

Television as a tool: Understanding the trajectory of India's development

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Abstract: This article provides a backgrounder to locate the entry of television into a country at a time, which was in the throes of regular challenges, having gained independence newly to rule over its own population. The Nehruvian vision of socialism along with his penchant for scientific temper led to India's investment in technology for a faster rate of growth and development. Of these, television, as an audio-visual medium found favour as a tool of development, given the illiteracy and the subsequent challenges that a young India had to face. The entry of television in India as a tool of development through the Satellite Instructional Television Experiment (SITE) program and Jhabua experiment given the illiteracy of a young nation and Nehruvian understanding of development post-independence. This article will also deal with the evolution of television as a mass media and contextualize it through the birth of national broadcaster- Doordarshan. Towards a colourful future: From B/W to colour: The era of Asian Games and the popularity of Doordarshan. The building of TV towers and relay stations for connectivity by Ms. Indira Gandhi. The political atmosphere of the seventies and early eighties will provide the political sentiment of that time to utilize television as a tool of propaganda.

INTRODUCTION

For almost three decades after its introduction in 1959, television in India was synonymous with *Doordarshan*, the audio visual wing of the Government of India. *Doordarshan* or the Distant vision', identified as the voice of the Government of India, in its meanderings across the decades earned many brickbats and a few bouquets, most prominently for losing sight of its vision' than for anything else! The lone crusader for almost three decades, it became irrelevant with the onslaught of private television channels that appeared on the broadcast *terrafirma* from the nineties. Caught in the dilemmas of being a public broadcaster; a necessity to accrue profits and be controlled by

the government in power, it lost its way and could neither become a serious contender economically nor content-wise. The public broadcasters were always overshadowed by a puritanical Government which dictated the boundaries of what was acceptable to the Indian electorate be it the All India Radio or *Doordarshan*. This did not allow *Doordarshan* to grow into an independent medium, although autonomy was a constant refrain of the broadcasters, right from the All India Radio days. The postcolonial influence with the narrow ideological disposition of the early years post-independence and the strong nationalistic fervour of a new democracy shaped *Doordarshan* into the entity it finally morphed into. With the Government's vision of developing television only as a medium of education and development, unlike its counterpart the radio, it could not provide a platform for the varied range of arts and culture that were in the margins and which eventually got lost. In the news front, *Doordarshan* did try briefly in 1985, to break free of its bureaucratic shackles during Mr. Rajiv Gandhi's tenure as Prime Minister. However, it died a natural death as the concept of a professional newsroom was inconceivable to a majority of the information officers who wanted to end its autonomy. The Director General of Doordarshan, Mr. Bhaskar Ghosh wanted to make it completely professional which he thought was the only way to cope with the increasing competition from the private players. He laid down a blueprint for ensuring fair and impartial news coverage (Prasar Bharati 2004). Unfortunately, it did not last long and before long, *Doordarshan* was far from reflecting the changing political or technological developments in the media market and instead fell back into being the voice of the State (Bhushan 2018).¹⁸ Television in India came into existence in 1959, exactly two

decades after the British Broadcasting Corporation (BBC) launched the world's first television service in 1936. *Doordarshan* began on a very modest note as initially it underwent a series of experiments in Delhi. Under the aegis and support of UNESCO, a pilot project was conceived and implemented in its endeavour to study the feasibility of television as a medium of education, rural upliftment and community development. The growth and expansion of television in India can be roughly divided into three phases – the experimental phase (1959 – 1966) the growth phase (1967 -1983) and the privatisation phase (1983 – to present). The focus of the first two decades was almost totally on development and education, where television established itself as an agent of community development among the public. In the second phase it increasingly saw public demand and interest as an entertainment agent as the potential for commercialisation and entertainment far outweighed the educational purposes. In the third phase, the economic liberalisation in the country offered immense potential for growth in the form of FDI and the private players from within, providing competition and variety in programming as well as infrastructure growth. The development of Indian television broadcasting has a direct relationship with its government policies and technological development in the field influenced by the changes internationally from time to time. In the initial decades of the post-colonial nineteenth century, most nations that were on the brink of a new dawn viewed television as an essential element in nation building. A young democracy like India was no different in this thought, with a majority of its population being neo-literates or illiterates. Yet, the thinkers and policy makers of the country initially were not in favour of television, as it was seen through the prism of being a luxury item that India could ill afford, immediately after its independence. Foreign investment of any kind was anathema, more so in media for a long period, but more often than not, developing nations usually required technological assistance from abroad and a state strong enough not only to engage in meaningful programme production but also mediate mass media reception in socially constructive ways (Rajgopal 2014). It was the determination of the Government of that day that made possible the

