

## Rural Development @ Digital Innovation: Digital Setu to Digital India Programme

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### Abstract

‘The future of India lies in its villages’ **Mahatma Gandhi**

Indian prismatic society reflects an agglomeration of Sala model,<sup>1</sup> in which, we find overlapping of socio cultural and economic customs, traditions and people. India compared to world superpowers is a young and dynamic child. By 2020 it will hold more than half of the world’s human resources; India is set to become the world’s youngest country with 64 per cent of its population in the working age group<sup>2</sup>. But 70 percentage of that young are living in rural part of country with lack of awareness happening around the world. To this effect Information communication technology is like blessing in disguise. Government of India is trying to utilize this untapped human potential by making them skilled and connecting through Digital India programmes. Information technology has played a major role in inclusive growth of country by bringing the neglected rural India onto its radar.

In this paper, we present real life implementation of series of Digital interventions in a typical rural setting in Sabarkantha district of Gujarat. Many of these interventions were implemented in a time frame of just two years, ranging from Sept 2013 to Dec 2015. These interventions collectively titled as “Digital Sabarkantha” provide models of digital initiatives that support the goals of Digital India Programme.

The Digital Sabarkantha Model<sup>3</sup> involves creation of Villages that have the “Soul of Village and Facilities of a City” by providing services like internet, mobile libraries, bank facilities, technical education, digital classrooms(E-shikshak), etc to villagers. This paper is a case study on the process of digitalization and understanding how Digital Setu can give a conceptual framework and a practical demonstration for Digital India.

**KEYWORDS:** Digital Setu, Communication technology, Digital India, Digital Sabarkantha, Skilled labour Programme, Cyber Kitley, E-shikshak,

### Introduction

In present days, Digital Governance or E Governance<sup>45</sup> has become buzz word. Everywhere governments have made used of information communication technology for

<sup>1</sup>In administration in developing countries (1964) Riggs presented the concept of "prismatic society" to explain the unique conditions and the dynamics of politics and administration in developing countries.

<sup>2</sup> Report published by IRIS Knowledge Foundation in collaboration with UN-HABITAT

<sup>3</sup>Sabarkantha district portal website [www.Sabarkanthadp.org](http://www.Sabarkanthadp.org)

<sup>4</sup>Digital India: Understanding Information, Communication and Social Change by Pradip Ninan Thomas

<sup>5</sup>e-Governance for Development: A Focus on Rural India by S. Madon

a wide range of activities. Realizing the importance of digital governance many countries all over the world have taken up electronic governance projects on a priority basis. Though there are success stories from urban parts of the world but we find hardly any such success stories from rural areas about the delivery of the services to underprivileged. Particularly in India, the overall success percentage has been significantly low due to its geographical diversity, lack of public awareness, complex technology, political and administrative bottlenecks etc. Therefore, it is essential for one to provide services to all corners of country, particularly rural India. The authors have tried to highlight the factors that contribute to the sustainability of the digital Setu project. Good governance is the set of information or knowledge as recognized by the decision makers and people alike.<sup>6</sup> Digitization of this recognized information and making it available and accessible on a network to all individuals, opens up vast possibilities for its use. This has paved the way for Digital Governance or E-governance. Digital Governance ensures that citizens can participate in, and influence decision-making processes which affect them. Citizens no longer remain inactive recipients of government services provided to them, but can pro-actively decide the type and standard of the services they want and the structures which can best deliver them. It is essential to understand the models of digital governance before going into details of digital Setu and how its activities fit into various characteristics of the digital governance models. Digital Governance models keep on expanding and evolving along with new applications of ICTs. There are no rigid or definite models of Digital Governance. In fact developing countries are experimenting on their own to find which models will work for them and will best serve their needs. Some of these models may be technologically simple but are changing the way information is distributed and used in the society. Based on broad perspective, a few generic models have emerged and they are being practiced and been identified as emergence of knowledge societies and knowledge networkers, the role of information in governance process and the link between ICT and governance.

All these models share in common, the inherent characteristics of the new technologies, which are:

- Enabling equal access to information to anyone who is linked to the digital network, and
- De-concentration of information across the entire digital network.

