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Building E-Literate Societies through E-Governance in Kerala

Chandana Unnithan and Bardo Fraunholz

The advancements in Information Communication Technologies and diffusion of the pervasive Internet into societies world wide had sparked the creativity of governments in many nations, to create new channels for public services delivery. The article details about literacy to citizen empowerment through e-governance and how and why various projects have started. Explained in detail are the various initiatives like FRIENDS for distribution of services, Akshaya-the project to bridge the digital divide, SLIDE-State Level Informatics System for Strengthening the Decentralized Plan Implementation—focused on creating effective and responsive mechanisms for governance at local levels, AIMS (Agricultural Information Management System) and e-Krishi to refine the efficiency of administration and implementation of varied plan programs of department of agriculture.
1. Introduction

The advancements in information communication technologies (ICTs) and diffusion of the pervasive Internet into societies worldwide had sparked the creativity of governments in many nations, to create new channels for public services delivery (Kumar and Gupta, 2006). In retrospect, the Indian government had widely acknowledged for three decades, that the usage of ICTs in the public sector could offer important benefits such as cost savings through rationalisation, improved planning and more effective public service delivery (Madon, 2003). Furthermore, Dogra (2005) concurs that the economic benefits and efficiency gains for the government are well recognised.

In the year 2000, the United Nations (UN) established a broad set of Millennium Development Goals and amongst the most prominent was to “make available the benefits of new technologies — especially information and communication technologies” (Brewer et al., 2005:25). Rudimentary for the diffusion and growth of technologies that enable electronic services delivery is literacy, which confronts developing nations in particular. The digital divide that remains in India is perhaps the main cause of it being ranked 37th among 133 nations, in terms of electronic government services delivery (Shrikanth, 2004). Nevertheless, among developing nations, India is considered exemplary in progressively deploying e-Governance reforms to empower citizens in democratic processes (Fraunholz and Unnithan, 2007). The main impasse of the economy is achieving the even spread of literacy across the country and bridging the digital divide.

E-governance, in the context of this chapter, relates to public services delivery by governments, through active participation by citizens, thereby engaging and empowering them in the democratic governance processes. It has been acknowledged that e-Governance has the power to enable transparency and accountability in governments, thereby reducing corruption via wider community participation (Bhatnagar, 2001) in the Indian context. Fraunholz and Unnithan (2006) highlighted the success of e-Governance in India in facilitating its progress as a democracy, by empowering the citizens.

Varied initiatives have been progressing at national and state levels, initiated by the respective governments, supported also by private partnerships to increase
the reach of ICTs to average citizens. The ninth national e-Governance conference held at Kochi, in the southern state of Kerala, in India, showcased citizen right to information and exhibited transparency of government (Hindu, 2006). This event was jointly organised by the Department of Information Technology (DIT), Department of Administrative Reforms & Public Grievances and Department of Information Technology, India. The award for commendable leadership and ICT achievement for the year 2006 was awarded to the computerisation initiatives of Kerala State Government (Hindu, 2006).

Kerala State had become an exemplar for other States of the Indian Union with its achievement of total literacy in 1991 (KSLM, 2007). Furthermore, it has achieved some visionary successes such as the Akshaya project, which created the first wholly e-literate village (Parthasarathy, 2003) in a typical backward district in Malappuram, setting a benchmark among developing nations. In this chapter, we examine some major initiatives in the state of Kerala that is facilitating the transition to a digital society through empowering citizens, *via* e-Governance. The chapter narrates the objectives, implementation and where information is available, the assessed impact of the projects on the quality of life of the citizens within the State. It is a snapshot in time and not a complete research analysis of all the existing and ongoing projects within the State, which is beyond the scope of this chapter. Nevertheless, the chapter expects to inform wider research on the successes of the State, which may be expanded by interested academic and other communities worldwide.