introduction of television in India for development and educational purposes. Broadcasting emerged as a utility in Euro-American contexts within relatively well-developed civil societies, but in a developing country like India, steeped in a culture with a colonial hangover, the most natural approach regarding the role of television was that of a public broadcaster for the upliftment of the masses' where the majority of the population was illiterate. Being completely under the Government control, it reflected predominantly the nationalistic ideological view of the state within the underlying multi-language, multi-cultural ethos. This in turn questioned the legitimacy of its role as a public broadcaster, and with the entry of the private media in a post liberalised world later on, the fundamental question of the role of television remains an enigma.

Doordarshan as national broadcaster

Television made modest beginnings in India on 15 September 1959, with a small experiment in Delhi, as UNESCO along with Ford Foundation gave the government of India \$20,000 (Rs 9.7 lakh) and 180 Philips TV sets to telecast programmes, predominantly educational. (Malhan 1985). *Doordarshan*, had its head office in a makeshift studio, and they worked with just a small transmitter. In the beginning the accent was on education as the initial purpose of the government was to use television to train personnel in the field and to find out what it could do in the area of community development and formal education. With this intention, it began its operations to transmit over an area of 40 kms with 180 teleclubs situated within it. To assess the merit of the project 20 specially designed programmes were telecast twice a week for twenty minutes at a time, and UNESCO studied and bought out a report in 1961 regarding the nature and degree of the programmes' impact. It indicated that these programmes did have some impact on the viewers. The positive results enthused the government to take on another project, this time with school programmes in the same year. The success of these experiments led to the commencement of regular television in India. (Malhan 1985). Ironically the first family to own a television in India was the wealthy Niyogi family from Kolkata despite its intended usage for the

upliftment of the less fortunate. (Indiatvnews 2019). *Doordarshan* was initially called Television- India and renamed as *Doordarshan* in 1975 (Indiatvnews 2019). However, the entry of television had several limitations as initially there were no trained professionals in an audio-visual medium either in the department of Engineering and Programming, or in the Information and Broadcasting Ministry. *Doordarshan* in the early days depended completely on the knowledge of the All India Radio officials and professionals who were trained to write for the ear than the eye. Tuning to the new medium was a challenge that was overcome as newer and younger trained professionals entered the field later on. A daily one-hour service with a five minute news bulletin began in 1965. Television, at this early stage, was not considered a medium of entertainment, but primarily an education tool. Understanding the utility, television carried out its educational work through various programs during this period. It was based on the school curriculum as a daily course for one hour after a year. The duration of the daily one-hour service, including the news bulletin, which commenced in August 1965, increased gradually. These programmes included entertainment and information-related programs. Initially television sets were provided to *Gram Panchayats* and people would gather at community centres to watch programs on *Doordarshan*. Only a few rich families owned television sets initially and friends, neighbours would watch television together with that family (Raina & Chaudhary 2011). In 1972, television services were extended to a second city—Mumbai. By 1975 television stations came up in Calcutta, Chennai, Srinagar, Amritsar and Lucknow. The regular daily transmission began as a part of All India Radio in 1965, but by 1976, television services were separated from radio as it came into its own as a national broadcaster. Each office of All India Radio and *Doordarshan* were placed under the management of two separate Director Generals in New Delhi, currently under the common umbrella of Prasar Bharti. Indian television channel *Doordarshan* offers national, regional, and local service for Indian television viewers. *Krishi Darshan* (Agriculture related programme) was the first program telecast on *Doordarshan*. It commenced on 26 January 1967

and is one of the longest running programs on Indian television. Over the years, *Doordarshan* has grown into a network operating 34 satellite channels besides providing free-to-air DTH service. The single studio from its small departmental home in All India Radio has grown into 66 studio centres all over the country, including 17 major studio centres at State capitals and 49 other studio centres located in various cities (Prasar Bharati 2021)

