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ELECTRONIC GOVERNMENT BACKBONE – WBSWAN

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ABSTRACT

The actual results of e-governance activities will gain more visibility and citizen focus only if many of the stand-alone systems are properly networked and integrated. The Departments will not only have a more efficient/ transparent delivery mechanisms, but will also have updated information at all levels for monitoring, and more importantly for planning. An answer to this is the State Wide Area Network (SWAN), envisaged to work as core common network infrastructure for e-governance, over which all applications would run – Government of Kerala (2008).This paper is the first series of a nine month research work on the WBSWAN (West Bengal State Wide Area Network) and takes a technical appraisal way back from 2001 to 2011 and introspect its growth, expansion and challenges. The consecutive two series would focus on the dimensions of good governance (inter-governmental efficiency) and participatory governance (e-participation) brought by WBSWAN.

Keywords:WBSWAN, DIT, GOI, DIT, GoWB, E-Government

1. INTRODUCTION

A *network* consists of two or more computers that are linked in order to share resources (such as printers and CDs), exchange files, or allow electronic communications. The computers on a network may be linked through cables, telephone lines, radio waves, satellite or infrared light beams. *Network* is a group of stations or entities, inter connected to each other to share resources and to exchange information. A network consists of two or more computers that are linked in order to share resources, exchange files or allow electronic communications will be termed as Networking for computers.

Three basic types of IT networks include:Local Area Network (LAN); Metropolitan Area Network (MAN) and Wide Area Network (WAN). *Local Area Network* (LAN) connects network devices over a relatively short distance. A network in office building, school, or home usually contains a single LAN, though sometimes one building will contain a few small LANs. *Metropolitan Area Network* (MAN) is the interconnection of networks in a city into a single larger network. It is also used to mean the interconnection of several local area networks. A MAN connects an area larger than a LAN.*Wide Area Network* is a collection of network spread over a geographical area. The interconnected networks may be anywhere from several hundred miles away to each other. A WAN connects an area larger than a MAN.

State Wide Area Network (SWAN) covers whole State where one or many WAN will be connected with each other providing data, voice and video services (as required) throughout the State. The National e- Governance Plan (NeGP) envisages SWAN as a highway for electronic transfer of information in the form of voice, video and data. SWAN connectivity would bring speed, efficiency, reliability and accountability in overall system of Government-to-Government (G2G) functioning. SWAN would work as a converged backbone network for voice, video and data communications across each State/ Union Territory (UT).State governments plan to develop state wide area networks (SWANs) as a delivery platform for the e-governance applications. The high growth of the telecom sector in India since 1993-94 raises the prospect of a major jump in tele-density and hence of web and network applications to improve governance. Earlier applications were implemented over leased/ dial up lines. The state governments recognized that in order to increase access, multiply usage, and carry more data and applications, they would need to have a SWAN. Due to its extended outreach, many state governments envisaged establishment of SWAN as part of their IT policies from 1999 onwards.

2. WEST BENGAL AND WBSWAN

West Bengal is one of the 28 States (federal units) of India, situated on the eastern part of the country. The total area of the State is 88,752 Sq Km. The total population is 91.35 million as per the Census of India, 2011. West Bengal is the fourth most populous State of India and also the most densely populated. It is the seventh most populous sub-national entity in the world. The Capital city is Kolkata (Calcutta), which remained the capital of British India for more than 150

years.The State as on 01.01.2012 is administratively divided into 19 districts (Districts are the local administrative units), 66 Sub Divisions (Sub- Divisions are sub- administrative units of a district) and 341 Blocks (Blocks are the sub-administrative units of a Sub-Division) (Census of India, 2011).

The ***Information Technology Policy, 2000*** of the Government of West Bengal laid down State-widefibre optic cable based backbone project. The project comprised of a 1600 km long backbone network over the WBSEB (West Bengal State Electricity Board) Transmission network, connecting all the 17 district headquarters, an additional 10 centers with population of over one lakh, 10 Engineering colleges, 6 Medical colleges, 9 Universities, 13 Industrial Growth Centers, Falta Export Processing Zone and border posts of Petrapole and Hilly. The West Bengal State Wide Area Network (WBSWAN) implementation plan is presented in Table 1.

