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Satellite Television and Development in India: A Utopian, Dystopian, Neutral, and Contingency View

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The role of technology in society has long been an important intellectual issue for social scientists. Historically, scholars have adopted one of three meta-analytical viewpoints regarding technology (Gendron, 1977). The *utopian* viewpoint holds that technology 'is an unalloyed blessing for mankind' (Mesthene, 1981, p. 99). Utopians see technology as a factor in providing shortcuts to the solution of many social problems. Weinberg (1981) refers to these shortcuts as 'technological fixes.' In addition, technology provides solutions to problems caused by technology itself. The utopian viewpoint espouses rapid technological development and is skewed toward technological determinism. Policies should promote development and the application of technology. Failure by a technology to impact society is seen as the fault of the business and political communities, who according to the utopians, are unfortunately in control of contemporary society. The utopian viewpoint has been championed by such scholars as Fuller (1981) and Weinberg (1981).

Second are the *dystopians*, who 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 restraint in technological development, and reject the notion of 'technological fixes.' Policy, according to them, should protect the privacy and solitude of an individual from the technological onslaught. Failure of social programs is attributed by the dystopians to technocrats who, they fear, are gaining control

of society. They believe that technocrats should be excluded from all policy-formulation. Ellul (1981) and McDermott (1981) are fervent proponents of the dystopian approach.

Third, the *neutral school* argues that technology does not have an important effect on society; technology, per se, is neither a problem-solver nor a problem-generator. In other words, technology is neither good nor bad . . . it depends on how we use it. The neutral school of thought seeks to assess, forecast, and/or control technology. Unlike the utopian or dystopian points of view, the neutral school is skewed toward social determinism, espousing that the impacts of a technology are shaped entirely by social, economic, and political institutions. Policy, according to the neutral school, should not be oriented toward technology. The concept of a failure is irrelevant to the neutral viewpoint, since society (not technology) determines the impacts of technology on society.

Mesthene (1981) claims that these three viewpoints (utopian, dystopian, and neutral) are by themselves 'unhelpful' to policy-makers. Based on studies conducted by Mesthene and his colleagues during the mid-1960s in Harvard University's Program on Science and Technology, Mesthene proposed the '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 analyze the contingencies that determine the positive and negative effects of a technology; society can then attempt social, technological, and political reform in order to optimize the positive effects while minimizing the negative effects. The fourth viewpoint, the *contingency approach*, therefore sees technology as a problem-solver *and* a problem-generator. It sees technology as malleable. It selectively adopts and designs technological innovations, and assesses the social and technological constraints on their use. Policy is the collective responsibility of social, political, and technological institutions. Examples of studies that have used the contingency approach include Pool's (1977) dual-effects analysis on the social impact of telephone and Kling's (1980) social analysis of computing. Table 18.1 summarizes the major characteristics of the four viewpoints of technology under discussion.

In this chapter we further such a contingency approach, to identify the potentially desirable and undesirable impacts of satellite

Table 18.1
Four Perspectives on Technology and Society

Perspectives	Characteristics of the Perspectives
Utopian View: Technology drives social progress application	Technology as problem-solver; Faith in the technological fix; Support for rapid technological development; Skewed toward technological determinism; Policy should promote development; Proponents: Buckminster Fuller, Daniel Bell.
Dystopian View: Technology generates and intensifies more problems than it ameliorates.	Technology as problem-generator; Oppose the technological fix; Restrain technological development; Skewed toward technological determinism; Policy should protect privacy, solitude, and individualism; Proponents: Jacques Ellul, John McDermott.
Neutral View: Impacts of technology are negligible, both positive and negative, and people adapt to them.	Technology not a major problem-solver nor a problem-generator; Technology is neutral, depends on how it is used; Technology assessment unnecessary; Skewed toward social determinism; Policy should not be oriented toward technology; Proponent: David Sarnoff.
Contingent View: Controls specific technologies in particular social settings.	Technology as problem-solver and generator; Technology is malleable; Selectively adopt and design impacts; Attempt to assess both social and technological aspects; Constraints on use and impacts; Policy should promote social, political, and technological reforms; Proponents: Ithiel de Sola Pool, Robert Kling.

Historical Perspective on Satellite in India

In the mid-1960s, a noted Indian scientist, Dr. Vikram Sarabhai, 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 Communications Group (NASCOM) was established in India in 1968 (see Table 18.2). Based on its studies and recommendations, the Government of India in 1969 approved the proposal for a Satellite Instructional Television Experiment (SITE) using the National Aeronautics and Space Administration's (NASA) Application Technology Satellite-6 (ATS-6).

