Towards an Open Government

E-Governance Infrastructure-Status and Challenges

Case Study on Himachal Pradesh

Dr. Saurabh Gupta
&
Shailender Kaushal
National Informatics Centre
Department of Electronics and Information Technology
Shimla- 171002, Himachal Pradesh
saurabh.gupta@nic.in

Abstract—**"Bharat Nirman" envisages delivery of Government Services at the lowest level and thus established NOFN, NKN, SWAN, CSCs to strengthen e-delivery infrastructure. This paper presents the scenario of this Information Technology infrastructure facilitating E-governance initiatives in the Country. The strength of present infrastructure led to think of programs like Direct Cash Transfer to the citizens of India. The paper also covers future challenges that need to be taken care to have a strong backend for delivering e-Governance services.**

I. INTRODUCTION

Government of India has taken many important initiatives like National Knowledge Network (NKN), State Wide Area Networks (SWAN), State Data Centers (SDC), National E-governance Service Delivery Gateway (NSDG) and common Service Centers (CSCs) to support E-Governance for making effective and efficient delivery of services. Recently initiative to connect 250000 panchyats through fiber enhances the reach of Government to rural India for elimination of Social exclusion and to attain the concept of Total Government, a transformed government having participation from lowest level in planning and formulation of schemes to be delivered in Rural India. Besides participation, a citizen wants government services delivery at his doorstep in a single window service catering mode which can only be achieved by strengthening the e-Delivery Infrastructure, and is being under active consideration in Bharat Nirman.

II. STATUS

A. National Knowledge Network

Globally, research and development activities and innovations are increasingly multidisciplinary, collaborative, and require substantial computational power. The key to successful research today demands live consultations, data sharing and resource sharing. Therefore in order to optimally utilise the potential of institutions engaged in generation and dissemination of knowledge in various areas, it is important to connect them through a high speed broadband network. This requirement initiated the plan of setting up a National Knowledge Network. Government of India and the National Knowledge Commission after extensive discussions with key stakeholders including experts, potential users, telecom service providers, educational and research institutions, established National Knowledge Network for which National Informatics Centre was considered as an executing agency.

The NKN comprises of an ultra-high speed CORE (multiples of 10 Gbps), complimented with a distribution layer at appropriate speeds. Participating institutions at the Edge will connect to the National Knowledge Network seamlessly at speeds of 1 Gbps or higher.

Multiple 10G Connecting all the State Capitals
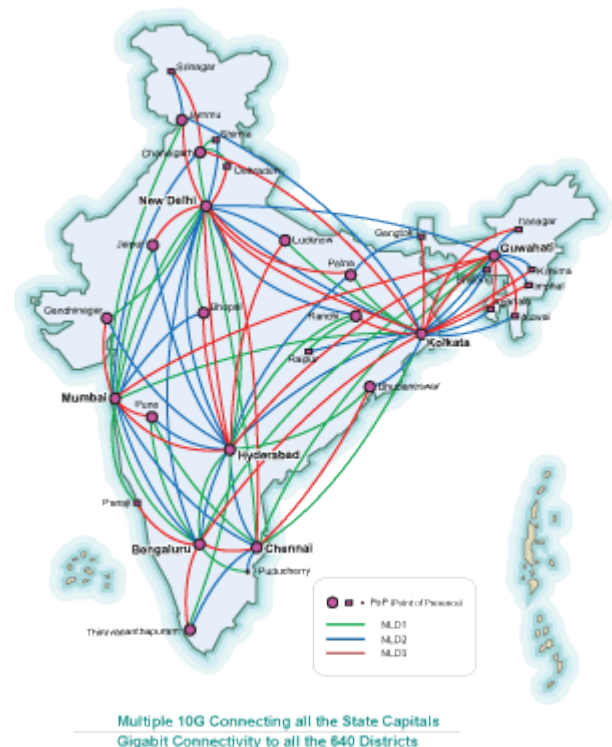Gigabit Connectivity to all the 640 Districts