Table- 1: WBSWAN implementation plan

Phase	Target Completion Period	Connectivity Targets	Mbps/ Kbps
A	August 2001	18 District Headquarters (DHQ) with State Headquarter(SHQ)	2 Mbps
A(A)	December, 2001	8 Sub- Divisions (SDHQ) with DHQ	64 Kbps
C	March 2002	341 Block Headquarters (BHQ) with SDHQ	64 Kbps

The first phase of the project involving connectivity to the district headquarters was completed by August 2001. This was contracted out to Tata Infotech Limited (TIL) through a tender to the lowest bidder for expenses towards the hardware and one year's operating and maintenance costs as per the Service Level Agreement (SLA). The hardware, and operating & maintenance cost was about Rs 10 crores ($ .1 billion). The annual payments to BSNL for the bandwidth for the first phase were approximately Rs 2 crores ($ 0.02 billion). TIL, had also been mandated to extend the scope of WBSWAN to the eight cities and proposed to be completed by December 2001. The second phase was expected to be completed by March 2002 where all blockheadquarters would be connected with their district headquarters on 64 Kbps leased line upgradable to 2 Mbps bandwidth. Selected Panchayats (village level politico-administrative units) would be connected with their block headquarters during subsequent phases of expansion of WBSWAN. There was provision for horizontal expansion for connectivity at all levels.

In 2003, the network was expanded on the sole initiative of the Government of West Bengal to eight more commercially important Sub Divisionsviz. Siliguri, Haldia, Alipurduar, Kalyani, Kharagpur, Bolpur, Asansol and Durgapur.The ***Information Technology Policy, 2003*** of the Government of West Bengal highlighted the achievements of WBSWAN with connection to 18 district headquarters and eight other important townships in the State in the Phase I. It laid down the strategy of connectivity of WBSWAN to 341 blocks and 3600 Panchayats in Phase II.

3. NATIONAL e- GOVERNANCE PLAN (NeGP) ANDSWAN

The Government of India approved the National e- Governance Plan (NeGP), comprising of 27 Mission Mode Projects (MMPs) and 8 components, on May 18, 2006. NeGP aims at improving delivery of the Government services to citizens and businesses with the following vision:

"*Make all government services accessible to the common man in his locality, through common service delivery outlets and ensure efficiency, transparency & reliability of such services at affordable costs to realize the basic needs of the common man".*

The infrastructure pillars of NeGP are determined to be the Connectivity: State Wide Area Network (SWAN)/ NICNET, State Data Centers and Common Service Centers (CSC). NeGP recognizes that creation of independent infrastructure required to ensure service delivery by each department is neither cost-effective for government nor convenient for the citizen. Considering the need for creating reliable access network throughout the country, State Wide Area Network (SWAN) has been identified as one of the Mission Mode Projects (MMPs) under the NeGP.

The SWAN Policy Guidelines announced by DIT, GOI on October 2004, provided States with two options for implementing SWAN. The first option is that State Governments to identify a suitable Public Private Partnership (PPP) model (BOO, BOOT etc.), select an appropriate agency through a suitable competitive process for outsourcing establishment, operation and maintenance of the

SWAN. State Government will than designate an appropriate Central/State agency to take the overall responsibility for receipt of funding support, implementation and rendering accounts/utilization certificates.The entire process of outsourcing, including advising on the most appropriate PPP model, could be managed by an appropriate consultancy organization to be engaged by the designated agency through a transparent process under the direction of an implementation committee to be established by the states. The second option is to designate NIC as the prime implementation agency for the SWAN for establishment, operation and maintenance of the Network as an integral part of NICNET, with an appropriate end-to-end Service Level Agreement (SLA). In this alternative, funds would be released to NICSI by DIT and execution would be carried out by NIC.

The eligibility conditions laid down for States for DIT Funding Support for establishment of SWAN is that State Governments would need to enter into firm agreements regarding bandwidth with operators in order to avail of DIT support for establishing SWANs. A State may opt for coverage up to district level only initially, or up to block level. Minimum bandwidth to be made available would be 2 Mbps up to district level as well as up to block level on a dedicated basis (leased lines/satellite). DIT would separately indicate norms for leasing of bandwidths in consultation with DOT and BSNL. States could utilize these norms as benchmarks for contracting. States would need to make available the 2 Mbps bandwidth (which is negotiated from the service provider) to the PPP vendor or to NIC depending on the implementation option adopted for establishment of the SWAN.A State would need to have undertaken implementation of at least three major statewide e-governance projects that require such connectivity of which at least one should have been completed in order to be eligible for funding support.