Table 18.2
Main Events in the Development of Satellite Television in India

Year	Event
1. 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).
2. 1969	ISRO signs an agreement with the United States' National Aeronautics and Space Administration (NASA) to launch the Satellite Instructional Television Experiment (SITE) in India.
3. 1975-76	SITE broadcasts television programs to 2,400 Indian villages from NASA's Applications Technology Satellite-6 (ATS-6) for one year.
4. 1982	Indian National Satellite-1A (INSAT 1A) is launched by NASA, and broadcasts radio and television programs for five months, before it is deactivated due to technical problems.
5. 1983	INSAT-1B is launched by a U.S. space shuttle, and begins television broadcasting in India.
6. 1985	Sixty million people watch television, while 396 million (53 percent of the total population) live in areas covered by television broadcasts. Advertising sales earn US \$52 million for Doordarshan (the government television network) in 1985, up from US \$8.5 million in 1980.
7. 1990	About 90 percent of the Indian population will have access to television broadcasting, thanks to satellite transmission of television programming to low-power television transmitters.

communication technology in the development of rural India. We chronicle the views of scholars investigating these impacts, we summarize the lessons learned from past experience, and we describe current developments and debates surrounding the role of satellite television in India. Based on our analysis we present a series of contingencies which mediate the impacts of satellite television on rural development. We describe the Kheda experiment in India which adopted the contingency approach. We conclude with a discussion of how arguments from the utopian, dystopian, neutral, and contingency viewpoints are manifested in the social analysis of satellite television for rural development.

SITE was a one-year pilot project in 1975–76, 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 nutrition practices, and to contribute to family planning and 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, 1979). After SITE's one 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. This communication satellite provided radio and television broadcasting for five and one-half 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 by a U.S. space shuttle, on 15 October, 1983.

INSAT-1B led to major expansion of television broadcasting in India. Prior to 1983, television access in India was limited to the 28 percent of the nation's population living mainly in the four urban centers of Calcutta, Delhi, Bombay, and Madras. With the direct reception of television signals from INSAT-1B, about 53 percent of the population gained access. By 1990, about 90 percent of the Indian population had access to television broadcasts. This increase in access was due to the large-scale installation of television transmitters in India. Many of these television stations are low-powered, covering an area with a radius of fifteen to twenty-five miles. During 1984 and 1985 alone, the number of television viewers almost doubled from 37 to 60 million people. Today, television sets are being sold in India at the rate of four television sets a minute. Rogers, in Chapter 2 presented full detail on the accessibility of television in India.

Satellite television in India is seen as both a *problem-solver* and *problem-generator*; it has dual effects. 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 enhance national integration (Agrawal, 1985a). Detractors fear that satellite television will widen the gap between the urban

elites and the rural poor, that it will be used to promote the government's own interests and will eventually lead to a degeneration of traditional Indian values through television advertising, which promotes commercialization and consumerism.

In the following discussion we look at the dual effects of television in its quest to provide educational information, to narrow the gap between the rich and the poor, and to promote national integration. We also document the *contingencies* that affect the pro-development role that television could play in filling these three goals.

The Role of Television In Providing Education and Information

Vikram Sarabhai felt that satellite television could play a major role in ushering rural India into the information age. The role of satellite television was envisioned as: (a) to provide curriculum-based education to help ameliorate India's high rate of illiteracy; and (b) to provide useful information to both literates and neo-literates so as to prevent them from slipping back into functional illiteracy.

Curriculum-based Education

The role of satellite television in 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 probably the world's) first attempt to utilize satellite television to educate rural illiterates. The experiment was only a partial success. A series of evaluations of SITE helped identify three serious impediments (Agrawal, 1981). They were: (a) lack of teacher training; (b) inappropriate use of the telecast language; and (c) centralized production of television program materials for culturally diverse audiences.

Information Programs

In addition to curriculum-based educational programs, satellite television can inform viewers about current developments in agriculture, family planning, and health and nutrition. Information

provided by these television programs may require viewers to contact extension agencies, banks, or hospitals to obtain further information, products, services, or other resources. Television viewers do not always have access to these institutions, or the appropriate agency may not be prepared to provide follow-up information or other resources. SITE indicated that:

1. The training of extension workers was inadequate.
2. Portable video and communication support materials were not used widely enough.
3. There was a lack of communication and coordination between development agencies and the television broadcasters (Eapen, 1979).