2. Literacy to Citizen Empowerment through e-Governance

For any e-Governance venture to be successful, one of the key factors is the literacy of citizens in the respective constituencies and bridging the digital divide that often exists between remote and metropolitan areas. According to Aruna Sunderarajan, the IT Secretary of Kerala, the southern Indian State of Kerala has set itself the goal to "make it the country's first e-literate state and to be a 100% digital society" (Shrikanth, 2004). Recognising the digital divide within the State, the government has been organising e-literacy campaigns throughout the state, with an objective of removing the fear of the unknown (ie technologies/computers) (E-gov Kerala, 2007). This has no doubt, helped in building a minimum set of skills in all people through functional IT literacy training, creation of relevant
local contents to benefit all interest groups thereby being an enabler in generating substantial economic growth. Furthermore, it has also enabled the creation of direct employment opportunities in the state, thereby developing the socio-economic scenario within the state. A comprehensive technology policy was primed with the objective of taking technology to masses in 1998 (Shrikanth, 2004).

The initiatives, may it be the application of information technology to public services delivery, or connecting the government to citizens and businesses, they reflect the conviction that service has to be above commercial gains. The government aims to make the services delivery transparent, efficient and accountable (KIT, 2007a).

2.1 Making FRIENDS

The Fast Reliable Instant Effective Network for Distribution of Services (FRIENDS) was a pioneering e-Governance initiative of the Department of IT, Government of Kerala, through its nodal agencies KSITM and TSP-CDIT (Friendscentre, 2007). To date, it is considered one of the most successful initiatives of the Kerala State government. FRIENDS centres facilitate the collection of various payments pertaining to the payees within area limits of the municipality or corporation, through an easily accessible and convenient single collection centre. A typical centre offers collection of remittances from the participating departments or institutions at any of its available counters. The centre has pertinent infrastructure and conveniences such as a visitor lounge with a colour television where citizens can wait until token number comes up on the screen with the respective counter number (Friendscentre, 2007).

The project was implemented by the Information Technology Department, Government of Kerala (DIT, 2007) through its nodal agency, the Kerala IT Mission in conjunction with other participating departments like the Kerala Electricity Board, Kerala Water Authority, Civil Supplies, Revenue Department, MG University, BSNL etc. Participating departments were empowered with the freedom to maintain payment counters in their office premises. Currently, FRIENDS counters handle bill payments of seven departments i.e. revenue, motor vehicles, civil supplies, local bodies, universities, electricity, water, and telephones (DIT, 2007). The project was launched in Thiruvananthapuram Corporation in.
When the project was initiated, the aim was to set up a one stop service centre for the public. The idea was that remittances are processed within the minimum possible time, providing help desks and complaint boxes for frequent feedback and improvement, available throughout the week including Sundays from 9am to 7pm except for public holidays and every second Saturday (Friendscentre, 2007). The centres were conceived as multipurpose facilities, helping not only with bill payment services but also acting as information kiosks on government activities. Varied constraints have rendered difficult to realise these objectives. To address the constraints, the government decided to set up call centres. To begin with, the Thiruvananthapuram facility was enabled by a call centre that provides information to the citizens on various government procedures and norms. For instance, if a citizen were to acquire a ration card or a building permit, procedural details can be obtained via a telephone call to the call centre (Friendscentre, 2007). Since the inception of the project, FRIENDS has coverage in all 13 districts of Kerala with one centre at each of the district head quarters. There are plans to start more centres in districts such as Ernakulam, where the urban population is higher (e-gov Kerala, 2007).

In 2007, the project was assessed by 31-Infotech, an independent agency where the overall score of the project was found to be 53.33, which fell under the category of Good projects (DIT, 2007). Friends centres made a drastic change in the perception of common citizens and their attitude towards the public service departments. For example, citizens are able to save significant time for paying their dues to the different government bodies. Students in particular save costs of conveyance when the university is situated almost 60 kms away from their home (DIT, 2007).

2.2 Perpetuating Prosperity – AKSHAYA

Launched in November 2002, the AKSHAYA project was an effort by the IT department of the Kerala State to bridge the digital divide (Shrikanth, 2004). It was the second major e-government initiative of the State, with the objective of bringing in total e-literacy in the State and bridging the recognised digital divide (Radhakumari, 2006a). At the inception, the project had the objective of setting up a network of 6000 information centres, which will potentially impact
families in the State. It also aimed at generating and distributing locally relevant content, improve public services delivery and create employment opportunities. The implementation was made through Panchayat Raj Institutions and involved private enterprises in the development of training institutions and content generation (Shrikanth, 2004).

