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Metatheoretical Perspectives on Satellite Television and Development in India

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The role and impact of satellite television in the recent national development of India is explored from four metatheoretical viewpoints: the utopian view that technology is intrinsically good for humankind, the dystopian view that technology is an unmitigated curse, the neutral view that technology per se has no important effects on society, and the contingency view that the potentially desirable and undesirable impacts of a technology are differentially determined by the context in which the technology is introduced at a particular time. The contingency viewpoint is stressed and used to analyze the Kheda experimental communication project in rural India.

During the past decade or so, many Third World countries have implemented satellite-based broadcasting systems. Television audiences, thanks to communication satellites, have expanded tremendously in recent years in India, People's Republic of China, Indonesia, Mexico, and Brazil. For example, satellite television now serves about half of China's 1 billion population, about 80 million of India's 770 million, and 70 million of Mexico's 80 million people. These millions of new viewers offer a huge potential audience for development communication messages.

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The objective of the present article was to analyze the role of satellite television in the national development of India from four metatheoretical viewpoints, focusing on a contingency viewpoint. Technology's role in society has long been an important intellectual issue for social scientists. Historically, scholars have adopted one of three metatheoretical viewpoints of technology (Gendron, 1977). *Utopians* believe that technology "is an unalloyed blessing for mankind" (Mesthene, 1981, p. 99). They see technology as tools that provide shortcuts to the solution of many social problems. Weinberg (1981) referred to these shortcuts as "technological fixes." In addition, technology provides certain solutions to problems caused by technology itself. The utopian viewpoint espouses rapid technological development and is skewed towards technological determinism. Policies should promote the development and application of technology. Failure by a technology to impact society positively is seen as the fault of the business and political communities, who are unfortunately in control of contemporary society, according to the utopians. This viewpoint has been championed by such scholars as Fuller (1981) and Weinberg (1981).

Dystopians are convinced "that technology is an unmitigated curse" (Mesthene, 1981, p. 99). Like the utopians, they view technology as very influential in society. However, they see technology as a problem-generator rather than as a problem-solver. They argue for constraint in technological development, and reject the notion of a technological fix. Policy, according to them, should protect the privacy and solitude of the individual from technological onslaught. Failures of a social program are attributed to technocrats who dystopians fear are gaining control of society, and who they believe should be excluded from policy formulation. Ellul (1981) and McDermott (1981) are fervent proponents of the dystopian approach.

The *neutral* school argues that technology does not have an important effect on society. Technology, per se, is not a problem-solver nor a problem-generator. Proponents view technology as neither good nor bad (Barnow, 1975). This school disregards attempts to assess, forecast, or control technology. Unlike the utopian or dystopian points of view, the neutral school is skewed towards social determinism. The impacts of a technology are shaped entirely by social, economic, and political institutions. Policy, according to the neutral viewpoint, should not be oriented toward technology. The concept of a failure is irrelevant to this viewpoint, because society, not technology, determines the impacts of technology on society.

Mesthene (1981) claimed that the utopian, dystopian, and neutral viewpoints are by themselves "unhelpful" to policymakers. Mesthene proposed a "dual effects" hypothesis. Technology has "both positive and negative effects, and it usually has the two at the same time and in virtue of each other" (Mesthene, 1981, p. 103). The role of the social analyst, therefore, is to identify the contingencies that determine the positive and negative effects of a technology. Society can then attempt social, technological, and

political reform to optimize the positive effects while minimizing the negative effects. Thus, the *contingency* approach recognizes the desirable and undesirable impacts of a technology and proposes that these impacts are differentially determined by the context in which the technology is introduced. Technology is both a problem-solver and a problem-generator. Technology is perceived as malleable. Technological innovations are selectively adopted and designed and the social and technological constraints on their use are assessed. Policy is the collective responsibility of social, political, and technological institutions. Examples of studies using the contingency approach include Pool's (1977) dual-effects analysis of the social impact of the telephone and Kling's (1980) social analysis of computing.

The present article represents a contingency approach to identifying the potentially desirable and undesirable impacts of satellite communication technology in the development of rural India. We chronicle the views of scholars investigating these impacts, summarize the lessons learned from past experience, and describe current developments and debates surrounding the role of satellite television in India. Our analysis presents contingencies that mediate the impacts of satellite television on rural development, as in the recently concluded Kheda experiment in India. We show how arguments from the utopian, dystopian, neutral, and contingency viewpoints were manifested in the social analysis of satellite television for rural development.