### 1. Modes of Digital Governance<sup>7,8</sup>

**2.1 Broadcasting / Wider-Dissemination Model:** Broadcasting model is based on mass dissemination of governance-related information which is already available in the public domain into the wider public domain using ICTs. This raises awareness among the citizens about ongoing governance processes and government services that are available to them and how they can benefit from them.

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<sup>6</sup>digital governance website, <http://www.digitalgovernance.org>

<sup>7</sup>e-governance: concepts and case studies by C. Prabhu

<sup>8</sup>information technology in 21st century by Prof Ramesh Chandra

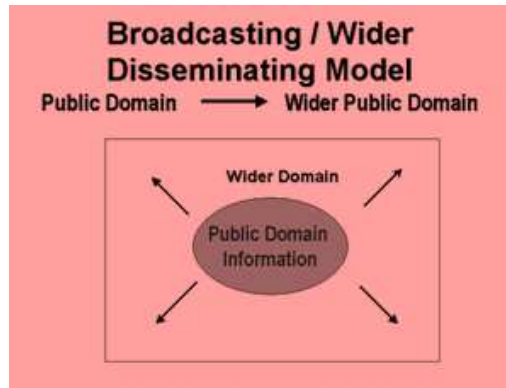


Figure1: Broadcasting/ Wider Disseminating Model

**2.2 Critical Flow Model:**The model is based on broadcasting information of 'critical' value (which by its very nature will not be disclosed by those involved with bad governance practices) to targeted audience using ICTs and other tools. Targeted audience may include media, affected parties, opposition parties, judicial bench, independent investigators or the general public.

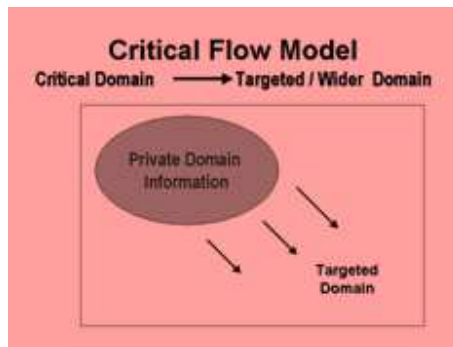


Figure2: Critical Flow Model

**2.3 Comparative Analysis Model:**Comparative Analysis Model is one of the least-used but has high potential for developing countries. The model can be used to empower people by comparing cases of bad governance with those of good governance and identifying specific aspects of bad governance, the reasons and people behind them, and how the situation can be improved.

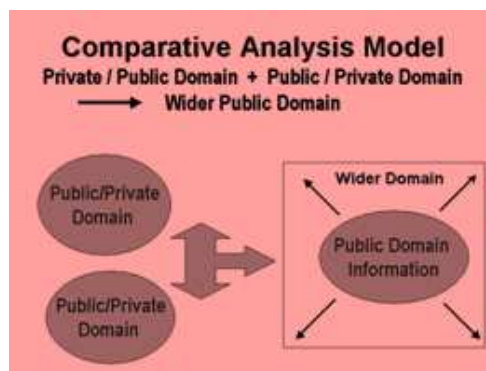


Figure3: Comparative Analysis Model

**2.4 E-Advocacy/ Lobbying and Pressure Group Model:** E-Advocacy / Mobilization and Lobbying Model is one of the most frequently used Digital Governance model and has often come to the aid of the global civil society to impact global decision-making processes. The model is based on setting-up a planned, directed flow of information to build strong virtual allies to complement actions in the real world. Virtual communities are formed which share similar values and concerns, and these communities in turn link up with or support real-life groups/ activities for concerted action. The model builds the momentum of real-world processes by adding the opinions and concerns expressed by virtual communities.

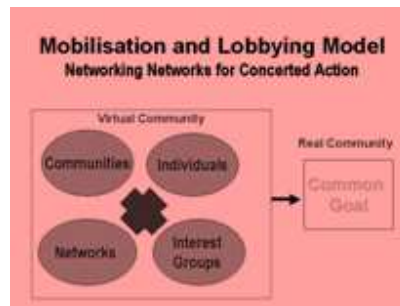


Figure 4: Mobilization and Lobbying Model

**2.5 Interactive- Service Model:** Interactive-Service model is a consolidation of the other digital governance models and opens up possibilities for one-to-one and self-serviced participation of individuals in governance processes. ICTs have the potential to bring every individual into a digital network and enable interactive (two-ways or multiple-ways) flow of information among them. The true potential of ICTs is fully leveraged in this model. As the participation is direct and not through representatives, it can bring greater objectivity and transparency in decision-making processes, and give a greater feeling of involvement and empowerment, provided that individuals are willing to engage in the governance processes.