KHEDA and SITE- Early Initiatives on using TV as development tool

In the mid-1960s, an ambitious plan was made by Dr Vikram Sarabhai, founder of India's space program, for promoting the socio economic development of India that could result in a giant leap in introducing the state-of-the-art communication technology and speed up the development process. He convinced the think tanks of the government that a satellite television system would be of great help in the broadcast of programmes in a country of such vast and diverse area geographically. At Sarabhai's initiative, a National Satellite Communication group (NASCOM) was established in 1968. The government proposed a hybrid television broadcasting system which gave opportunity for both communication satellites as well as ground based microwave relay transmitters to operate and be used. (Rogers and Singhal, 2001, Indian's Communication revolution). It was in this climate, that the first Indian national satellite INSAT was planned for launch. However, before such a monumental task was carried out, a pilot project was essential. This resulted in the now famous Satellite Instructional Television Experiment or SITE to utilise the ATS 6 satellite for direct broadcasting in Delhi. The core idea behind this experimental project was to use NASA's first direct broadcasting satellite ATS-6 (with a powerful, nine-metre antenna that opened in space like an umbrella) to beam television programmes to remote Indian villages. While the satellite would be foreign, the hardware (like the direct-reception equipment, the TV sets and the earth stations for uplinking programmes to the satellite) would be designed and made in India (Pal 2017). The Satellite Instructional Television Experiment (SITE) programme was launched in the year 1975 along with the much acclaimed Kheda Communication project to carry out the flagship idea of the Government on

community development, family planning and national integration as well as education, teacher training, improving agriculture, and communicate the concepts of health, hygiene and nutrition to a large population through the use of satellite. The SITE programme was to be carried out for a period of one year - August 1975 to July 1976 jointly by the Department of Atomic Energy of the Government of India and National Aeronautics and Space Administration (NASA) of the U.S.A. which helped in the launch of INSAT. The Kheda project was carried out from 1975 to 1989. Although the first satellite INSAT -1A developed technical snags within a few months, the INSAT -1B developed by Ford Aerospace in California was successfully launched in the year 1983 (Singhal and Rogers 2001). The Kheda Communications Project was set up under SITE with emphasis on local programmes to suit the local audience as United Nations Development Programme (UNDP) advised setting up of Low Power Transmitters (LPT) for limited rebroadcast to towns. The village selected for India's first local rural television telecast was Pij in Kheda district in the state of Gujarat. A low-powered transmitter gifted by United Nations Development Programme (UNDP) and a local production studio was set up at Pij while a satellite earth station was set up at Ahmedabad's Space Applications Center (SAC). About 651 television sets were distributed among the residents of 400 villages in a 35 km radius (Pal 2017). The transmitter was linked to a studio and earth station complex, so that it could relay local programmes (originated from the studio) or the central satellite programmes received at the Earth Station. Kheda Communications Project was intended to be carried out for a period of one year, but its tremendous success led to an indefinite extension long after its official period ended in 1976. Programmes were produced by ISRO on hardcore areas like agriculture, health, animal husbandry etc., as well as on social issues like untouchability, woman's status, children's programmes etc. The medium was extensively used for problem solving by recording the problems and taking these to the decision makers or by bringing the villagers and the decision makers together to discuss the problem. Thus television was thought to be a powerful tool to help in creating a proper climate for the development of a country. On the other hand, the SITE programme

began with 2400 villages in 20 districts of the six states of Rajasthan, Bihar, Orissa, Madhya Pradesh, Andhra Pradesh and Karnataka. (Pal 2017). The programmes were designed to teach school going children in rural areas who had no access to good schools and also for adult neo-literates and illiterates apart from other things. The SITE programme became a huge success as it fulfilled its role of providing 'informal education to the rural population of India through an intimate medium of communication'. The objectives of this programme were to:

- (a) Explore the potential of satellite for nation-wide communication through the medium of TV and
- (b) broadcast instruction programmes in the field of agriculture, family planning, education etc.

The Government faced many challenges both in terms of infrastructure, equipment as well as in programming. Content had to be generated in four different languages to suit the different states chosen for the study. Once INSAT became operational, the Indian government set up several community television sets in thousands of villages hoping to replicate the success of SITE programme. However, lack of infrastructure for all the rural areas and operational mismanagement led to systems failure as the responsibilities were not clear. Maintaining television sets and sophisticated equipment in remote areas posed extraordinary challenges, as did the involvement of many organisations and State governments. (Karnik 2015).