Background on Satellite Television in India

In the mid-1960s, a noted Indian scientist, Dr. Vikram Sarabhai (1968), began arguing that a nationwide television system could play a major role in promoting economic and social development. At Sarabhai's initiative, a national satellite communication group (NASCOM) was established in India in 1968 (see Table 1). Based on its studies and recommendations, the government of India in 1969 approved a proposal for the Satellite Instructional Television Experiment (SITE) using the National Aeronautics and Space Administration's (NASA's) Application Technology Satellite-6 (ATS-6).

SITE was a 1-year pilot project from 1975 to 1976 primarily undertaken to experiment with television through satellite communication to reach rural areas in India with specially designed programming. SITE's objectives were: to improve rural primary school education; to provide teacher training; to improve agricultural, health and hygiene, and nutritional practices; and to contribute to family planning and to national integration (Agrawal, 1981). Indian technicians were provided an opportunity to gain expertise with operational problems concerning satellite hardware, costs, and management on a small scale prior to launching their own national satellite (Mody,

Table 1
Main Events in the Development of Satellite Television in India

Year	Event
1968	National Satellite Communications Group (NASCOM) is formed by the Indian Government, headed by Dr. Vikram Sarabhai, Director of the Indian Space Research Organization (ISRO)
1969	ISRO signs an agreement with the U.S. National Aeronautics and Space Administration (NASA) to launch the Satellite Instructional Television Experiment (SITE) in India
1975–1976	SITE broadcasts television programs to 2,400 Indian villages from NASA's Applications Technology Satellite-6 (ATS-6) for 1 year
1982	Indian National Satellite-1A (INSAT 1-A) is launched by NASA, and broadcasts radio and television programs for 5 months until it is deactivated due to technical problems
1983	INSAT-IB is launched by the U.S. space shuttle and begins television broadcasting in India
1985	60 million people watch television; 396 million (53% of the total population) live in areas covered by television broadcasts. Television advertising sales earn U.S. $52 million for Doordarshan (the government television network) in 1985, up from U.S. $8.5 million in 1980
1990	About 90% of the Indian population will have access to television broadcasting due to satellite transmission of television programming to low-power television retransmitters

1979). After SITE's year of television broadcasting to 2,400 Indian villages, the ATS-6 satellite was returned to the United States.

The first Indian national satellite, INSAT-1A, was launched in April 1982 by NASA, and provided radio and television broadcasting for 5½ hours each day until it was deactivated in August 1982 due to technical problems. A second Indian satellite, INSAT-1B, was built by Ford Aerospace and launched on the eighth flight of the U.S. space shuttle, on October 15, 1983.

Still in operation, INSAT-1B has led to a major expansion of television broadcasting in India. Prior to 1983, television access in India was limited to 28% of the nation's population living mainly in the four urban centers of Calcutta, Delhi, Bombay, and Madras. With the direct reception of televi-

sion signals from INSAT-1B, the number of people who can access television signals increased to 53% by the end of 1985, and to 62% in early 1987. By 1990, about 90% of the Indian population will have access to television broadcasts. This increase in access is due to the large scale installation of television transmitters in India: from 1 in 1959, to 5 in 1973, to 19 in 1981, to 42 in 1983, to 175 in 1985, and to 186 in 1987. Many of these television stations are low-powered, covering an area with a radius of 15 to 25 miles. During 1984 and 1985 alone, the number of television viewers almost doubled from 37 to 60 million people. In 1986, television sets were being sold in India at the rate of four television sets every minute. By 1987, the number of television viewers increased to about 80 million.

Satellite television in India is seen as both a problem-solver and problem-generator. Its chief proponent, the national government of India, contends that satellite television can combat illiteracy, narrow the gap between the rich and the poor, and facilitate national integration (Agrawal, 1985). Detractors fear that satellite television will widen the gap between the urban elites and rural poor, will be used for political purposes to promote the government in power, and will eventually lead to a degeneration of traditional Indian values through television advertising, which promotes commercialization and consumerism.

We look at the dual effects of television in its quest (a) to provide educational information, (b) to narrow the gap between the rich and poor, and (c) to promote national integration. We also document the contingencies that affect the prodevelopment role that television plays in filling these three goals.

Television's Role in Providing Educational Information

Sarabhai (1968) felt that satellite television could play a major role in development. The role of satellite television was envisioned as two-fold: (a) to provide curriculum-based education to decrease India's high rate of illiteracy, and (b) to provide useful information to both literates and neo-literates so as to maintain literacy once gained.