The norms for sharing of cost between DIT, GOI and State Governments is that DIT support will cover the entire cost of establishment, operation and maintenance of the SWAN for a period of five years on 100% grant basis.DIT grant support will cover the cost of entire terminal equipment at each Point of Presence (POP). Support for the SWAN would cover only one POP at each location (State/ District/ Subdivision/ Block HQs) covered by the SWAN and for which bandwidth arrangements have been tied up by the state. All other costs would be borne by the states. The support would only be for the infrastructure but not for staff. Costs for infrastructure and bandwidth must be provided by the states. Any up-gradation costs would also have to be borne by the states.The cost of consultancy for undertaking Technical Feasibility Study, advising on most appropriate PPP model, preparation of EOI, RFP, SLA, etc. and managing the bid process in case of first option, will be provided as 100% grant by DIT to the agency designated by the states to undertake the selection of the consultant.

4. TECHNICAL DIMENSION AND FRAMEWORK OF SWAN

A wide area network deployed in a State or Union Territory (UT) would have two components (NeGP, GOI): Vertical Component and 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 networks aim at increasing the efficiency of the government delivery mechanism and optimize 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.

WBSWAN is implemented as an IP based triple play network with facility for simultaneous communication of DATA, Voice and Video signals. The connectivity up to all Blocks of the State is planned over terrestrial leased circuit rented from BSNL. The connectivity between State Headquarter (SHQ) to each District Headquarter (DHQ) is over individual 4 Mbps wide path. Each Sub- Division Headquarter (SDHQ) is connected to respective DHQ over 2 Mbps Leased circuit and each Block Headquarter (BHQ) is connected to the respective SDHQ with 2 Mbps Leased circuit. The DIT, GOI guidelines had classified the nodes in administrative offices (DHQ, SDHQ, and BHQ) in two distinct categories: POP and Co- located node. In a city or town if more than one administrative office exists, the primary switching equipments are located in only one office which is the highest in

the administrative hierarchy. This node is designated as the POP (Point of Presence). All other administrative offices are to be designated as Co-located nodes, and these would derive their connectivity from the POP.

The Co-located Nodes were classified into two categories:**Category A**: If the distance of the nearest POP from the collocated node is > 2 km, the proposconnectivity would be through 2 Mbps BSNL leased line. **Category B**: If the distance of the nearest POP is within 2 Km, but greater than 150 meters, the connectivity can be achieved using dead copper pair leased from BSNL.The Government of West Bengal classified the administrative offices in the above two categories: 56 nodes are declared as Co-located nodes and balance 369 offices are designated as POPs.To optimize on the connectivity expenses and network maintenance etc. it has been mandated by the GoWB and GOI that all departments needing to build a WAN shall ride the WBSWAN from respective POPs. To connect to the WBSWAN, the respective offices of the department need to connect to the nearest POP. The WBSWAN backbone connects POP located in the SHQ (Kolkata) with POPs located at various DHQs, SDHQs and BHQs. The department and directorates wishing to form their WAN based on WBSWAN connects to the nearest WBSWAN POP from their respective offices. A lateral connectivity is established from the SHQ to the department/ directorate head quarters located at Kolkata. The Data Flow from respective offices to their headquarters happens over the lateral connection up to the nearest POP and subsequently using the back bone reaches Kolkata based WBSWAN SHQ. The data is then transported to the respective HQ through the lateral connection from the SHQ. As per the policy of DIT, GOI all connectivity bandwidth in both the back bone and lateral shall be minimum 2 Mbps. For achieving the lateral connectivity the medium chosen is dependent on the application, distance, geographical terrain and bandwidth provider availability. WTL formed the following general rule, shown in Table 2.

Table- 2: Guideline of WBSWAN by WTL

Connectivity Class	Distance & Location (WBSWAN POP)	Connectivity Mode
A	< 100 meters and situated within the same premises	Cat 6 Copper LAN
B	➢ 100 meters but < 200 meters	OFC/ WiFi LAN
C	➢ 200 meters but < 3 km with clear LOS	WiFi LAN/ LAN extension on Non-exchange Private Wire from BSNL
D	➢ 3 km	Conventional Leased Line

WBSWAN connectivity up to all Blocks in the State implemented over terrestrial leased circuit hired from single bandwidth provider BSNL. The SHQ implemented in two location high availability ode. The original SHQ created in 2001 has been retained at Writers' Building (Secretariat of the Government of West Bengal at Kolkata). The 2 Mbps connectivity to the districts and lateral connectivity emanating out of the Writers' Building have been terminated on the new router installed in a newly built SHQ at WebelBhwan, Salt Lake, Kolkata. The two units have been linked using 4 Mbps leased circuit to provide redundancy. The backbone has been built around Cisco routers and switches uses EIGRP protocol. However, the modus operandi of the leased circuit provisioning is different in the two routers at the two locations. Where in the Leased circuits are aggregated and supplied as an integrated STM1 OFC feed directly into the router at WebelBhawan, Salt Lake, Kolkata, the aggregated STM1 link is terminated on an onsite DLC of BSNL at the Writers' Building and bunch of demultiplexed and individual E1 circuits over copper is feed to the router at Writers' Building. The lateral connectivity for Kolkata nodes were earlier exclusively provisioned from Writers' Building SHQ. After the WebelBhawan SHQ has been provisioned the distribution of lateral nodes has been provisioned based on location proximity and nodes in and around the area of Salt Lake are being provisioned from the new SHQ. WebelBhawan SHQ is going to be collocated with the State Data Center (SDC) and is connected over OFC at the gigabit core switch port of the SDC. All POPs of expanded WBSWAN has built in redundancy with respect to Serial ports and has sufficient headroom for enhancing the bandwidth, once the WBSWAN usage builds up.

