

Chapter 3

Case Studies

Introduction

“Peoples all over the world have high hopes that new technologies will lead to healthier lives, greater social freedoms, increased knowledge and more productive livelihoods”

Human Development Report, 2001
[Making New Technologies Work For Human Development]

There are a number of social scientists who believe that we are now living in a new “Information Age”. There are others who have serious doubts about the validity of the notion of an information society [Webster, 1997]. Irrespective of the reach and spread of this new age, one must concede that there has been some sort of change in the world economy during the past two decades. This change has been empowering for some and marginalising for some and this change has been in some way related to Information and Communication Technologies. The World Development Report 2000-2001 states “the global forces of integration, communication and technological advance have proceeded apace, bringing significant advances to some. But they have bypassed others”.

There is increasing recognition of the potential of technology in improving the quality of human lives. The Human Development Report 2001 says that “technology is like education –it enables people to lift themselves out of poverty. Thus, technology is a tool for, not just a reward of, growth and development”.

Like with all paradigms, this one too has attracted its share of criticism and praise. On one side of the spectrum there are those who swear by the inviolable need for information technologies and its vast potential to bring about development .On the other side there are those who focus on the exclusion and misery that it can bring about in people’s lives. Everything in this world is Janus-faced, so is technology. “If technology offers particular benefits for the developing world, they also pose greater risks.”[Human Development Report 2001]. Thus the key to harnessing information technology in developing countries is by applying it to situations where it is appropriate, affordable and beneficial and this is often not easy to figure out *apriori*.

Since there is a possibility that information technology can lead to exclusion, special care must be taken to see that its use leads to greater capabilities and greater choices among people, the poor in particular.

The Impact Assessment of ICT projects

In the broadest sense, impact assessment is the process of identifying the anticipated or actual impact of a development intervention, on those social, economic and environmental factors which the intervention is designed to affect.

However, most assessments focus excessively on quantitative issues: How many people accessed, what technologies are used, how much cash, how much increased production, or how many jobs are generated, rather than a broad range of human and livelihood issues. Project impact assessments tend to look inward on internal management issues, focusing on existing project objectives, through planned activities. To gain a picture of the broader development and poverty reduction impact of projects, assessments must take a longer-term view, looking at both intended and unintended consequences of projects across a variety of livelihood concerns. They should also look beyond the target beneficiaries to consider all stakeholders.

Impact, by definition, involves “demonstrating the social, cultural, economic, political, environmental and other benefits that are associated with the consequences of making effective use of information”

Approaches to Impact Assessment

Any approach to analysing the use of ICTs must start with overall development goals and an understanding of the role of information to meet those goals, and only then go on to see how ICTs and other technologies might help.

- **Conventional approaches** to impact assessment focus on whether a project has met its stated objectives and contributed to the achievement of the overall project goals. This approach uses criteria of project relevance, efficiency, effectiveness, impact and sustainability and looks at both intended and unintended impacts. Most of the ICT projects tend to follow this method. While this method can be a cost-effective method, the following demerits often make an evaluation a ceremonial exercise.

Evaluation based on conventional approaches, if not properly administered, can become a one-way linear process, with little or no feedback to the project. In an ICT

project, project recipients and all stakeholders should be involved in understanding the internal dynamics of their project, its successes and failures, and in proposing solutions for overcoming the obstacles and utilising the ICTs in context.

- **Participatory evaluations** in ICT projects should primarily be oriented to the information needs of the programme stakeholders. The scope of participants should include all stakeholders, beneficiaries and non-beneficiaries of the programme. This will result in finding the reasons for not participating in the programme. Participant negotiations are very important to reach a consensus on evaluation findings, and to solve problems and make plans to improve performance. Views from all participants should be sought as more powerful stakeholders can undermine the others in a group. Many ICT projects suffer from a lack of understanding of the project aims, objectives and concepts by all the stakeholders. New technologies, such as the Internet, can often be difficult to rationalise and care is needed to prevent some people from becoming marginalised due to their lack of understanding of the technology. For example, a project to bring Internet connection to peri-urban enterprises via Telecentres was surprised to find what was expected from the Internet. The beneficiaries were told it could provide information, and one beneficiary stated that he thought it would be useful to find out where was the cheapest place to buy his shoes!
- **Sustainable livelihoods** is a systematic approach that links issues of poverty reduction, sustainability and empowerment process such as participation, gender empowerment, human rights and good governance. We have adopted our own framework which essentially adopts the essence of the SL Framework.

Development requires the removal of major sources of unfreedom: Poverty, as well as tyranny, poor economic opportunities as well as systematic social deprivation, neglect of public facilities as well as intolerance.

An important way of evaluating the role of IT would be to view its role in ‘Capability Enhancement’. The word ‘Capability’ here has a much deeper meaning than that appears at first sight. The evolution of Prof. Amartya Sen’s ‘Capability Approach’ has its roots in the development discourse that has been and is the hub of ever-changing ideas.

Development is about expanding capabilities where the expansion of human capabilities has both direct and indirect importance. The indirect role works through the contribution of capability expansion in enhancing productivity, raising economic growth, broadening development priorities, and bringing demographic changes more within reasoned control. The direct importance of human capability expansion lies in its intrinsic value and its constitutive role in human freedom, well-being and quality of life. It treats human beings as goals or ends in themselves and not just as a means to higher income and growth. Development, in this view, is the process of expanding human freedoms, and the assessment of development has to be informed by this consideration.

Thus what is extremely important while judging policies or programs is the ultimate impact on human capabilities and not just the impact on economic growth. This is essentially the policy implication of the Capability Approach as one would gather. It is suggested that the holistic view of development provided by Sen's Capability Approach justifies its adoption for the current analysis.

Knowledge as Power or Vice-Versa?

The new types of market failure which are analysed in modern micro theory are closely related to informational or knowledge failures. In case of market failure, market prices either does not exist or do not reflect the true value of what they are pricing or they are irrelevant. [Meier, 1997] If information is inadequate or inaccurate, market signalling will not be read or correctly interpreted by the agents in the market. A certain resource allocation will occur, but it will differ from the efficient allocation based on accurate and adequate information. [Meier, 1997]

Stiglitz, one of the students of the new market failure theories, emphasises informational imperfections and incomplete markets. He propounds the thesis that market failures related to imperfect and costly information may provide insights into why developing countries have a lower level of income: "What is at stake is more than just differences in endowments in factors, but basic aspects of organisation of the economy, including the functioning of markets..."[Meier, 1997]

Failure to use knowledge is explained either by the information provided being inappropriate to decision-makers' needs or by institutional arrangements which are inadequate for the optimal exploitation of information

(Davies, 1994). Further, there may be different perceptions between the providers and users of information, which might reduce the utility of knowledge within a particular context.

It is hypothesised that the type of information disseminated determines the utility of the knowledge created which in turn influences (depending upon obstructive/facilitative structures of power) the formation of the capability set, thereby ultimately impacting the freedom of individuals. It is true that pre-existing functionings also determine the ability to realise the potential of knowledge but since poor people have a limited capability set, it can be argued that the role of increased knowledge in enhancing the capability set, in this case, is greater.

Taking that as a given, the type of information is the starting point within this hypothesis. Moreover, since ICTs are regarded within the literature as a necessary conduit of information, issues of the digital divide are very relevant. Conventional evaluation technologies to assess the effectiveness of ICTs as a means of acquiring and disseminating information, such as the calculation of Internet density (Harris, 1998), seem somewhat unhelpful since ICTs are used to produce an intermediate good or product, i.e. information, the value of which varies dramatically depending on the context. Instead, Brown's (1991) information-based evaluation methodology, which is sensitive to context-specificity, is deemed more appropriate for this purpose.

Key areas for measurement in evaluation:

- Measures of coverage: volume of information sources/ their diversity and range.
- Measures of linkage: networking processes, feedback mechanisms.
- Measures of direction: permeability within population in question, origins of information flows, political aspects of access and information flow.

While evaluating various ICT case studies we will make use of a mix of theoretical frameworks. We will focus on the qualitative aspects since we have adopted a broader definition of development in line with Professor Sen's thinking, while also mentioning the quantitative effects. We will also provide other information relevant for evaluation.

Framework for Evaluation of ICT Case Studies

Approach	Criteria of Evaluation
Sen's Capability Approach	Indirect measures <ul style="list-style-type: none"> • Increased productivity • Increased Growth • Demographic influences • Direct measures • Human development
Brown's Information Based Evaluation Methodology	<ul style="list-style-type: none"> • Measures of Linkage • Measures of coverage • Measures of direction

Professor Sen (1984: 315) pointed out the notion of a good (rice), the characteristic of the good (calories and nutrition); the functioning of a person (living without calorie deficiency); that of utility (the pleasure of desire-fulfillment). Similarly, viewing ICT and Knowledge through the capability approach: ICT is a good, information its characteristic, functioning is the management of knowledge and information by individuals and the community and utility is the conversion of knowledge into social and economic returns.

It will be evident from the ICT case studies that they can be used to improve the quality and quantity of information, delivery of services, plugging corruption and much more. The analysis will provide a clearer understanding of the initiatives and also highlighting issues of importance.

We have also tried to incorporate the geographical diversity of our country by selecting case studies from all 4 regions—North, South, East and West (subject to the existence of ICT initiatives/projects and availability of data)

KERALA

The FRIENDS

Fast, Reliable, Instant, Efficient Network for the Disbursement of Services Project

Background

The common man has always been burdened with the task of standing in long queues for payment of bills. He has often to pay bribes for such tasks. The Kerala State IT Mission, an executive wing of the Department of Information Technology, has succeeded in making IT a boon for the common urban man. The FRIENDS project, (acronym for -F-fast, R-Reliable, I-Instant, E-Efficient Network for the Disbursement of Services) consists

essentially of centers that offer a one-stop, front end, IT enabled payment counter facility for citizens to make all kinds of government payments.

As in all Indian states, Kerala has a number of different government and public sector organisations collecting taxes, utility bills, and other fees and payments. Individual citizens have historically been expected to pay at the office of the department or the agency concerned. This means that every citizen has to personally visit at least seven offices and stand in queues waiting their turn to pay the taxes and other payments due to government. Some efforts were made earlier to facilitate payments through the banking network. However, given the fact that many banks and government departments/agencies were not computerised, this effort only led to delayed collections and reconciliation problems. Moreover, only two to five percent of the population used this facility. It was against this background that the FRIENDS project was conceived, enabling citizens to visit a single location to pay all bills without the requirement for back office computerisation in the involved departments/agencies.