Figure 5: Service Delivery Model

Digital Setu fits into Interactive Service Model in dissemination of e-governance through various Central and state mission mode projects and integrating the social, economical and welfare services to deliver governance to the targeted group and citizens. It is a multi way transmission of information from G2C, G2B, B2G, C2G and B2C. As participation

is direct and scope of middlemen is narrowed, things move without corruption in better direction towards a more transparent government. ICT directly has increased efficiency and effectiveness in delivering good governance. Moving onto characteristics will elucidate in detail the role of local bodies and its involvement in making the project a successful and prove that individuals are willing to engage in the governance processes.

## 2. Characteristics of Digital Setu<sup>9, 10, 11, 12, 13</sup>

### 3.1 Application Characteristics

**3.1.1 Target group:** We know service providers are ready to expand business in urban areas as they find profit out of it. But it is hard to find any subsidized and encouraging policies from government to connect to rural citizens living in interior and hard to reach areas. Digital Setu the word denotes to bridge the gap between urban facilities and rural connectivity. The goal is to establish urban facilities in rural areas. Target is the tribal villages of Khedbrahma Taluk, Sabarkantha district of Gujarat state, India.

**3.1.2 Mission critical application:** It is to provide various services, where the government wants to disseminate welfare and development activities to the targeted and/or general public of rural areas through online medium. Access to internet is a key factor in empowerment and it is reducing the exploitation of rural citizens. Digital have and have-nots.

### 3.2 System characteristics:

**3.2.1 Rigidity:** It is structural rigidity in convincing the local public and field level intervention with public private partnership involving local governments with low and high level of stakeholder, consultations with all groups to elucidate the variability. It was an articulation of a felt need.

**3.2.2 Integration of needs:** Integration of administrative, technical, political, citizens and other stakeholders by provide governance structure. Ensuring that project is sustainable, and convincing local groups in covering at least operating expenses and developing confidence in remaining partners like service providers, political heads and administrative subunits.

**3.2.3 Technology Challenges:** 5.8 Ghz and 2.4 Ghz spectrum are free and delicensed since 2004 but has not been properly utilized to deliver life empowering services to rural masses.

**3.2.4 Ground level preparedness:** Initially a trial run of concept was done during General Elections 2014 at Khedbrahma Block. 106 polling booths in government primary schools were connected wirelessly and polling was broadcasted live on uStreamTV from

<sup>9</sup> E-Governance in India: Initiatives & Issues by R.P.Sinha

<sup>10</sup> E-Governance: Implementation, Adoption and Synthesis in Developing Countries by Kelvin J, Bwalya, Stephen M. Mutula

<sup>11</sup> Active Citizens participation in E- Government, A Global Perspective, Edited by Manoharan, Aroon

<sup>12</sup> Management Information Systems by Dr Nirmalaya Bagchi

<sup>13</sup> Project Management: Concepts, Methodologies, Tools and Applications by Management Association

these. Technical feasibility was established through this experiment. The model takes internet bandwidth from the nearest available point and transmits it to longer distances using 5.8 GHz spectrum. The typical distance varies from 15 – 20 KM. Every 15 km a tower is erected and the bandwidth is relayed further. It is possible to relay bandwidth even up to 50 km with line of sight clearance. Using a hub and spokes model internet is relayed to all villages in a 10 – 15 km radius. At every village the signal received is converted to 2.4 GHz (802.11g Wi-Fi standards) and a Wi-Fi hotspot is created across as much area as needed.

**3.2.5 Architecture:** Hardware and networking, 96 items rate contract was created to enable Annual maintenance and replacement quickly. One agency for AMC was appointed for out of warranty items. AMC for a group of 50 villages was created to enable economies of scale for AMC vendors and to keep costs under control and still maintain service levels.

**3.2.6 Data and Application:** OSS/BSS software was used for Customer relationship management, KYC for issue of new connections. For free Wi-Fi plans one time password (OTP) was used.

