.

OBSTACLES TO THE SUCCESSFUL IMPLEMENTATION OF INS

Officials of Nippon Telegraph & Telephone cite privatization of NTT and the deregulation of the telecommunications equipment and software markets in Japan as complementary for the development of INS. While it is quite possible that greater competition from both domestic and foreign firms will drop the costs and improve the quality of information technologies that NTT, in building INS, can then draw on, these structural changes strike a blow at the very heart of the INS developmental scheme. For it is the concentration of power and decision-making ability - crucial in the past for the construction of large public works

projects and the coordination of industrial policy--that increased competition threatens to unravel. And though recent legislation may be better characterized as reregulation rather than deregulation, change appears to be resulting in a decentralization of power.

Obstacles to the successful construction and operation of INS come from three areas: 1) Japanese and foreign private businesses; 2) the government; and 3) NTT itself.

In December of 1984 the Diet passed three bills that restructured NTT into a semi-private corporation and broadened competition in telecommunications industries (11). These changes not only encourage competition in services to be carried over INS but also enable competition in delivery systems (infrastructure). The stakes are huge: The market for INS-related private investment and products, including software and terminal equipment, has been estimated at \$250 billion U.S. dollars (12).

It will be possible, for example, for businesses to enter the common carrier market and operate a telephone network by leasing facilities from NTT, much to NTT's displeasure (13). The businesses will then be able to offer computer-to-computer linkages and value-added networks (VANS), both services which are expected to yield high revenues. Several well-financed ventures have already begun building common carrier businesses in the lucrative Tokyo-Nagoya-Osaka corridor. One with over 200 participating firms and headed by Kyocera, Sony and Mitsubishi,

will use microwave transmission. Keidanren, an organization representing Japan's largest businesses, will rent out satellite transponders to such telephone companies, offering complete country coverage (14). Mitsui Trading Company and Nihon Kogyo Bank are leading a consortium of 16 companies that will provide major cities with a data transmission network.

The competition for enhanced services will be joined by hundreds of firms including foreign companies. Tymnet Inc. will work with the large trading company Marubeni. IBM is aligned with Mitsubishi. AT&T is involved in a cooperative arrangement with Nihon Kogyo Bank, Kokusai Denshin Denwa (KDD, Japan's international telephone company that was privatized along with NTT) and other firms (15).

A few large firms, notably NEC, Fujitsu, Hitachi and Oki, have long supplied NTT with equipment as part of the NTT "family." They will not likely choose to compete openly with NTT in infrastructure, though they may compete in enhanced service provision, since this would be a new area for everyone involved. Nevertheless, the competitive environment will be brutal with nimble, innovative, well-financed businesses siphoning off a large share of the profits. Initial construction is focused on the Tokyo-Nagoya-Osaka route since it carries about one-fourth of Japan's total telecommunications traffic and accounts for approximately 40 percent of NTT's service revenues (16). NTT, due to its enormous size, will likely be saddled with maintenance

of unprofitable telephone service provision throughout the rural Japanese archipelago (Japan is 85 percent mountainous). In addition, the government hung a five-year review over NTT's corporate head threatening divestiture to ensure "good behavior" from the newly privatized behemoth. Accordingly, officials from NTT have made statements to the effect that they welcome competition and are willing to help their competitors gain a market niche.

Profit potential is so great in delivery systems too that even NTT's family of suppliers may not be able to resist setting up shop. NEC, for example, maintains corporate connections with Hughes Aircraft as joint manufacturers of the Japanese weather satellites, and also with RCA Astro Electronics. According to Davis:

... it would not be at all surprising to find NEC ordering a large Hughes satellite and supplying it with NEC-made transponders and other intricate electronics-communications gear, to be used as a spacebound relay station for high-speed business data communications, simultaneous multi-destination communications, and other such select services which would be conducive to conveyance by satellite. (17)

An NEC alliance would now likely be with RCA since Hughes has already entered the common carrier foray with a 30 percent share in Japan Communication Satellite. Two of Japan's largest

trading companies, C. Itoh and Mitsui, are partners in this venture (18).

NTT, with about \$40 billion in assets and annual revenues approaching \$20 billion, is now one of the largest companies in Japan (19). Considering its entrenched market position, NTT could likely crush or at least ward off threats by private businesses to its position and planned expansion. It, too, is forming partnerships and entering VAN markets: Witness the recent NTT-IBM joint venture, Nippon Information & Communications. A major complicating factor, however, will be competition from the government itself. With NTT privatized, both its regulatory parent, the Ministry of Posts & Telecommunications (MPT), and the rival Ministry of International Trade & Industry (MITI) have stepped up their own local community telecommunications development plans. Reflecting MPT's close relationship with NTT, this ministry's local community development plan will complement INS. The MITI plans, however, will not necessarily complement INS. One MITI official claimed that NTT's INS project is unreliable in terms of technology and scheduling; thus, MITI will proceed in building its own telecommunications systems and interconnecting them if need be (20). In addition to MITI intransience, which cannot be expected to subside (21), comes competition from the Ministry of Construction. This ministry is entering the common carrier business by leading Japan Expressway Communication (Teleway

Japan), which will, in partnership with 49 private firms including Toyota and Sumitomo, lay optical fiber cables along the train route linking Tokyo and Osaka. Selling excess capacity will augment ministry coffers nicely.