Each of the DHQ and the SHQ has layer 3 switches in addition to the routers. Each router is equipped in such a way that large number VPNs can be created in the network. Lateral connectivity for individual department/ directorate is implemented over individual VPNs to ensure exclusivity, confidentiality and security. In addition to the Routers and switches, the WBSWAN is provided with Firewalls at multiple locations as well as

NIDS, HIDS at SHQ to implement network security. Trend Micro IMSS suite is installed in the SHQ and provides Antivirus support to all registered PCs in the network. However, any department connected on horizontal/ lateral mode has to install their own antivirus protection. The WBSWAN has a built e-mail server running on Lotus notes. Two types of Video conference facility are inbuilt into the backbone. A conventional 48 port MCU based studio type VC system based on Polycom system is deployed in all DHQs and few department HQs in Kolkata. Custom built software based VC solution, INVC, is available upto all Block HQ. The system is also being installed in different Urban Local Bodies (ULB) and offices under Municipal Affairs Department and different offices of the Land & Land Revenue Directorate. WBSWAN is also equipped Call Manager and Voice gateway for IP telephony using IP phones as well as analog phones and EPBX connected to FXS modules on routers. Power supply system for the WBSWAN nodes has been fortified with Isolation transformers feeding into Double Conversion IGBT based UPS. In aggregating nodes like DHQ and SHQ is equipped with dual redundant UPS system working in hot standby load sharing mode. D.G Sets are provided for power back up for all nodes.

5. EXPANSION OF SWAN UNDERNeGP

The growth and expansion of WBSWAN got a boast after the NeGP phase. The Government of West Bengal designated WebelTechnologies Limited (WTL) (subsidiary of WBEIDC LTD) as the State Nodal Agency for the WBSWAN under NeGP. Indian Institute of Technology (IIT), Kharagpur has been appointed as the 'External Network Consultant' for SWAN. West Bengal opted for the first option of extension of SWAN by a private operator, who would be selected through the process of competitive bidding. The SWAN extension project, as sanctioned by Department of Information Technology (DIT), Government of India (GOI) is as follows - **Project A**: Expansion of WBSWAN up to all Gram Panchayats in the pilot district: Bardhaman(to be completed by June, 2007) and **Project B**: Expansion of WBSWAN up to all Blocks of the balance 17 districts.

For the SWAN project, Bharat Sanchar Nigam Limited (BSNL) was selected as the Bandwidth provider. As per the policy guidelines, the DIT, GOI shall bear the cost capital and cost of operation for 5 years. The bandwidth cost and the site preparation etc. would have to be borne by the State Government. The DIT, GOI guidelines also laid down the horizontal connectivity of 20(twenty) offices at the State level, 10(ten) offices at the District level and 5(five) horizontal offices at the block level. The Government of West Bengal identified 369 PoP (Point of Presence) in the State along with 56 co-located nodes. The *Apex Committee* in its 3rd Meeting held on 10th February 2006 identified the 20(twenty horizontal offices at the State level, 10(ten) at the District level and 5(five) at the Block level which are as below:

Table- 3: Twenty state level offices located at state capital for horizontal connectivity

SL No.	Name of the Offices	SL No.	Name of the Offices
1.	BikashBhawan, Salt Lake	2.	PouroBhawan, Salt Lake
3.	MayukhBhawan, Salt Lake	4.	NagayanBhawan, Salt Lake
5.	PurtaBhawan, Salt Lake	6.	ParibeshBhawan, Salt Lake
7.	SechBhawan, Salt Lake	8.	JalasampadBhawan, Salt Lake
9.	New Secretariat Building	10.	Police Commissioner, Kolkata
11.	BhabaniBhawan	12.	Jessops Building
13.	KhadyaBhawan	14.	4, Camac Street
15.	Raj Bhawan	16.	Commercial Taxes Office
17.	Employment Exchange Office	18.	ATI, Salt Lake
19.	SwasthyaBhawan	20.	Survey Building