The role of satellite television as replacing the school teacher was rejected in India. Instead, satellite television was considered an effective teaching aid for in-school teachers. SITE was India's (and arguably the world's) first attempt to use satellite television to educate rural illiterates. Evaluations of SITE identified three serious impediments to success: (a) a lack of teacher training, (b) the language used for the telecast was often inappropriate for the audience, and (c) the centralized television production facilities were unable to take into account the culturally diverse audiences (Agrawal, 1981).

Satellite television also can inform viewers about current developments

in agriculture, family planning, health, and nutrition. Information provided by television programs may require viewers to contact development agencies, banks, or hospitals to obtain further information, products, services, or other resources. Certain viewers in India did not have access to these institutions and the appropriate development agency was often not prepared to provide follow-up information or other resources. Evaluations of SITE indicated that (a) the training of development workers was inadequate, (b) portable video and communication support materials were not used widely enough, and (c) a lack of communication between development agencies and the television broadcasters occurred (Eapen, 1979).

SITE showed that several contingencies mediated the role of satellite-based television in providing development information. First, the planning of software requires more time than the planning for hardware (Mody, 1979). Second, policymakers, program plan designers, producers, and social scientists should work in teams. Third, defining target audiences, conducting needs assessments, preparing program specifications, trying out programs before their transmission, and collecting feedback data from transmissions are necessary (Mody, 1979). Fourth, television messages should be concretized by boundary-spanning organizations like agricultural extension agencies, banks, hospitals, community organizations, and local governments (Agrawal, 1981). Fifth, agricultural innovations that were cost-effective and locally usable were more likely to be adopted than other agricultural innovations.

Drawing upon the experience gained from SITE, INSAT-1B routinely transmits educational programs which in 1987 were received by over 10,000 community-viewing television sets provided by the national government. INSAT-1B beams educational programs for primary school children for 90 minutes each school day. The content of these programs ranges from science, to entertainment, to national awareness, to health and nutrition, and to biographies of great men. After each telecast, in-school teachers explain to their students the details of the television programs they have just viewed. INSAT-1B also offers in-service training for school teachers in a multimedia approach using print media, interpersonal discussions, and experimentation in pedagogical methods. So the present satellite television broadcasting takes into account the importance of teacher training. However, the majority of telecasts ignore regional languages and cultural norms.

In addition, each weekday afternoon, INSAT-1B broadcasts television programs for university students. The goal is to emulate the Open University of England. Many of the Indian university programs, though, merely duplicate classroom lectures, which are said to have an "unimaginative" content (Vedantam, 1986).

INSAT-1B also transmits information programs especially for the rural viewer, for 1 hour each day. These programs focus on agriculture, family

planning, health, and nutrition. To aid television's role in development, television messages about agricultural innovations are supplemented by multimedia training programs for extension workers and farmers.

The major policy debate in India about satellite television is three-fold. First, is satellite television economically more viable than conventional methods of teaching? The role of satellite television as an aid to curricular-based education faces enormous challenges. There are more than 400 million illiterates in India. Three-quarters of all children never go to school at all, or drop out before they are 12 years old. Only a small percentage of villages in India have central-station electricity. Given such fundamental inadequacies, critics argue that satellite television is a luxury that rural India cannot afford.

Second, can the rural viewer put the information obtained from a satellite television program to proper use? Viewers watching television programs often are frustrated because they cannot follow through on the information that they obtain from television. For instance, about 70% of the water sources in India are polluted; this is a major cause of ill health. Many village women have to walk several miles a day to fetch water. How can satellite-broadcast television programming, critics ask, help solve India's drinking water problem?

Third, besides raising the level of literacy in India, has satellite television increased the gap between the "haves" and the "have nots"? For instance, Indian farmers may find satellite television programs about agriculture to be informative, but only those who can afford fertilizers and who own land can actually gain from the televised information. As a result, the gap between the landowners and the landless laborers (who form 90% of the village population in India) is widened by television broadcasting. Here we see an illustration of the threat that new communication technology poses to equality (Rogers, 1986; Tichenor, Donohue, & Olien, 1970).

The debate surrounding the criticisms of television in India is unlikely to be resolved in the near future. Information "haves" and "have nots" are likely to become economic "haves" and "have nots" (Porat, 1978). In the following section, we show that satellite television is directly related to the gap between the rich and the poor.