SITE showed that certain contingencies mediate the success of satellite-based educational television. They were:

1. The planning of software requires greater amount of time than does planning for hardware (Mody, 1979).
2. Policymakers, program-plan designers, producers, and social scientists should work as a team.
3. 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).
4. Television messages should be orchestrated by boundary-spanning organizations like agricultural extension agencies, banks, hospitals, community organizations, and local governments (Agrawal, 1981).
5. Agricultural innovations that were cost-effective and locally usable were more likely to be adopted than other agricultural innovations.

The Current Policy Debate

Satellite television has had some degree of success in educating the Indian masses. The major policy debate in India about satellite television is threefold.

1. Is satellite television economically more viable than conventional methods of teaching? The role of satellite television as an aid to curriculum-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 twelve years old. Of the half-million schools in India, two-thirds have no school buildings. In addition, one-third are either one-teacher schools or completely unstaffed. Only a small percentage of villages in India have central-station electricity. Critics argue that given such fundamental inadequacies, satellite television is a luxury that rural India cannot afford.
2. Critics concede that satellite television programs have succeeded in informing viewers, but can the rural viewer put the information to proper use? Viewers watching television programs are often frustrated since they cannot follow up the information that they obtain from television. For instance, about 70 percent of water sources in India are polluted, which is a major source of ill-health. Many village women have to walk several miles daily to fetch water. How can satellite broadcast and television programming, critics ask, help solve India's drinking-water problem?
3. Critics argue that even though satellite television has improved the overall level of literacy in India, the technology has 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 percent of the village population in India) is widened by television broadcasting (Tichenor et al., 1970; Rogers, 1986).

The debate surrounding criticisms of television in India is not likely to be resolved in the near future. As the world enters the Information Age, the information 'haves' and 'have-nots' are likely to become the economic 'haves' and 'have-nots' (Porat, 1978). It seems that there is now considerable evidence that a direct relationship does exist between satellite television and the widening gap between the rich and the poor.

Television as a Gap-Reducer Between the Rich and the Poor

India's Seventh Five-Year Plan stated that television would 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). 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). However, 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. But only an extremely small fraction of the budget was earmarked for software development. SITE demonstrated unequivocally the need for emphasizing such software components in the television programs.

To supplement financial support from the government, Doordarshan (India's television authority) turned to commercial sponsorship. In the first three years that the INSAT-1B satellite had been broadcasting, Doordarshan's commercial revenues from advertising sales increased from about Rs. 200 million (US \$16.5 million) in 1983, to Rs. 625 million (US \$52 million) in 1985, an increase of 300 percent.

The Current Policy Debate about Commercial Television in India

The commercial success of Indian television comes at a price. Television, critics argue, 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 six million TV sets in the country, more than three-quarters are 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 their rural and urban-poor counterparts. Catering to urban/elite tastes interferes with the government's commitment for 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 has made inroads into 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 insists that television in India should not encourage conspicuous consumption. However critics argue that television commercials propagate a consumerism mentality and serve the ends of the rich more than those of the poor. If commercialization is not checked, critics contend, television will become a means of exploiting the poor (Chowla, 1986).

The debate between the two roles of satellite television (to inform versus to entertain) has resulted in one fruitful outcome: social-content soap operas. These soap operas inform the public about important social problems within traditional entertainment formats. These commercially-sponsored and indigenously-produced television soap operas caused a programming revolution at Doordarshan (Rogers and Singhal, 1986). Social-content soap operas in India began in 1984 with *Hum Log*, which touched upon such social and moral issues as family planning, improving women's status, illiteracy, the evils of dowry, drinking, and drug abuse. Programs like *Hum Log* are attempts by the Indian government to provide pro-development entertainment to the public, by utilizing television to purvey desired social values.

The Role of Television in Promoting National Integration

In addition to the pragmatic goals of reducing illiteracy and poverty in India, Sarabhai had also described satellite television as a tool for 'continued stability and national integration' (Sarabhai, 1969). A utopian goal for television is to help create a sense of political oneness among India's disparate linguistic groups (Mody, 1979). Coverage of events like the Republic Day parade, the Independence Day celebration, 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, are all attempts at fostering national integration through television.