The project FRIENDS comprises multiple computer counters that deliver services in a pleasant setting, with highly trained and motivated young staff. FRIENDS centres have been set up in 14 districts of Kerala and they work seven days a week, 12 hours a day.

FRIENDS Initiative

FRIENDS seeks to extend the benefits of full-fledged computerisation of individual departments to citizens, even before the whole back-end computerisation is completed. The counters are equipped to handle around 1,000 types of payment bills (in various combinations) originating out of various public sector departments/agencies. The payments that citizens can make at the counters include utility payments for electricity and water, revenue taxes, license fees, motor vehicle taxes, university fees, etc.

The major stakeholders include the State Government, the citizens, the employees of FRIENDS, participating public agencies/departments and Kudumbasree units (self-help groups of women from below the poverty line who have undertaken some of the auxiliary data entry and related work for the centres). Government was able to provide better service to the citizens and also demonstrate the benefits of ICTs in governance. Citizens now get better services at lower direct and indirect costs.

The two basic objectives of project-FRIENDS can be restated as follows:

- To induct a philosophy of service delivery in government
- To treat the citizen as a valuable customer who pays for services, to be treated with respect

Physics

Firewalls safeguard the data from manipulation and other misappropriations. Print-outs of transaction details in a particular counter are done on the printer attached to each terminal, on pre-printed stationery. Printing of a receipt for the citizen is done simultaneously with saving of the transaction on the hard disk. The application has provisions for adding more modules and for rolling back incorrect entries without affecting the database even at the user level. The centres are not networked with the participating departments/agencies and therefore the print-outs of all payments made are taken and physically handed over to these organisations for processing.

Evaluation

In order to evaluate the impact of any program one needs to undertake a cost-benefit analysis. This analysis should include externalities as only then it includes the true benefits or costs of the entailed program.

In financial terms an average investment of \$48,0000 is required for such a project. The average monthly recurrent expenditure incurred by each centre comes to \$ 1340 which includes hardware maintenance charges and payments on account of rent, electricity, etc. These costs are borne centrally by the Department of IT. The salaries of the Service Officers are an additional recurrent cost, covered by those government departments that collect payments at the centres. FRIENDS centres can also be used for payments to BSNL (a Government of India-owned telecommunications company). BSNL does not provide staff at the centres; instead, it provides a transaction payment of roughly 12 cents per BSNL-related transaction, giving an average monthly income for each centre of US\$250.

It has been calculated that, with FRIENDS, citizens need to spend an average of only 35% of the cost involved in making separate payments at department counters. By saving on travel costs,

costs of using agents, and related costs, citizens using FRIENDS centres therefore make an average monthly saving of about US\$1 per citizen. Moreover, on an average, citizens save about 42 minutes of their time every month. Generally, each centre deals with around 400 citizen transactions per day.

The level of satisfaction could be gauged from the fact that 97.4 per cent of users prefer FRIENDS to department counters according to surveys undertaken. The increased participation of women customers is also a positive contribution. Moreover, the project in itself was able to convince 80.1 per cent of the user-citizens of the possibilities of ICTs in providing better citizen services. It has also demonstrated that with appropriate training, skill upgradation and technology, existing government employees can deliver better services.

In spite of the project's dependence on the central government funds, FRIENDS has had beneficial effects for not only the citizens but also the staff members of the project and government. These benefits are mostly qualitative in nature and as important as the quantitative costs and benefits are as follows:

Citizens

- Single interface
- Transaction time dramatically reduced to 3-5 minutes
- Government open always
- Treated with respect as a valued client
- Corruption-free

Staff

- Better service conditions, sense of fulfilment

Government

- Improved perception of Government
- Enhanced Revenues
- Demonstration of advantages of IT induction

This project has contributed to development through increased productivity led by time savings. It has provided an important convenience for the public.

Supplementary Framework for Evaluation of ICT Case Studies

Approach	Criteria of Evaluation
Sen's Capability Approach	<p><u>Indirect measures</u></p> <ul style="list-style-type: none"> Increased productivity-through reduced unproductive rent seeking, reduction in transaction time and improved service delivery, increased productivity of existing employees through training and motivation during implementation of the project. Increased Growth-by increased efficiency. <p><u>Direct measures</u></p> <ul style="list-style-type: none"> Human development- through employment of destitute women, gender development through increased participation of women in this project, better employment conditions and improved self-esteem.
Brown's Information Based Evaluation Methodology	<ul style="list-style-type: none"> Measures of coverage-diversity of information; information about bill payment of different departments available at one stop. Measures of linkage-Feedback mechanism existent at the help desk. Measures of direction-political aspects of information: corruption free government, high permeability of use of this facility

One key benefit of the project has been the human resource capitalisation and capacity building within Government. The project was able to demonstrate to the common citizen that with appropriate training and skill upgradation, the very same government officers who were considered as arrogant and customer unfriendly could be turned to play the exact opposite roles. The enthusiasm of these officers seems to have been one of the major reasons for the success, however limited it may be, of the project. It is to be noted that the average age of the Service Officers was found to be 36 years and hence the enthusiasm and energy exhibited could very well be on account of the age factor. This raises questions about the sustainability in enthusiasm over the next few years. It is also disturbing to note that only 17.5 per cent of the Service Officers are females

Challenges

It should however be kept in mind that the benefits brought about by the project were not free of obstacles. We can identify the following three challenges that we faced during the implementation of the project:

1. *Departmental compartmentalisation:* The governmental structures are such that each department undertakes a specific task (usually vertical in nature) and delivers only part of a process that an individual citizen needs (usually horizontal in nature and cutting across departments). This administrative convenience has created strict compartmentalisation of departments with employees and heads of departments interested only in the affairs of the department without usually having the larger picture in mind. As an integrated front-end project with one single interface, FRIENDS was opposed by the participating departments on account of the fear that

they would lose their existing authority and power. This was particularly evident in Kerala, which is ruled by a coalition government, with different political parties in charge of different departments.

2. *Procedures and processes:* Though the State Government has a consolidated fund for operation of its activities, separate budgeted heads are operationalised for each department. Money remitted by the citizens at any counter could pertain to a combination of departments/agencies. Though for all practical purposes the collection at FRIENDS is equivalent to remittance to Government, individual departments insist that their share reach them at least by the next day. There is stiff resistance from all quarters to changing and rationalising these procedures. Moreover, the rules and procedures framed under each department caused major constraints in the implementation of the project.
3. *Updating details in departmental registers:* FRIENDS centres are not networked with the participating departments and therefore print-outs in specific formats are taken and physically handed over to these departments. Due to clerical errors— some of which were initially deliberate by the employees of participating departments— transaction details entered in the FRIENDS centres are at times not documented in the department registers, leading to the disconnection of service (e.g. electricity or water) in spite of the citizens making payments. This led, on a few occasions in the early stages of the project, to the threat of terminating the FRIENDS project. This was finally controlled by an order from the Government (with top political leadership involved) stating that a receipt from a FRIENDS counter would be equivalent to a receipt from the participating department/agency.

Lessons Learnt

In spite of the above roadblocks FRIENDS can be considered largely successful, verging on total success, considering the direct and indirect benefits and win-win situation provided to both government and citizen. The *front-end-first* approach has been proven as a way forward for e-governance. Of course, the real solution to the problem of multifarious government entities lies in undertaking major administrative reforms. To that extent, FRIENDS can at best be seen only as a solution to the symptom and not to the real problem. The implementation of the FRIENDS project highlights the following:

- It is the quality of service that matters, not the level of technology
- The key factor is motivated manpower
- There are certain virtues of starting small

Sustainability of the centres

The sustainability and growth of the FRIENDS centres would depend on the following five important factors: (1) possibilities of self support (2) wider geographical coverage (3) wider service range (4) maintaining quality service and (5) backend computerisation and web enabling. As pointed out earlier, each centre on an average spends Rs. 65,000 as revenue expenditure every month. This is in addition to salary payments made by the participating Departments. The only revenue generating activity of the centre is the commission obtained from BSNL. The authorities are now thinking of adding more services including those from the private sector, with a view to generate a healthy revenue stream. Considering the historic resistance that people in the state has shown towards service charges on any public good, one would ideally expect such a resistance from the public. This was evident during the study also. However, considering the acceptance of FRIENDS and the displeasure that most people have regarding conventional department counters, it is felt generally that a reasonable service charge might be finally accepted by the public. However, the fact remains that cost of collection is a factor inbuilt into the charges collected from the citizens and as such does not warrant an additional service charge. One important internal income-generating stream for all FRIENDS centres is the revenue that can be collected from offering hoarding and advertisement space within the centre to corporates.

Concluding Remarks

FRIENDS is not the ideal solution but it has created a demand and a constituency for IT services among the public and in government. FRIENDS has demonstrated dramatic improvements in the quality of service delivery; and has changed perceptions of government.

However in the future there is a need to *build a front-end user interface before completing the whole back-end computerisation process*. In the case of developing countries with capital scarcity and a not very efficient departmental structure, it is advisable to start e-governance from the front-end, and then use it as a pull factor to implement back office computerisation.

For any future program, it is important to keep in mind that *the human factor is critical*. While IT is an advanced technology, it should only be viewed as an enabler of government reforms. The real success of any e-government project largely depends on the human stakeholders behind the project.

To gain acceptability it is vital to *focus on immediate benefits and high visibility with broad citizen benefit*. The FRIENDS project shows that for an e-governance project to succeed, the underlying technology need not be very sophisticated. What is required is an understanding of citizen needs, proper structuring of the project and early delivery of benefits. It is also important to have projects that have a fairly high degree of public visibility and which serve a broad spectrum of society so that people at large are convinced about the use of ICTs in government.

MADHYA PRADESH

The Gyandoot

Background

The Gyandoot project was initiated in January 2000 in Dhar district of Madhya Pradesh, as an e-commerce and e-governance activity, with the objective of providing useful information to people in rural areas, and also to act as an interface between the district administration and ordinary people.

The Dhar district of Madhya Pradesh is located on the south-western corner of central India and has a population

of 17 lakh. About 54 per cent of the population is tribal (*Bhils, Bhilalas, and Patleiyas*) and 60 per cent live below the poverty line. The goal of the Gyandoot project has been to establish community-owned, technologically innovative and sustainable information kiosks in a poverty-stricken, tribal dominated rural area of Madhya Pradesh. During the design phase of the project, meetings were held with villagers to gather their input. Among the concerns highlighted by villagers was the absence of information about prevailing agricultural produce auction centre rates. Consequently, farmers were unable to get the best price for their agricultural produce. Copies of land records were also difficult to obtain. A villager had to go out in search of the *patwari* (village functionary who maintains all land records), who often was difficult to get hold of as his duties include extensive travel. To file complaints or submit applications, people had to go to district headquarters (which could be 100 miles away), resulting in a loss of wages/earnings.

