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Executive Summary

This paper considers seven e-government projects that have been implemented in India. Four are well known: Bhoomi, CARD, Gyandoot and eSeva, and three are relatively lesser known: Akshaya, Lokvani and SARI. Each project is an attempt by various state governments to use ICT for development, a goal that includes poverty reduction and improved access to government services. These projects were selected because they addressed the needs of a large population, have sustained for a period of time, and have been used by a significant portion of the target population. Further, the projects were studied with a clear delineation of the issues pertaining to demand-side and supply-side stakeholders. The former are the consumers of the services of an e-government system and the latter are the main providers of the services (such as government departments).

The framework used for the analysis of the projects is based on an assessment of first- and second-order effects. First-order effects result from the immediate roll-out of e-government projects and second-order effects result from continued use of the system over a longer period of time. All the projects showed positive and significant first-order effects. For example, Bhoomi is used by about 800,000 people a month to access land records, eSeva has registered over 41 million transactions since inception, and even a small project like Lokvani has registered almost 30,000 transactions in a few months. Few of the projects have shown any significant second-order effects. eSeva has had a small impact in terms of forcing participating departments to streamline their activities.

A deeper analysis of the developmental impact of e-government systems is undertaken by using Amartya Sen's fundamental freedoms approach. This analysis was conducted for the Bhoomi project in particular, for which detailed data was available. The analysis shows that for landless and poor farmers and for women, a system such as Bhoomi has been of marginal relevance. Poor farmers are adversely affected by Bhoomi as it enables, for example, in the Bangalore periphery region, land sharks to identify and target them. Tenant farmers use records that are not covered by the Bhoomi system. Farmers do obtain some benefit from RTC certificates by being able to obtain credit and insurance, but a portfolio of applications is missing.

In the SARI, Gyandoot and Lokvani projects there is direct evidence of participation by women. Women used the Akshaya kiosks for computer literacy, and this is the highest recorded participation by women (65%). There is very little evidence of participation by dalits and other marginal groups in these projects.

Many projects experienced conflict and resistance at the time of implementation. Both demand- and supply-side stakeholders resisted and contested the powerful e-government systems that disrupted their existing ways of working. Although this was overcome by the project managers, it left an impact on the outcome of the projects. It is evident from the analysis that the two most important capacity gaps are those of the digital divide and political participation. These gaps prevent the adequate participation of stakeholders and their ability to adapt to the changes introduced by the new systems.

Recommendations include: participatory approaches to requirements analysis and design of e-government systems; experimentation with multiple designs and systems dispersed across diverse groups; government process re-engineering as demanded by target populations; participation by grassroots officials in the design and implementation of systems; and inter-departmental cooperation and coordination at the governmental level.

The Impact of Indian E-Government Initiatives: Issues of Poverty and Vulnerability Reduction, and Conflict

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1 Introduction

The introduction of e-government systems¹ in India started out in the late 60s and early 70s with an emphasis on computerizing applications for defence services, for the economic planning department, for the national census, for elections and for tax collections etc. The government mainly did the spending and the development was entirely done by internal Information Technology departments. In the 80s the National Informatics Centre was established, whose main role was to implement and support large-scale computerization projects in India. The 90s saw the emergence of a national IT initiative by the Government of India with corresponding plans in the states. External funding was sought from agencies such as the World Bank and external parties such as NGOs and private corporations were involved in the computerisation efforts. The focus also shifted to external e-government systems that could provide services to the public.

The 90s saw a spate of e-government initiatives in India, in various states, that addressed issues of land records management through digitisation, issue of government documents to public and collection of various dues via kiosk-based centres and the use of GIS-based services for assisting agriculture. Currently, in the year 2005, the government in India is poised to spend Rs 120 billion on e-government initiatives.

The results of such efforts are not very promising, though: most e-government systems that are implemented in developing countries around the world fail, with the failure rates at over 80% (here 50% are partial failures while the rest are total failures. Many reasons are attributed to such high failure rates, most of which have to do with a lack of direction and continued support by the responsible government department. Projects are, apparently, conceived of as a response to the push to 'computerize' from the government without a clear understanding of the problem being addressed or the adequate design of such systems. Or, projects are conceived of to address certain immediate problems without analysing the deeper causes of the problem.

Various commentators provide different rationales for the deployment of e-government systems in India, not least of which are the arguments for leap-frogging development - the idea being to push India into a developed country status, technology-wise, without going through the pains of the technology development and adoption process. Other reasons include bringing about efficiency and transparency in governance, a much-needed cure for India's various ills. The arguments about development and the need for e-government often include the benefits accruing to Indian industry and markets and the government, however, few focus on the needs of the most marginal and poor sections of society.