Eventually, the great experiment of utilising television for rural development was a closed deal by the 1990s. This later provided a base for the GRAMSAT pilot project.

JHABUA COMMUNICATION PROJECT (JDCP)
The Jhabua Development Communications Project or JDCP was another successful venture by the Government of India which introduced the utilization of satellite communication to supply program support communication for development efforts. The project was set up in Jhabua, primarily a region with an outsized tribal population within the state of Madhya Pradesh in central India. The Jhabua Development Communication Project was launched

within the mid-1990s by the Development and Education Communication Unit (DECU) of the Space Application Centre (SAC) in Ahmedabad. The purpose of the Jhabua Development Communication Project was to experiment with the utilization of an interactive satellite-based broadcasting network to support development and education in remote and rural areas of India. Some 150 direct-reception systems like satellite dish, TV sets, VCRs, and other equipment were installed in several villages of Jhabua, which received television broadcasts for 2 hours every evening from DECU's Ahmedabad studio, uplinked through satellite. Moreover, 12 talkback terminals were installed in each of the block headquarters of Jhabua district, through which village functionaries could ask questions, provide feedback, and report on the progress on various development and health related topics. This provided an interactive communication between the villagers and the media producers in Ahmedabad. In this way, parallel to the entertainment-driven market model of television, India also developed a number of educational and social communication experiments mainly through the Development and Educational Communication Unit (DECU) of Indian Space Research Organisation (ISRO). The notable ones are GRAMSAT (Gramin Satellite- Accelerating the pace of Rural Development), Training and Development Communication Channel - EDUSAT and GyanVani- educational radio and television services.

What went wrong with the Public Broadcaster?

In the decades since 1959, vast changes took place in the television landscape of India. In its early years, apart from being used as an educational tool, television was also misused as a mouthpiece for the central government and the party in power. Programming was primarily in Hindi and much of the news and current affairs focussed on Delhi – the seat of political power (Johnson, 2000; Singhal and Rogers, 2001). Thus, while television was entrusted with the brave goal of promoting national integration, the same medium was found to reinforce a sense of alienation in many parts of the country particularly in the north-eastern states (Joshi, 1985; Ninan, 1995; Page and Crawley, 2001). Despite being the world leader in experimenting with television and satellite technology, India failed to capitalise on the lessons learnt from early

development communication projects such as the Satellite Instructional Television Experiment (SITE) and the much acclaimed Kheda Communication Project (Singhal and Rogers, 2001). Contemporary Indian television is criticised by many for having shifted from its humanitarian goals and becoming a medium for the urban middle class. It is this class which owns and operate most of the television industry in India. It is the same class which is transmitting its own values, principles, and opinions to the rest of India (Johnson, 2000). Consequently, the cause of the poor, underprivileged people for whose development the medium was brought to the country has suffered a setback. Changes in the television system did not occur in India alone. There was a worldwide trend during the 1980s towards the commercialisation of television. Herman and McChesney (2001) argue that during this decade the policies of deregulation and privatisation were applied to national broadcasting and telecommunication systems that were traditionally regulated and often publicly owned and operated. This had a detrimental impact on public service programs which were replaced with more and more entertainment programming.

Educational Television (ETV)

As one of the main aims of the Government was education, having a television channel dedicated to education seemed most logical. In the final analysis, it did result as Gyan darshan, a channel totally dedicated to education was established in the year 2000. There were precursors to the entire initial concept of Educational Television (ETV) as BBC and ITV already began to telecast educational programmes for their Open Universities. Taking a leaf out of it, the Indian Government decided to experiment with telecasting curriculum based lessons more so on select subjects like sciences which required heavy infrastructure in schools. As most Government run schools especially in the interior rural areas seldom have access to science laboratories or other educational materials, telecasting it on television was deemed a boon to schools in far flung areas. *Doordarshan* began beaming programmes through its centres in Delhi, Bombay (now Mumbai) and later to all centres through its national channel. The initial programmes telecast became a huge success as both teachers and