The SITE experience helped identify certain problems that must be addressed before satellite television could be used as an effective tool for national integration. These were:

1. 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.
2. Satellite television programs are broadcast only in Hindi and English. English is understood by only 3 percent of the nation's population; Hindi by about 40 percent. In a nation of many languages, television broadcasting in just two languages alienates a large section of the population.
3. 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 have often demanded that the government handover broadcasting to an autonomous body. Thus far the government has resisted such demands, defending its monopoly as necessary to ensure a balance between educational and entertainment programs (Kagal, 1983). Certain critics of satellite television in India are convinced that satellite television is not likely to succeed in fostering national integration.

On the other hand, certain critics believe that satellite television is successful in integrating the nation. They recognize the inherently centralizing nature of this technology. Further, they contend that the success of satellite television should not be gauged by the ester of integration, but rather by the values that are being used to integrate the nation. Critics contend that the films broadcast on television create needs in viewers which cannot be fulfilled. The televised films, soap operas, and advertisements introduce village viewers to a world of totally different social values.

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

The Contingency Approach

Previous sections discussed satellite television's role in providing education information, in reducing the gap between the rich and the poor, and in promoting national integration. Contingencies affecting television's role in development (Figure 18.1) were discussed based on (a) the SITE experience, and (b) the limited experience to date with INSAT-1B. In earlier sections, we discussed certain lessons learned from India's interaction with satellite television. The lessons learned are briefly presented in Figure 18.1 as the contingencies affecting the success of satellite television in India.

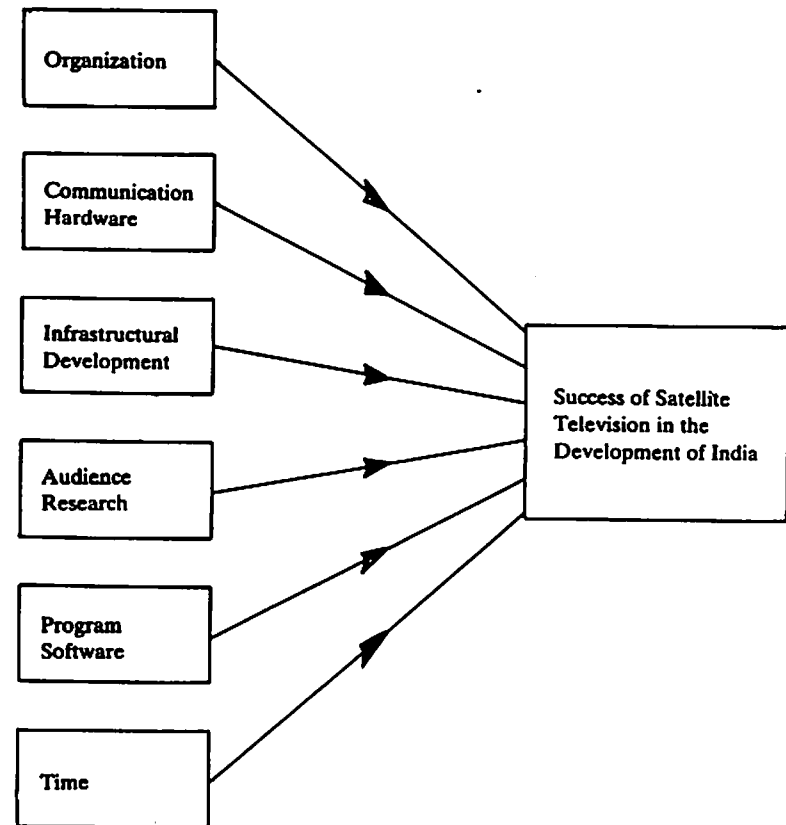


Figure 18.1: Contingency Factors Affecting the Success of Satellite Television in the Development of India

The role of time as a contingency factor has been grossly underplayed in past research. Most social science researchers have conducted re-evaluations of satellite television by gathering data either immediately before, during, or immediately after the implementation of satellite television. Majority of evaluation research efforts have been 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, though it informs us about immediate effects following the introduction of satellite television, does need to be refined.

Empirical evaluations of SITE and INSAT-1B, so far, have left many processual questions unanswered, for example:

1. Were the impacts of satellite television only temporary, vanishing shortly thereafter?
2. Did the impacts of satellite television continue to increase over time?
3. Was there a long gestation period before the impacts began to appear?
4. What were the consequences of withdrawing satellite television from village audiences, as was the case at the end of the 1975-76 SITE project?