¹We use the phrase e-government system with a broad definition: e-government systems are information and communication technology based systems that are used to deliver governance services. This definition includes within its ambit a whole host of systems that provide government services, where the systems are maintained either by the government or by other agencies.

The objective of this paper is to examine the role of e-government systems in addressing the needs of the marginal sections of India's society, particularly women and dalits (the lowest caste groups). Although many studies of e-government systems in the past have included an analysis of costs and benefits and an assessment of the project itself, few have actually addressed the issues of impacts on the population that is a stakeholder in these projects. It is implicitly assumed in most projects that certain principal stakeholders will be benefited and the assessment studies only survey these stakeholders and include the benefits or problems from the implemented system. Marginal population groups are rarely included as the stakeholders that benefit from (or are harmed by) such projects.

With a recognition that marginal groups such as women and dalits and landless farmers are also stakeholders in e-government systems, a special set of issues have to be included in the analysis: are these stakeholders included in the design of the processes that the system will implement; are their concerns for access to resources and services impacted by the systems; are their existing means of dealing with the government reduced or enhanced and in what ways; is their lack of access to electronic resources (owing to the digital divide) included in the design of the new systems. These issues have to be articulated in the particular context and location of the e-government system and then examined in that light.

The rest of this paper includes the following sections: criteria for the selection of projects for analysis; a brief description of the projects selected for analysis; issues by which the projects will be analyzed; detailed analysis and discussion of the impacts of the selected projects on marginal groups; discussion on the participatory nature of such projects; conflicts of stakeholders and the resolution of conflicts related to these projects; conclusions and recommendations.

2 Selection of E-Government Programmes for Analysis

There are well over a hundred e-government projects that have been initiated in India by the central government and the different state governments. For this study a few projects are chosen using the following criteria.

1. The e-government project provides some service or product to a fairly large population. This criterion would rule out internal, intra-government systems. The emphasis is on government-to-citizen systems.
2. The project has sustained for a period of time that exceeds its rollout period. Roughly, the project should have been 'around' for some time, beyond the time it took to build it. This ensures that projects of a certain scope and scale are included.
3. The project has been demonstrably used by a large number of people in the targeted population. The exact numbers are not important, but the project has to have had some impact on the users that can be measured.

Though the above criteria are somewhat fuzzy, they do allow one to select projects that have had some impact in the e-government scenario and that can be assessed for their impacts and detailed analysis is possible.

3 Projects to be Studied

The projects that will be studied for the purposes of this paper are described here. The descriptions cover details about the origins, objectives, targets, implementors, stakeholders, duration and current status of the projects.

Stakeholder groups are understood, for this analysis, to belong to either the demand side or the supply side [4]. On the supply side are the government departments, district offices, project champions and implementation agencies (public or private) that design, implement and maintain the system. On the demand side are the users of the system such as citizens, departments, private institutions, public institutions and others.

The details about the projects are provided in summary fashion below and more about them is covered in the analysis section later. The first four projects are possibly the most well-known in the Indian context. The last three - Akshaya, Lokvani and Sari - are less well known and present a somewhat contrasting picture.

Bhoomi Origin: The Bhoomi project originated in the mid-nineties in Karnataka at the behest of the central government of India that was demanding reforms in land administration. The Karnataka government had made two earlier attempts at land records digitization but had failed owing to the complex nature of the problem. In 1999, under a new chief minister, the project was planned carefully and rolled out by 2001. 20 million records were digitized and maintained in a database. The system provides access to farmers via kiosks located at taluk (part of district) headquarters where for a nominal sum farmers may obtain certification of their land holding and cropping, as also submit applications for mutation. In 2001 the Bhoomi system was legally vested and all manual records were made illegal. **Objectives:** Bhoomi was intended to ease the access of land record certificates (called RTC certificates) that are issued by a village accountant to farmers. There were delays, lack of transparency and corruption in the certificate delivery, where the certificates are used to access official loans and sell produce to the government. **Targets:** The main beneficiaries (intended) are the farmers of Karnataka who can now access an RTC certificate easily from the system and also enter their requests for land record changes (known as mutations) in the system that maintains a FIFO queue and enables transparency. **Implementors:** The system was initiated and funded by the Karnataka government and implemented with the help of the National Informatics Centre, a central government organization that is principally responsible for rolling out e-government projects across India. **Stakeholders:** The main supply-side stakeholders are the kiosk-operators and officials in the taluk offices. On the demand-side the main stakeholders are the farmers and the banks and financial agencies that benefit from Bhoomi's improved services. **Duration:** The systems was initiated in 1999 and the implementation across all districts was completed by 2001. Currently (late 2005) the system is being used across the state. **Status:** Most commentators believe that Bhoomi is one of the most successful e-government projects in India. The Bhoomi model of land records digitization is being adopted at the national level and will be replicated across all states.