The Gyandoot Initiative

In January 2000, an Intranet network was developed whereby computers were installed in 20 village *Panchayat* centres in five blocks of the district. These were wired through an Intranet network and connected to the District Rural Development Authority (DRDA) at Dhar town. This Intranet system was named Gyandoot, a Hindi term meaning “Purveyor of Knowledge”. Local rural youth were selected to operate the initial 20 cyber kiosks, without a fixed salary or stipend. The computers in the network were established in *Gram Panchayats* (Village Committee Offices) and called *Soochanalayas* (Information Kiosks), with operators known as *Soochaks*. Later, 15 *Soochanalayas* were opened as private enterprises. The *Soochanalayas* provide user-charge-based services to the rural people.

Physics/Technology Used

The Gyandoot Project Office houses the main servers, which are backed by battery power and two Uninterruptible Power Supplies (UPS). The UPS are able to provide four hours of backup power during the frequent power outages. The NT Servers are connected to five modems, which in turn are connected to five dedicated BSNL lines (dedicated lines increase connection speeds and allow the users to send both voice and data transmissions). Three ISPs provide Internet/Intranet infrastructure. Kiosks are connected to the Intranet through dial-up lines.

The dial-up lines are to be replaced by wireless connections using CorDECT technology. The TeNet group of the Indian

Institute of Technology (IIT), Chennai, is working with Gyandoot to provide the service. It is expected that CorDECT or Wireless Local Loop (WLL) technology would be implemented shortly. The CorDECT units have already been installed. However, only the kiosks within 10 km of the DECK Interface will have initial access. The DECK Interface Unit is responsible for switching voice and Internet traffic via DECT standard specifications set by the European Telecommunications Standards Institute (ETSI).

The application software was created in a surprisingly short period of time using an array of web and database languages. Gyandoot reserves the copyrights to the software source. Initial research was done to determine structure — not much consideration was addressed regarding feedback and demand-side content creation. Nevertheless, features of the Gyandoot software are continuously being updated. The user interface is menu based with information presented in Hindi, the local language. Web-based email has been provided in the local language as well. Various services are provided through the Intranet, which is updated by five Gyandoot programmers (two programmers at any given time). Some observations made regarding the technical success of the content can be traced to the variety of governmental departments that are hooked into the network providing support and information to the Gyandoot project. Technical skill levels of the kiosk managers are quite high. Managers of the kiosks visited are able to operate both the local software as well as the Windows Operating System effectively. The only technical problems faced are due to inadequate connectivity.

The content on the Intranet is extensive and in Hindi. Not all the information provided is being used to its full potential. Information related to agricultural produce and government services are being extensively used. This has resulted in the reduction of middlemen who previously bought agricultural produce from farmers at suppressed prices as well those who facilitated access to government offices to expedite applications for land registration or caste certificates, and other services provided under the numerous programmes for poverty alleviation. The interface between the local government and the citizen has improved thereby empowering the villagers who were previously intimidated by the government machinery and civil servants. However, the contents do not include sufficient information for women and therefore women users of the Intranet are few. Moreover, for the contents to communicate directly to the illiterate user, an interface that includes audio-visual material would be more suitable.

This project has been financed entirely by the village *panchayats* (the basic unit of local government), the community, or private entrepreneurs with no contribution from the government. The cost of establishing one information kiosk is US\$ 1,500. Each kiosk caters to approximately 30 villages in the vicinity. These kiosks are located in government buildings or at prominent locations in the markets or along the main roads. Kiosk managers who are typically young, educated and motivated are encouraged to maximise the use of the services to make a profit on their investment. Some of them are combining other services such as telephony, photocopying, and using the computer for other services (including showing movies in one case) to become more profitable. The kiosk managers meet once a month at the district headquarters to exchange their experiences. The majority are male and only one female kiosk manager could be identified.

It took an entire year to make the village users accept the system, as they had no previous exposure to technology. The kiosk manager had to establish a relationship of trust in the villagers and increase their confidence in the potentials of technology. As several villagers are illiterate, there has to be great emphasis on the levels of trust between them and the kiosk manager. The kiosk managers therefore have to bear multiple roles to: (a) familiarise users with the technology, (b) manage the kiosk, and, (c) collect and send feedback from the user to the main office at the district level that develops the content of the system. Opportunities to provide feedback occur when the kiosk manager visits the district centre to renew his license or meet with the system managers at that end. These visits take place at least once a month. There is a need for users and kiosk managers to become more proactive in content creation. In most cases, the kiosks are located in local government or school premises thereby ensuring that most villagers become aware of the facility. The village *panchayats* select the kiosk managers.

The Gyandoot project has increased awareness of the empowering ability of information in Dhar district and the possibilities for increasing transparency and accountability in governance. There were initial difficulties in acceptance of this project by local politicians and middlemen who felt that they were losing control over their constituents and clients, respectively. However, the project has been sustained by the demand of the users and the strong support of the local bureaucrats.

It is recommended that the District Informatics Officers (DIOs) be given training in content creation through the

use of Participatory Rural Appraisals (PRAs) in addition to the technical training being received from the National Informatics Centre (NIC). The kiosk managers are key change agents in the system and they need to be prepared well to perform their role as the interface between the community and the outside world. Officers in the district administration have to be prepared for the impacts of e-governance and need to be trained on maximising the use of information as well as coping with the ensuing changes in their roles and powers over the people.

Services and Facilities

The services offered under the Gyandoot network are:

- Commodity marketing information system (*Mandi Bhaav*), where grain prices are updated on a daily basis;
- Income certificate (*Aay Pramanpatra*);
- Domicile certificate (*Mool Niwasi Pramanpatra*);
- Caste certificate (*Jaati Pramanpatra*);¹
- Landholder's passbook of land rights and loans (*Bhoo adhikar evam rin pustika/Khasra Nakal*);²
- Rural Hindi email (*Gram Daak*);
- Public grievance redressal (*Shikayat Nivaran*);
- Forms for various government schemes (*Avedan Patra*);
- Below poverty line family list;
- Employment news (*Rozgar Samachar*);
- Rural matrimonial (*Vaivahiki*);
- Rural market (*Gram Haat*);
- Rural newspaper (*Gaon ka Akhbaar*);
- Advisory module (*Swastha Salahkar, Krishi Salahkar, Kanooni Salahkar*);
- E-education (*Shiksha Gyandoot*)

Evaluation

The concept behind Gyandoot was to provide access to information to villagers regarding useful services and to provide links between the people and the administration. Although this service was only started in January 2000, it has already managed to generate a considerable amount of interest among the rural people. According to the findings of the study, nearly half the population surveyed is aware about the Gyandoot project. Furthermore over one-third of the people are aware of one or more of the services provided by Gyandoot. Gyandoot has, in its short span of activity, managed to have an impact on the rural people. These impacts can be measured on several parameters as discussed in the following sections.

Social impacts

The district of Dhar is a tribal dominated area and in such a setting where people are deprived of even the basic necessities of life, Gyandoot has served as a medium for empowerment and direct access to the administration. The major issues here are how to create greater awareness about Gyandoot, especially among the poor and to exploit its potential.

- The online village newspaper informs the villagers about the happenings in and around their village thereby increasing their awareness;
- The advisory modules help the villagers find easy and expert advice on various legal and social problems;
- With services such as online matrimonial and advertising facilities, Gyandoot has introduced previously unknown choices and interesting options to people in villages;
- Gyandoot can help people become more aware of their rights by providing them information about government fund allocation and schemes, etc.
- Promise of grievance redressal by the administration has encouraged the rural population to become interested in better management of government

Therefore it is clear that this project has contributed to the development process by positively effecting growth and productivity and by contributing to elements of human development. This project has also contributed to development if development is measured according to the Brown criteria. As mentioned above, there is a tremendous increase in the volume of information available and this information has led to better opportunities for the poor. The project has effected decision-making by making the complaint mechanism easy and transparent.

Supplementary Framework for Evaluation of ICT Case Studies

Approach	Criteria of Evaluation
Sen's Capability Approach	<p><u>Indirect measures</u></p> <ul style="list-style-type: none"> ▪ Increased productivity through elimination of the middlemen in sale of agricultural produce and direct information about government schemes. ▪ Increased growth-through better market prices, better legal and professional advice <p><u>Direct measures</u></p> <ul style="list-style-type: none"> ▪ Human development-through movement from ignorance to cognisance, through creation of entrepreneurial skills by training village boys to maintain the <i>Soochanalayas</i>.
Brown's Information Based Evaluation Methodology	<ul style="list-style-type: none"> ▪ Measures of linkage-variety of information available on government schemes, matrimonials, market prices etc ▪ Measures of coverage-Not much attention was paid to feedback and demand side content creation during the implementation period. ▪ Measures of direction-kiosk information available to all and government does act on the complaints made-thus effecting the decision-making process. Therefore making the government more transparent and accountable.

Challenges

The Gyandoot system helps in filing complaints not just because a communication system has been installed, but also because of improvements at the back end which has made district offices more responsive. The first individual to receive the complaint is a private functionary with an incentive to forward it through the system. However, if the kiosk manager were to collect all petitions in a week and travel to the district, could the same responsiveness be achieved? For information about commodity prices would radio, which has the largest reach in rural areas, be an effective alternative means? The question concerns the delivery of local content. Regulations have prevented this from happening through private sector, as the government has guarded against losing control over a powerful media. Some fundamental issues need to be resolved before

opportunity for self-employment and helped to enhance their entrepreneurial skills;

- Timely and useful information such as that of *Mandi* prices and local market transactions are available to ordinary farmers.

large-scale investments are made to create more kiosks. These relate to the mix of technologies that can be used and the types of services that truly can be enhanced through the Internet.

Fortunately, the showcase project initiated in Dhar district won many accolades. However, reports say that the warts have now started to show. The Gyandoot project worked very well till the person who headed it was moved to another post.

As a matter of fact this is the problem everywhere - programs such as Gyandoot are hardly self-sustaining - they last only so long as a very upbeat administrative official at the top holds his position. They start to rot as soon as the officer under whom the programme is mooted moves out. Interestingly, the project at Dhar was to be funded by the panchayats themselves. Revenue officials had even collected a small amount from farmers towards this. But the farmers reportedly go to the kiosks to obtain certificates or other details for getting financial credit, and more often than not come away because the communication link is not working or there is no electricity.