A second competing governmental common carrier, Nihon Telecom, is led by debt-ridden but enormous Japan National Railways (JNR). In conjunction with 218 private companies, JNR is also stringing optical fiber cables along the Tokyo-Osaka corridor and will later do so throughout Japan. Taken together, public and private plans for communications infrastructure building may result in a technological over-capacity of communication channels. Excess capacities typically lead to pricing wars that, in this case, could seriously undermine NTT's long-range profit and its investment in INS.

Lastly, there are reasons within NTT itself why the implementation of INS will be impeded. Much like AT&T in the U.S., NTT for years operated from the knowledge that it was charged by the government and the public with a monopoly in telecommunications. There was a great deal of pride associated with working for the telephone company. As with many of AT&T's employees, there can be little doubt that many of NTT's 323,000 employees considered their work a public service. Both corporations shared a world wide reputation for excellence in service and equipment at very reasonable prices. But in both cases their "public mandate" was rebuked. Divestiture in the

U.S. came as a harsh lesson to many AT&T employees. Their company was cast as a villain by the Federal government and in the mass media.⁴ Now with competition in the common carrier market, U.S. telephone service has disintegrated, the public is paying higher telephone bills (long distance calling by business users had formally been subsidizing public local calls), and many consumers are confused about their newfound choices. Will the same scenario take place with NTT? Though not yet being divested, certainly many of the other elements of turmoil are present. It might be reasonable to conclude that long-range plans such as INS--made in a noncompetitive time devoid of market pressures--will suffer from delays.

In addition, an important bureaucratic support that NTT has long leaned on is being diminished. The Ministry of Posts & Telecommunications has in the past been little more than a regulatory body for controlling the telephone company. Though MPT had a large bureaucratic staff, they were a jigyo kancho, or "business ministry." Thus MPT was of lower status than a sesaku kancho, or "policy ministry," such as the much smaller but more prestigious MITI or the Ministry of Finance. According to Ito:

MPT wanted to catch up with these agencies in policy-making abilities, social and political influence, and prestige. The current telecommunications revolution or "new media" revolution seemed to MPT a very good chance to achieve such a goal. (22)

Thus MPT's strategy will be to distance itself from the business matters and complaints of NTT.

Perhaps the obstacle within NTT with potential for the greatest disruption of building INS is a power struggle at the top echelon of the company. Kitahara, the designer and main force behind INS, is vice president. The president, Hisahi Shinto, recently from the shipbuilding industry, believes that market forces should drive telecommunications development. Kitahara prefers an NTT monopoly. Politically, Shinto is aligned with Prime Minister Yasuhiro Nakasone; Kitahara with former Prime Minister Kakuei Tanaka's still powerful faction. Thus the top two officers of NTT are divided philosophically and politically. According to Salvaggio, "Had Tanaka continued in office it is entirely possible that NTT would not have been privatized (23)."

Will INS be built on time and as envisaged? According to Komiya and Renaud:

Outside NTT and the stockmarket... there is scepticism. Experts point out that NTT, whose public-corporation status enabled it to implement the universal telephone service while protected from competition, will hardly succeed in achieving nationwide penetration of INS in a competitive environment where market forces dominate. Thus far, INS has failed to attract more than curiosity interest. (24)

Perhaps a useful developmental analogy exists in the history of one of the Ministry of International Trade & Industry's "new media" experiments (25). Hi-OVIS (Highly Interactive Optical Visual Information System) was a small-scale, precocious cable experiment carried out in a suburb near Osaka. Hi-OVIS was the dream of Masahiro Kawahata, a visionary engineering graduate of Tokyo University, not unlike the man behind INS, Yasusada Kitahara, a visionary engineer from Waseda University. Hi-OVIS was promoted as a great technical and social advance, yet MITI had difficulty selling the concept to corporate investors. If working Hi-OVIS systems are built they will be scaled-down versions for business applications. Consumer demand simply did not match the system's communication capabilities. Upon reading the promotion for INS the similarity in tone is striking.

Perhaps Kitahara's dream will come true and INS will revolutionize the very foundation of communications. But in telecommunications at least, it appears that the Japanese version of the government-led model is giving way to partisan self-interest in both private industry and government; a juggernaut brought about by the unleashing of intense competitive forces. Given the obstacles that have arisen since Kitahara's plan was laid, a pessimistic outlook might be warranted both in terms of what INS will finally offer and when it will be completed.

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NOTES

1. James Dearing is a Doctoral Fellow at the Annenberg School of Communications, University of Southern California, Los Angeles.
2. Chalmers Johnson, in his text MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975 (1982), divides Ministry of International Trade and Industry industrial policy into two types: Sangyo gorika seisaku (industrial rationalization policy) and sangyo kozo seisaku (industrial structure policy).
3. The "invisible college" of academic researchers and policymakers that formed in Japan around the johoka shakai concept was very similar in influence and intellectual fervor to the invisible college that followed the publications in the U.S. by Fritz Machlup (The Production and Distribution of Knowledge in the United States, 1962) and Daniel Bell (The Coming of Post-Industrial Society, 1973). An invisible college represents a geographically dispersed group of researchers (and in this case policymakers) who center their interests around a common, often compelling, research paradigm. For further information see Diane Crane's Invisible Colleges: Diffusion of Knowledge in Scientific Communities (1972).

4. Prior to the privatization and divestiture of AT&T, there was great interest on the part of the established mass media in the profit potential of publishing "electronic newspapers," and the concomitant fear that AT&T, unless broken apart, would dominate this market. According to Ito, the situation in Japan was very similar. It has been suggested that financial considerations may have influenced mass media editorial policies.

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