Pasha (2004) offered a close look at the technological implementation of the Akshaya project, also considered as India's and world's biggest rural wireless network (Djick, 2007). Initial attempts at using dial-up connections between locations had failed, because bad quality connections allowed less than 10 percent of the centres to go online. To achieve the objectives of the project, it was recognised that an 'always-on' connectivity is required. However, wiring the entire district spread across 3,550 square km was overwhelming. The geography comprised the Nilgiris mountains in the east, the Arabian Sea in the west, evergreen forests, ravines, hills, rivers, and palm fringed coasts. Particularly difficult was the terrain of Malappuram district with thick vegetation and hilly conditions rendering it unsuitable for radio frequency set up. Subsequently, the state government decided that rolling out a wired infrastructure would be impractical and expensive (Pasha, 2004).

Thereafter, the government sought solutions from wireless solution providers, particularly investigating the feasibility of having a single wireless hybrid solution. From among 75 solution providers offering solutions, Tulip IT Services Ltd was chosen as the wireless system integrator for the project because the government found that the solution was based on hybrid technology, claimed to be scalable, and economical. A wireless network was designed with fibre in the backhaul by a team of four people from Tulip IT Services Ltd, who worked with the Kerala State IT Mission's technical panel. Tulip began implementation in December 2003 with a 40 member team and post implementation of 10 people were to remain to manage the network (Pasha, 2004).

As Djick (2007) informs, the project uses a combination of various wireless technologies to provide internet access to 3,500 square kilometers of rural areas in the rough and rocky terrain of Malappuram. The network is set up with a central Network Operating Centre (NOC) to the Internet and provides cha-
bandwidth. They have routers and firewall. All network traffic flows through this central access point. A radio tower stands next to the NOC which provides wireless Internet access to POPs (points of presence). Each of these POPs is a radio tower on a hill, which provides access to local Akshaya centres and relay access to the next POP (Djick, 2007).

Pasha (2004) explained the implementation which clearly explained the scalability and economic nature of the network, as follows.

“The backhaul fibre cables was laid by Bharti Telecom. Subsequently, Tulip chose a mix of wireless technologies such as Wireless IP in Local Loop (WipLL) and Versatile Intelligent Network (VINE) for implementation. Specifically, the backbone utilises VNE which has seven VINE points, using 2.4 GHz frequency, spread across the district connecting to the fibre backhaul cables laid by Bharti Telecom. The backbone itself is a number of radio links with high capacity. Due to VINE technology, each repeater station requires only one radio with two antennae: one facing forward and another backwards, which reduced the number of radios to half. At the same time, the throughput of radios in VINE is high at 8Mbps. This kind of network topology allows easy scalability. If the bandwidth requirement doubles to 16 Mbps one can simply add another pair of radios to the existing infrastructure. The radios at the POPs can also talk to other radios in the adjoining backbones creating mesh architecture, building redundancy into the system in the process. All the 630 Akshaya centres hook up to 22 POPs using WipLL radio stations. WipLL is based on a Multipoint Microwave Distribution System (MMDS) used for Internet access and the equipment from Airspan Networks (a UK-based company) has been used for this project. Sectoral antennae that cover 90-degree sectors are being used at the base station. Four such antennae offer complete 360-degree coverage. The transmission has a capacity of 4 Mbps although the government mandated requirement is 16 Kbps to 64 Kbps. This bandwidth is being used to provide services like e-Governance, voice, intranet, and video for e-learning (Pasha, 2004).”