Television as a Gap Reducer between Rich and Poor

India's seventh 5-Year Development Plan states that television is to act as a "vehicle of education and extension," especially in remote and backward areas so as to narrow the gap between the urban rich and the rural poor (Hussain, 1986, p. 1). The SITE experience demonstrated that community television viewing was an important factor in breaking down caste barriers between untouchables and high caste Hindus (Agrawal, 1978). SITE also

made clear that effective television programming required a very high financial investment. The government of India had already made a large financial commitment to the development of satellite television. Only an extremely small fraction of this total budget was earmarked for software development. SITE demonstrated unequivocally the need for emphasizing such software components in television broadcasting.

To supplement financial support from the national government, Doordarshan (India's television authority) turned to commercial sponsorship. In the first 4 years that the INSAT-1B satellite was broadcasting, Doordarshan's commercial revenues from advertising sales increased from about 200 million rupees (U.S. $16.5 million) in 1983, to 960 million rupees (U.S. $80 million) in 1986, an increase of 500%.

The commercial success of Indian television comes at a price. Critics argue that television has not succeeded in reducing the gap between the rich and the poor in India because of the urban bias of Indian television. Of the 6 million television sets in the country in 1985, more than three-quarters were in the four metropolitan cities of Delhi, Calcutta, Madras, and Bombay. Television programming decisions are influenced by the elite middle class, who want more entertainment and have less need for educational programs than do their rural and urban poor counterparts. Catering to urban elite tastes detracts from the government's commitment to using television to reduce the gap between the "haves" and "have nots" (Reddi, 1985).

Indian television's educational potential is overshadowed by entertainment programs. Bombay's well-established film industry is becoming heavily involved in commercial television production. Doordarshan is in an unenviable predicament, caught between the opposing forces of commercial film domination on one side and the television system's stated educational objectives on the other side (Joshi, 1983).

Doordarshan's Working Group on Software insisted that television in India should not encourage conspicuous consumption. However, critics argue that television commercials propagate a consumerist mentality and serve the ends of the rich more than the poor. If commercialization is not checked, critics contend that television will become a means of exploiting the poor by the rich (Chawla, 1986).

The debate between the two roles of satellite television (to inform vs. to entertain) has resulted in one potentially fruitful outcome: prodevelopment soap operas. A prodevelopment soap opera is a melodramatic serial that entertains and subtly attempts to convey an educational-development theme (Singhal & Rogers, 1987). Prodevelopment soap operas in India were begun in 1984 with *Hum Log* (*We People*), which touched upon such social and moral issues as family harmony, family planning, amelioration of women's status, the evils of dowry, and drinking alcohol. *Hum Log* was

immensely successful with its viewers (achieving audience ratings of up to 90% in North India, and half that in South India) and advertisers.

Television's Role in Promoting National Integration

In addition to the pragmatic goals of reducing illiteracy and poverty in India, Sarabhai (1969) also described satellite television as a tool for "continued stability and national integration" (p. 2). A utopian goal for television is to help create a sense of political oneness among India's disparate ethnic and linguistic groups (Mody, 1979). National integration is fostered by coverage of events like the annual Republic Day parades, the Independence Day celebrations, and major national festivals, along with programs of classical music and dance from different regions, know-your-India travelogues, and biographies of great Indian teachers.

The SITE experience helped identify certain problems to be addressed before satellite television could be used as an effective tool for national integration. First, news broadcasts are mostly national (thus excluding regional and local coverage) because Indian news organizations are ill-equipped to provide on-location regional and local news coverage. Second, satellite television programs on the national network are broadcast only in Hindi and English. English is understood by only 3% of the nation's population, and Hindi by about 40%. In a nation of many languages, television broadcasting in just two languages alienates a large section of the population. Third, a large section of the populace views television as a propaganda apparatus for the ruling political party. As a result, the source credibility of television is severely eroded.

Based on these observations, members of the Indian Parliament and of the national press often have demanded that the government hand broadcasting over to an autonomous body (Akash Bharati, 1978). Thus far, the government has resisted such demands, defending its monopoly as necessary to ensure a balance between educational and entertainment programs (Kagal, 1983). Many critics of satellite television in India are convinced that satellite television is not likely to succeed in fostering national integration.

Certain other critics, on the other hand, believe that satellite television is successful in integrating the nation. They recognize the inherently centralizing nature of satellite broadcasting technology. Further, they contend that the success of satellite television should not be gauged just by the extent of integration, but also by the values that are being used to integrate the nation. Critics fear that the centralized control of television is homogenizing regional cultures in India. As a result, local regional languages and customs not shown on national television may ultimately fade away.

