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Implementation of IT-based services in Rural India

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Abstract- India has emerged as a global hub in providing I.T. (Information Technology) based services adding value to businesses around the globe. But is this expertise being used to add value to its own rural sector? IT-based services play a significant role in - minimizing processing cost and time, increasing scalability, reliability, availability, Manageability and transparency – Thereby scaling up the efficiency of the processes (Business/Governance) to which they are applied. Several commendable initiatives have been taken by govt. as well as private organizations to provide IT-based services to rural India to make full use of information and communication technology (ICT) expertise. This paper analyses some of the successful projects ,already in place ,providing IT-based services to the last mile in rural India and the implementation of an ambitious project of establishing 1,00,000 Common Service Centers(CSCs) across the country at Gram Panchayat (Local Government body) level by Govt. of India under its National e-Governance Plan (NeGP). The paper also highlights the issues and challenges lying ahead in implementation, sustainability and success of these projects.
Keywords- Common Service Centre (CSC), e-Governance, India, Information Technology, NeGP, Rural Development

I. Introduction

In India nearly 2/3rd of the population lives in rural areas, which is nearly 700 million living in about 0.6 million villages. India is a multicultural and multilingual country with its vast geographical and varied climatic conditions. Basic infrastructures like transport and power are inadequate to support its huge population. In these conditions implementing any kind of service or doing business in rural India becomes an uphill task. The task becomes even more challenging as most of the rural population is poor (living on less than 2 dollars a day). In spite of the fact that India has state-of-the-art technology and expertise in providing IT or ICT based services to the world, its own rural population has not realized the full potential of IT-based services.

In this paper in section II we discuss some of the successful IT-enabled projects providing services to common citizens. Most of these projects have been started independently. Then in section III we discuss about the Government of India's initiative in providing e-government services to rural India under its National e-Governance Plan (NeGP). In section IV we have suggested the services which can be provide at CSCs as well as at kiosks operated by social entrepreneurs. Section V elaborates the issues and challenges which have arisen in earlier projects and may further arise during implementation of NeGP. Section VI deals with the issue of sustainability failure and section VII is a brief conclusion.

II. Some successfully implemented it-enabled services

A. e-Sagu

e-*Sagu* (*Sagu* in Telugu means *cultivation*) is a system which provides Agriculture experts (Scientist's) advice to remote farmers through internet. It was developed at International Institute of Information Technology (IIIT), Hyderabad under supervision of computer science Prof. P. K. Reddy. Reddy realized that the farmers in rural areas are facing problems and low yields because of non-availability of timely expert advice. He noted that agriculture expertise and knowledge is available in India but there is gap in dissemination of expert advice to the farmers. By using Web Technology and database concepts Reddy's team developed an agricultural expert advice dissemination system. Using it farmers now get quick (about 24 hours or one day), timely and personalized expert advice (consultancy services). This model is very cost effective, scalable, replicable and sufficiently efficient. The farmers of the Andhra Pradesh are practically benefiting a lot from this system. e-*sagu* is a 3 tier system -Farmer at remote village, Coordinator (educated farmer in the village) who takes information from the farmers using camera and questionnaire at villagesand agricultural expert at urban / city / research location. Till now coordinator

sends the crop status and problem on CD to the agricultural expert on weekly basis. Then agricultural expert sends suggestions online to the e-sagu centre. This system has improved the productivity of the region and farmers are taking benefit of it. [1]

B. e-Sampark

Initiative of e-*Sampark* (*sampark* in Hindi means contact) project is taken up by Chandigarh Department of Information Technology. Through 10 centers in the city & 13 centers in the villages e-Sampark is providing "One-Shop-Stop" for 22 G2C and 5 B2C services. These services include Issue of Birth / Death certificate, payment of taxes, water / sewerage / electricity bills, sale of stamp papers, booking of tube-well for irrigation in rural areas. Citizens are satisfied with this facility as it removes the multiple interaction points and waiting time in queues. E-sampark is being extended as e-Jan Sampark to provide free information dissemination to its citizens. The services include providing all procedures & forms for all departments & health related information, daily updates, inquiry related to passport status, Railway booking status, train timings etc. For grievance redressal services, complaints related to all departments are registered at e-Sampark centre with an ID which can be further tracked.[2]