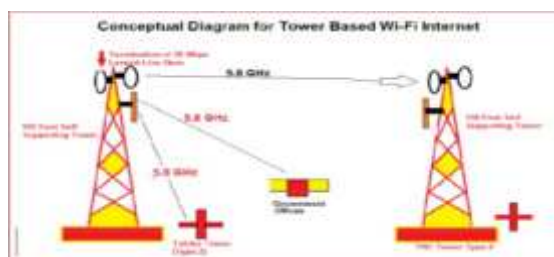


Figure 6: Conceptual Diagram of Tower based Wi-Fi Internet

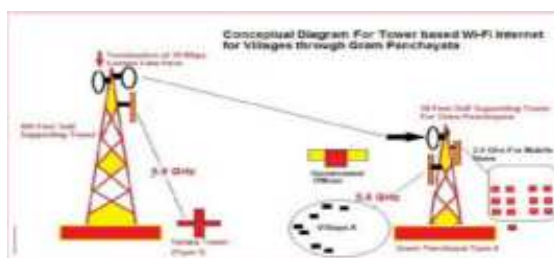


Figure 7: Conceptual Diagram of Tower based Wi-Fi Internet for Villages through Gram Panchayats

### 3.3 Project Management characteristics:<sup>14</sup>

**3.3.1 Cost and resources:** The long distance links are constructed by the District Panchayat (local rural government). Each tower and transmission equipment costs approximately INR 5, 00,000. At the village level, the cost of receiver and the access points for Wi-Fi at the district panchayat (in Sabarkantha) hotspot is borne by Women’s Self Help Group (SHGs) or the Village Panchayat, who participate as Digital Setu Service Provider (DSSP) for the area. For any sale or turnover happening in their area of

<sup>14</sup> Experiences of Mr. Nagarajan, IAS and Service Providers

operation, a 10% commission on the revenue generated is paid to the digital Setu service provider. They provide billing, distribution and receivables collection services and customer care. There is no other risk to the service provider. The Village Computer Entrepreneur (VCE) will work on behalf of Village Panchayat. He will earn sales commission on recharge coupons and bill collections. The bandwidth is provided by a private party who has been appointed by the District Panchayat after following an open tender procedure on a revenue sharing basis in Public Private Partnership (PPP) mode. The PPP partner signs a Service Level Agreement (SLA) and is responsible for the services like provision of adequate bandwidth as per demand, user management, Billing, Security and bandwidth management under various regulations.

**3.3.2 Marketing and outreach Project Costing Details:** Five Towers for long range transmission cost approximately 25 lakhs in total. Each Digital Setu Service Provider invests INR 60,000/- to 1,50,000/- as per area of the village. The average revenue expected (in remote areas) is INR 400 \* 150 customers = INR 60,000. 10% revenue share to DSSP is equal to INR 6,000 per month. The investment will be recouped in 10 months and rest of the months will be actual profits. The revenue is likely to be much higher in semi-urban areas and bigger villages. It is a benefit to villages with 3, 00,000 population of a remote and Khedbrahma tribal taluka.



Figure 8: PPP Model on Revenue Sharing and Multi-stake holders inclusive Approach

### 3.4 Personnel characteristics:<sup>15</sup>

**3.4.1 Political leaders:** Full support of political body was achieved by communicating the usefulness of the project the project was approved by General body of Sabarkantha district panchayat with 100% unanimous resolution to scale the project and authorized funds of INR 2 crores from local body funds. Sarpanch (Elected head) of the village is the key stakeholder for Village Panchayat partnership. All projects are approved by the Village Panchayat body and Gram Sabha thereby providing local participation and acceptance of the project.

**3.4.2 Administrators:** The team was led by Mr. Nagarajan IAS who is the District Development Officer at the time of roll out of the project. He was supported by the District Statistical Officer, Assistant Programmer and other staff.

**3.4.3 Vendors:** Railwire - a division of Railtel Corporation of India Ltd (RCIL) a mini-ratna PSU of Government of India provided bandwidth, OSS/BSS software and acted as ISP. The revenue generated was shared with District Panchayat, Village Panchayat and eGram (CSC) operators in the villages.

<sup>15</sup> Details provided by service providers, village communities, sarpanch, and Mr. Nagarajan, IAS

**3.4.4 Citizens:** This is an apt example of people participation in transforming villages into empowering societies and knowledge economies. It has increased respect for local self government among citizens.