Longitudinal research designs are required to address such process questions. Answers to these questions will undoubtedly provide additional contingencies that must be considered (Monge, et al., 1984).

The Kheda Communication Project: An Example of the Contingency Approach

A promising experiment in decentralized television broadcasting was the Kheda Communications Project. As mentioned earlier, SITE was conducted as a pilot project of satellite television during 1975-1976 by India's Space Applications Center (SAC), which 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 the Kheda district, which

neighbors SAC headquarters in Ahmedabad, India. The Kheda Communications Project (KCP) was the outcome of considerable planning and of attempts to learn lessons from the successes and failures of SITE. Intellectually, the Kheda Project rejected the utopian, dystopian, and neutral views of satellite television's role in rural development. Instead, the Kheda Project identified many of the contingencies that determined the efficacy of using satellite television in India.

How did the Kheda Project deal with various contingencies? Organizationally, the Kheda Project was a decentralized unit. It relied heavily on government funds for financial support, thus making it independent of commercial interests. The Kheda Project enjoyed a great deal of political autonomy from the central government. The organization fostered a participatory form of management, recognizing the fact that individuals working at various levels in the organization were often the most qualified to suggest improvements. The Kheda Project 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 Kheda Project had taken into account organizational factors—Contingency I (see Table 18.3).

The Kheda Project hardware represented a hybrid configuration. A low-power transmitter was located at Pij village about 50 kilometers (30 miles) 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 Kheda Project could broadcast both local television programs (originating either in their own studios, or in the local Doordarshan station), and the national (satellite) television programs received from the SAC earth station (Bannerjee, 1981). The Pij transmitter covered a radius of about 35 kilometers (21 miles), which is most of Kheda district (Agrawal, 1981).

A large proportion of the Kheda transmission equipment was obtained from the International Telecommunications Union (ITU). The television receivers were manufactured in India. Six hundred and fifty community TV sets were provided to 400 villages, and installed in public places (frequently schools) where village audiences could gather. A team of technicians periodically toured

Table 18.3
Contingency Factors Affecting the Role of Satellite Television in India's Development

I. Organization	
1. Autonomy:	(a) from the government, and (b) from commercial interests.
2.	Decentralization of administrative, research, and production units.
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.
II. Communication Hardware	
1.	Building, operating, and maintaining equipment and facilities for television broadcasting and reception.
2.	Using 'little media' (VCR's, folk media, posters, and puppetry) along with 'big media.'
3.	Using television in conjunction with print, radio, and film media; complemented by interpersonal communication.
III. Infrastructural Development	
1.	Opening schools of communication in universities.
2.	Development of, and liaison between, boundary-spanning units in organizations such as banks, hospitals, extension agencies, community organizations, and local self-governments (<i>panchayats</i>).
3.	Integrated development in the transportation, power, irrigation, telecommunications, health, and education sectors.
IV. Audience Research	
Research methodology:	
(a)	in-depth formative and summative evaluation using both qualitative and quantitative methods, and
(b)	needs assessment and message analysis.
V. Program Software	
1. Advanced software:	(a) the language of planning regarding TV broadcasts, (b) source credibility, (c) program scheduling, (d) geographical and economical access.
2. Content of programming:	(a) audience participation in program development, (b) format of programming, and (c) message design.
VI. Time	
The manner in which the effects of satellite television occur over time.	

these villages to service and repair these television receivers. Each day ninety minutes of local programs and 100 minutes of national programs were broadcast (Bhatia and Karnik, 1985). Half of the local programs were produced by the Kheda studio at SAC, and half by Doordarshan. Thus, the planners at SAC had attended to Contingency II, i.e., having Communications Hardware.

The Kheda district comprises some 1,000 villages with three 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). The cooperative philosophy has been embedded in the district for the past forty years. '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 resulting spirit of participation among the villagers at Kheda was complemented by financial and institutional support from state and local governments and milk cooperatives. The Kheda Project collaborated with extension agencies working on dairying, agriculture, and health services, and with local banks, cooperatives, and employment exchanges. So, the Kheda Project had to its advantage the presence of an infrastructure (Contingency III) that was desirable, yet not easily replicable in other villages of India.