Table -4: Ten field level offices located at districts for horizontal connectivity

SL No.	Name of the Offices	SL No.	Name of the Offices
1.	Police	2.	Irrigation and Water
3.	Health	4.	L & LR
5.	Education	6.	ZillaParishad
7.	Agriculture	8.	Food & Supplies
9.	Women Development & Child Welfare	10.	Water Investigation & Development

Table- 5: Five field offices at block level for horizontal connectivity

SL No.	Name of the Offices	SL No.	Name of the Offices
1.	Police	2.	Irrigation and Water
3.	Health	4.	BL & LRO
5.	ARO		

The Department of Information Technology (DIT), Government of West Bengal constituted the following committees for successful extension of the WBSWAN under NeGP:

1. State level SWAN Project Implementation Committee chaired by the Chief Secretary, Government of West Bengal by vide Memo No. 315 DS(IT)/IT/P/28/2005 dated 25.05.2005 and later partially modified vide Memo No. 792 DS(IT)/IT/P/28/2005, dated 29.11.2005.

2. Burdwan SWAN Project Implementation Committee chaired by Sabhadhipati, BurdwanZillaParishad vide Memo No. 312 DS(IT)/IT/P/28/2005 dated 25.05.2005 and later partially modified vide Memo No. 791 DS(IT)/IT/P/28/2005 dated 29.11.2005.

3. Technical Committee including representatives from IIT, Kharagpur and DIT, GOI vide Memo No. 375-SIT/IT/P/28/2005 dated 22.06.2005.

4. Committees for the Evaluation of the Financial Bids vide Memo No. 80-SSIT/IT/O/55/2005 dated 04.04.2007.

WTL Ltd floated request for proposal (RFP) for the expansion of the WBSWAN up to Gram Panchayat in pilot district of Bardhaman (NIT No. 02/ WBSWAN/ EXP/05) on 30th December 2005.WTL Ltd floated RFP for the expansion of WBSWAN to all the districts, sub-divisions and blocks except Bardhaman (NIT No. 02/ WBSWAN/EXP/06) on 25th May 2006. Tulip IT Services Ltd was awarded the WBSWAN expansion project on Build Own Operate & Transfer (BOOT) model. The total project cost was Rs 53 Crores ($ .53 billion). Tulip IT Services will deploy, manage and operate the entire network for a period of five years. The Annual Report, 2006-07 of the Department of Information Technology, Government of West Bengal is explicit about the extension of the WBSWAN connectivity up to the Block level- the intermediate tier of the Panchayati Raj system in West Bengal. The capital expenditure of the entire project would be funded by the Department of IT, GOI. This means extension of connectivity to 65(sixty five) sub- divisions and 341(three forty one) blocks. WTL Ltd floated RFP for Co- located Nodes for WBSWAN (NIT No. 01/WBSWAN/EXP/09/Rev 3.0) dated 14th May 2009.

6. CURRENT STATUS OF WBSWAN

The current status of the connectivity and spread of the WBSWAN as on 1st January 2012 are presented in Table 6 to Table 9. The connectivity of sub-divisions, blocks and gram panchayat in all the 18 districts are shown in Table 6. The horizontal connectivity of the important offices, directorates and secretariats located in the State capital are presented in Table 7. The horizontal connectivity in the districts is shown in Table 8. The horizontal connectivity in the districts is the connectivity of the different field offices of different departments (police, health, education, agriculture, women & development, child welfare, L & LR, zillaparishad, food & supplies, water investigation & development). Table 9 shows the details of the various departments of the Government of West Bengal implementing geographically located e-governance applications using the WBSWAN backbone.

Table- 6: WBSWAN connectivity of Sub- divisions, blocks and panchayats district-wise as on 01.01.2012

District	SD	WBSWAN as on 01.01.2012	Mbps	B	WBSWAN as on 01.01.2012	Mbps	GP	WBSWAN as on 01.01.2012	Mbps/ Kbps
Darjeeling	04	04	2	12	10	2	134	-	
Jalpaiguri	03	03	2	13	12	2	146	-	
Cooch behar	05	05	2	12	12	2	128	-	
Uttar Dinajpur	02	02	2	09	05	2	98	-	
DakshinDinajpur	02	02	2	08	04	2	65	-	
Malda	02	02	2	15	12	2	146	-	