Further, Indian television mainly broadcasts Hindi films and soap operas

that portray a Westernized and urbanized lifestyle. Indian cultural traditions, therefore, may be threatened. The televised films, soap operas, and advertisements introduce village viewers to a world of different social values.

Will television unify India at the cost of its cultural diversity? Bhatia and Karnik (1985) feel the solution to this dilemma is the decentralization of television, both politically and culturally. Most development problems can be dealt with most effectively at the regional or local level, they said, and Indian television should reflect such localization.

Contingency Approach

Our previous sections discussed satellite television's role in (a) providing educational information, (b) reducing the gap between the rich and the poor, and (c) promoting national integration. Contingencies affecting television's role in development (see Figure 1) were discussed based on the SITE experience and the limited experience to date with INSAT-1B. Table 2 summarizes certain lessons learned from India's experience with satellite television, presented in the form of contingency factors.

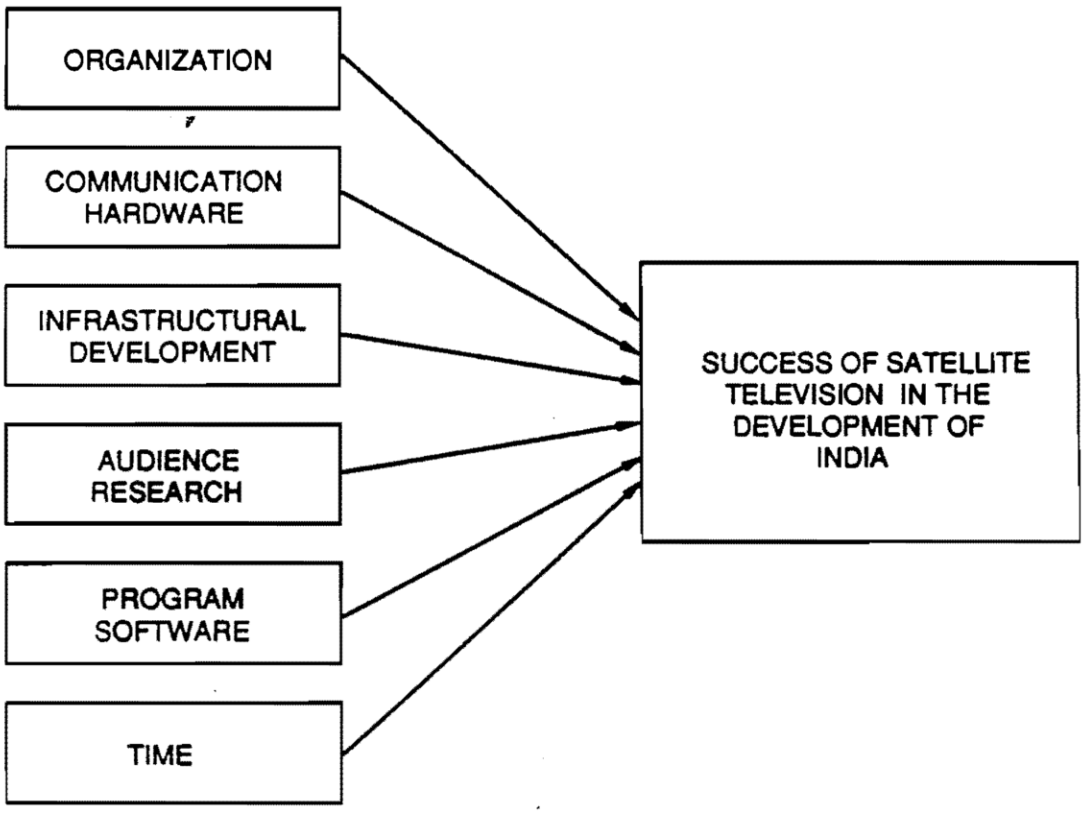

Figure 1. Contingency factors affecting the success of satellite television in the development of India

The contingency of time has been underplayed in past research. Most social science researchers have conducted evaluations of satellite television by gathering data immediately before, during, or immediately after the implementation of satellite television. The majority of the evaluation research efforts were cross-sectional in design, using data gathered at one point in time, or at best consisting of a single pretest followed by a single posttest. Such a research strategy informs us about immediate, direct effects following the introduction of satellite television. Empirical evaluations of SITE and INSAT-1B in India, so far, have left many processual questions unanswered. Are the impacts of satellite television only temporary, vanishing shortly thereafter? Do the impacts of satellite television continue to increase over time? Is there a long gestation period before the impacts begin to appear? What are the consequences of withdrawing satellite television from village audiences, as was the case at the end of the 1975–1976 SITE project? Longitudinal research designs are required to address such questions (Monge, Rogers, Contractor, & Cozzens, 1987).