Lessons Learnt

On the technical side problems exist with connectivity. A respondent working with the district information services said that until now the telephone department has not been particularly responsive to the needs of the Gyandoot and has been treating it like any other customer. District representatives of the telephone department need to be included in the committee's running and planning Gyandoot services. It seems that the district administration is thinking along these lines.

Since the rural population is predominantly illiterate and e-payments are not yet legally sanctioned in India, transactions cannot be purely virtual within Gyandoot. A physical element (clerk/office) has to participate as an intermediary in lieu of e-payments. As in many countries, credit cards are rare and upfront payments are popular even with large-scale enterprises. Face-to-face relations and bargaining are essential to business.

It is preferable to train local educated youth for operating Gyandoot kiosks from the point of view of sustainability, local acceptance and labor cost. Since the cost of Gyandoot E-commerce transactions for most villagers is high, it is important for basic services (e-mail, government databases) rather than high-end applications. Because power cuts are frequent, many *soochaks* use diesel generators to keep their Gyandoot operation running. Villagers and local

politicians are quite willing and enthusiastic about accepting the new technology.

Given the current state of rural telecommunications infrastructure, network capacity must be expanded. India's long distance telecommunications companies and international connections, formerly a government monopoly, are in the process of being deregulated. There will be no license limit with operators just paying a fixed fee and share of revenues to the government. The government has also given unrestricted right-of-way to companies laying cables along highways and other major roads. This combination of events could produce a huge increase in capacity.

Concluding Remarks

Various studies which examined the impact on a cross-section of the population concluded that the effect on poorer groups has been limited. There are a number of ways in which the project could be made more successful. At present the connectivity at the *Soochanalayas* is poor and the Gyandoot services stand largely underutilised. This could be rectified by implementing the WLL as soon as possible for the entire district. This would ensure availability of facilities at all times.

GUJARAT

Computerized Interstate Check Posts

Background

Gujarat has an extensive road network, which carries a large volume of commercial traffic. Major highway systems link Delhi to Mumbai and provide the principal link to the Kandla seaport on Gujarat's west coast. Gujarat's 10 check posts are positioned at the border with three neighboring Indian states. Nearly 25,000 transport vehicles enter daily through these check posts.

The Gujarat Motor Vehicles Department (GMVD) controls the road transport activity in Gujarat. While the broad policies are laid down by India's central government in the Motor Vehicles Act, State Governments are empowered to determine the penalties for infractions and procedures for enforcement. Nevertheless, State Governments typically have been ineffective at reducing the number of overloaded vehicles. Trucking companies want to maximize their earnings from each vehicle. Often this has prompted transporters to load their trucks beyond the permissible axle load, creating a serious safety hazard.

The Central Excise and State Sales Tax is levied on the basis of a record of the weight/count of manufactured goods that are shipped out from the factory or shipped to a trader. Yet, the number of trucks dispatched in a day is the primary basis of this assessment. Thus, by overloading trucks, manufacturers have evaded excise duty (some estimates are that 80-90 per cent of vehicles are overloaded). Inspection of 100 per cent of commercial vehicles has been impossible and check post inspectors have been notoriously corrupt. The GMVD department has 137 inspectors, of whom 27 were on suspension (under scrutiny for corrupt practices). It is common knowledge that inspectors' posts at lucrative check posts can be bought for as much as Rs. 1 crore.

In Gujarat's traditional check post system, a suspect vehicle is flagged to a stop, and then weighed on a weighbridge located away from traffic. The legal penalty for overload is Rs. 2,000 per tonne. However, any fine often has been (illegally) negotiated. Inspectors are also expected to check for the driver's inter-state transit permit and whether the vehicles registered in Gujarat have paid the state's annual road tax. Corruption by departmental inspectors at these check posts has led to harassment of truck drivers and loss of revenue to the state.

The problem of corruption was particularly difficult to attack. In the absence of any systematic inspection of vehicles, the transport companies also adopted various illegal practices. Duplicate copies of a single registration book from the Regional Transport Office (RTO) have been used for many different vehicles using fake license plates.

Computerized Interstate Check Posts

In late 1999, to improve the situation at check posts, the transport department of Gujarat redesigned the processes at its check posts. Large yards were created at the check posts and processes of inspection and estimation were mechanised by deploying electronic weighbridges, video cameras and computers. Such modernised check posts called the **Computerised Interstate Check Posts (CICP)** were created at all the 10 inter-state sites. CICP is expected to improve the processes of identification of vehicles and estimation of penalties using electronic weighbridges and computers thereby minimising the inconvenience to the transporters. Above all, this technology is expected to plug the leakage and significantly increase revenues from the check post for the state government.

In this direction SMART card drivers licenses were introduced in 1998 and computerised communication

networks to collect fines from overload vehicles. In the computerised process, all the check posts are monitored at a central location using video cameras installed at every check post cabin. The video camera captures the registration number of all trucks approaching the check post (there are floodlights and traffic lights, which make the check posts, appear like a runway at night). A software converts the video image of the registration number to a digital form and the details of the truck are accessed from a central data base. An electronic weighbridge captures the weight and the computer issues a demand note for fine, automatically. Drivers can use a stored value card for payment.

Computerized Inter-state Check Posts were created with multiple objectives of enhancing government revenues by improving efficiency of check post operations, plugging revenue leakage and minimizing harassment of transporters. Surprisingly, the project objectives did not include remedial measures to minimize overloading/over-dimensioning trends and improve safety of the truck traffic. The system design did not include the database creation or alert mechanisms for habitual violators of norms.

Physics/Technology Used

At each of the revamped check posts, a 10-lane approach road of 1.3 km length has been built to receive the vehicles. Each lane has a video camera positioned high, on a pole, with a proper protective casing. There is a control room with two computer servers - the Data Base server that transmits the vehicle data through a 64 KBPs leased line, and a video server that captures and relays the video images, frame by frame, to a central server at the RTO. Power to the system is assured by dedicated lines from the State Electricity Board, backed up by a high capacity generator and 72 hour backup UPS. The video capture and transmit process (known as SIPCA - Satellite Image Processing and Capturing unit) has been supplied by a subsidiary of Philips. The software for license tracking and the weighbridge equipment is also by Philips. RTO has an IBM Server with DB2 RDBMS. Operators who man the cabins are from the private sector. Although GMVD employees have been trained to operate the new equipment, they are not operating the key nodes at the check posts.

A database of all the 5 lakh commercial vehicles registered in Gujarat is being created at the Head Office in RTO premises. A powerful IBM server (AS 400) is installed there with DB2 as the RDBMS. With the vehicle's registration number the data base can retrieve information on the make of vehicle, whether or not the National Permit exists and is valid, insurance, whether the vehicle tax has

been paid, etc. Once the vehicle arrives at the weighbridge, the un-laden weight, the actual weight, the amount of overload, and the fine that must be paid is displayed on an electronic (plasma) boards. In this way, the process is made wholly transparent to the driver.

Drivers hold a pre-paid card (in denominations of Rs. 2,000 or Rs. 5,000) which are used for paying any penalty. This card costs Rs. 50. Operators also are expected to check headlights, tax payment, etc. Any shortfall is recorded in the computer. Only if the corrective measure is taken and recorded in the system, will the sensor-controlled barrier allow the truck to proceed. If the driver cannot pay the penalty, the vehicle must be parked in a designated parking lot. The RTO Inspector confiscates the vehicle's registration documents until the payment is made. Future plans include integrating payment of sales tax on the goods carried by the vehicles.

Evaluation

We can look at the changes in the process of levying duties by examining the following parameters—effect on waiting time, weighing, payment process, corruption and transparency. The drivers interviewed gave mixed responses on the impact of CICIP. Most of them expressed satisfaction over the electronic weighbridge, which has become an integral part of check post operations and they perceive that the time taken to weigh the vehicle has gone down significantly. In the earlier system, often they had either to accept the estimates of the RTO staff or in case of a dispute, had to go to a nearby private weighbridge. The drivers found that the waiting lanes and parking lanes are spacious and comfortable now.

It was observed that a transaction (the process of weighing, penalty calculation and document checking) took about two to three minutes, which is much less compared to what it takes at a manual check post. Almost all the drivers revealed that an unofficial entry fee of Rs. 20 to Rs. 50 has to be paid by them irrespective of the weight of the goods being carried by them. The transporters are therefore dissatisfied with payment system at the check posts and express a strong desire for smart cards to be deployed for payment procedures, to prevent malpractice and for their convenience.

Framework for Evaluation of ICT Case Studies

Approach	Criteria of Evaluation
Sen's Capability Approach	<p><u>Indirect measures</u></p> <ul style="list-style-type: none"> Increased productivity-through reduced unproductive rent-seeking, reduction in transaction time-assessment and payment time Increased Growth- possibilities through increased tax revenues
Brown's Information Based Evaluation Methodology	<p><u>Measures of coverage</u>-The ICT project improved the quality and quantity of information available for the authorities to act on.</p> <p><u>Measures of Linkage</u>-This project did not include any features for feedback from the concerned people i.e. no grievance redressal method.</p> <p><u>Measures of Direction</u>- CICIP has led to accuracy in the imposition of fines which was arbitrary earlier thereby effecting the decision making process.</p>

Notwithstanding the implementation difficulties with the new system, the inspection of all vehicles has produced three-fold increase in tax collection over two years. Revenue increased from \$12 million to \$35 million, paying back the total project cost of \$4 million in just six months. On an average, vehicles are cleared in two minutes instead of 30 in the manual system. Harassment of truckers continues, abetted by problems with the video monitoring system.

The large and medium transport owners are happy with the system because they can come to know the exact date and time their driver passed the check post. The pre-paid card means that the driver does not have to carry much money.

While a majority of truck drivers feel that the overall attitude of the inspectors continues to be negative even after computerisation, a few perceive that the fairness of treatment given to them at check posts has improved slightly.

Drivers find the electronic weighbridge at the check post a major value addition. Disputes over weight have been taken care of and transporters are careful at the loading point itself, to indicate the accurate weight. Thus, the weighbridge is a useful piece of equipment. However, the total time taken to cross a check post remained the same or has increased slightly.

The truck drivers find that the two amenities at the check posts, namely waiting lanes and parking sites, are quite comfortable and a value addition in the new system.

The financial costs at the check post can be attributed to two main components: technology equipment and infrastructure build-up. Technology equipment includes the weighbridges, computers, printers, video cameras, video servers, database servers and other such hardware.

Infrastructure refers to the development of lanes, construction of small cabins and installation of traffic and flood- lights at the check post.