C. Gyandoot

In year 2000, *Gyandoot*(*Gyandoot* in Hindi means Purveyor of knowledge) intranet based information and service delivery project was taken up by Government in Dhar district of Madhya Pradesh in Central India. The network is Govt. owned. This intranet connect 34 rural cyber cafes kiosks called "*Soochanalayas*" , each giving service to 10 Gram Panchayats (local government body) and in total serving 30000 populations. Services planned through *gyandoot* are commodity/*mandi* (local market) prices, issuing domicile/caste/income certificate, land holders Land rights certificate and loan pass book [3]. These kiosks run on Windows NT, IIS server. The remote access server is placed in District Panchayat. The information kiosks are based on dial-up connectivity or VHF / WLL (wireless in local loop) technology developed by corDECT and n-lounge communication. Based on the success of Gyandoot similar model has been developed in Sitapur district of Uttar Pradesh named as *Lokvani* to provide e-government services[4]. Another case is *Drishtee* project which has been taken up by a social entrepreneur on the lines of *Gyandoot*. *Drishtee* is currently functioning in many states of the country through its kiosks in the rural areas. [5]

D. Bhoomi

Bhoomi is an e-governance project taken up by the Department of Revenue, Karnataka with technical assistance from National Information Centre (NIC) in Karnataka state of southern India. The aim of the project is to provide hassle free land rights, tenancy and crops (RTC) record to the farmers.20 millions records of land ownerships of 6.7 million farmers have been computerized to make these data available online.

Earlier, farmers had to wait from 3 to 30 days, pay bribes ranging from few hundred to thousand rupees to bureaucratic/government officials to get the land title certificates. This computerization of land records has brought faster availability of land records and their mutation done within 30 days. Earlier it could be up to 1-2 years. Now mutation request can be put online. Mutation requests are processed on First-in-First-out basis. Using Touch Screen Kiosk easy & quick access to land records documents & status of mutation has been made available in rural areas.

Accountability of the operators of computerized system has been ensured using bio-login system (along with maintaining logs of all the transaction made). Now the land records have come in public domain. These land related documents are available for just Rs. 15/- within 30 minutes and this model has proven to be financially self-sustainable. *Bhoomi* project can be taken as a model for other e-governance projects.[6]

E. e-Chaupal

e-Chaupal (*Chaupal* in hindi means *A gathering place*) is an initiative taken up by one of the India's large corporations ITC's International Business Division to give farmers the best price of their agricultural produce by eliminating role of middlemen using a set of Information and Communication Technologies (ICT). E-*chaupals* are totally owned and set up by ITC.Typical e-*Chaupal* kiosk consists of a Computer and Internet connection via telephone line or VSAT link. A local farmer

(called *Sanchalak*) operates the kiosk, who is trained by ITC. Earlier, farmers had to sell their produce at *mandi* (Government mandated marketplace), where prices were decided by *mandi* middlemen (irrespective of the prevailing market prices) and weighing was done improperly. Farmers had to bear the transport, commission and handling charges. At e-*chaupal* farmers can sell their produce at previous day's closing price, where the crop is weighed electronically and payment is done on the spot. Transport cost is reimbursed to farmers by e-*chaupal*. Farmers are given bonus points for crops with quality above the norm which are exchangeable for the products which ITC sells. This model has become a great success in rural India and sets an example of doing business in rural India with profitability. Table [7] below shows the current and future plans of ITC e-*chaupals*:

e-Choupal	Now	Next 5 Years
States covered	10	15
Villages covered	40,000	100,000
No. of e-Choupals	6,500	20,000
Farmers e-empowered	4 million	10 million

III. National e-governance plan

In India over past decade many isolated and independent projects have been undertaken with the aim to provide services to its rural population. These efforts have provided organizations great opportunities to learn and understand from their successes & failures. Some of these initiatives like e-*sagu*, e-*sampark*, e-*seva, e-chaupal* and *Bhoomi* have become very successful and they can be taken as examples to replicate.

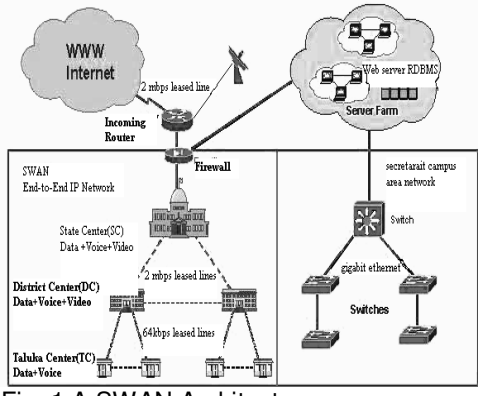

Fig. 1 A SWAN Architecture

Department of Information Technology, Govt. of India, has taken initiative to bring government services to the citizen's door step. This initiative was called National e-Governance Plan (NeGP). NeGP was approved on 18th May 2006 by Government with the vision to *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 cost to realize the basic needs of the common man.*

What is the Plan?