Chu, Alfian, and Schramm (in press) provide one of the few examples of a study of the long-term social and cultural impact of satellite television in rural Indonesia. In 1976 Indonesia launched its domestic communication satellite, PALAPA 1. In part, PALAPA 1 was used to broadcast development-oriented television programming to rural viewers in many islands outside of Java. This 6-year study found that television viewers significantly gained in knowledge about national development programs, and increasingly adopted new health practices and agricultural innovations. Television viewing resulted in more social participation, increased the learning of the national language, and significantly impacted the long-term economic behavior of Indonesians. Farmers learned to market their own produce, and put unused resources in savings. Consumption of advertised items (e.g., soft drinks, cigarettes, toothpaste, hair cream) increased sharply among rural viewers. The Indonesian government found this trend so alarming that it abolished all television advertising in 1981.

Kheda Communications Project: A Contingency Approach Example

The Kheda Communications Project was a promising experiment in decentralized television broadcasting. As mentioned earlier, SITE was conducted as a pilot project in satellite television during 1975 and 1976 by India's Space Applications Center (SAC), which in turn is part of the Indian Space Research Organization (ISRO). The lessons learned from the year-long SITE project spurred SAC to experiment with a hybrid, decentralized broadcasting system. The site chosen for the experiment was Kheda District, an area near SAC headquarters in Ahmedabad, India. The Kheda Communications Project (KCP) was the outcome of considerable planning and was based on lessons learned from the successes and failures of SITE.

Table 2
Contingency Factors Affecting the Role of Satellite Television in India's Development

I. Organization	II. Communication Hardware	III. Infrastructural Development	IV. Audience Research	V. Program Software	VI. Time
1. Autonomy: (a) from the government (b) from commercial interests	1. Building, operating, and maintaining equipment and facilities for television broadcasting and reception	1. Opening schools of communication in universities	1. Research methodology: (a) in-depth formative and summative evaluation using both qualitative and quantitative methods (b) needs ascertainment and message analysis	1. Advanced software planning regarding: (a) language of television broadcasts (b) source credibility (c) program scheduling (d) geographical and economic access	1. The manner in which the effects of satellite television occur overtime
2. Decentralization of administrative, research, and production units	2. Using "little media" (VCRs, folk media, posters, and puppetry) along with "big media"	2. Development of, and liaison between, boundary-spanning units in organizations such as		2. Content of programming: (a) audience participation in program development	

		banks, hospitals, development agencies, community organizations, and local self-governments (*panchayats*)		(b) programming format (c) message design	
3. A participative form of management, and a reward system for program planners, producers, and researchers 4. Training of communication researchers, production personnel, custodians, and teachers	3. Television in conjunction with print, radio, and film media, complemented by interpersonal communication	3. Integrated development in the transportation, power, irrigation, telecommunications, health, and education sectors			

The KCP rejected the utopian, dystopian, and neutral views of satellite television's role in rural development, and identified contingencies that determined the efficacy of using satellite television in India.

Organizationally, the Kheda Project was a decentralized unit. It relied mainly on government funds for financial support, thus making it independent of commercial interests. The KCP enjoyed a great deal of political autonomy from the central government. The Project's organization fostered a participative form of management, recognizing that individuals working at operational levels in the organization were often the most qualified to suggest improvements. The KCP encouraged a high level of lateral communication between production, research, and administrative staff. Organizational members were encouraged to attend training workshops in their respective skills (many of which were organized by SAC). These initiatives demonstrated that the KCP had taken into account organizational factors (Contingency I in Table 2).