### **3.5 Risk Management characteristics:**

Obviously, there is other side of the story that uncontrollable risk like technical, manual, economical, behavioral and political and uncontrollable risk like natural calamities and manmade disasters. Coming to controllable risks, this risk is divided and handled as per the capacity of stake holders. Sharing of risk is not going burden any one stakeholder. Financially, politically and socially all are equally involved, therefore the risk is scanty. Involvement of local government is an added advantage. As project is sharing benefits to all stake holders involved and results are immediate, so risk is comparatively low. Coming to uncontrollable risks, there would be loss of equipment and that can be restored, until it is demand of the time.

### **3. Benefits of Digital Setu<sup>161718</sup>**

Khedbrahma Model of Rural Broadband Internet aims to provide broadband internet and Wi-Fi services in the interior and hard to reach areas of Gujarat, thereby, reducing Digital Divide and Rural-Urban Divide. It will help in making e-services accessible to the local citizens in their locality, through common service delivery windows and ensure better costs to fulfil the basic needs of the common man. It will make him to be connected with the government in the promotion of wellbeing of state. It will help government to potentiate Mission Mode Projects at the Centre, State and integrated service levels through strengthening of e-Governance and m-Governance. It helps in integrating with all the departments under one platform – Digitalgov. It is easy to access through Video conferencing with every department at each level to understand the ground reality and a regular monitoring is possible this reduces red-tapism in government. It has increased the respect for the local self government and increased the income of internet users. Communication directly with consumers has increased the business flow and in return generated income to village panchayat.

As government is thinking in a big way to integrate all services and to disseminate public welfare schemes through e-governance mode to reduce constrains in interacting with remotest of remote citizen. Most of the villages in India do not have access to basic facilities like health, education and communication which are vital for better livelihood. Information Technology is providing platform for this facilities in rural India. Services like Telemedicine can provide remote consulting, Ultrasound images and Tele dermatology and many others can be provided to the most interior places of tribal area. Tele training for field health professionals can increase knowledge of doctors. Tele OPD can be helpful in the places where hospital facilities are not available. Collection of e-data at village level is helping government to analyze the data and take appropriate decision in allocating resources and facilities. e-Education is promoting ICT based teaching practices for government officers and other staff and also education of community at Gram Panchayat level. Various courses or short term refresher online

<sup>16</sup>Sabarkantha district portal website [www.Sabarkanthadp.org](http://www.Sabarkanthadp.org)

<sup>17</sup> Digital Setu- Khedbrahma Model of Rural Broadband Internet, shared on [www.slideshare.net](http://www.slideshare.net) submitted by Mr. Nagarajan, IAS

<sup>18</sup> Report on Digital Setu \_Sabarkantha from [www.Panchayat.gov.in](http://www.Panchayat.gov.in)



training can be arranged for government staff. Internet browsing centre (cyber cafe) can be established in all the connected villages by the local youth. This will provide employment opportunities to educated tribal youth and bring business to SHG. All the schools can be connected with each other and share good teaching practices with each other. Internet connection at Gram Panchayat can be made a “Hot-Spot” to serve internet/Wi-Fi services to area covered. It gives them an opportunity to establish a small business model by which a Gram Panchayat will be earning revenue.

Digital Setu is a step ahead in providing internet services to the tribal villages of Khedbrahma Taluk, Sabarkantha district Gujarat, with the initiative of district administration prior to Digital India announcement. Digital Setu was in pipeline from March 2014 and was officially launched on 12 Sept 2014. Cost sharing method and PPP model for providing service is a unique model in facilitating public internet connectivity. Central, state and private parties are able to access the remote tribal corners in providing services. This model facilitated access to high speed Wi-Fi at a much subsidized price consequently bringing income to villages. The government is trying to emphasis more on some aspects aligned to Digital India which also aspires to provide digital connectivity to all corners of India so that every village should become empowered as a knowledge society.

**4.1. Drawbacks:**<sup>19</sup> Officials says that the aim of the government is last mile connectivity in backward areas. Internet is supposed to be installed in each panchayat covering 10 to 15 km radius. But because of high capital, technical, and maintenance cost involved, it is still struggling to implement last mile connectivity. Affordability of smart phones, laptops, technical education, monthly recharge of internet, 80% tribal population of Taluka and in-between natural calamities are bottlenecks for bridging the infrastructural divide.