The cost of electronic equipment at the check posts per lane is about Rs.38 lakh. The total cost is thus about Rs. 19 crore for the 58 lanes in 10 check posts. Additionally the cost of widening the highway and other civil works was Rs. 75 lakh per lane and in totality to Rs. 44 crore.

On the other hand the revenue collection levels have gone up remarkably from Rs.56.6 crore to Rs 237.4 crore over a period of three years, although the number of vehicles may have increased by only about 6-7 per cent.

Challenges

The new system has teething problems. The central database is being built, and for many vehicles it still does not hold the requisite details. Hence, the operator uses his judgement and, depending on the make of the vehicle, selects the permissible weight from a drop-down selection box.

The leased line (64 KBPs) connectivity is currently available at only two check posts (Shamlaji & Bhilad, the two largest). The centralized video monitoring is therefore not working properly. In some check posts inspectors may still harass the drivers to extort bribes.

The writing and pattern of license plates is often non-standard and not in compliance with the law. Hence, the license tracking software has not worked properly (only about 35 out of 5,000 number plates were read accurately). Now trucks with non-standard number plates are required to replace them at the check post. A vendor is available to make the change, for a fee.

Initially the system issued manual receipts with limited information, since the automatic receipt generated by the computer, without a signature of the officer, was not legally valid. With the passage of the central IT Act, the RTO's signature has been digitally incorporated on the receipt.

Data on the number of vehicles crossing the check post suggests that some vehicles have begun to divert through longer routes in adjoining states to avoid the penalty. Implementing similar systems in other states could plug the loophole.

In spite of the early success of this initiative the government has failed in ensuring the sustenance of the project. The project manager, the Transport Commissioner was transferred within a year of the commissioning of the project. Within a subsequent period of 18 months, four

commissioners were posted and transferred. The maintenance and operations contracts were not renewed on time. Monitoring mechanisms to ensure that the technology is not misused were not put in place. These lapses have resulted in defeating the objectives. The study team has observed the bypassing of technology by RTO staff at all the three check posts surveyed. The databases are not fully created and maintained at the control room. Video cameras are switched off at the check post preventing monitoring from control room.

Lessons Learnt

To root out corruption, automation has been used to reduce the discretion of manual operators to a minimum. Education of clients (drivers and transporters) about the operation of the new system is a key to stop any harassment. The total revamping of the check post area has helped in selling the concept to truckers.

The new system could be used by the sales tax department of the State, which must monitor the movement of goods in the state, as well as transshipments. This might require that documents carried by truckers be made computer readable (bar coded). The Government is already working on a smart card based registration card. However coordination across departments is difficult, and resisted by the senior bureaucracy.

Conclusion

Through the use of computers and other electronic devices at 10 remote inter-state border check posts in Gujarat, a team of savvy public officials have reduced corruption and significantly increased the state's tax revenue by automating the highway toll and fine collection system. The system was a good investment. Within one year, the system had paid for itself, illustrating how strategic investment, properly planned, can lead to long-term benefits.

However it must be conceded that the technology deployed is not fully utilised in this system. The total computerised operations should be re-started at every check post. Towards this, the contracting process at the state government level should be expedited. A comprehensive contract should be drawn up, for a minimum of three years, to operate and maintain the equipment at the check posts. The Control Room should be re-activated, as it is the nerve centre of CICIP, allowing monitoring and supervision of the activities at the check posts. This is a crucial factor, without which CICIP cannot be totally successful. Electronic payment system should be introduced in CICIP. This will streamline the payment process and remove redundancies and

inefficiencies of payment process (waiting at the cashier window, unaccounted collections, etc).

KARNATAKA

Bhoomi: Online Delivery of Land Records



Background

Sixty six per cent of the population of Karnataka reside in villages where agriculture is the main occupation. About 67 lakh farmers own 2 crore land holdings. The crucial document, which records various parameters and information pertaining to the land holding, is the Record of Right Tenancy and Cultivation (RTC). The RTC is required for land transaction, for obtaining crop loans, other loans and concessions linked to the size of the land holding. In the earlier manual system, 9,000 Village Accountants (Vas) who serviced farmers in about 27,000 villages maintained these records. The manual system of maintaining RTCs was exploitative.

Requests to alter land records (upon sale or inheritance of a land parcel) had to be filed with the Village Accountant. However, for various reasons the Village Accountant could afford to ignore these “mutation” requests. Upon receiving a request, the Village Accountant is required to issue notices to the interested parties and also paste the notice at the village office. Often neither of these actions was carried out, and no record of the notices was maintained. Notices were rarely sent through post.

An update to the land records was to be carried out by a Revenue Inspector, if no objections were received within a 30-day period. In practice, however, it could *take 1-2 years for the records to be updated*.

Land owners find it *difficult to access the Village Accountant*, as his duties entail travelling. The time taken by Village Accountants to provide RTCs has ranged from three to 30 days depending upon the importance of the record for the farmer and the size of the bribe.

Over time, several inaccuracies crept into the old system through *improper manipulation by the Village Accountant*, particularly with respect to government land. Even where accountants were law-abiding, village maps could not remain accurate as land was parcelled into very small lots over generations. The system of physical verification of

records by deputy *tehsildars* (supervisors of Village Accountants) became weak as the number of records multiplied and these functionaries were burdened with a host of other regulatory and developmental work.

The Central and State Governments have been acutely aware of the need to reform the land record system with the following objectives:

- Facilitating easy maintenance and prompt update of land records.
- Making land records tamper proof.
- Allowing farmers easy access to their records.
- Collating the information to construct database regarding land revenue, cropping pattern, land use, etc.
- Utilising the data for planning and for formulating development programmes.
- Enabling usage of this database by courts, banks, private organisations and ISPs.

Computerisation of land records in Karnataka was started in 1991 when a pilot was initiated by the Government of India. By 1996, projects for computerisation of land records were sanctioned for all districts in the State aimed at creating computer records from manual data. However, since no provision was made to install computers at the sub-district level, where online updating was to be done, these projects failed without achieving the above objectives.

Bhoomi – A New Approach

The first e-governance project of the Government of Karnataka was the Land Records Computerization System, “BHOOMI”. This project has been sponsored by the Ministry of Rural Development, Government of India, and implemented by the Revenue Department, Government of Karnataka. It permits online updating of land records, making it radically different from land records systems attempted elsewhere in India, which update databases in offline model making it less current and therefore of not much use. The required software has been designed and developed in-house by the National Information Centre, Karnataka State Unit, Bangalore.

Under the scheme, computerised land record kiosks have been set up in 140 sub-district offices from where farmers can obtain RTC copies on-line. At these kiosks a second computer screen connected to the kiosk computer faces the clients so that they can see the transaction being performed. Any number of copies can be collected for any land parcel belonging to anybody by providing the name of the owner or the plot number.

When a change of ownership takes place through sale or inheritance, farmers can file online requests at these kiosks for initiating the mandatory process known as mutation for effecting necessary changes in the RTC. Each request is assigned a number by the computer. Notices are then generated from Bhoomi, which are served by the Village Accountant on interested parties. After waiting for a statutory period of 30 days from the day of serving of notices, the Revenue Inspector (RI) passes the mutation order in a register maintained for this purpose. The mutation order passed by the RI is processed on Bhoomi and a new RTC is generated duly incorporating the details of the new owner. As part of the process, the mutation order is also scanned to take care of non-repudiation. While the mutation records are pending for orders of the RI, farmers can trace the status of the application, using the computer number provided to them, on the Touch Screen Kiosks provided on a pilot basis in three of the computerised kiosks.

Physics/Technology

Bhoomi is unique in the manner that it utilises the Bio-logon metrics system from Compaq, which authenticates all users of the software on the basis of their finger prints and, therefore, makes officers accountable for their decisions and actions. This is not prone to hacking as is the case with traditional password based authentication. A log is maintained of all the transactions carried out by the officers.

As an implementation strategy, manually written RTCs were declared invalid from the day on which the computerised system became operational in a sub-district. This has forced the department to completely rely on the new system.

Another unique aspect of the project has been the imposition of user charges for all transaction. Rs.15 per copy is charged for land records and mutation extracts. By November 2001, Rs. 50 lakh has been collected as user fees from the distribution of 30 lakh RTCs from kiosks, which have been operational for periods varying from 3 – 12 months. It is estimated that every year Rs.3 – 3.5 crore would be collected as user charge, which would be ploughed back to maintain and improve the Bhoomi programme.

Evaluation

If we concur with Sen's view of development, the Bhoomi project brings in wide ranging benefits which cannot be quantified in value terms. The table below illustrates how this ICT project promotes development. This project has improved the information database and information diffusion which is a sign of development according to Brown's Framework.

Supplementary Framework for Evaluation of ICT Case Studies

Approach	Criteria of Evaluation
Sen's Capability Approach	<p><u>Indirect measures</u></p> <ul style="list-style-type: none"> Increased productivity-through less cumbersome access to farm credit, through reduction in corruption/bribes, reduction in litigation costs Increased Growth <p><u>Direct measures</u></p> <ul style="list-style-type: none"> Human development-Lack of tampering with Land Records/better ownership rights would facilitate long term increase in income generating capacity
Brown's Information-Based Evaluation Methodology	<p><u>Increased transparency in information</u></p> <ul style="list-style-type: none"> Measures of Linkage Measures of coverage-Comprehensive database available for government planning, greater volume of information available to courts for litigation Measures of direction-Kiosk used widely by all irrespective of caste-religious affiliations

Beneficiaries of the Bhoomi project are not only the farmers but also the administrators and others.

Farmers

- Farmers can now get a copy of the RTC from the information kiosk at the sub-district headquarters without harassment.
- The farmer can file an application for effecting a mutation in the RTC and trace the status of the mutation application.
- Use of biometrics authentication system for updation of records have freed the farmers from the worry of probable manipulation of their records by unscrupulous officials.
- Before Bhoomi, the process of obtaining land use documents took weeks and required farmers to pay between Rs.100 and Rs.2,000 in bribes to officials. Now, the farmers get their record in less than two minutes by paying a charge of Rs. 15.
- Access to farm credit would now be less cumbersome. Online connectivity to banks would ensure farm credit to farmers in less than 5 days as

- against 25-30 days in the manual system.
- It would be easier for farmers to pursue land related litigation in the court.

Administrators

- A comprehensive database is now available which can be used for planning for agriculture and development programs. For example, It is now possible to identify what percentage of the land holdings are held in the name of women.
- Accurate and timely preparation of annual records like land revenue, etc.
- Monitoring of government lands and prevention of their encroachments. Lack of monitoring had costed a reported loss of Rs. 2,500 crore to the State Government by way of officials tampering with records.