Fig. 1. NKN Architecture

The network is designed to support Overlay Networks, Dedicated Networks, and Virtual Networks. Advanced applications in areas such as Health, Education, Science & Technology, Grid Computing, Bio informatics, Agriculture, and Governance will be an integral part of NKN. The entire network will seamlessly integrate with the global scientific community at multiple gigabits per second speed.
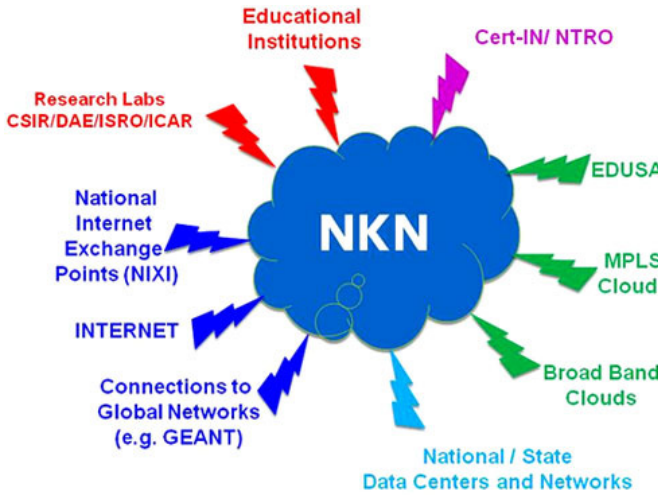

Fig. 2. Objective of NKN

The purpose of such a knowledge network goes to the very core of the country's quest to build quality institutions with requisite research facilities and create a pool of highly trained persons. The NKN while impacting the existing academic and student community will also alter the R&D landscape for future generations. NKN is also going to cover State Wide Area Networks established in the states for delivering Government Services. This is going to strengthen back end applications with automated workflow for bringing e-Governance in the country by process re-engineering in the government processes.

B. State wide Area Network

Wide Area Network is an advanced telecommunication infrastructure, which is used now-a-days extensively, for exchange of data and other types of information between two or more locations, separated by significant geographical distances. The medium of connectivity can be copper, optical fibre cable or wireless, as may be found feasible. Such wide area networks, in a way, create a highway for electronic transfer of information in the form of voice, video and data. Department of IT in Government of India has implemented an approved Scheme known as State Wide Area Network (SWAN) Scheme, to create such a connectivity in each State / UT, to bring speed, efficiency, reliability and accountability in overall system of Government-to-Government (G2G) functioning. In near future SWAN would work as a converged backbone network for voice, video and data communications across each State / UT. SWAN is designed to cater to the governance information and communication requirements of all the State / UT Departments. SWANs across the country are expected to cover at least 50000 departmental offices through 1 million (10 lacs) route kilometres of communication links.
SWAN Features

A wide area network deployed in a State or UT would have two components viz. (a)Vertical Component (b)Horizontal Component

The vertical component of SWAN is implemented using multi-tier architecture (typically, three-tier) with the State/UT Headquarter (SHQ) connected to the each District Head Quarter (DHQ) which in turn gets connected to the each Block Head Quarter (BHQ). Each SHQ, DHQ and BHQ point of connection is called a Point of Presence (PoP), which is a point of bandwidth aggregation for several network links getting connected at this point. The bandwidth provisioning for network connectivity between all the above PoPs is a minimum of 2 Mbps. Presently, the connectivity provisioning between every SHQ and DHQ is for 4 Mbps and DHQ to every BHQ is 2 Mbps. For the horizontal component, the government departments at each tier are connected to the respective PoPs.

The SWAN aims to create a dedicated Closed User Group (CUG) network of minimum speed of 2 Mbps by connecting around 7500 pops, providing Data, Voice & Video connectivity to more than 50,000 govt. offices. The network aims at increasing the efficiency of the government delivery mechanism and optimizes the performance. The backbone thus created would provide reliable, vertical and horizontal connectivity within the State / UT administration and would facilitate electronic transactions between all the government departments.