students enthusiastically joined in watching the programmes. However, similar to the SITE programme, over the years, poor maintenance of television sets distributed to schools, lack of improvement in the content or in its presentation and unrealistic timings of telecast cast a long shadow over the ETV. The NCERT programmes are produced for the school level students while the University Grants Commission (UGC) launched the Country Wide Classroom which broadcasts its lessons to the rural undergraduate students at 5.30 AM regularly on all days. Indira Gandhi National Open University (IGNOU) makes programmes and telecast them for their learners at IGNOU. However, high upfront costs of investments, rapid obsolescence of technology, and the poor quality of trained teachers who need to be updated and upgraded on the new and emerging convergence of technologies led to the under-utilisation of the ETV. Although television is not expected to replace the teacher but act as an additional resource for the students who would benefit from the lessons given by experts, there needs to be a regular slot in the curriculum for the students who should not see it as dispensable. Moreover, making the lessons more interesting and interactive could go a long way in enthusing the students as the intention of a visual medium is to excite and interest the student than make it seem drudgery. On the other hand, the responsibility of the school authorities and the Government to make it a viable option would go a long way in making ETV a success.

Changing Eras: B/W to Colour

The end of SITE experiment gave conviction to the utility of television as a tool of development but it slowly waned under the pressure of manufacturers as well as the audience. The Government was obliged to begin entertainment and information based programmes besides the social education programmes. The emphasis slowly turned commercial as the potential of advertising revenue dawned on the Government. The number of television sets which were imported, excluding the community sets increased to around 22,000 by 1970. (Keval J Kumar 2020). By mid-seventies, Indian television sets were in the market and the number of sets sold was over a lakh (100,000) which increased to over two lakhs (200,000) in a decade in Delhi and

the neighbouring states alone. By 1972, television grew and expanded its services to Mumbai and by 1976 to other cities like Calcutta, Chennai, Srinagar, Amritsar and Lucknow, to cover the North, South and Eastern India. The number of urban viewers increased gradually as they realised the potential of television for entertainment purposes. The Government set about rapidly increasing the infrastructure to cover larger areas where television could reach, as it realised that one of the major requirements for the growth of the television sector was an extensive and efficient infrastructure network. This resulted in the setting up of terrestrial transmitters nationwide rapidly, for commercial purposes. Two tier cities like Jaipur, Hyderabad and others had terrestrial transmitters by 1977 and by 1980, the number of television receivers stood at more than 0.92 million. There were eight centres with studio facilities and 18 transmitting centres. On an average three to four hours of programming took place in these places (Keval Kumar 2020). Until then, national transmission was deemed impossible; but the launch of INSAT 1 B, along with ISRO, Indian Posts and Telegraph Department and Ministry of Civil Aviation and MIB opened up possibilities of a national hook-up once all micro wave transmitters were installed. The INSAT series also helped to fulfil the objective of getting DD the maximum number of community television sets. (Khandekar, 2013). The year 1982 was the defining year, when Asian games were hosted by India. The black and white television turned colourful, breathing fresh life into television. As Bhaskar Ghose, former director general of *Doordarshan* told India Today in 1999, "Colour was just a metaphor for a switchover to high technology." It was followed by *Doordarshan's* networking phase. In 1982, television transmitters jumped from 35 to 100, by 1990, the figure was getting ready to cross the 400 mark. (India Today 2009). This allowed sports fans to watch that year's Asian Games in colour. But there were opponents to the introduction of colour TV much like the opposition to the entry of television itself in 1959. The opponents argued that the government ought to expand the existing black and white system to reach the rest of India rather than planning the costly switchover. But given the rapid stride the rest of the world was making, as well as the potential to reach out to foreign markets to sell their programmes if they

were produced in colour, the Government decided to go ahead with the introduction of colour television. (Honsa 1982). *Doordarshan* was given 18 months to shift to colour technology. Four Outside Broadcasting (OB) vans were purchased immediately to provide live colour coverage of at least two events at any point in time. Engineers from different *Doordarshan* centres across the country were chosen to undergo training in India and abroad. There was heavy demand for colour television sets where people were ready to pay up to INR 8000 for a television set. Around 50,000 sets were imported initially which number rose to over one lakh within a year (Roy 2011). Post Asian Games, *Doordarshan* came into its own, coming out of the shadow of the big brother All India Radio. This period witnessed a rapid progression in terms of the infrastructure and content. In July 1983 the central government announced a Rs 680-million special project for a massive expansion of television transmitters. This was aimed at bringing 70 percent of the population under the television umbrella within the year 1984. Under this plan, the installation of 13 high-power transmitters (HPT) of 10 kW each and 112 low-power transmitters (LPT) of 100W each, was undertaken. All towns with a population of a hundred thousand or more were covered by these transmitters. Broadcast and production infrastructure and new studios were added or built in all large cities. By the end of 1982, there were about 2.1 million television sets with an estimated viewership of over 15 million. By the end of the decade, this number would grow to over 15 million sets and viewership of 75 million and rising by the day (Khanna 2020). As more and more transponders became available, it was possible to reach out to even the remotest parts of India by erecting low-power transmitters. In 1986, the metros got a second channel, offering viewers a choice to view alternate programming. Sound multiplexing technology made it possible for the simultaneous broadcast of pre-dubbed entertainment programmes in different audio tracks. (Khanna 2020).