Burdwan	06	06	2	31	31	2	277	277	64
Murshidabad	05	05	2	26	17	2	254	-	
Nadia	04	04	2	17	13	2	187	-	
North 24 Parganas	05	05	2	22	20	2	200	17	64
South 24 Parganas	05	05	2	29	25	2	312	13	64
Hooghly	04	04	2	18	17	2	210	-	
Howrah	02	02	2	14	14	2	157	17	64
PurbaMedinipur	04	04	2	25	20	2	223	-	
PaschimMedinipur	04	04	2	29	17	2	290	-	
Bankura	03	03	2	22	14	2	190	-	
Birbhum	03	03	2	19	12	2	167	-	
Purulia	03	03	2	20	11	2	170	-	
	66	66		341	266		3354	324	

Note:

1. SD: Sub Divisions
2. B: Block
3. GP: Gram Panchayat

Table- 7: Horizontal Connectivity of important government offices at state capital as on01.01.2012

SL No.	Name of the POP	Name of the Office/ Building	Connectivity Status as on 01.01.2012
1.	Administrative Training Institute (ATI) (State training institute)	SHQ WEBEL BHAWAN	✓
2.	BikashBhawan (School Education, Higher Education & Technical Education Departments)		✓
3.	ILGUS Bhawan		✓
4.	JalasampadBhawan (Water Resources Department)		✓
5.	MayukhBhawan		✓
6.	NagarayanBhawan (Urban Development Department)		✓
7.	NIC, BidyutBhawan (National Informatics Centre, W.B State Unit)		✓
8.	ParibeshBhawan (Environment Department)		✓
9.	PouraBhawan		✓
10.	PurtaBhawan		✓
11.	SechBhawan (Irrigation Department)		✓
12.	SwasthyaBhawan (Health Department)		✓
13.	Chief Electoral Officer	SHQ WRITERS' BUILDING	✓
14.	Commercial Tax Office		✓
15.	Employment Exchange		✓
16.	IT Dept		✓
17.	Jessop Building(Rural Development &Panchayati Raj Department)		✓
18.	KhadyaBhawan (Food Supplies & Consumer Affairs Department)		✓
19.	New Secretariat Building		✓
20.	Police Commissioner Office		✓
21.	BhabaniBhawan (West Bengal Police, State Information Commission)	DHQ, ALIPUR	✓
22.	Survey Building		✓

Note: ✓- Connectivity completed

Table -8: Horizontal Connectivity in Districts as on 01.01.2012

Name of the District	A	B	C	D	E	F	G	H	I	J
Darjeeling	×	Y	×	Y	×	×	Y	Y	×	×
Jalpaiguri	×	Y	×	Y	×	×	Y	Y	×	×
Cooch Behar	Y	Y	×	Y	×	×	Y	Y	×	×
Uttar Dinajpur	Y	Y	×	Y	×	×	Y	×	×	×
DakshinDinajpur	×	Y	×	Y	×	×	Y	×	×	×
Malda	Y	Y	×	Y	×	×	Y	Y	×	×
Murshidabad	Y	Y	×	Y	×	×	Y	Y	×	×
Nadia	Y	Y	×	Y	×	×	Y	Y	×	×
North 24 Parganas	Y	Y	×	Y	×	×	Y	Y	×	×
South 24 Parganas	Y	Y	×	Y	×	×	Y	Y	×	×
Hooghly	Y	Y	×	Y	×	×	Y	Y	×	×
Howrah	Y	Y	×	Y	×	×	Y	Y	×	×
PurbaMedinipur	×	Y	×	Y	×	×	Y	×	×	×
PaschimMedinipur	×	Y	×	Y	×	×	Y	×	×	×
Purulia	×	Y	×	Y	×	×	Y	×	×	×
Bankura	×	Y	×	Y	×	×	Y	×	×	×
Birbhum	×	Y	×	Y	×	×	Y	×	×	×

Note: Y – Under implementation, × - Not started
A: Police, B: Health, C: Education, D: Agriculture, E: Women Development & Child Welfare, F: Irrigation & Water, G: L & LR, H: ZillaParishad, I: Food & Supplies, J: Water Investigation & Development.