The NeGP envisages to implement many Mission Mode Projects (MMPs) into several ministries of central government & state government to create a wide spread & substantial impact. To take the benefit of e-governance to the grass root level special emphasis he been put to create 1 Lakh common service centers spread across the urban & rural India.[8]

Implementation Strategy

For the implementation of NeGP, DIT has to create the Commuication and Support Infrastructure (National/ State Wide Area Networks(SWAN), National /State Data Centres(SDC), and Common Services Centres (CSC)& Electronic Service Delivery Gateways and make suitable arrangements for monitoring and coordinating the implementation of NeGP.

1. SWAN – To establish network infrastructure it has been planned to create a State Wide Area Network (SWAN) in each state. Govt. of India will support the establishment of SWAN up to district *taluka* or block level. States have been given 2 options to establish SWAN.

I. By identifying & suitable PPP model (BOO, BOOT) and select a suitable agency for establishment, operation & maintenance of the network.

II. Designate NIC as the main implementation agency for the SWAN establishment, operation & maintenance.

The minimum bandwidth of network up to district & block level has been planned to 2 mbps dedicate (lease lines / satellite). In some cases to ensure connectivity in case of link failure ISDN Back up is also planned.

Current status of Implementation of SWAN

Establishment of SWAN in most of the states of the country is in full swing using

PPP/NIC model. Till March 1, 2009, SWAN is implemented in 6 states (Haryana, Himachal Pradesh, Tamilnadu, Chattisgarh, Delhi, and Tripura). Implementation was at advanced stage in 13 states and in other states it is in progress. All of the states, who have taken up implementation of SWAN, have set the time line to complete the implementation by Sep 2009.

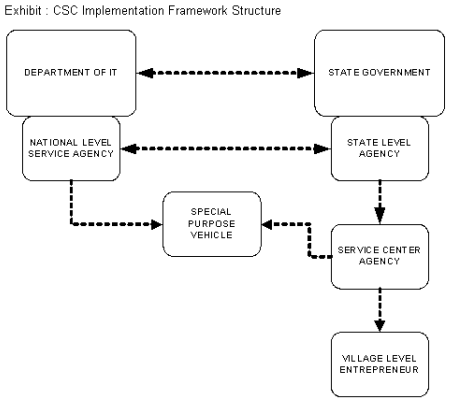

Fig. 2 CSC implementation Framework

Andaman & Nicobar and Goa have opted out of SWAN scheme. They are implementing WAN under other scheme.

2. Common Service Centre (CSC) – In India there are approximately 6,00,000 villages. To deliver the government, private and social sector services to the grass root level in these villages. Government has envisaged to open 1,00,000 common service centers (CSCs), at least one CSC in a cluster of 6 village (in a honey comb structure) at Panchayat level. These CSCs will be broadband internet enabled. CSCs are planned to have IT-enabled Kiosks having a PC along with printer, Scanner, UPS etc. CSCs would cater high quality & cost effective voice & data content. Each CSC would be owned and operated by a Village Level Entrepreneur (VLE) who is a local from the respective Panchayat. The VLE is the key to success of CSC. He is expected to have good entrepreneur traits, strong social commitment, a passion for the welfare of fellow citizens and commands respect within the community. Services to be provided at CSC are – Information in form of agricultural inputs, weather, commodity prices, health and services in the form of e-government, tele-medicine, bill payments , bookings, data entry, digital pictures, education, e-learning, micro-finance etc. In e-government services CSCs will offer various application forms, certificates and nodal point for payment of various bills like electricity, telephone and water bills. Government of India has decided to establish these CSCs based on Public Private Partnership (PPP) model. It has appointed Infrastructure leasing & Financial Services (IL & FS) as the National level service agency (NLSA) for project development, facilitation and coordination of the CSC scheme. [9]

NLSA has major responsibility to carry out speedy implementation and management of rollout of CSCs through SCAs (service centre agencies), who will establish and operate the CSCs. SCA will be responsible for a division of 500-1000 CSCs. A state Designated Agency (SDA) identified by the State Government will be responsible for managing the implementation over the entire state.

IV. Services that can be provided

In India citizens have to depend on government for many services. Government plays an important role in day to day life. Some of the government works are administered by central government and other powers are delegated to state government. For administration state is divided in many districts, which have subdivisions (called *taluka*) then block and Gram Panchayat. Common citizens have to go to government for services like land registration, copy of land rights certificate, birth/death/caste/domicile certificates, payment of taxes, railways, treasuries, police, municipality, judiciary etc. They have no choice to go elsewhere. In most cases getting access to these services becomes a time consuming and irritating process due to slow processing and multipoint interactions. People have to wait in long queues for almost all the services.

Wherever IT-enabled services have been implemented, the process has become considerably faster as single point delivery of the services has become possible. Citizens are pleasantly surprised with the new systems, be it the case of e-*sampark* in Chandigarh, e-*seva* in Andhra Pradesh or *bhoomi* in Karnataka. This shows the huge scope of IT-enabled services when implemented properly.