Judicial Administration

- Courts would be able to make use of land record database for adjudicating various civil disputes related to ownership, possession and cultivation in various courts.

Financial institutions

- Online connectivity to financial institutions would help banks in planning for their farm credit related activities. In the manual system they worked on two-year-old data or just guessed the farm sector requirement.
- Online connectivity would also helps banks to ensure that revenue administration is indicating bank's charge on land records of such farmers who have availed crop loans.
- Facilitates creating change on land of those farmers who take crop loans.

Challenges

Rolling out the applications to 177 locations was a real challenge. In the first phase, the project was implemented on a pilot basis in a controlled environment in four sub-districts. After gaining experience in data entry operations and implementation of the software, the scheme was extended to one pilot sub-district in each of the 27 districts. In the third phase, the project was rolled out to all the 177 sub-districts simultaneously.

Records in the field were not up-to-date due to poor work culture and lack of training amongst the revenue staff. In addition, farmers often do not report transactions within the family, either because they are discouraged by the

attitude of the revenue staff or due to internal family problems. The maintenance of land records is not uniform across districts.

The data entry work was done in an off-line mode through private data entry agencies. Many problems were encountered in off-line data entry. The process was slow and error prone due to poor work quality by data entry agencies. Technical guidance from officers of the district informatics center was not easily available as they were overloaded with other work. Moreover, data entry agencies were unwilling to recruit more manpower as it required investment in training on a specialised data entry software, which would not be useful to them for other projects. Moreover, interruptions in electrical power in *taluk* headquarters and delay in maintenance of computers at *taluk* level by vendors are a problem.

Comprehensive software, which accommodated variations in manual records across districts, was developed. After the initial data entry, print-outs were taken and validated by the VAs with reference to their original records. The entire software was developed in Kannada, the official language of Karnataka.

Intensive training was imparted for bringing about an attitudinal change amongst departmental staff. Twelve State-level seminars were organised for 1,200 senior and middle-level officers. Four divisional-level workshops were organised to train 800 officials. More intensive training was imparted to the officials who handle the computers at the kiosks. To clarify various technical and administrative issues more than 150 circulars were issued and compiled into compendia. A "Bhoomi-Help Manual" was printed and distributed at the sub-district level. A "computer lab" for training was set up.

The political executive was completely involved in the computerisation project. The State's Chief Minister and Revenue Minister highlighted the importance of the project in many public fora. The Chief Minister himself inaugurated many such kiosks and took several meetings to impress upon the team the need to commission this project in a time bound manner.

A participatory software development strategy was followed. Selected field level personnel were involved in the development of various modules of Bhoomi through a formal state level committee. Suggestions for improvement were elicited and where valid, were incorporated in the software.

Lessons Learnt

Many reform efforts fail because they are undermined internally or have little support from current stakeholders whose buy-in is critical for success. In case of Bhoomi, minimising resistance from the staff by harnessing political support was an important contributory factor. Extensive training, coupled with a participatory style, also helped to diminish resistance.

In Bhoomi, significant benefits are delivered in issuing RTCs, but much of the old mutation process remains unaltered. As there is no change in the role of the Revenue Inspector in passing the mutation order, corruption in the mutation process may not necessarily reduce. Bhoomi has reduced the discretion of public officials by introducing provisions for recording a mutation request online. Farmers can now access the database and are empowered to follow up. Reports on overdue mutations can point to errant behavior. Still, supervisors must examine the reports and take appropriate action. In remote areas, operators may turn away citizens by saying that the system offering online service is down. *Strict field supervision is needed (through empowered citizens committees and NGOs) to curb such behavior. Ultimately, the only recourse that a citizen has against such practices is to lodge a complaint. The process for lodging a complaint should be facilitated through the Web. The back end has to be geared up to handle complaints received electronically.*

As an implementation strategy, manually written RTCs were declared illegal from the day on which the computerised system became operational in a *taluka*. The notification was issued on a *taluk-by-taluk* basis as and when the scheme became operational there. This forced the department and the farmers to completely rely on the new system. The strategy worked because the application design was robust and did not falter.

There was some concern in Karnataka about raising the user fee to Rs.15 from Rs.2 in the manual system. Often these fears about user fees are exaggerated, particularly if services have genuinely been improved. The response of the people at taluk level has been overwhelming. Queues can be seen at the kiosks in 140 taluk centers, and 330,000 people have paid the fee without grumbling.

Concluding Remarks

Bhoomi has successfully undertaken the task of computerising over 2 crore land records. The existing database can generate reports on land ownership by size, type of soil, crops, and even demographic particulars. The government plans to use this information to use to develop programs for poverty alleviation, bank loan processing and for even solving legal disputes, besides providing a ready input for conducting further land reforms. *The lessons we have learnt in relation to deployment, roll out and maintenance can be used as a best practices guide that other states in the country can benefit from.* Additionally, the Department of Revenue also plans to web enable the system to truly permeate the administrative structures, and provide any time, anywhere access to the farmers.

PONDICHERRY

The Information Village – Pondicherry

Background

The Information Village Project is an ICT- based rural development programme, implemented in the Union Territory of Pondicherry of south India in 1998, by the Chennai based M. S. Swaminathan Research Foundation (MSSRF) with the support of the International Development Research Centre (IDRC), Canada. Pondicherry was selected for this initiative for three main reasons:

- 1) the availability of reasonable telecom infrastructure and general infrastructure support including roads, markets and hospitals;
- 2) an accessible government;
- 3) high level of rural poverty;
- 4) the expectation that this ICT project would complement a pre-existing fully operational community asset building programme based on biological technologies also sponsored by the Foundation. Therefore there appears to have been a strong degree of local preparedness that would favour the success of a software initiative.

In order to ensure that the Information Village concept would maintain a demand-driven perspective, MSSRF decided that telecentres (also called Knowledge Centres) should initially complement the functions of existing local networks of information exchange and then extend these in order to provide value-added information. PRA was used to assess how far the community was willing to go in

operationalising the local centre, by way of making in-kind or cash contributions. It was also used to identify a group of individuals, with sufficient education (a minimum of high school level), who would be consensually chosen by the community for managing the local centre. Gender sensitivity in assessment of information needs was incorporated at the inception with training and advice regarding content creation, given by a gender expert and the suggestion that women should constitute 50 per cent of volunteers.

Physics/Technology Used

Technology for gaining access to the Internet was based on a hybrid of two-way VHF radio and the wired public telephone network thereby providing integrated voice and data communication capacity. Through a PBX (office-intercom style), each telecentre was connected to this hybrid network. To overcome electricity shortages, a hybrid system of solar photovoltaic panels and grid power, interfaced by a commercially viable digital circuit, was installed.

The Information Village Project

The Information Villages project has established a rural information network along a hub-and-spokes model. In each village is a small, community-owned and operated Village Knowledge Centre, staffed by trained volunteers and equipped with several computers, printers, telephones and Internet access.

At the centre of the project is the project headquarters, Villainur, the value addition centre. Here, the hub of the wireless system was placed and dial-up Internet accounts were established. Using Villianur as the informational hub for the other telecentres reduced the costs of providing full Internet access to all the centres. Village centres were set up in places where the community offered secure space, free of cost. The village centre operators were trained in PC operations, using the data-cum voice network, maintaining a register to log use of the centre by the local residents, basics of management and handling of queries by illiterates. Assistance and advice is given by staff,

who frequently visit the centres, and all the centre operators and staff meet once a month to sort out issues. Since 98 per cent of the population speak Tamil (Harris, 2001), the project staff developed the use of standard Microsoft Office applications in Tamil script. Operators have learnt the appropriate keyboard codes for the Tamil characters with the use of a western, Roman script QWERTY keyboard.

Information needs are identified at each centre and transmitted to Villianur via e-mail across the wireless network. The staff at Villianur then track down the required information and transmit it back to the centres by e-mail and e-mail attachments, sometimes in the form of digitised audio messages. The project staff helped generate a number of locally relevant databases. Each centre contains data on:

Health—health-related information, a directory of hospitals and medical practitioners -grouped with specialisations such as orthopaedics, paediatrics; Government schemes—a directory of government schemes available to rural families, list of families below poverty line and a directory of general and crop insurance schemes; Agriculture— local prices (agricultural input or produce), grain prices in Pondicherry region, input prices (quality seeds/fertilisers) in Pondicherry region, etc. as well as information about integrated pest management in sugarcane crops; Other information— cultural/public events in the locality, local transport/traffic details including timing (MSSRF, 2000).

Evaluation

Of the original six knowledge centres (excluding Villianur centre), two closed down while the rest were fully functional. During the year 2000-01 four more knowledge centres were established. The following table presents the category of users at the knowledge centres.

Categories of users of knowledge centres

Village	Total no. of users	Men	Women	Children below 14 years	Dalits (low caste)	Families Below Poverty Line	Illiterates
Veerampattinam	5,823	4,842	813	168	29	2,552	117
Kizhoor	7,425	5,226	862	1,337	100	2,694	179
Embalam	12,601	6,681	2,401	3,519	336	3,278	238
Pooranangkuppam	1,344	983	94	267	—	373	49
Thirukanchipet	1,693	1,379	102	212	1,455	1,400	58
Kalitheerthalkuppam	961	767	97	97	16	128	146
Ariyur	140	71	30	39	12	51	1
Pillayarkuppam	620	300	260	60	—	—	—
Total	30607	20249	4659	5699	1948	10476	788

Source: MSSRF Annual Report 2000-01: <http://www.mssrf.org/annualreport11/PA500.html#spa501>¹

As can be seen from the table that (although there are regional differences) ultra-poor families constitute a large portion of the total number of users. Children (below 14 years) feature as the next largest group followed by Dalits (socially disadvantaged group) and illiterates. The data showing the difference between the number of men and women users also has great regional variations with the number of men users being higher in every case. However, it must be noted that women users are present in every village whereas this is not always the case for poor families, illiterates and Dalits.

Market prices are greatly sought after both by farmers and landless labourers. Farmers can decide whether to sell to the regulated market or the local buyer and thereby maximise profits. The bargaining power of landless labourers (including women) has also increased, since they can gauge their employer's profit and, in case of exploitation, demand an increase in wages. Information about access to quality seeds to farmers is also enhancing food security.

Information about government schemes has been a boon since people earlier did not bother to find out about beneficial government schemes. Shah (2001: 29) states that this was due to a combination of villagers' interests only in short-term gains and the bureaucratic mechanism of obstructing free flow of information. Increased knowledge amongst the people has meant that they no longer have to resort to petty bribery in order to navigate through bureaucratic channels (ibid.).