Fig. 3. Swan Architecture

To ensure desired Quality of Service (QoS) by the Network Operator and the Bandwidth Service Provider, a Third Party Audit mechanism has been created in the SWAN Scheme which would monitor the performance of the SWAN network in each State / UT. The Third Party Audit (TPA) agency shall perform for a period of five years from the date of final acceptance test of the network and primarily monitor the compliance of the Service Level Agreement (SLA) which the State / UT would enter with the Network Operator and also with the Bandwidth Service Provider.

SWAN Implementation Model

There are two Options for SWAN implementation; the PPP Model and the NIC model. In the PPP model the State / UT identifies a suitable PPP model (e.g. BOOT) and selects an appropriate Network Operator agency through a suitable competitive bid process for outsourcing establishment, operation and maintenance of the Network. In the NIC model the State / UT designates NIC (National Informatics Centre) as the prime implementation agency for SWAN for establishment, operation and maintenance of the Network. NIC in turn would identify a Facility Management Service (FMS) agency for the State / UT concerned, to manage day-to-day management and operation of the network. Majority of the States / UTs have opted for the PPP model for the implementation SWAN. BSNL has been identified as a preferred Bandwidth Service Provider for SWAN Scheme across the country.

C. National eGovernance Service Delivery Gateway

The National e-Governance Plan (NeGP) of the Govt. of India aims to cooperate, collaborate and integrate information across different departments in the Centre, States and Local Government. Government systems are characterized by islands of legacy systems using heterogeneous platforms and technologies and spread across diverse geographical locations, in varying state of automation, make this task very challenging.
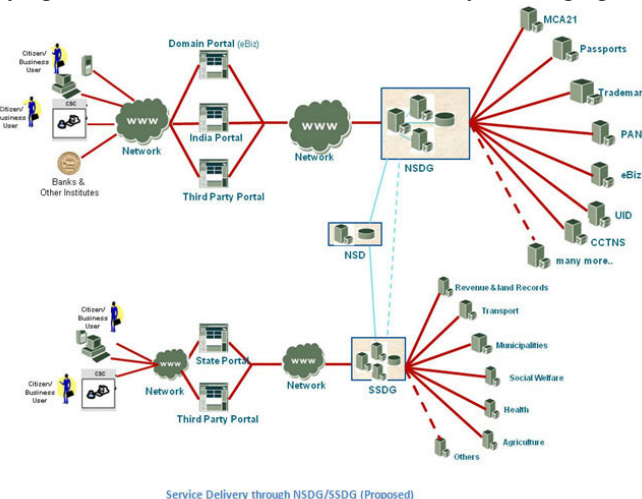

Fig. 4. Service Deliver Gateway Concept

The National eGovernance Service Delivery Gateway (NSDG), an integrated MMP(Mission Mode Project) under the National e-Governance Plan (NeGP), simplifies the above task by acting as a standards-based messaging switch and providing seamless interoperability and exchange of data across the departments. NSDG acting as a nerve centre, would handle large number of transactions and would help in tracking and time stamping all transactions of the Government.

D. State Data Centre

State Data Centre (SDC) has been identified as one of the important element of the core infrastructure for supporting e-Governance initiatives of National eGovernance Plan (NeGP).