HumLog- the first soap opera: The story of India's television is not complete without the mention of *Doordarshan*'s first soap opera, *Hum Log*. Launched in 1984, *HumLog* (We the people) changed the definition of television entertainment and gave a new meaning to family time. Until then, *Doordarshan*,

known for its documentaries and social issue based programmes entered the world of entertainment through *Hum Log*. With not much fanfare or advertisements and no promos aired, it became a household name that propelled television to the next level. Conceived by writer Manohar Shyam Joshi and director Vasudev Kumar, for a 13 week run, it exceeded all expectations and ran for a record 17 months. The theme of *Hum Log* was based on a popular Mexican TV show *Ven conmigo* (1975) directed by Miguel Sabido. *Hum Log* - a blend of an Indian middle class family story with subtle moral and social lessons, can be understood as a deliberate attempt to abide by the basic tenets of *Doordarshan* - a combination of education and entertainment. The soap reflected the many social, technological and economic changes that was shaping India at a time when joint families were giving way to nuclear families and yet the concept of joint family was valued even among the urban audiences. The show also coincided with the beginnings of colour TV in India as the first few episodes were shot in black and white, until colour TV officially made its entry in India. *Hum Log* came to not only be the first soap opera but one of the first few colour TV shows. (Jha 2019). The fact that TV then was subsidised and sponsored by the government also meant that there was no pressure to get sponsors or advertisers or make it commercially viable for the show unlike today's competitive world. Viewers sent more than 400,000 letters, many of them addressed to the characters rather than to the actors and actresses. Many of these viewers identified with one or more of the characters, and many commented on the social issues raised by the show. (Chatterji 2008).

Television 'Live'

One of the major transformations in Indian television is the telecast of live shows and more importantly, news. Live television began in India with the live telecast of the Independence Day speech by prime Minister Indira Gandhi on 15 August of 1982, followed by the colour telecast of the 1982 Asian Games in Delhi. On September 30, 1995, the first half hour live news bulletin in a private channel was telecast by a Malayalam television channel Asianet. The news anchor sat in Phillipines and read out the news as the Indian Government allowed only for downlinking of signals but not for uplinking.

Private news channels like Zee, SunTV and Asianet initially used transponders based out of Russia for uplink facility, but later shifted to locations closer to Phillipines and then to Singapore. Until then, *Doordarshan* and the other private channels were telecasting recorded programmes, so live programmes were still a novelty. Although the information was live, the visuals were not and the channels used stock footage to go with the current news. Stories were sent through a fax or teleprinter, while the bytes from politicians could be picked up through an ISD call which was then read out live according to Sashi Kumar, the CEO of Asianet then. (Rajenderan 2019). Until then there was only a single news bulletin in a day which soon became two bulletins. Quoting Pramod Raman, the anchor who made a history of sorts, by being the first news reader in private television, "We started anchoring a bulletin at 12.30pm IST. This bulletin mainly focused on international news events and so we could use daily footage from Reuters." (Rajendran 2019). Soon, technological advancement in telecasting live news became simpler as the downlinking of signals was allowed. On the reporting side, the move to record electronically generated images on tape from gathering news and recording on film based tapes led to the Electronic News Gathering (ENG) and then to Satellite News Gathering (SNG), and Digital Satellite News Gathering (DSNG). As the news channels needed news from across the country, it meant developing a news gathering network countrywide, to meet its operational requirements, which is when the ENG provided the big break. ENG field operations were usually done with a specially modified truck or van called the Outside Broadcasting (OB) van. These OB vans are fitted with professional video camera and microphone signals that come into the production truck for processing, recording and possibly transmission. Although the ENG cameras and recorders fitted with a heavy 3/4 inch cassette tape recorder were heavier and bulkier than most film equipment and difficult to carry, it was still preferred over the film. Editing was also expensive and time taking, having to transfer the footage from the tape. With digital evolution, bulky tape editing systems are today mostly replaced with single computers using multiple monitors or the computer's screen while SNG and DSNG has rapidly improved upon ENG.