CARD Origin: Another land records project implemented in the state of Andhra Pradesh in over 200 centers. The project was initiated by the Commissioner and Inspector General of the Department of Revenue and Stamps, in 1996, and after a pilot demonstration was approved for the entire state by the Chief Minister 1997. The system was officially enabled in 1999 after the passing of an act in the legislature allowing digital storage and handling of land records. **Objectives:** The goal of the system was to introduce transparency and efficiency in the land registration process. Owing to cumbersome procedures and delays in transactions, the records access and mutations process was rife with corruption (via the use of agents known as 'document writers'). **Targets:** The main beneficiaries are the land-holding citizens of Andhra Pradesh, for whom payment of land taxes and registration duties on property was made easier. **Implementors:** The AP state contracted out work to private vendors and also state agencies. The tasks included digitization of records, implementation of hardware and software infrastructure and training of personnel. **Stakeholders:** The principle stakeholders on the supply-side are the registration office employees whose work was changed by the system and on the demand-side are the citizens who have property and the agents who worked with the citizens, for a fee, to help with the registration process. **Duration:** The project was rolled out in 212 registrar offices of the state, over a period of two years ending in 1999. **Status:** CARD is actively used right now by citizens across the state.

Gyandoot Origin: A project to directly provide e-government services to citizens in the relatively poor Dhar district of Madhya Pradesh state. The project was initiated and championed by the District Collector in Dhar in 1999 and by 2000 the kiosks had been rolled out in 38 villages. **Objectives:** The project aimed to bridge the digital divide by providing computing services to rural citizens and also to generate employment for youth who were to man the kiosks as

entrepreneurs. Each Gyandoot kiosk offered services such as: prices of agricultural produce at various auction centers in the state; copies of the record of rights to land at a nominal price; online application for revenue, caste or domicile certificates etc. **Targets:** Twenty villages opted to set up information kiosks, with their own money, that were networked in an Intranet and served a population of about 20-30000. Youth from the villages were trained to man these kiosks as self-sustaining ventures. **Implementors:** The state government, with assistance from the World Bank, funded the infrastructure. Private companies participated in setting up the networks and kiosks. **Stakeholders:** The supply-side stakeholders are the kiosk operators who provided the services and the taluk and district officials who supported the governance services. The main demand-side stakeholders are villagers living in Dhar. **Duration:** The project was initiated in 1999 and inaugurated a few months later in 2000. Initially 20 villages were connected by kiosks and later 18 more were added. **Status:** Gyandoot facilities were used by up to 40,000 village users in the first few months of its deployment, with usage ranging from auctioning cows to seeking brides. The project won the prestigious Stockholm Challenge award in the 2000, but since the back-end support from the government declined most of the kiosks are not used much (and the project is considered to be a failure).

eSeva Origin: eSeva is also a project in the state of Andhra Pradesh but its location is in the urban twin cities of Hyderabad-Secunderabad. The project originated as TWINS, which was an attempt to have a centralized location for the payment of utility bills for citizens. Later it was expanded to include various other services. **Objectives:** A central facility (distributed across the two cities via 48 centres) for payment of taxes, delivery of certificates, bill payments, document clearance, granting of licences and permits, asset licensing, forms submission etc (a total of 66 services). The goal was to eliminate the multiple offices and timings that citizens had to suffer to pay their bills and obtain other government services. **Targets:** The main target beneficiaries are urban citizens. **Implementors:** The system was designed and implemented by the city administration with help from the National Informatics Centre and private companies. **Stakeholders:** The supply-side stakeholders include all government departments such as transportation, taxes, revenues, human resources and others whose services are being offered via the eSeva centres. Closest to the system on the supply-side are the kiosk-operators and system administrators whose job it is to maintain the kiosks for 12 hours a day (and 6 hours a day on holidays). The main demand-side stakeholders are urban citizens. **Duration:** eSeva was launched in early 2001 and the centres have been running ever since. **Status:** eSeva too is widely regarded to be a very successful project where the service delivery is very efficient.