Under NeGP, it is proposed to create State Data Centres for the States to consolidate services, applications and infrastructure to provide efficient electronic delivery of G2G, G2C and G2B services. These services can be rendered by the States through common delivery platform seamlessly supported by core Connectivity Infrastructure such as State Wide Area Network (SWAN) and Common Service Centre (CSC) connectivity extended up to village level. State Data Centre would provide many functionalities and some of the key functionalities are Central Repository of the State, Secure Data Storage, Online Delivery of Services, Citizen Information/Services Portal, State Intranet Portal, Disaster Recovery, Remote Management and Service Integration etc. SDCs would also provide better operation & management control and minimize overall cost of Data Management, IT Resource Management, Deployment and other costs.
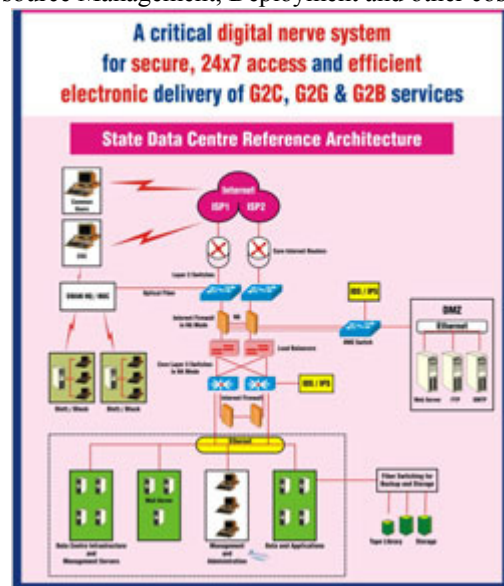

Fig. 5. State Data Center Conceptual Architecture

Department of Electronics and Information Technology (DeitY) has formulated the Guidelines to provide Technical and Financial assistance to the States for setting up State Data

Centre. These Guidelines also include the implementation options that can be exercised by the State to establish the SDC.

E. National Optical Fibre Network(NOFN)

At present OFC (Optical Fibre Cable) connectivity is available in all State Capitals, Districts, HQs and upto the Block Level. There is a plan to connect all the 2,50,000 Gram panchayats in the country. This will be done by utilizing would use existing fibres of PSUs (BSNL, Railtel and Power Grid) and would laying incremental fibre to connect to Gram Panchayats wherever necessary. Dark fibre network thus created will be lit by appropriate technology thus creating sufficient bandwidth at the Gram Panchayats. This will be called the National Optical Fibre Network (NOFN). Thus connectivity gap between Gram Panchayats and Blocks will be filled.

Non-discriminatory access to the NOFN will be provided to all the Service Providers. These service providers like Telecom Service Providers(TSPs), ISPs, Cable TV operators and Content providers can launch various services in rural areas. Various categories of applications like e-health, e-education and e-governance etc. can be provided by these operators. The NOFN project is estimated to cost about Rs. 20,000 Cr. It is proposed to be completed in 2 years' time. The project will be funded by the Universal Service Obligation Fund (USOF).

F. Common Service Centers

Common Services Centres (CSCs) Scheme is the nationwide initiative of Government of India to provide support for establishing 1 lakh Common Service Centers in 6 lakh villages of India. CSCs scheme has been started in 2006 with the vision to develop these centres as a front-end delivery points for Government, private and social sector services to rural citizens of India in an integrated manner.

The objective is to develop a platform that can enable Government, private and social sector organizations to align their social and commercial goals for the benefit of the rural population in the remotest corners of the country through a combination of IT-based as well as non-IT-based services.

An estimated amount of Rs. 5742 crores, will be spent over a span of 4 years for the project. A major portion of the total amount will be pooled from contributions made by the state and central governments, while the balance will be mobilized from the private sector. The central government would contribute Rs. 856 crores while the state government contributes an amount of Rs. 793 crores out of the total amount. The Scheme is to be implemented through a Public-Private Partnership. CSCs are the primary physical front-end for delivery of Government and private services to citizens.

The government has taken a three pronged approach for effective implementation of National egovernance plan to enable anytime anywhere delivery of government services.

CSC's are one among the three pillars, they support the infrastructure requirements
State Wide Area Network provides the necessary support for Connectivity. This has already been approved by the Government for Rs 3334 crore
State Data Centre Scheme is useful for secure hosting of data and applications
The Common Services Centres would be designed as ICT-enabled Kiosks having a PC along with basic support equipment like Printer, Scanner, UPS, with Wireless Connectivity as the backbone and additional equipment for edutainment, telemedicine, projection systems, etc., as the case may be.