Table- 9: Departments implementing e-governance applications on WBSWAN backbone as on 01.01.2012

SL No.	Department	Network Details	Category
1.	Directorate of Treasuries & Accounts (DTA)	DTA is one of the largest users in Government of West Bengal who have used the WBSWAN backbone to implement a directorate WAN connecting different district /sub division treasuries to their collocated WBSWAN POP. The WAN connectivity is completed with SHQ POP at Writers Building being connected to DTA Headquarters in Kolkata. The remote treasuries being mostly collocated with DM/ SDO offices get connected to the respective WBSWAN POP through extension of the LAN. All of the 87 treasuries and pay & accounts offices have been connected with WBSWAN to the SHQ.	G2G
2.	Department of Health & Family Welfare	Swasthya Network, leveraging the WBSWAN connectivity with 2 Mbps linking 9 Medical College & Hospitals, 18 District Hospitals, 8 Specialty Hospitals, Central Medical Store, Central Blood Bank and West Bengal University of Health Sciences. The Tele Medicine system is working on this network.	G2G
3.	Department of Municipal Affairs	All the 121 Municipalities (Urban Local Bodies) and 6 Municipal Corporations across the State connected with WBSWAN as part of the initiative of the Municipal e- Governance.	G2G
4.	t Bengal Police	Crime & Criminal Tracking Network and Systems (CCTNS) of the West Bengal Police	G2G
5.	Directorate of Commercial Tax	All the charge offices at Head Quarters and charge offices are connected with WBSWAN. Six numbers of important check posts are also connected with the centralized system.	G2G
6.	Land & Land Reforms Department	The field offices of the L & LR in the Howrah district are connected with WBSWAN.	G2G

7. CURRENT STATUS AND CHALLENGES

In a reply given to LokSabha Standing Committee on IT (2009-10) by the Department of Information Technology, Government of West Bengal, the following status update had been included:

- Connectivity between SHQ to DHQ: Two 4 Mbps links, upgradeable to 8 Mbps
- Connectivity between DHQ to SDHQ/ BHQ: 2 Mbps upgradeable to 4 Mbps
- Total number of POPs to be created in 367 out of which 321 POPs have been completed by Network Operator and 12 sites is yet to be allocated by Government of West Bengal
- 303 numbers of POPs completed by BSNL with L/L Circuit
- PAT (Partial Acceptance Test) completed for 286 locations.
- FAT(Final Acceptance Test) has been conducted by the third party Auditor
- 329 DG sets has been installed and commissioned out of 367
- 50 per cent advance payment for radio modems to connect TNF sites already made to BSNL in May, 2010
- 18 Government departments are connected to WBSWAN in Kolkata. The departments of Police, PHE, PWD and Directorate of Treasuries & Accounts, Commercial Tax offices are also connected to WBSWAN.
- Wi Fi already extended to all 277 Gram Panchayats in the Bardhaman district
- Connectivity to Gram Panchayat level through WIMAX being rolled out in three Districts i.eJalpaiguri, Bankura and Howrah
- QGR to start by mid -September 2010

The specific problems/ hurdles faced and addressed are the ***allocation of space*** which is due to space constraint in some of the POPs, it was difficult to identify adequate room-space. The hurdle was crossed by intervention of senior Government of West Bengal officials. In some cases the network racks have been wall mounted in Block Development Officer's chamber. BSNL being the only service provider having reached up to all the blocks was chosen as Bandwidth Service provider for the project. State HQ POP initially planned in the State Headquarter at Writer's Building could not be located there due to severe space constraints. New space has been located at Webel Headquarters at Salt Lake, Kolkata near the proposed SDC site. A collocated node had to be however created at the Writers' Building, Kolkata to handle the Video Conferencing requirement of senior officials of the State Government. This was created and maintained out of State funds.

Service Level from BSNL is another issue. The WBEIDC is not been able to get BSNL sign an SLA for the circuits. BSNL offers to sign only for OFC and MLLN circuits which constitute only 15 per cent of the total WBSWAN. For the rest of the circuits BSNL can provide only "Letter of Comfort". 5 per cent circuits have been declared as Technically not Feasible (TNF) by BSNL. Through DIT, GOI and GoWB has sanctioned extra funds for radio connectivity, BSNL is yet to implement the same even after payment of extra funds in advance 4 months back. The Mean Time to restore/repair for the rest of the circuits is stretching to days. In absence of redundant link not sanctioned in the original DIT, GOI SWAN scheme the up time for the majority of the circuits can't be assured. Deployments of applications in the Blocks and beyond are hence seriously jeopardized. The resolution of the problem could not be assured in spite of seeking help from DIT, GOI.***Delayed project completion by Network Operator (TULIP)*** is another problem. Regular follow up and review being conducted at senior GoWB official levels. Though services like Video Conferencing, VOIP, Data Services to various GoWB departments, hosting of the State Portal is in place, in absence of formal FAT completion the QGR could not be started.