An edit suite, which used to weigh over one hundred pounds, has been replaced by a laptop computer which eases transportation as digital video takes less bandwidth. In addition, terrestrial microwave vehicles used by *Doordarshan* (with its terrestrial transmission), are usually fitted with masts which can extend up to 50 feet (15 m) in the air (to allow line-of-sight with the station's receiver antennas). Satellite trucks on the other hand, normally use a dish that points towards the geo-stationary satellites. These satellite antennas were, as of 2010, adapted from the military and aircraft applications for news gathering by networks and local stations. These systems allowed live broadcast from moving vehicles. The interior of DSNG, satellite trucks and microwave vans resemble small control rooms on wheels. The Very Small Aperture Terminal or VSAT technology, defined as a two-way satellite ground station with a dish antenna that is smaller than 3 meters, that can access satellite(s) in geosynchronous orbit and relay data from small remote earth stations to other terminals or master earth station "hubs" became synonymous with the DTH and other forms of internet transmission. Digitisation, the use of OB Vans and computers made live news coverage in sports, politics, and entertainment a possibility to cover events as they unfurl. Moreover, holding press conferences through video conferencing and via the Voice over Internet Protocol (VOIP) and such devices brought down the cost of production. The minute to minute coverage was a boon in 24/7 news coverage. Coming to the telecast of live events, technological gains in the satellite broadcasting, and the worldwide net along with mobile technology, made transmission of Simulcast, Vodcast, Podcast, Webcast, with the extensive use of Fibre Modems, Broadband in FTP MODE with DSL links, Voice Activity Detection (VAD) feature etc. change the dynamics of news production and consumption. In the current, totally digital world, NDTV has become the first news channel to switch to complete mobile technology leading to a lean mean use of equipment and production costs.

Cable Television – a challenger to *Doordarshan*
The first competition for *Doordarshan* came in the 1980s and early 1990s as illegal distribution of television signals by cable and foreign television

channels caught on (Manchanda, U. 1998). The cable industry began as a solution to a small problem like having to set up multiple antennas to beam programmes telecast by *Doordarshan* in big cities and alternately, in small remote villages where the terrestrial transmission was weak. One giant antenna for entire apartments in cities like Mumbai with each home connected via cables in one apartment complex introduced the concept of cables. Some enthusiastic entrepreneurs began to show films through Video Cassette Recorders (VCRs) using these cables and charging each home for the service. This caught on and soon hundreds of cable operators in apartment complexes began to beam films using cables (Khandekar 2008) as there was no regulation or law against such distribution. Similarly, small cable operators in remote villages began to connect homes in a small vicinity through a cable and then transmit films by using Video Cassette Recorders that were popular by then. People were happy to pay and watch two films every day. The entry of satellite transmission through the telecast of the Gulf war in CNN in 1991 spurred the growth of cable television as all that the operators needed was a dish antenna and a booster to catch and strengthen the satellite signals of foreign channels. The signals received at a central location on a common antenna were then modified, combined, amplified and distributed to viewers via a co-axial cable. It was initially transmitted via the analog mode, until the conversion to digital transmission which began in four phases from the year 2010. ATN was the first Indian satellite television channel to be launched through ASIASAT 1, which was set up by billionaire LiKa Shing's Hutchinson Whampoa Group in August 1991. STAR launched Prime Sports, MTV, BBC and STAR TV. Zee Telefilms was launched in 1992 along with Essel Packaging Ltd, and became India's first privately owned Hindi satellite channel. Sun TV began broadcasting in 1993 with one Tamil channel. Soon many more regional channels followed. Slowly, business and service establishments like hotels, hospitals, office buildings and housing colonies began to offer cable services. The three multi-transponders available 24 hours for the Indian sub-continent are Express 6, PAS-4 and ASIASAT. By 1995-96, cable networks grew at a rapid pace, with an estimated 60,000 cable operators and subscriber bases ranging from 50 to as high as in the thousands.