The implementation as explained above won the project the PC Quest award for Best IT implementation in 2004 (Akshava, 2007a).
Radhakumari (2006a) reports the implementation of this project in stages. Initially, the pilot implementation have benefitted 583,264 people spread over 78 Panchayats and the municipalities in the district of Malappuram, a typical backward area in the State. At least 1,000 persons from each Panchayat were converted into e-literates, ready to take advantage of the Internet. It became India’s first 100 percent e-literate district, as the project created over 620 kiosks and generated employment to over 2,500 people in the area. In the second stage, the project was rolled out into another six districts. Subsequently, as the IT Secretary of the State, Sunderarajan envisioned, “with the success we have derived from Malappuram, the government has decided to replicate the Akshaya model in other districts of Kerala. Our vision is that Kerala should become India’s first fully e-Literate State (Pasha, 2004)”.

The functioning of the project (Radhakumari, 2006a) is via the Public-Private Partnership model where three tier Panchayats lead the planning and the selected private entrepreneurs conduct the implementation. The project itself has been divided into three phases: the first phase is for achieving 100 percent e-literacy in the State; the second phase is the “e-vidya” program, where all citizens who have completed the first phase take part in the 30 hour computer training program and achieve a recognised certification; and the third phase is the “Internet Package” which involves comprehensive training in the use of Internet including browsing for knowledgeable information and is provided with a free email account. Thus, Akshaya e-centers provide training that not only familiarises people with the basics and scope of IT, but also ensures hands-on skill in operating a computer. Shrikanth (2004) reports that a “carefully designed content module in Malayalam of 15 hours duration per person is a major highlight of the project. The process of providing the skill sets is creating a long lasting relation between the Akshaya centers and the families in the area”. At the time when Shrikanth (2004) reported, approximately 6 lakh people in Malappuram were trained.

The impact of the project on the quality of lives of the citizens was assessed through a survey in 2006 (Radhakumari, 2006a,b), using two independent variables sex and marital status and a series of variables such as specific reasons for undergoing training, utilisation of training for generation of income and so on— in
In a gender comparison, the basic awareness regarding technologies was higher among females in Calicut as compared to Malappuram. Interestingly enough, the decision to undergo training was more out of willingness than compulsion in both districts and among genders. In Kerala, a significant portion of people live overseas, especially in Gulf countries. The reason to undergo training was cited as the need to be in touch via Internet to their families as well as to be involved in the educational development of their growing children—among all people surveyed. Analysis of survey data also reveals that an equal proportion of females and males are trying to use the knowledge gained for generating a permanent source of income (Radhakumari, 2006a).

The success of the project can be attributed to exemplar leadership by the State Government in creating the necessary environment, mobilising unemployed youth and private entrepreneurs, thus promoting self-employment and entrepreneurship development in the State, while involving local bodies and citizens in the knowledge revolution, enabled by the Internet. Of particular significance is the utilization of technology as an entrepreneurship development tool that acted as a "spark plug" which transformed the entire State (Radhakumari, 2006b). A survey was conducted on the Akshaya project to analyze the unique contribution made by the project to entrepreneurship development. The sex-wise composition of the private entrepreneurs revealed that the proportion of males is more in both the districts surveyed and they have readily joined the utilization of employment opportunities, which came through the form of the project. However, females also have taken active development in the entrepreneurship activities. The study of selected entrepreneurs based on marital status revealed that more of the married members are actively involved in the project implementation. This result is attributable to the support between couples for an effective outcome. A significant proportion of entrepreneurs were identified as educated and unemployed youth. For example, 29 percent from Calicut and 25 percent from Malappuram district were youth who had completed school level up to year 12. The analysis of nativity factor revealed that majority of entrepreneurs were from the same region that they hailed from. Majority of the entrepreneurs perceived the project as a method to achieve total computer literacy in rural areas and thus wanted to participate in a government initiated venture. The investment was considerably low, as the government panel assessing education and potential for entrepreneurship
The Akshaya project won Silver Icon award in Innovative Operations and Best Practices—New Entrants for Exemplary Implementation of e-Governance Initiatives for the Year 2004, for implementing the project in Kerala to address the issue of digital divide in the state in an integrated and holistic way. Providing ICT access to all sections of the society even those located in the remotest part of the state, development of minimum skill sets to all the people through functional IT literacy training and creation of local content to benefit all the interest groups are the main components considered while selecting the project for the award (Akshaya, 2007a). In the year 2005, the project was selected for the Golden Nica award of Prix Ars Electronica in the Digital Community category for the year. The award was constituted by Austrian based Ars Electronica. Akshaya receives the honour, as the project achieved integration of multiple objectives of mass e-literacy, entrepreneurship development, ICT interventions and community upliftment in the state (Akshaya, 2007a). Currently, the project has been involved further in activities to improve quality of life such as health mapping of citizens of the State; bio-diversity mapping and planning for herbal cultivation; water preservation mapping to help improve drinking water facilities; and establishing tribal access points in the respective areas (Akshaya, 2007b).