The CSC Scheme has a 3-tier implementation framework:

First (CSC) level would be the local Village Level Entrepreneur (VLE) to provide service the rural consumer in a cluster of 5-6 villages
Second/middle level would be an entity termed the Service Centre Agency (SCA) to operate, manage and build the VLE network and business. An SCA would be identified for one or more districts.
Third level would be the agency designated by the State-the State Designated Agency (SDA) - to facilitate implementation of the Scheme within the State and to provide requisite policy, content and other support to the SCAs.

III. IMPACT

Presence of such infrastructure makes us think of applications like Direct Cash Transfer which Government has recently announced. It is a poverty reduction measure in which government subsidies and other benefits are given directly to the poor in cash rather than in the form of subsidies. It can help the government reach out to identified beneficiaries and can plug leakages. Currently, ration shop owners divert subsidized PDS grains or kerosene to open market and make fast buck. Such Leakages could stop through this scheme. The scheme will also enhance efficiency of welfare schemes. It makes a lot of sense for India to have UID and DCTs. A big part of the inefficiency in government service delivery is due to the inability to authenticate the identity of individuals. This was, for long, held responsible for hitches like the poor not getting their ration and banks not being interested in deepening their presence among the poor, especially in rural areas. The UID provides a platform amenable to technological innovations to resolve the numerous pinpricks that affect service delivery. The use of micro ATMs, for instance, can enable people (with a UID number) to open a bank account at their preferred kirana shop. Delhi started such a scheme, Saral Money, in December 2012, where merely stating your UID number suffices for KYC

norms. The Unique Identification Authority of India (UIDAI) transfers the relevant data to the bank branch concerned without losing time or depending on the kirana shop owner to use his discretion. This system can be a boon for the poor. Similarly, in principle, DCTs of food, fuel and fertilizer subsidies—which account for close to 2.3 percent of India's GDP—to UID-enabled bank accounts of the beneficiaries can effectively cut down on leakages by way of ghost accounts.

NKN project is successfully running in Himachal Pradesh. 10Gbps connectivity is providing high speed low latency to 13 institutes in Himachal Pradesh. All the nodes have been connected to the National Knowledge network. HIMSWAN is also given 1 Gbps connectivity through the NKN. IIT Mandi is making full use of NKN by conducting online sessions using virtual class room created under NKN Project. Following institutes were provided connectivity under NKN.

1. HIMSWAN
2. IIT Mandi
3. HP University
4. Central University
5. IIAS
6. NIT Hamirpur
7. Indira Gandhi Medical Collage
8. Dr. Rajinder Prasad Medical Collage, Tanda
9. IHBT Palmpur
10. Central Patato Research Centre
11. HFRI
12. Agriculture University Palampur

HIMSWAN is the State wide Area Network(SWAN) implementation in Himachal Pradesh. Total 132 Points of Presence (PoPs) were to be established in HIMSWAN. The project started on 2 February Status of PoPs is as follows:

a) 121 PoPs are commissioned.
b) 8 PoP sites are non-feasible from BSNL end as on date (i.e. Spiti at Kaza, Hangrang, Sangla, Pangi, Dodra Kawar, Kupvi, Rait, Ronhat). BSNL has been asked to work out alternative mode of connectivity at all these locations.
c) At remaining 3 locations, site preparation of PoPs is going on (i.e. Nohra, Krishangarh, Multhan).
d) Till date horizontal connectivity (only LAN connectivity) has been provided at 131 locations: Treasury: 32 locations, Election: 29, Police: 7, DPRO: 1, DRDA: 2, Fisheries: 1, Agriculture:3, CDPO:2, Others: 54.

Wireless Masts are being established at all PoP locations and are expected to be completed in 45 days time. Thereafter, horizontal connectivity to remaining offices will be provided.

Third Party Audit Agency (TPA) to be appointed to monitor the Service Levels of HIMSWAN Operator during 5 years operation period.RFP template from DIT, GoI has been received for TPA. The same is being modified as per State specific requirement.