IT-enabled kiosks are able to provide multiple services under one roof through single window. Proper interdepartmental integration in providing services can help to add more services successfully e.g. if '*Bhoomi'* land record project is integrated to banking services, farmers can get loan for their crops quickly without any hassle.

Table-I shows the list of services which can be provided online through Common Service Centres (CSCs). It contains the role of State and Central governments as well as other services which can be provided by private players, corporations or social entrepreneurs. Proper implementation of these services can become a source of profitable and sustainable ventures.

Table 1- list of services

State Government Services	Central Government Services	Other Services
Gram Panchayats	Income tax	Tele-medicine
Land Records	Electoral Services	entertainment
Commercial Tax	Passport Visas	horoscope
Agriculture	MCA 21 (opening new business)	matrimonial services
Municipality	Banking	employment opportunities
Treasuries	Pensions	career counseling
Land Record	Insurance	e-Education Distance learning
Police	Central Excise	e-Bazar online sale of rural products
Judiciary	EDUSAT	mobile bills/ Recharge
Education	National ID	Banking / Financial services microfinance
Civil Supply	Legal Support	

V. Issues and challenges: the road ahead

- To keep the huge infrastructure of SWANs fault tolerant.
- To cope up with the power cuts in the rural areas, which are sometimes up to 15 hours a day.
- To keep providing new services; to keep abreast with the advancement in technology.
- To help rural population to increase their per capita income through CSCs to ensure sustainability of the system.
- Integration with the new services, departments and ensuring proper
- interoperability between different departments.
- Ensuring consistency of data. In the case of *Bhoomi* Project IT Audit report [10] points out that name of the land owners in 99,186 cases were recorded as junk characters in 3 talks tested. Also data in several fields were found incorrectly captured.
- Ensuring updated data availability. It was recorded in the audit report that in *Bhoomi* project there are delays in updating the crop data.[10]
- There are inadequate physical security and authentication controls observed in the IT audit. At one of the e-*Seva* centers incident of theft of router (Cost Rs. 3 Lakh) shows inadequacy of physical access security.[11]
- User account management system, network security, preventing unauthorized access to the database by putting database servers at some other location than the kiosk itself Data transmission should be in encrypted form.
- Irregularity of data was observed in case of e-*Seva* in as many as 9277 transactions involving transaction of Rs.68.43 *Lakh* pertaining to electricity charges, the consumers name was blank. Inter departmental transaction data were mismatched.[11]

Wherever the projects have been implemented successfully there have been at least few people who have continuously put forth their efforts. They had a strong self motivation towards implementation of the project. To take a few examples S. *Shivakumar* is the man behind ITC's e-*chaupal* initiative, *Rajeev Chawla*, Additional Secretary Department of Revenue, *Karnataka* (Project champion) has been instrumental in implementing *Bhoomi* Project, *Lokwani* project on the lines of *Gyandoot* project was a brainchild of *Amod Kumar*, District Magistrate, *Sitapur*, in Uttar Pradesh.

To overcome the challenge to implement the initiative taken by Government of India to implement NeGP we need to have these *three Powers*

Will Power*:* There must be strong will, support and dedication from all the stakeholders not only till implementation but also in day to day operation.

Man Power*:* For proper implementation and functioning of the system well trained and skilled manpower has to be in place all over the country.

Electric Power*:* To keep the implemented

system up for the maximum possible time (round the clock) power backups like solar panel and batteries must be made available.

VI. Sustainability of CSCs

Study of Kumar & Best (2008)[12] points out that there can be multiple reasons which can cause sustainability failures of rural IT-based kiosks ; Lack of financial viability leads to closure of kiosks; Inability to generate sufficient income for the operator or owner of the kiosk; Lack of proper technical and operational support from the technology provider. This causes failure of connectivity for a prolonged period.

To ensure the sustainability of NeGP – it is VLE (Operator of the CSC) whose role becomes very important. VLE must be available full time to help rural people, and should always ensure fair practices & transactions at the centre and services involved. Regular update of new & relevant content in the websites is also necessary to sustain. Common service centers (CSCs) should become a facilitator of improving per capita income by providing timely agricultural advice (as in case of e-*sagu*). Providing market / commodity prices information (as in case of e-*chaupal*).

VII. Conclusion

This paper has briefly reviewed some of the successful initiatives to provide IT-based services in rural India. It has then discussed the NeGP initiative. It is important to provide need based services in rural areas for economical feasibility. As C K Prahalad [13] points out that rural population is value conscious and they accept new technologies rapidly if it proves to be beneficial for them. Therefore while implementing the project main focus should be to provide low cost, reliable and useful services to the rural population. It will ensure the success of the project being implemented. The project of this kind of huge size and complexity not only poses big challenges but also opens the doors of great opportunities.

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