2.3 Sliding into a Strong Self-Governance – IKM

A project better known as SLIDE (State Level Informatics System for Strengthening the Decentralised Plan Implementation) was conceived in 1997 to focus on creating efficient and responsive mechanisms for governance at the local levels (IKM, 2007a). The project, evolved into the better known Information Kerala Mission or IKM, which then computerized and established a wide area network connecting the 1,215 local governing bodies throughout the state. The uniqueness of IKM project is the extensive effort taken in systems documentation, the overall emphasis on business process re-engineering and development of an integrated services backend database. The IKM project is an attempt to strengthen local self-governance through ICT applications. It addresses the entire array of issues concerning local body governance, decentralised planning, and local economic development (IKM, 2007a).

The main success of IKM has been the enabling of savoir-faire Panchayats,
the Panchayats (IKM, 2007b). The Vellnad Panchayat in Kerala state has been declared the first fully computerized in India and the current activities involve initiatives that replicate the model in other Panchayats in Kerala State (IKM, 2007b). The IKM has among its software solutions for citizens the Sevana which keeps an observant eye on the demographic development of the state, via civil registrations and widening the reach through social security schemes (IKM, 2007c) and a variety of others such as Sanchita, the site that keeps citizens abreast of laws, Samoohya the citizen database, Saphalya the human resources site for job seekers and providers and so on (IKM, 2007a).

The Janasevakendrams or People Service Centres were established as a concept for replacing the non-user friendly counters in municipalities and to cater to the demanding new generation (Janasevanakendram, 2007). It is a modern technology facilitated front office, situated within respective municipality offices and corporations to cater to the needs of average citizens. Unnikrishnan (2006) reports on the impact of IKM projects, which was assessed via a survey in 2006. The quality of service delivery has shown improvement through the Jansevanakendrams, with perceptible improvement of services in 60 percent of the cases surveyed. Similarly, the metrics for Sevana showed that time for issuing a new certificate has reduced from 5 days to 5 hours and time for issuing an old certificate has reduced by 50 percent. The time for disbursing pension had reduced to 5 hours from 10 days and time for disbursing social security has reduced from 4 days to 1 day (Unnikrishnan, 2006).

2.4 Cultivating Growth – AIMS and e-Krishi

The objective of the Agricultural Information Management System (AIMS) was to refine the efficiency of administration and implementation of varied plan programs of the Department of Agriculture, Government of Kerala, so that the ultimate objective of delivering the benefits anticipated to the farmers is speedy (KIT, 2007c). The software is installed for one Directorate, 14 districts, 61 agricultural farms, three soil testing labs and one floriculture centre. Registration at State, District, Block and Krishi Levels takes care of the basic details of the location of the office and there is flexibility to work with State, District, Block and Krishi levels (KIT, 2007c).
One of the major criteria was the security of data from unauthorised access (KIT, 2007c). Master data can be updated only at the Directorate and there is high security at Krishi level even when the entry takes place at Block Level during the time of hardware failure. There is comprehensive software for all levels i.e. Krishi, Block, District and the Directorate offices. Software registration takes care of basic details of installation site. There is uniform coding by way of maintaining the State Level Control of directories. Software patches for directory updating (masters) are available at all centres. Fast search enables quick entry from key attributes of the database. There are facilities for user-defined queries. Import-Export data facility is available through mail or media for better data exchange between Krishibhavan, block, district and the Directorate. Software is adaptive and can easily include the new schemes and head of accounts with minimum changes. E-mail integration is facilitated for reports and data transfers; and there is online help (KIT, 2007c).

