

SATELLITES DRIVING SOCIAL DEVELOPMENT

It took an exceptional head of state to establish societal programmes on a nationwide basis. With satellite as the key driver of the programme, solutions provider, Riaz Lamak, in conversation with SatellitePro ME, describes the far-reaching programme across India that has endured a decade



(Inpic: Dancers from Mizoram) The distance learning programme is currently operational in the Northeastern Indian states of Arunachal Pradesh, Sikkim, Assam, Meghalaya, Tripura, Mizoram and Nagaland

Riaz Lamak remembers with pride the inauguration of a network at Rashtrapati Bhavan (official residence of the President of India) connected with a hub at a university premises in the South Indian city of Coimbatore, India.

“At 3 am, my engineer got a tap on his shoulder. He turned to see the genial face of Honorable Dr. A.P.J. Kalam, the 11th President of India, under whose personal initiative some of premier institutes of the country were being connected via satellite. It was a huge honour for us to be part of the project.”

As President and Director of Mahdi Bagh Group of Companies, Riaz Lamak was one of the handful of satellite solutions providers chosen by the Indian Space Research Organisation (ISRO) to set up remote earth stations and hub operations towards the execution of a range of social development programmes to be driven with Edusat, a satellite launched in 2004 with

Ku and extended C-band transponders with a footprint covering the whole of the Indian subcontinent.

“The main programmes on Edusat were distance learning and tele-education; tele-medicine; village resource centres and a disaster management system,” explains Lamak.

Distance learning via satellite

The government underwrote the cost of installation, testing and commissioning of hardware and software, end-to-end connectivity, satellite bandwidth and O&M support. The main hub was housed at ISRO’s -Telemetry, Tracking And Command Network (ISTRAC) facility in Bangalore, and there were other independent hubs for statewide networks.

In the seven Northeastern states of India, where the central government wanted to alleviate poverty, the task was



“We are recurrently supporting ViaSat Link Star in all these seven Northeastern states. In terms of other equipment, we had HP computers, Osprey cards to convert from digital to analogue and vice versa, Bosch amplifiers and mikes, Ahuja amplifiers, HP and Ben Q projectors in classrooms. To overcome the problem of intermittent supply of power, each remote site had a UPS with four hours backup”



straightforward, recalls Lamak.

“In addition to setting up a hub and around 50 remote terminals in each of the states, we were tasked with running a Technical Support and Training Centre (TSTC) for a period of two years by ISRO – specifically by the Space Application Centre’s Development and Education Communication Unit. We put one support centre in Guwahati (see map) and in each of these Northeastern states except Manipur, we had one field engineer. This engineer’s job was to go from institute to institute and train the local operator at the institute over a couple of days. The idea was to ensure that the programme is hand held and taken forward.”

The hand-holding continued for a two-year period to end in December 2012. The distance learning programme is currently operational in the states of Arunachal Pradesh, Sikkim, Assam, Meghalaya, Tripura, Mizoram and Nagaland.



Riaz Lamak, President and Director, Mahdi Bagh Group of Companies

“The only constraint was satellite capacity. So ISRO gave us a schedule. Accordingly each network was given a morning or evening slot. The state of Assam, for instance, would have a session in the morning and Mizoram would use the same capacity in the afternoon”

“Initially there was a degree of indifference. The notion was that the equipment was complicated or at times, bureaucratic inertia would hinder acceptance. However, the hand-holding did help. Now people have begun to see value and are taking active interest in the implementation.

“The only constraint was satellite capacity. So ISRO gave us a schedule. And accordingly each network was given a morning or evening slot. The state of Assam, for instance, would have a session in the morning and Mizoram would use the same capacity in the afternoon. Initially, we saw two or three remote colleges logging in. When we ended our TSTC initiative, an average of 22 to 23 colleges were logging in depending on the subject being discussed.

“Every state had one hub for distance education and on an average 50 remotes were installed in each state. The project started seven years ago and there was a

SatVertical: Government

little lull because the satellite, Edusat, had reached its end of life. It has since revived with the alternate capacities provided by ISRO on Insat 4CR.”

The respective state governments reportedly foot the bill for the equipment, and the satellite capacity and bandwidth is provided free of charge by ISRO.

The tele-education programme, Lamak explains, has mainly two types of content delivery mechanisms: Satellite Interactive Terminals (SIT) and Receive Only Terminals (ROT).

“An SIT-based network has a hub, teaching centre and remote SITs. The remote SIT has two-way audio/video interaction between the remote station and the teaching end. Whereas an ROT-based network is one way and gets the lecture delivered at the remote end.”

Across 24 states in the country, sixty four networks have been set up so far on Ku- and C-band capacities. There are more than 3,300 SIT-based interactive classrooms and 31,000 plus ROT-based classrooms thus totalling more than 34,000 terminals.

Technology and equipment

For every piece of equipment, ISRO had shortlisted at least two vendors, states Riaz.