Table- 10: Budget Allocation, Expenditure & Unspent Fund Details (2007- 2011)

WTL Ltd (WBSWAN)	NeGP Fund ($ billions)		Status as on August 2010 ($ billions)			
Year	Total Outlay		Expenditure Incurred		Unspent Balance	
	Grant from GOI	Grant from GoWB	From GOI	From GoWB	From GOI	From GoWB
2007- 08	13	1.5	2.82	0.00	**10.18**	**1.47**
2008- 09 C/F + New	10.2	7.8	1.37	1.26	**8.9**	**6.53**
2009- 10	8.9	25.13	0.46	1.40	**8.4**	**23.73**

C/F + New						
2010- 2011 C/F + New	8.4	24.45	0.00	0.17	**8.4**	**24.38**

Note:

1. The above financial details presented to Parliamentary Standing Committee on IT (2009- 10).
2. C/F stands for Carried Forward.
3. GOI – Government of India
4. GoWB – Government of West Bengal

The unspent fund as on August 2010 shows the shortfalls in the planning and implementation of the project. Apart from the above, the following issues related to WBSWAN have been highlighted by the Department of Information Technology (DIT), Government of West Bengal in their internal policy note on June, 2011. WBSWAN has been conceived with redundancy at the equipment level primarily at the aggregating nodes. The network operator has been bound with SLA terms and the same is being monitored by an independent Third Party Audit agency. Round the clock manning of the SHQ node has been provided for. The other aggregating nodes like the DHQ and SDHQ are also manned. In spite of efforts of DIT, GoWB and DIT, GOI, SLA is yet to be provided by the bandwidth provider (BSNL). In absence of any redundant link for majority of the nodes this has proved to be a major issue in providing service continuance to users. The security against SPAM, virus attack etc has been provided for the back bone equipments. The individual departments using the WBSWAN back bone have to provide for antivirus and other security features for their respective deployed equipment. Similarly, since the equipments deployed by the departments independently, the operation, maintenance of the deployed equipments are to be independently arranged.

8. VISION2021

In 2021, WBSWAN would be celebrating 20 years of its journey (2001 – 2021). A vision has been developed for WBSWAN with specification of some milestones to be achieved. The successful achievements of these milestones would be analyzed with a revisit on 2022.

Table- 11: Targets to be achieved by 2021

Particulars	Total	Status 2011	Vision 2021
Districts (administrative sub-units of a State)	18	All the 18 districts connected with State Headquarter through WBSAN with 8 Mbps.	8 Mbps would be up-graded to more advanced versions and technology.
Sub-Divisions (administrative sub- units of a district)	66	All the 66 sub-divisions are connected with district headquarter with 4 or 2 Mbps	All the 66 sub-divisions would be connected with more advanced versions of WBSWAN.
Blocks (administrative sub-units of a sub- division)	341	266 out of 341 blocks are connected with 2 Mbps.	All the 341 blocks would be connected with 4 Mbps.
Gram Panchayats (village level politico- administrative units)	3354	Only 324 panchayats are connected under WBSWAN and at some palces WIMAX technology has been implemented	All the 3354 panchayats would be connected and there would be random utilization of WIMAX technology.
Horizontal connectivity at District level	180 points	70 points are under implementation	All the 180 points would be fully connected.
Horizontal connectivity at Block level	1705 points	Nil	All the 1705 points would be connected.

Apart from the above it is also expected that the Government of West Bengal Ensuring will ensure convergence of stake holders on real time share basis which is missing- example SLA (BSNL) not delivering, two e- districts of Bankura and Jalpaiguri districts not have 100 per cent connectivity. The Government will also keep the user environment free of virus as contamination can destroy data and would bring in PPP (Private Partner Partnership) at implementation level for online services under G2C mode when UIDAI will enable delivery at push button mode.

9. CONCLUSION

The objective of this study is to analyze the growth and development of West Bengal State Wide Area Network (WBSWAN) from its initiation i.e. from the year 2001 to the year 2011. This study has important practical implications for

the government decision makers. Till date no analysis in the form of any impact assessment or any other has been conducted either at the official level or by any academic institution. This study is successful in giving a clear picture of the targets established and achieved in this period 2001- 2011. It is found that the Government agencies have succeeded in connecting all the headquarters of the administrative districts (18) and 78 per cent of the blocks of West Bengal. The study also highlighted the poor performance of the agencies with respect to connectivity to the gram panchayats which is only 10 per cent as on 1st January 2012. The Department of Information Technology (DIT), Government of West Bengal need to take strong policy initiatives for rapid connectivity of the gram panchayats which are the pillars of grass root governance. This study is also successful in bringing the deficiencies and short-comings in project management and implementation as well as unspent funds. The Government needs to restructure the project management strategies and implementation policies.

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