The Kheda Project's hardware represented a hybrid configuration. A low-power transmitter was located at Pij village about 50 kilometers south of Ahmedabad. The Pij transmitter was connected to the local Doordarshan station, as well as to a satellite earth station at SAC. Thus the KCP could broadcast (a) local television programs (originating either in their own studios, or the local Doordarshan station), and (b) national (satellite) television programs received from the SAC earth station. The Pij transmitter covered a radius of about 35 kilometers, most of Kheda District (Agrawal, 1981). Most of the Kheda transmission equipment was gifted by the International Telecommunications Union (ITU). Some 650 community television sets were provided to 400 villages, and installed in public places (frequently schools) where village audiences gathered. A team of technicians periodically toured these villages to service and repair the television receivers. Each day 90 minutes of local programs and 100 minutes of national programs were broadcast (Bhatia & Karnik, 1985). Half of the local programs were produced by the Kheda studio at SAC, and half by Doordarshan. So the planners at SAC had attended to Contingency II (in Table 2).

Kheda District comprises some 1,000 villages with 3 million inhabitants. Kheda is a major center for milk production. Following a mass rally of farmers in 1946, the private dairy marketing firms were transformed into the Kheda District Cooperative Milk Producers Union (AMUL). "It is often stated, and sometimes believed, that landless laborers have been most benefited by AMUL, and indeed participation in dairying is typically widespread" (Gelb, 1984, p. 22). The KCP collaborated with extension agencies working in dairying, agriculture, and health services, and with local banks, cooperatives, and employment exchanges. So the KCP had to its advantage the presence of an infrastructure (Contingency III in Table 2) that facilitated the Project's success, although it was not easily replicable in other Indian villages.

The Kheda Project also relied heavily on audience research (Contingency IV). The SITE Continuity Research Center (SCRC) helped identify three areas of specific social interest to Kheda viewers: (a) bondage and oppression by feudal landlords, (b) ritual and superstition that were used to reinforce the class structure, and (c) failure of government machinery in implementing national and state programs.

The broad software goal (Contingency V) set by planners of the Kheda Project was to promote rural development and social change at the local level. Audience participation was aggressively encouraged at all levels. Villagers were involved as actors, writers, and visualizers in the production of television programs dealing with such social problems as exploitation, caste discrimination, minimum wages, alcoholism, cooperatives, and local and national elections. For example, agricultural experts were televised in farmers' fields; they then returned to the same fields a few weeks later to discuss with the farmers their difficulties in implementing the previous recommendations. A variety of formats including puppet shows were used to deal with taboo issues. A campaign approach was followed, synchronizing intensive television programming with local efforts by field agencies. Health programs focused on preventive measures including immunization of children and antimalaria measures. The general attempt in many television programs was not merely to convey *what* to do, but also *why*. The KCP relayed many national television programs via satellite. To ensure their fullest impact, the KCP often provided regional language commentaries or introductions to programs. These program capsules provided a context for rural viewers not familiar with either the language of the telecast or the significance of the event.

The Kheda Project was a success in decentralized broadcasting. A study of the health and agricultural program viewing indicated a substantially higher level of knowledge in the television villages, compared with the nontelevision villages. In television viewing villages, 76% knew of cholera symptoms, in contrast to 32% in nontelevision villages. Further, 46% in television viewing villages knew where to get soil tests, in contrast to 4% in nontelevision villages (Staff, 1984). The experiment gained wide recognition when the KCP received the prestigious UNESCO prize of U.S. $20,000 for rural communication effectiveness. The KCP was successful because it took into account the contingencies of organization, communication hardware, infrastructure, audience research, and program software. It fell short on the contingency of time (Contingency VI). The KCP concluded before its long-term developmental effects could be empirically assessed.

The Kheda Project ended on July 25, 1985, with the commissioning of a high-powered Doordarshan transmitter in Ahmedabad. The Ahmedabad transmitter, with a range of 120 kilometers, covered the entire Kheda District. The government ordered the Kheda equipment to be transferred to Madras to facilitate a second television channel there, but residents of

Kheda District protested the removal of the Kheda transmitter, physically resisting attempts by the Indian government to dismantle the equipment. As of mid-1987, the Kheda residents continued to block the transmitter's removal, thus demonstrating testimony as to how highly they valued the KCP.

The Kheda Project represents a historic intellectual advancement. Although conducted under the auspices of the Space Applications Center, it rejected (a) the primacy of satellite television as a single panacea for rural development, and (b) the previously held utopian, dystopian, and neutral views of satellite television in development, in favor of a contingency view.