The AIMS networked 1,500 offices spread across the state, through which farmers can access the database in the Krishi Bhavan to know about the soil conditions and get details of Government schemes, relief measures and other beneficial data (Kurian, 2007). The Collectorate, Palakkad became the first IT enabled district headquarter in the country. The project titled "DC Suit" is a web enabled, centralised and integrated service delivery solution and comprises of a set of applications covering all areas of work in the collectorate. It enables electronic file management, revenue recovery management and public grievance monitoring. Government to Government network and Government to citizen access through the internet are the major highlights of this project (Kurian, 2007).

The reported impact on the society has been manifold (KIT, 2007c). Farmers even in the remotest villages have access to computers in the Krishi Bhavan and the databases. Thereby, a better interface between the farmers and agricultural offices imparting knowledge about status of soil conditions, analysis of land etc become easier. The details of varied schemes are made available from the database. Moreover, details regarding varied relief measures to sustain agricultural activity during natural calamities, crop diseases etc are easily accessible.
In an interview with the special secretary for IT in the State, KR Jyotilal, Kaul (2007) reported that under the framework of the National e-Governance plan, the State is further gearing up towards launching more projects. Among them is e-Krishi which aims to establish a connected farmers community throughout Kerala which will have access to information on market demand, prices, good agricultural practices, and quality agricultural inputs supported by a technology enabled robust transaction platform that facilitates all their offline activities. According to Jyotilal, as of end January 2007, there was an established network of 7,500 farmers in the Malappuram district and more than 10,000 farmers and buyers registered in the e-Krishi portal for selling and buying produces (Kaul, 2007). As of then, the project had developed linkages with agricultural institutions, krishi bhavans, agroclinic centers, krishi vinjana kendraams, soil testing lab, seed farms, agricultural industries corporation, agri related centers, agricultural banks, directorate of marketing (Agmarknet), agricultural organizations, NIC, Kudumbasree or family welfare unit etc. A portal providing trade related information known as VUAT Kerala, connected to WTO, is maintained by the virtual university for agricultural trade, attached to the Kerala Agricultural University (Kaul, 2007).

2.5 Registration Make Overs – PEARL

The Registration department touches citizens at all levels, at some point of time. The dreary manual routine of this work was transformed via the implementation of Package for Effective Administration of Registration Laws Software (PEARL). The Sub Registrar Offices are fully automated, enabling quick registration of documents, issue of certificates and all related activities (Kurian, 2007). The reported benefits of this project are (KIT, 2007d):

- Registration of a document and returning the original which used to take about a week, is now possible in an hour.
- Preparation and issue of Encumbrance Certificate, which used to take about 15 days earlier, can now be done in about 15 minutes. The computer printed encumbrance certificate in the place of hand written certificate adds quality to the services of the department.
2.6 Ownership Redefined – BHUREKHA

The objective of BHUREKHA, meaning land records is to issue the Record-of-Right to the landowners on request (NIC, 2007). The software was developed to create, update and retrieve the records about land in suitable formats. It has been implemented in the taluks of Kerala. Data related to various activities namely Transfer of Registry, Land Assignment, Land Acquisition and Land Relinquishment are captured with the help of the software to form a centralised database for land records (NIC, 2007).

The software provides facilities to generate Thandapper Accounts Register and Puramboke Register. Online query system within the software provides facilities to view a Thandapper account in no time (NIC, 2007). Another major highlight is the facility provided to shortlist the details of similar names by giving surname and name so that same person having different Thandapper account can be easily identified and brought under the same account by the officials, which is practically impossible in the manual system. The land records database once built-up may help various agencies like banks, agricultural agencies, financial institutions, planning organisations, local bodies, Land Use Board etc. Since its inception in 1997, to date, the project has achieved in minimising corruption, updating village records, monitoring disproportionate land allocation to a single owner and in achieving certain level of efficiencies (NIC, 2007).