Common Service Centers (CSCs) scheme known as LokMitra Kendra (LMKs) in Himachal Pradesh envisages establishing 3366 LMKs at Panchayat level in the State. The scheme envisions LMKs as the front-end delivery points for Government, Private and Social Sector services to rural citizens at their doorsteps, in an integrated manner using Information and Communication Tools (ICT). In order to setup these centres, Master Service Agreements were signed with 2 companies viz. M/s Zoom Developers for Kangra division in August, 2008 and with consortium of M/s Terasoft& GNG for Shimla and Mandi divisions in September, 2008.

Government Services:

In order to facilitate the delivery of services to the citizens,VLEs are providing following G2C services through their LMKs:

- HPSEB Electricity Bill Collection
- Issuance of copy of Jamabandi
- Grievance/ demand through e-Samadhan
- IPH Water bills
- BSNL Post-paid bills payment
- Issuance of HRTC bus tickets
- Issuance of copy of ShajraNasab
- Application of Inclusion of Name in Electoral Roll
- Application for Seeking Deletion of Name in Electoral Roll
- Application of Transposition of Entry in Electoral Roll
- Application for Correction to Particulars in Electoral Roll
- Application for Relief for Injury Death by Wild Animals
- Application for Issuance of BPL Certificate
- Application for Registration under NREGS
- Application for work under NREGS
- Application for Soil testing
- Application for establishment of Poultry farms
- Application for establishment of Ram Centre OR Sheep Breeding
- Application for Old Age Financial Assistance is an application for providing Pension to Non Pensioners who have age above sixty years
- Application for Gallantry Award Winners Pension
- Application for providing Bus Pass for Award Winners and War Widows
- Application for providing Employment to Ex Servicemen
- 4 services of Himachal Pradesh Public Service Commission

TABLE I.

Social Pensioner Details in Himachal Pradesh			
S. No	*District*	*Females*	*Male*

Social Pensioner Details in Himachal Pradesh			
S. No	District	Females	Male
1.	Bilaspur	12738	7916
2.	Chamba	14680	9122
3.	Hamirpur	11617	6131
4.	Kangra	32969	18145
5.	Kinnaur	2795	1264
6.	Kullu	12076	7428
7.	Lahaul&Spiti	853	367
8.	Mandi	35152	19868
9.	Shimla	20184	12774
10.	Sirmaur	12162	7121
11.	Solan	7730	3615
12.	Una	10562	5417
	Total	173518	99168

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IV. CHALLENGES

The real challenges with the government is to keep the cost of equipments low to end users and also provide fast and secure information across the country. Second challenge in country like India is to provide the information in local content even if possible in local dilacte   , since our country is country of contrast. Thirdly applications that can support e-governance, e-commerce, e-learning an telemedicine should be promoted to make full use of huge investment made on IT infrastructure.

Our country is lagging behind in Major Civic Infrastructure as Roads , Power , Transport which are crucial element for establishing and maintaining better IT infrastructure. Failure of power grid can bring whole network and services to standstill. Recent failure of North grid also affected the communication networks.

 New initiatives by departments   should be proposed to support existing infrastructure instead of setting up parallel system. Like integrations of major networks under NKN can strengthen the network for providing services . Information security is also another very important issue. Standards must be defined and developed.

Data tariffs along with ICT (Information and Communication Technology) literacy as two areas that will continually require government intervention. , The movement of content from anglocentric, text-based availability to multi-lingual access would assist immensely in deepening Internet usage.

The shift from text-based web to voice-based web, also had the potential to become the single biggest factor in enhancing Internet access in the country.

Mobile operators and ISPs have been working closely with Bharat Broadband teams to seek commercial opportunities. It is clear that early days will have teething problems, but for the most part, transport infrastructure should be in place by the end of 2013.

The immediate next challenge for Government would be to build a sustainable business model that can encourage private sector to invest and deliver continued technological support and financial returns — preferably through killer applications that suit the Indian rural citizens.

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