“When the operations began in 2002-03, ISRO had shortlisted two platforms – Hughes and Viasat Link Star. We worked with BEL, the systems integrator for Viasat and we are currently supporting Link Star in all the seven Northeastern states. In terms of other equipment, we had HP computers, Osprey cards to convert from digital to analogue and vice versa, Bosch amplifiers and mikes, Ahuja amplifiers, HP and BenQ projectors in classrooms. To overcome the problem of intermittent supply of power, each remote site had a UPS with four hours backup.”

Every site posed a challenge in terms of installation, recalls Lamak.

“The places were remote and we often faced a local language barrier. The language barrier was especially pronounced with regard to the Village Resource Centre project.

“We mostly installed on the ground because of sloping roofs in these remote

The tele-education programme has mainly two types of content delivery mechanisms: Satellite Interactive Terminals (SIT) and Receive Only Terminals (ROT)



“With a hub at the ISRO Telemetry, Tracking And Command Network (ISTRAC) facility in Bangalore, the tele-health programme is on the national network. Terminals are set up at the district level centres that connect to super speciality hospitals”

areas in the Northeast that face heavy rainfall. Achieving the line of sight was difficult at times owing to trees. While cutting down a tree was never an option, at the most we would request for a slight trimming here and there. Installation included fencing of the area, cement blocks to secure the antenna, proper conduit pipes to protect cables and the all-important task of grounding so that there is no return current to pose a threat to the equipment.”

Reiterating that the network design and remote configuration had been thoroughly tested by ISRO scientists and engineers, emphasis was placed on optimising the bandwidth, asserts Lamak.

“Higher quality of video will eat up more bandwidth – 384kbps was allotted per terminal. With DVB S2 technology deployed there was no issue with the quality of transmission. It is a pooled bandwidth concept. Since tele-medicine and VCR were on the national grid, they were on extended C-band and distance education was facilitated via Ku-band spot beams. The terminals used were 1.2 mts for Ku-band and 1.8 mts for extended C-band. The latter

The Village Resource Centre (VRC) programme was facilitated purely by extended C-band on the national beam



has been challenging in terms of installation of antennas, but we have not faced much of interference issues because of the remoteness of the sites.”

Maintenance and after-sales service

With the distance education network, after the two years of hand-holding, a number of states hired their own staff to manage the network, states Lamak.

“For the Northeast, our engineers are the hub—five in number. We have extra engineers too, to compensate for any absenteeism.

“Typically, for terminal maintenance, ISRO or the nodal agency maintain the spares. When we get a call from a particular state government, our engineer collects the necessary spares and heads to the site.”

Riaz Lamak is the President and Director of Mahdi Bagh Group of Companies based in India. He is also associated with GVF activities, which he represents in the region. For more information visit <http://www.mbcin.com/> or e-mail at riaz.lamak@gmail.com

Tele-health: Extending medical services

With an estimated 50% of the population in rural India having no access to basic medical facilities, the benefits of providing remote health care via satellite cannot be understated, asserts Lamak.

“With a hub at the ISRO Telemetry, Tracking And Command Network (ISTRAC) facility in Bangalore, the tele-health programme was on the national network. Terminals have been set up at the district level centres that would connect to super speciality hospitals. Patients requiring specialist care are called on specific days and our engineer onsite ensures two-way video conferencing with the patient connected to the relevant diagnostic machine.”

ISRO’s tele-medicine programme started in 2001. The programme connects remote district hospitals with super speciality hospitals in cities through a satellite

interactive link. This programme is broadly classified to provide tele-consultations and treatment; continued medical education; mobile rural health camps, especially for Ophthalmology and community health; and assistance during disasters through support and relief operations.

ISRO’s satellite-based interactive network has reportedly enabled 380+ hospitals, health centers and 15+ mobile units connected with 60+ super speciality hospitals in major cities.

“These centres use remote diagnostic devices for measurement of basic parameters such as blood pressure, heart rate, electrical activity of the heart and pulse rate.

“When you consider that 75% of the diagnosis and treatment can be done remotely, the significance of tele-medicine in a developing country such as India can truly be appreciated.”

Village Resource Centre: Disseminating expertise

The Village Resource Centre (VRC) programme was facilitated purely by extended C-band on the national beam. The hub was collocated with the tele-medicine hub in Bangalore with 50 plus regional networks that connects different linguistic groups.

“Typically NGOs with good track records such as the MS Swaminathan Research Foundation; Pondicherry Multipurpose Social Service Society; Ramakrishna Foundation and so on, apply. ISRO has certain criteria and the NGOs are required to provide the space to put up the equipment. Once the equipment is put up in the designated expert centre, 12 to 50 remote centres are set up. At the expert centre, trainers impart different skills ranging from basket weaving to harvesting medicinal plants.”

As of now there are over 470+ VRCs all over India with multiple expert centres.