Gender inequalities are being addressed by providing women with access to relevant information. For example, a group of women starting out as sub-contractors of incense sticks eventually used the telecentre to market their own brand of incense and thereby increased their income. Kapadia (1995) notes that increases in women's income not only raise their status but also benefit the family since women tend to spend the larger portion of their income on family needs as opposed to men's tendency to spend more on personal needs. Moreover, women are the primary users and seekers of health related information in the centres reflecting their divergent needs from men.

The hypothesis outlined earlier was that the type of information disseminated determines the utility of the knowledge created which in turn influences (depending upon obstructive/facilitative structures of power) the formation of functionings or the capability set, thereby ultimately impacting on the freedom of individuals.

Further, key areas for measurement of information were adopted from Brown's (1991) methodology:

- Measures of coverage: diversity, range, appropriateness of information / and sources;
- Measures of linkage: networking processes, feedback mechanisms;
- Measures of direction: permeability of information within population in question; political aspects of access and information flow; information flows and effects on decision making.

Measures of Coverage

It can be seen from the case study that the volume and diversity of information in each centre seems to be demand driven and therefore quite suitable. Sources of information included interactive CD-ROMs, newsletters and pamphlets (PANAsia, 1999). Audio messages are particularly helpful in overcoming the barrier of illiteracy - one of the dimensions of the digital divide. For example, the fishing hamlet of Veerampattinam receives information, via verbal transmission across a public address system from loud speakers on the roof of the centre, on wave heights in the Bay of Bengal downloaded twice daily from the US Naval Oceanographic laboratory (ibid.). Plans to link the computer aided rural Knowledge Centres to a community radio network, will provide another far-reaching source of information (Swaminathan, 1993).

Measures of Linkage

The sharing of information between village centres (e.g. each centre was obliged to buy a different newspaper, summarise the main headlines and transmit the information to other centres) as well as between staff and volunteer operators (during monthly meetings) contributed to the creation of a network of information flows.

Measures of Direction

Permeability within the population: This project has shown that ICT based information succeeded in reaching disadvantaged groups of people (albeit with many regional variations). Moreover, the use of Tamil language either in written or spoken format has greatly contributed to the diffusion of information (PANAsia, 1999). It must be noted that MSSRF sought to *add to* rather than *replace* the pre-existing forms of information flows.

The use of ICTs, as another option of obtaining information, has succeeded not only in increasing the overall volume and permeability of *relevant* information but more specifically in the inclusion of disadvantaged people within

the sphere of information. Therefore, there is scope for this information to ultimately result in increasing people's freedoms. It must be noted that in view of the fact that the digital divide is viewed as an absence of access to information rather than as an absence of access to technology (Harris, 2001) the sensitivity of the strategies used by MSSRF successfully overcame the barriers, commonly associated with the digital divide, of language, education, income and gender.

It is thus heartening to know that the information village project promotes development/progress on criteria defined both by Sen and Brown. This project has definitely been helpful in attaining human development directly as well as indirectly through the channels of growth and productivity. It has also increased the volume, diversity and coverage of information flows in the area.

Supplementary Framework for Evaluation of ICT Case Studies

Approach	Criteria of Evaluation
Sen's Capability Approach	<p><u>Indirect measures</u></p> <ul style="list-style-type: none"> Increased productivity-through improved market prices for farmers and landless laborers <p><u>Direct measures</u></p> <ul style="list-style-type: none"> Human development-through greater gender equity, through better health related information
Brown's Methodological Framework	<ul style="list-style-type: none"> Measures of coverage-Variety of information available on a variety of issues-governance, health, agriculture Measures of Linkage-Interchange of information between centers Measures of direction-information able to reach disadvantaged

Political aspects of access: MSSRF embedded certain norms in the agreement terms about the need for equal access to the knowledge centre by disadvantaged people. During the entire process of reaching an agreement on issues of access, the MSSRF staff were careful not to undermine the local power structures, viz. the traditional panchayat which, according to Shanmugavelan (programme director at MSSRF, personal communication), aided in the success of the programme. However, two of the original centres were closed down due to political conflicts. In one case a political party wanted to take over the management of the system and in the other the village volunteers had reservations about Dalits using the knowledge centre and were misusing the equipments.

However, the relevant information did enhance functionings for people and aid in the reduction of capability deprivation in other villages.

Therefore, it can be deduced that in this case the innovative use of ICTs has led to increased democratization of information flows and has increased, to some extent, the real freedoms that people can enjoy. It is important that ICT should not be viewed as mere goods and service or as a provider of a utility. While elaborating the capability approach in the context of food security, Sen (1984: 315) pointed out the notion of a good (rice), the characteristic of the good (calories and nutrition); the functioning of a person (living without calorie deficiency); that of utility (the pleasure of desire-fulfillment). Similarly, viewing ICT and Knowledge through the capability approach: ICT is a good, information its characteristic, functioning is the management of knowledge and information by individuals and the community and utility is the conversion of knowledge into social and economic returns.

Challenges

Several constraints have been noted by the project staff—the near absence of a modern electrical and telephone infrastructure in the region. This led to some creative solutions like putting solar panels for electricity and wireless transmission systems where communication lines didn't reach. Costs were minimised. The emphasis on low budget technologies enabled more villages to be connected, freed up for funds for greater emphasis on training and evaluation aspects, which are often neglected in technology projects.

Sustainability of the network in a context where users are below the poverty line is one of the most difficult hurdles to overcome. Most of the knowledge centers are partially self-sustaining, thanks to the efforts of the volunteers. A key to sustainability is the fact that the centers are valued assets. When repairs are needed they are made not always with external assistance.

Diffusion

The tangible social benefits of the project are compelling to the Indian government. The Department of Science and Technology wants to see the experiment replicated in most of the villages in Pondicherry and is covering the cost of connecting five more villages through wireless technology.

Lessons Learnt

In order to achieve poverty alleviation (measured as capability expansion), are ICTs superior to other modes in terms of information dissemination? And, if so, what are the policy implications for development agencies?

The case study demonstrates par excellence the benefits of ICTs due to their ability to render generic information, locale specific. The critique that ICT-based information undermines sustainable indigenous knowledge systems (Heeks, 1999) is easily refuted when one considers that ICT can also be used to record indigenous knowledge (as was done in the current project) and thereby protect its illegal usurpation.

Several useful policy implications can be drawn from the project in question.

- The bottom-up process creating sensitivity to local information needs
- Community ownership of the equipment
- Participation of women, with a view to bridging the gender divide
- Sensitive strategies to reach the poorest of the poor
- Information dissemination in appropriate forms, e.g. local language
- Training volunteers and involving them in policy making to instil a sense of pride and enthusiasm
- Awareness of power structures both at the local and wider level

One could perhaps argue that this case study is demonstrative of Castell's (2001: 271) viewpoint that the Internet is fundamental to the development process and that without its adoption poor people are doomed to a life of poverty since they will be excluded from the network society.

However, the critique regarding the *development opportunity costs* of building and maintaining modern ICT infrastructure in the face of severe shortages of basic requirements (food, educational and medical facilities) in many rural regions in developing countries, and underdeveloped physical infrastructure (Roche and Blaine, 1996) is harder to ignore. It is proposed that although ICTs may be important, they are not a sufficient condition for development. As suggested by Martin and McKeown (1993) it is important to adhere to the principles of integrated rural development with at least a minimal infrastructure improvement in transport, education, health

and social and cultural facilities. Otherwise, it is unlikely that investments from ICTs alone will enable rural areas to cross the threshold from capability deprivation to capability expansion.

It must be remembered that the presence of a strong degree of local preparedness to facilitate the success of a software initiative was the reason for implementation of the Information Village project. The cooperation of the government, that wanted to project an image of being techno-savvy, in providing details of various schemes was crucial (Shah, 2001). Further, although the project has been successful in increasing information flows that have often translated into greater freedom for poor people, once MSSRF withdraws from the region, the long-term financial viability of the project is in doubt.

Concluding Remarks

In conclusion, on the basis of the analysis, it has been identified that increased flows of relevant information are conducive to expanding people's freedoms (and hence development) and that the use of ICTs, as a means of information dissemination, although no doubt feasible in this case, may not be as feasible in others where other kinds of technology (e.g. community radio, television etc.) may be more appropriate. In order to achieve potential benefits, it is necessary to focus on user-oriented and cost-effective applications rather than on technology driven applications. Further, the success of any kind of programme involving information disseminating technology in empowering the poor people is far from inevitable and depends on factors such as progressive NGOs and the need to create and justify the perception among the target population that the information is relevant to their needs and will improve their state of well-being. However, even if the aforementioned criteria are fulfilled, the support and responsiveness of the government (and other political structures) remains vital to ensure a genuine improvement in the well-being of the beneficiaries.

ANDHRA PRADESH

CARD-Computer-aided Administration of Registration Department Project



Background

CARD is one of the major IT projects undertaken by the Government of Andhra Pradesh. The CARD project was launched on 4 November 1998.

An appropriate media campaign was also simultaneously undertaken which made a definite impact not only in Andhra Pradesh but all over India in the days and weeks that followed. About 80 per cent of all transactions are now done through CARD. Some of the transactions are still being handled manually at a few places due to hardware and software related problems. During the period of stabilisation, the manual system of copying the indexing of documents was continued along with the computerised process.

The CARD project

CARD is a major IT project designed to eliminate the maladies affecting the system of registration through electronic delivery of all the registration services.

It was started based on the following primary objectives:

- Demystify the registration process;
- Introduce a transparent system of valuation of properties, easily accessible to citizens;
- Bring in speed, efficiency, consistency and reliability;
- Replace the manual system of copying and filing of documents with a sophisticated document management system that uses imaging technology;
- Replace the manual system of indexing, accounting and reporting;
- Introduce electronic document writing;
- Substantially improve the citizen-government interface.

Besides the primary objectives, this project also hopes to meet some secondary objectives like cater to different levels of users, bring in maximum user-friendliness, be

scalable and permit modular development and implementation.

The CARD project was funded entirely by the government of AP. The original outlay was about US\$3 million (Rs. 13 crores). It is likely to grow to \$4.3 million (Rs. 18.5 crores) when final accounts are drawn. This would include hardware, software, training, site preparation, data entry, air conditioners, furniture, stationery and storage media, CARD software training and other miscellaneous expenses.