Most of the networks could relay just 6 to 14 channels as higher channel relaying capacity demanded heavy investments, which cable operators were unable to make. By the late 1990s, more than 40 private television channels were available to Indian audiences which grew steadily crossing over 880 today. Data for cable and satellite homes were zero until 1989. Within a couple of years in 1992, the size of cable and satellite homes grew to a sizeable number of 1.2 million. By the late 1990s, India had more than 200,000 cable networks as it spread to smaller towns. Expansion of cable television naturally attracted more TV sets changing the structure of television industry in India. By 2019 there were over 83 million cable television households and 150 million households who watched both cable and satellite television across India (Keelery 2020). The proliferation of the cable and satellite channels and cable TV operators who were completely unregulated in the area of pricing or distribution resulted in the Government of India sensing a need to introduce new policies in the public interest. After the initial licensing of dish antennas to restrict satellite television, the Government finally came up with distribution regulation in the form of Cable Television Network Regulation Bill (1994) and the Act was passed in 1995. The Act made it mandatory for the cable operators, to register their companies in the post office and pay entertainment taxes. More significantly, the Act made transmission of at least two *Doordarshan* channels obligatory, and drew up a programming and advertising code, the adherence to which would be the responsibility of the operator. The attitude of the Government of India towards technological development in the television sector was further evident in the New Telecom Policy of 1999 which reads, 'The Indian telecommunications system continues to be governed by the provisions of the Indian Telegraph Act, 1885 (ITA 1885) and the Indian Wireless Act, 1933. Substantial changes have taken place in the telecommunications sector since 1992. ITA 1885 needs to be replaced with a more forward looking Act'. In 2001 the Communication Convergence bill for keeping pace with the convergence of telecom, Internet and broadcasting services occurring worldwide was introduced by the Department of Telecommunications to promote, facilitate and develop in an orderly manner the carriage and

content of communications. The Bill was still being discussed and in 2014, under the Bill it was sought to bring about a singular commission called the Communication Commission of India which will be formed in place of TRAI and Telecom Disputes Settlement and Appellate Tribunal (TDSAT) which will overlook all communication infrastructures. It will consist of seven members. Each member would be a domain expert on areas such as telecom, broadcasting, information technology, law and consumer affairs and finance. Its mandate would be to stimulate market competition in order to ensure better quality services for the consumer and prevent monopolies and take up certain powers of the Censor Board, Ministry of Environment and Competition Commission of India. This will directly try to regulate the content as well as the carriers who distribute that content. The bill was to be discussed in parliament and passed in 2015 to become an act, but none of the subsequent governments ever passed the bill and so TRAI and TDSAT continue to be the regulators and arbitrators respectively.

Direct to home (DTH) service: The next logical step to the satellite and cable transmission was Direct-to-home (DTH) television - a method of receiving satellite signals at your home transmitted directly from satellites. DTH services were first proposed in India in 1996. The proposal was not approved due to concerns over national security and negative cultural impact. In 1997, the Indian government banned DTH services when Rupert Murdoch-owned Indian Sky Broadcasting (ISkyB) was about to launch its DTH services in the country but finally permitted the reception and distribution of satellite television signals and DTH began its operations in 2000. The first DTH service in the country was launched by Dish TV on 2 October 2003. DD Free Dish, the first free DTH service in India, was launched by public broadcaster Prasar Bharati in December 2004. India is the largest DTH market in the world by the sheer number of subscribers. As on 30 June 2019, there were 54.36 million active pay DTH subscribers in the country. The Indian market is serviced by 4 paid DTH providers and one free DTH provider as of Sept 2019.

Mobile Television: The mobile phone has now

become the fourth screen for video after cinema, television and computers. Mobile TV can be said to have brought about a true convergence of the telecommunications and broadcasting sectors. It has caught on in a big way in India with the number of smart phone users being over 760 million in 2021. Of these, 390 million users access the internet via their mobile phones. (Asher 2020). The lock down during the 2020 global pandemic has led to a phenomenal growth of the mobile television largely due to the availability of the OTT platforms as it became the primary entertainment channel. This a different story altogether now and needs a different yardstick to assess its role in overall development of India.

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