Discussion

We began this article by describing four metatheoretical viewpoints in studying the impact of technology on society, and then applied them to the case of satellite television in India. Utopians believe that: implementation of satellite communication will solve problems of illiteracy, social and economic inequity, overpopulation, and regionalism; educational and informational programs beamed into classrooms will wipe out illiteracy; and the transmission of national events and ceremonies will foster a sense of national identity. "To put it as dramatically as possible," Clarke (1981) observed, "unless major investments are made in space, millions are going to die, or eke out brief and miserable lives. And most of these millions will be in the Third World" (p. 2). Problems not solved immediately by satellite communication will be solved by future refinements in satellite technology, such as more powerful satellites, more channels, and more reliable and portable power sources. They support rapid technological development and stress the importance of "leapfrogging" obsolescent technologies (Sarabhai, 1968). Policy formulation emphasizes development and application of satellite technologies, but excludes questioning selection of satellite technology. Failure is attributed to technocrats not being in control of society.

Some dystopians believe that educational and informational programs beamed by satellite will be ineffective. Others acknowledge that satellite television is influential but not economical. Further, television will increase the knowledge gap and accentuate the distinction between "haves" and "have nots," accelerating the creation of a "class media" rather than a mass media (Atal, 1985). In addition, satellite television engenders Westernization, urbanization, and regional resentment rather than national integration (Kagal, 1983). Problems caused by technology (e.g., water pollution) cannot be solved by satellite technology. Policy, in their opinion, is best kept out of the hands of technocrats, who should be confined to the area of their specific skills.

Proponents of the neutral view downplay the effects of the technology per se. In a contradiction of the McLuhan adage, Habibullah, an Indian media expert, said, "We have to remember that the medium is *not* the message" (Kagal, 1983, p. 5). Instead, the content of the message should be emphasized. As a result, the impacts of satellite television in India are, in their view, determined exclusively by what society does with this technology. The current commercialization of Indian television lends support to their hypothesis that it is the social and economic institutions, rather than the technology, that determine how satellite television will be used in India.

A contingent view of satellite television in India emerged in recent years. Proponents of the contingency viewpoint recognize the dual effects of satellite television. Satellite television can (a) help reduce illiteracy and increase the knowledge gap, (b) help reduce poverty and trigger economic inequity, and (c) help national integration and cause regional resentment. The likelihood of any of these effects occurring is determined by the presence (or absence) of a set of contingencies. For instance, satellite television will help reduce illiteracy only if it is accompanied by a set of contingencies like teacher training, and use of "little media." Likewise, satellite television will not increase the knowledge gap if it is accompanied by a contingency such as an infrastructure that allows greater access to television by more disadvantaged individuals.

Beyond the Indian Experience

The present application of the four metatheoretic viewpoints in the context of the Indian satellite experience can be generalized to the broader context of communication and development. Historically, scholars such as Lerner (1958) proposed mass media communication as the engine of modernization, positing strong media effects for society. Meanwhile, the dystopian viewpoint was proposed by critical scholars, such as Marcuse, who underscored the manipulative aspects of mass communication (Wigand, 1976). Both the utopian and dystopian perspectives were tempered by findings that did not indicate strong media effects in development (Alker, 1966; Cutright, 1963; Lerner & Schramm, 1967; McCrone & Cnudde, 1967). The mass media were not a quick fix to the development problems of the developing countries (Rogers, 1976). In response to these criticisms, Schramm and Lerner (1976) acknowledged that the media were no more than a component in the entire system of social change.

Further, a recognition occurred that all nations need not converge toward the linear path of Western modernization (Eisenstadt, 1976). There is no one right way of using the mass media for development. This view implied that the West should not be used as a model for the Third World.

The ramifications of using new communication technologies (invented in the West) in a Third World context are articulated by Mody (1985). From a metatheoretical standpoint, this realization represented the beginning of a contingency approach. Mass media were now viewed as only one component which, along with other mutually related contingencies, shaped the development process.

Many of the contingencies discussed in this article apply to other Third World nations contending with problems of illiteracy, economic inequity, and lack of national integration. For instance, the 22 Arab League nations' satellite, ARABSAT, launched in 1985 has been severely underutilized for broadcast purposes because certain contingencies were neglected: (a) not enough earth stations to back the ARABSAT project, (b) lack of trained manpower, (c) lack of software development, and (d) inadequate organization (Staff, 1985).

Generalizations from the Indian experience, however, must be made cautiously. For instance, the indigenous film industry in India is unmatched in the rest of the Third World. The absence of an indigenous entertainment industry in another Third World country may call for a different set of contingencies, such as media dependency on the West. Although recognition and articulation of these contingencies represent an important intellectual breakthrough, the implementation of policies based on these contingencies ultimately will determine the contribution of satellite television to development.

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