2.7 Reaching Rural – RURAL SOFT

The ‘Rural Soft’ is a web enabled e-Governance application for Rural Development Department of Kerala (KIT, 2007e). It enables citizens to monitor various schemes implemented at the Grama Panchayats and Block Panchayats, which are of interest to them, like construction of rural roads/village wells/school buildings etc. Particularly, they are informed of the works being undertaken or taken up, not taken up, with reasons, thus helping them to provide timely feedback to the government on what infrastructure is required for the locality. The gap between the Government and Citizen in the developmental activities is thus narrowed, bringing them closer to each other. Data capturing is done from the village panchayats and block Panchayats which are the implementing agencies of this scheme which is
additional wage employment in rural areas. This tool helps the officials at the District, State and Centre in monitoring the achievements of the scheme more efficiently and with more transparency (KIT, 2007e).

2.8 Secretariat Nurtures the SWAN

Secretariat is the Administrative Headquarters of Kerala Government and its buildings house the offices of all Ministers, Secretaries to Government and 37 Departments. These Departments are housed in six blocks (KIT, 2007b). A substantial automation process christened SWAN (Secretariat Wide Area Network) was initiated to link key areas of the Secretariat—the annexe, Vikas Bhavan and the Public Office in a phased manner. The implementation of SWAN was to scale up the current system: Secretariat Internet Communication System (SICS).

Meanwhile, the government is also in the process of establishing a state-wide area network aimed at linking the various district head quarters with the capital. This infrastructure, once completed, will become a platform to deliver various e-Governance services. The government has decided to set up accelerated data centers at Kochi and Kozhikode. The bandwidth for interconnecting is provided free of charge by service providers (DIT, 2007). The ICT vision 2010 document for Kerala (Kurian, 2007) envisages that community infrastructure will be built through the State Wide Area Network and establish rural connectivity by hooking villages to Internet by 2010.

2.9 Empowering Examinations – SSLC and HSC

This project involved the setting up of a full-fledged computer centre with four servers and one backup server at the Pareeksha Bhavan by the Government of Kerala (KIT, 2007f). Each server was connected to 20 nodes in client-server architecture and an intranet connects all these servers, the final result processing is done in a single server. The tabulation work is presently done by using data entry operators, abolishing the old practice of using about 3000 teachers from all over the state. The software developed for processing Secondary School Leaving Certificate examination and Higher Secondary Certificate examinations and the subsequent dissemination of results are addressed by the 'Examination
The objective of the Higher Secondary Examination System and SSLC examination system is to automate all activities with respect to Higher Secondary and SSLC Examinations. These systems take care of all activities starting from enrolling a candidate to the examination to the issue of result. The post result activities like revaluation, post result correction, duplicate certificate issue are done by the systems (NIC, 2007). The impacts are that marks obtained by students are released along with results, a detailed mark list is available via Web, authenticity is assured by web based reference for certificates and speedy declaration of withheld results (KIT, 2007f).

2.10 Enabling Employment – THOZHIL

In the Kerala State, unemployment of the educated is a big concern. The process of state level recruitments via Employment Exchanges is a slow process because of the sheer volume of people register as compared to the limited number of staff available to provide selection lists in time. Therefore, the government envisaged computerisation of the exchanges as a solution to this problem. The idea was conceptualised with a view that more employers, including private employers would be attracted to the exchanges, due to the possible availability of shortlists quickly and job seekers will be the beneficiaries. The implementation of the Thozhil Software, is expected to provide efficiency and transparency, as the job seekers can see their details any time. This software expects to computerize varied activities such as registration and renewal, vacancy booking, preparation of order cards, selection of candidates, preparation of seniority lists and such other reports (KIT, 2007g).

Mahendra (2007) reports that Kerala state government is counting on open-source software to boost its IT literacy rates by quoting the vision of the current Chief Minister, VS Achudanandan. “Kerala has always been a leader in literacy, and now we want to make Kerala a leader in e-literacy... We believe that free and open-source software is an essential component in our drive to democratise information technology and bring its benefits to all sections of society.”