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 the Kheda viewers:

1. Bondage and oppression by feudal landlords;
2. Ritual and superstition, which were used to reinforce the class structure; and
3. Failure of the 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 issues 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 earlier 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 focussed on preventive measures, including immunization of children and anti-malaria measures. Family planning programs aimed at both motivation and information. The attempt was not merely to convey *what* to do, but also *why*. In addition, the Kheda Project relayed many national television programs via satellite. In order to ensure their fullest impact, the Kheda Project often provided regional language commentaries or introductions. These program capsules provided a context for rural viewers not familiar with either the language of a telecast or the significance of an event.

The Kheda experiment ended on 25 July, 1985. After ten years of serving the villages of Kheda district, the transmitter was shut down despite vehement protests from the local population. The transmitter was then shifted to Madras to facilitate a second television channel for that city.

The Kheda Project was a success in decentralized broadcasting. The experiment gained universal recognition when the Kheda Project received the prestigious UNESCO prize of US \$20,000 for rural communication effectiveness. Kheda demonstrated that television can be used for development in India. The Kheda Project 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 Kheda Project was shut down just when its long-term developmental effects were becoming evident, and were being empirically demonstrated. The Kheda Project is no more, ironically, just at the time that India needs more Khedas.

Bhatia and Karnik (1985) claim that the Kheda Project 'attempted to not only work at the frontier of the permissible but, through planned brinkmanship, attempted to extend the limits of the permissible.' The Kheda Project represented a historic intellectual advancement. Although conducted under the auspices of the Space Applications Center, it rejected the primacy of satellite television

as the only panacea for rural development. The Kheda Project rejected the previously-held simplistic utopian, dystopian, and neutral views of the role of satellite television in development, in favor of a contingency view.

Discussion

We began this chapter by describing four meta-analytical viewpoints that have been adopted in studying the impacts of technology on society. In this section we review the case of a specific technology—satellite television—in India and classify the arguments about the role of satellite television in India, on the basis of these meta-analytical assumptions.

The utopians believe that implementation of satellite communication will solve the problems of illiteracy, social and economic inequity, overpopulation, and regionalism. 'To put it as dramatically as possible,' Arthur C. 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.' The utopians profess faith in the 'technological fix.' 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 the development and application of satellite technologies, although it does not include questioning the selection of satellite technology. Failure is attributed to the fact that technocrats are not in control of society. 'The administrative structure of governments in many nations is dominated at the top not by technocrats but by professional administrators, lawyers or soldiers, who are hardly likely to provide insights, experience and first-hand knowledge of science and technology' (Sarabhai, 1968).

The dystopians acknowledge that satellite television is influential, but contend that it accelerates the creation of a 'class media' rather than a mass media (Atal, 1985). It results in regional resentment rather than national integration (Kagal, 1983). Problems caused by technology (such as water pollution) cannot be solved by satellite

technology. They advocate constraint in the development of satellite television and argue for traditional education rather than 'electronic classroom.' Policy, in their opinion, is best kept out of the hands of technocrats, who should be confined to the area of their specific skills.

The proponents of the neutral view downplay the effects of 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). Instead, the content of the message must 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 formulation of policy, according to them, should be in the hands of the software developers. Interestingly, the current commercialization of Indian television lends support to their hypothesis that, rather than the technology, it is the social and economic institutions that determine how satellite television will be used in India.

The emergence of a contingent view of satellite television in India has been relatively recent. The Kheda Project embodied the spirit of the contingency approach. It began in 1975, and the first public statements supporting the contingency viewpoint appeared in the early 1980s. The Asia-Pacific Regional Seminar for Utilization of Satellite Television for Mass Communication organized by the Indian Institute of Mass Communication, with the assistance of UNESCO, was a landmark in the history of satellite television in India. The outcome of the conference was a series of principal recommendations which recognized the dual impacts of satellite television. Specifically, it proposed that:

1. Software should lead and not follow hardware.
2. Widespread provision for interactive community viewing should be provided.
3. The projection of foreign lifestyle and entertainment not only serves no useful purpose but can also be socially disorienting.
4. Training for television program producers is most important.
5. A video-recording and playing mode should be used along with television transmission for local-interest, development-promoting programs.
6. Television should be used for programming of national, regional, and local interests, utilizing satellite, microwave, single station, and video modes.

7. Feedback is of utmost importance for relevant television program-making in developing countries (AMCB, 1984).

While recognition of these contingencies represents an important intellectual breakthrough for policymakers, the implementation of policies based on these contingencies will ultimately determine the contribution of satellite television to Indian society.

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