#### **Connecting Digital Setu with Digital India**

The Digital India program which was launched by honorable Prime Minister, Shri Narendra Modi, on 15 August 2014, with a vision to transform India into a digitally empowered society and knowledge economy. It is a flagship programme of the Government of India. The concept of digital India was conceptualized out of the shortcomings of National e-Governance Plan<sup>20,21,22</sup> which was started way back in 2006 that included government inability in achieving any dynamic changes in providing quality digital services, service networks are not compatible with scope for emerging technologies like mobile internet, cloud network etc., it was limited with the infrastructural facilities and lack of integration amongst Government applications and databases. This had prompted to launch ‘e-kranti’ programme with a vision of “Transforming e-Governance for Transforming Governance”. Focus is to realize India tomorrow by Indian talent with use of information technology. Vision is to provide Digital Infrastructure as a core utility to every citizen, governance and services on demand and digital empowerment of citizens. The approach and methodology of

<sup>19</sup> Personal interaction with different stake-holders and news article from Indian Express and Gujarat samachar

<sup>20</sup> National e- Governance plan website, <https://negp.gov.in>

<sup>21</sup> National e-Governance plan on Website of ministry of electronics and Information Technology, <https://meity.gov.in>

<sup>22</sup> Administrative Reforms Commission website, [arc.gov.in](http://arc.gov.in)

implementation is by revamping, replicating, promoting, restructuring and adopting of existing and new programs through state and centre sponsored programs, Public Private Partnerships, etc.

Coming to the core area of Digital India, it aims to provide the much needed thrust to the nine pillars, namely Broadband Highways, Universal Access to Mobile Connectivity, Public Internet Access Programme, e-Governance: Reforming Government through Technology, e-Kranti - Electronic Delivery of Services, Information for All, Electronics Manufacturing, IT for Jobs and Early Harvest Programmes.<sup>23</sup> This need to be implemented by entire government and coordinated by department of electronics and Information technology. Here Digital Setu is connected with two pillars of Digital India in providing Broadband Highways to connect all villages and cities of India and Public Internet access program where in internet accessibility to public at subsidized rates.<sup>24</sup> Gujarat has connected all 32 Village Panchayats with high speed internet and also has the first tribal taluka to be 100% Wi-Fi enabled. The Khedbrahma model is a viable and a sustainable way to connect rural areas to internet highway. The project is called “Digital Setu” meaning digital bridge. The costs of various components of the project are borne by all the stakeholders. It is a participatory model where the community owns the last mile access and takes care of customer service and service quality.

Synergy with existing government networks like E-Gram Network which currently provides bandwidth to 13,800 Village Panchayats of Gujarat uses satellite bandwidth. Digital Setu can supplement overloading of E-Gram network by providing access to services through Digital Setu network. This will reduce cost and increase availability of satellite bandwidth to other villages. NOFN (National Optic Fiber network) aims to provide 100 mbps bandwidth to 2, 50,000 Village Panchayats by 2017. However, the last mile access can be provided by Wi-Fi access points that are setup under Digital Setu by channeling excess bandwidth. All applications that are run on GSWAN can provide access under Digital Setu network including Video conference, Office applications and services. This will enhance access and reach of Government initiatives to unreached areas. Future plans of the district panchayat of sabarkantha are to make the district India’s first 100% Wi-Fi enabled district.

### **Conclusion:**

Sustainability goals can be achieved when the inequalities in places, people and programs are removed. All developing countries are in conceptualizing the goals according to the local demands. How effectively the goals may be visualized, it is the attitude of the local government, which makes the real difference. Visualized transformation can be achieved through transparent, efficient and accountable governance. Digital India is a vision in bringing this transformation in the process of governance through electronic means. Dreaming this vision, Digital Setu is trying to bring the last mile into this network by connecting the remotest of the places. Digital Setu Model would be a vision comes true

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<sup>23</sup> Pillars of Digital India, website of [www.digitalindia.gov.in](http://www.digitalindia.gov.in)

<sup>24</sup> Digital Setu- Khedbrahma Model of Rural Broadband Internet, shared on [www.slideshare.net](http://www.slideshare.net), submitted by Mr. Nagarajan, IAS.

by connecting Centre with citizen, state with citizen and private with citizen and vice versa in transforming India into a digitally empowered society and knowledge economy.

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