The quality of registration services is expected to go up substantially under the CARD system, as can be seen from the following table:

Description of the Service	Time Taken to provide the service under	
	Manual System	CARD System
Market Value Assistance	New Service	5 Minutes
Sale of Stamps	30 Minutes	15 Minutes
Registration	1 to 7 days	1 Hour
Document writing	New service	15 Minutes
Encumbrance Certificates	1 to 5 days	5 Minutes

Building up a whole new system based on a highly sophisticated technology in a department with practically no IT skills to begin with, is a challenge and maintaining the system is a more formidable challenge. A high priority has, therefore, been given to the task of imparting the required IT skills to all the employees of the department, as part of the CARD project implementation. Nearly 1,600 employees at various levels have been trained in the technical and operational aspects required to maintain and run the systems NIIT and NIC have performed this onerous task in the limited time frame. A cadre of 75 DPOs (Data Processing Officers) has been built from among the employees of the department, to form the core team responsible for the transfer of skills to the operational staff on an ongoing basis. They form the most important human resource, so critical for the sustained operation and success of the CARD project.

Evaluation

- Impacted 1 crore citizens in three years;
- Number of Documents registered 28 lakh;
- Title Searches made 14 lakh;
- Transparency brought into the system of valuation of property;
- Efficient document management system;
- Estimated saving of 7 crore man hours of citizen time valued at US\$ 35 million (investment in CARD - US\$ 6 million).

Quantitative Benefits

The positive impact of the CARD project on the efficiency of registration operations can be gauged from the following table.

Description of Registration Service	Time taken in manual system	Time taken in CARD system
Valuation of properties	1 hour	10 minutes
Sale of stamp paper	30 minutes	10 minutes
Document writing	Not available	30 minutes
Registration	1 to 7 days	1 hour
Encumbrance Certificate	1 to 5 days	10 minutes
Certified Copies of Documents (registration under CARD)	1 to 3 days	10 minutes

Future Beneficiaries

There is a strong likelihood that the project will make a dent in the operations of brokers and middle-men, and reduce corrupt practices. Since 60 per cent of the documents, EC's and certified copies relate to agricultural properties, the CARD project will help the rural farming community. The agriculturists would also benefit from a possible link-up of the CARD network with the rural bank network, which enhances the efficiencies of the rural credit services by eliminating the need for paper medium.

From Sen's and Brown's perspective, this ICT initiative has been successful in providing benefits to the citizens and has the potential to provide greater benefits in the future and therefore is of great value.

Supplementary Framework for Evaluation of ICT Case Studies

Approach	Criteria of Evaluation
Sen's Capability Approach	<p><u>Indirect measures</u></p> <ul style="list-style-type: none"> Increased productivity-through reduced corruption/unproductive rent-seeking, reduction in transaction processing time. Increased Growth-through possible benefit to farmers with linkage of CARD network with the rural bank network. <p><u>Direct measures</u></p> <ul style="list-style-type: none"> Human development
Brown's Information Based Evaluation Methodology	<ul style="list-style-type: none"> Measures of Coverage-Improved information access and storage through use of ICT Measures of Linkage-No feedback mechanism yet incorporated. Measure of Direction-increased transparency in government has improved its image while at the same time effecting government procedures. Service available for the use of all sections of society.

Challenges

Implementation of an IT project in a government department across the state involving over 200 locations is a formidable challenge especially because of the rapid technological advances in this field. The project needed to be finalised and implemented rapidly, so that the technology, both hardware and software, did not become obsolete by the time the project was launched. A number of implementation issues have arisen out of the above complex scenario that were foreseen at the beginning of the implementation period.

Business process re-engineering

Computerisation of the age-old process of registration called for considerable re-engineering efforts. The more important results of this business process reengineering effort are:

a. *Amendment of the Registration Act*

The Registration Act of 1908, is a legislation of the Union of India, and does not provide for handling the registration process on computers. The Act, together with the Rules and Standing Orders, provide in minute detail the manner of presentation of document, its scrutiny, the registration process, copying of the documents into volumes of books, the ink to be used for copying, etc. Copies of documents preserved in any other way would not have the legal sanction and so would not be admissible as evidence. To

overcome this situation, the Registration Act, 1908, in its application to the state of AP has been amended to provide for the following:

- The process of registration of any category of documents may be completed and copying done with the help of electronic devices like computers, scanners and CDs and copies preserved and retrieved when required.

- Copies of documents registered and stored electronically, retrieved, printed and certified by the

sub-registrar shall be received as evidence.

- The software to be used for registration shall be prescribed by the Inspector General

It took over a year for the amendment to become effective. The Government of AP notified 214 sub-registrar offices, where the registration can be done using electronic devices. This Amendment is effective from 5 February, 1999.

b. Valuation of properties

This involves incorporating the basic value guidelines into a master table of the computer and making the system compute the value of any property instantaneously without causing loss of revenue to government or charging excess from the citizen. As a result,

- The procedure of spot inspection, which is often a discretionary process, has been dispensed with. It is replaced by a system of post-registration inspection of properties.
- The system of market value assistance across the counter is a direct offshoot of this effort.
- Site preparation

c. Training

To effectively use the technology, a well designed and large training program was implemented by the National Institute of Information Technology. Training was imparted to employees at five different levels.

- The training programs were implemented in a corporate-like environment at a cost of about \$262,000 (Rs. 1.13 crores)
- Decentralized training programs were run at 25 centers in the state
- Training course-ware was designed and supplied
- The Data Processing Officers were groomed as technical resource persons at the district level, competent to install various kinds of software, troubleshoot technically, and to transfer the skills required to manage the counters

Extensive and far-reaching reforms in a system cannot be brought about without adequate motivation of the organisation. The following steps brought about the required motivation of all the employees:

- A cross-section of the field personnel was closely associated with the design and development of the software and especially in the task of business process re-engineering.

- No external technical personnel were recruited.

Category	Number	Training period
Senior Officers (D.I.G.s and D.R.s)	45	1 week
Middle level managers (A.D.R.s)	50	3 weeks
Data Processing Officers (D.P.O.s)	75	6 months
Sub-registrars	300	2 weeks
Data Entry Operators	1,200	2 weeks

The head of the department undertook extensive tours over the state and conducted workshops, presentations and special training camps involving all the employees of the department. The officials who managed the two pilot sites were closely associated with this effort.

- The acronym “CARD” is catchy and has contributed significantly to the identification of the employees with the project.
- Support and association of senior functionaries of the government such as the Principal Secretary and Minister of the Revenue Department have been motivational factors as well.

d. Data backlog

The CARD masters (state level) could be built without much difficulty as the data is limited and is available. However, the project encountered major challenges in building up basic value data and the EC data for the last 15 years. The basic value data consisting of about 50,000 records at each SRO, was entered into the systems by the trained staff in 6 – 8 weeks. While building the database critical to the running of the CARD system, this also enabled the staff to acquire some hands-on experience. The task of entering EC data, which has a more complex size and structure— about 1.2 crore records of 2 KB size each—has been outsourced to five agencies in March 1998. The department had to face scores of problems in ensuring speed with quality of data entry. These were of enforcing standards in data definition, iterative data validation and coordination between departmental staff and the private agencies. The EC’s are now being issued to citizens in five minutes after searching more than 15 years of records, at over 50 offices.

e. Installation issues

Installing of CARD application software in 212 locations was considered to be a major problem. Seven versions of the software had to be developed, tested and deployed in a limited time frame of four months to achieve the desired functionality across the counter. This challenging task was made possible by the relentless efforts of the Data

Processing Officers who were groomed in anticipation of this task. One significant strategy adopted to ‘de-bottleneck’ this process was to enable the Data Processing Officers to contact the head of the department and a core team of technical personnel at the headquarters at any time to solve problems encountered in installation.

Lessons Learnt

Sustenance is an important issue in relation to all state-sponsored projects. To sustain the CARD system a transaction-based fee structure linked to the various registration services has been proposed, which is under consideration of the Government of AP. Under this scheme, a nominal fee would be charged for each transaction/service across the counter. The amount collected would be pooled at the district level—without having to remit to a government treasury—to meet expenditures for stationery and media, maintenance of the equipment, electricity charges, software up-gradation, etc. Above all, a continuous public awareness campaign and the enforcement of a Citizen’s Charter which lays down service standards, should help guard against the risk of the CARD system getting defunct or dysfunctional for want of maintenance and support.

The CARD system replaces the existing manual services with computerised services besides introducing a few new services. This is the first step on the road to an ever-expanding world of exploiting IT to improve citizen services. The following plans are being contemplated:

- Introduction of a Telugu version of the software;
- Establishing a CARD service center that provides all registration related services, except registration of deeds, relating to any property in the twin cities under one roof;
- Networking all the servers/PCs at 214 centers using the Andhra Pradesh State Wide Area Network (APSWAN) so that all registration services, except registration of deeds, can be accessed at any of the 214 offices irrespective of location of property;
- Providing registration information services on the Internet;
- Development of a property title database, which would be the precursor for introducing the Torrens System of registration (whereby registration of a sale deed guarantees title to a property);
- Linking up of the databases of all land related departments like land revenue, municipal administration and irrigation;
- Linking up the EC database with banking network to facilitate speedier processing of applications for rural credit.

Diffusion/Replication of CARD in Other States

The Registration Act 1908 is a Central Act, so the procedures are almost the same throughout the country. Therefore, it should be feasible to replicate the reforms brought about through the CARD project in Andhra Pradesh in other states with suitable customisation appropriate to local situations. However, it is essential to recognise that the respective states have to make concerted efforts to put the enablers in position to ensure successful replication within a limited time frame.

Concluding Remarks

The CARD project ensures speedy, transparent, easily accessible and reliable services to citizens. Initial results indicate a good possibility of the project shaping into an extremely citizen-friendly application with prospects of further improvements and replication in other states.

It was forecast that the CARD project would need three months after the launch to stabilise. The complexity of the system, need for enough experience on the job, rectification of problems of hardware and software at some places are the factors necessitating a period of stabilisation and transition from the manual to the computerised system. After about six months of operation of the project, the results are found to be highly encouraging.

The following are seen to be critical success factors for the success of the CARD initiative and should be taken into account by those States that want to replicate similar initiatives-

CARD has the inherent potential to deliver all the registration services to the satisfaction of the public. Its success depends on several environmental factors such as:

- Creation of adequate awareness among the public, about the benefits of CARD;
- Sustained maintenance and upgradation of the systems
- Upgradation of skill levels of the employees on an ongoing basis;
- Implementation of the Telegu version of the package.

¹ The total number of users is not provided in the original table but has been calculated here to aid in the analysis.