3. E-Enabling Infrastructure – SMART CITY

A recent report (Venkiteshwaran, 2007) exude with optimism that Kerala will be
offering a talent pool of engineering graduates and the state software exports showing a 50 percent annual growth, as compared to 33 percent at national levels. The high costs of operation and congestion in metropolitan cities of India has paved its way for investments in green field areas such as Kochi, in Kerala. The Dubai based Tecom Investments FZ-LLC has invested in the Smart City, considering the excellent talent pool of science and engineering graduates. The 8 universities in the State has approximately 25,000 engineering graduates annually and the employee attrition rates remain less than five percent in centres of excellence such as Indian Institute of Management and Indian Institute of Technology and Management. Conversely, infrastructure developers such as Larsen and Toubro, the Leela Group, Sobha Developers, Cochin International Airport Limited and the Muthoot Group are launching ventures in the State.

In September 2005, the Dubai Internet City team signed a memorandum of understanding (MOU), with the government of Kerala for setting up a smart city in Kochi (Smartcity, 2007). The total project cost would be INR 15 billion and the team is expected to bring in the entire investment. To start with, Kerala government is providing them 200 acres of land in Kakkanadu, near the Kochi Infopark. The smart city will need around 1,000 acres of land when it reaches the final stages of the project. The Smart City, expected to create more than 100,000 new jobs in the first stage and around 5 Lakhs jobs directly and indirectly in the last stage, would provide critical infrastructure for IT services and IT-enabled service companies (Smartcity, 2007).

The Peninsula reports (Mary, 2007) hope for local IT industry captains that the much needed eco system that the state requires to attract global players will be achieved via this project. Global brands such as Microsoft, Intel, Sun Microsystems, Hewlett Packard, Cisco, IBM, Dell, Siemens and Sony Ericsson would enjoy the same benefits here as the Dubai Internet City. A National Association of Software and Services Companies (NASSCOM) survey on 9 leading Indian ITES destinations covering a range of parameters including land costs, power and communication infrastructure ranked Cochin as the second best ITES destination above metros like Bangalore, Mumbai and New Delhi. Kerala is less polluted and cleaner than most parts of India. Direct flights to Kerala from Singapore and the Gulf with connections to the East and the West are another
4. Outlook

The State of Kerala, in India has made its mark earlier in literacy and post the information revolution in the field of ICT literacy diffusion. While the State boasts 100 percent literate citizens and high education levels among youth, unemployment levels are also high, leading to significant brain drain with an exodus mainly to gulf countries. The high levels of education and density of population with limited employment opportunities, has rendered the youth helpless in their decision to go overseas as otherwise depending on unemployment benefits.

However, in the past decade, the non-resident Indians, hailing from this State, seemingly have begun investing in it, contributing to certain levels of development, especially in airports and information technology related entrepreneurial activities. Leveraging on this strength, as well as taking on board the demands of a new generation of youth, the Government of the State has begun e-Governance initiatives also to utilise the pervasive power of the Internet and ICTs. Combined with computerisation of most government departments, citizen centered and participative programs have been envisaged, which since their inception, seemingly have improved the quality of life of the citizens within the State. The reforms have seemingly resulted in capacity building, kick started entrepreneurship activities, uplifted the life of families and rural areas in particular, reduced corruption and have enabled better efficiencies. The impact of these projects have been self-assessed via surveys, taking samples at different phases of projects. The accolades given to the projects also reflect exemplary successes.

Nevertheless, we recommend independent assessment of varied projects, also linking them together so as to reveal the overall impact on the quality of life of citizens, to evaluate a the real value of e-Governance initiatives. Such an evaluation may also reveal project overlaps that can be avoided, optimising resources for better utilisation in future. We wish to conclude this chapter, a narration of selected initiatives, successes and assessed impact, by throwing the forum open for such an evaluation, which we would like to initiate in the future.
Building E-Literate Societies through E-Governance in Kerala

(Chandana Unnithan, Lecturer, La Trobe University, HIM Department, School of Public Health, Faculty of Health Sciences and also Associate Lecturer at Deakin University School of Information Systems, Faculty of Business and Law, Australia, and can be reached at chandana.unnithan@deakin.edu.au)

Bardo Fraunholz, Senior Lecturer, Deakin University, School of Information Systems, Faculty of Business and Law, Australia, and can be reached at bardo.fraunholz@deakin.edu.au).

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