Akshaya Origin: Launched in the Malappuram district of Kerala in 2002. The project was initiated by requests from the panchayats (or village councils) to provide computer training to its constituents. **Objectives:** To bridge the digital divide by providing computer literacy and e-government services, and also to provide employment to rural youth. **Targets:** The targets are district residents who wanted to learn about ICT, in part to communicate digitally with their relatives abroad. **Implementors:** The kiosks were funded by the operators themselves, with loans from local banks. The state government officials assisted the operators in securing the loans. **Stakeholders:** The supply-side stakeholders are the panchayat councillors who demanded the kiosks to be set and maintained, as also the kiosk operators. The demand-side stakeholders are the citizens who avail of the literacy content and also the e-government services of the kiosk. **Duration:** Project was initiated in 2002 and by 2004, 630 kiosks had been rolled out across the district. **Status:** By 2004, the Kerala government had decided to roll out the Akshaya model of kiosks across the state.

Lokvani Origin: This project was initiated in 2004 in the Sitapur district of Uttar Pradesh state. The idea was to use existing computer kiosks to provide additional e-government facilities by entering an agreement with the district government. **Objectives:** The project aimed to provide citizens of the district with access to information on government programmes, on land records, and with a facility to file online grievances. The grievance mechanism was such as to move the grievance to the district magistrate's office from where it was forwarded to the relevant

department. **Targets:** The citizens of Sitapur district, which is a backward district in UP, were the targets. **Implementors:** The kiosk owners were responsible for setting up the connection with the government's system and file the complaints and service requests. They received a nominal fee (Rs. 20) for the service from the citizen. **Stakeholders:** The supply-side stakeholders are the district offices of the various departments that had to respond to the complaints, as also the kiosk owners who have ensure that the complaints are filed properly and a complaint number is obtained. Citizens of Sitapur are the demand-side stakeholders. **Duration:** The system was planned and executed quite rapidly in one and half years. **Status:** By March 2005 the system had registered about 29000 complaints. In November 2005 the Chief Minister of UP declared that the services of Lokvani would be made state-wide.

SARI Origin: The Sari (Sustainable Access in Rural India) project in the Madurai district of the state of Tamilnadu was started in the year 2000 to link up village kiosks using a wireless technology. The kiosks would provide e-government services to rural citizens. **Objectives:** The stated objectives were to improve the quality of life among the rural poor by creating employment opportunities with the help of ICTs. The kiosks would provide e-gov services along with information about health care, education, and economic conditions. **Targets:** The rural population of Madurai district were the targeted population, that included rural farmers, casual labourers and unemployed youth. **Implementors:** The Sari project received support and funding from MIT, Harvard and IIT Madras through various programs. The project also received funding from banks. A private company, n-Logue, was the technology provider and implementor. **Stakeholders:** The supply-side stakeholders are the kiosk owners who invest in the technology and the private partners who provided the internet connectivity to the kiosks. The supply-side also includes district government offices that provide the support to kiosk operators. The demand-side stakeholders are citizens of Madurai district. **Duration:** The project lasted many years and by 2004, 108 connections had been set up. **Status:** The Sari project is still functioning in Madurai although there are concerns about its sustainability. The service volumes and revenues are not high enough to bear the connectivity costs.

4 Analysis of Projects

4.1 Framework for Analysis

The first-order impacts of information systems are often a speed-up in processing and increase in processing volumes of the services that are computerized. These are experienced by almost all e-government projects in the period immediately after their roll-out. Citizens access, in increased numbers, the new services as a novelty and also because of the greater conveniences provided. Second-order impacts result from the longer term usage of the e-government services and show in the new arrangements and alignments made in the economy and in the lives of the stakeholders concerned. For instance, easier access to land records may imply an increase in the loans being applied for and processed in rural credit institutions. These second order effects are not always obvious (some may even be negative) and are often unintended. Measuring them requires an understanding of the way the systems are being used.

First- and second-order effects require a framing of the stakeholders that impact the e-government system and are impacted by it. Although, the eventual success of a system will depend on both the supply and demand stakeholder participation in maintaining and using the system, the role of the demand side in public systems is more important; for it is the demand-side users who will settle the fate of the system through use or non-use.

With the above points in mind one can now analyze the impacts that the specific systems being studied have had in terms of first- and second-order effects.

4.2 First- and Second-Order Effects

Bhoomi: When the system was first launched in 2001, an independent agency was contracted by the state to assess the usage by citizens [6]. The report from the agency, known as the PAC report, showed that there were significant first-order improvements in the service delivered by Bhoomi to citizens. The study covered close to 200 respondents in six different districts in Karnataka. The main findings of the study were that the Bhoomi system was easier to use (66% of users), users had to meet fewer officials to get their work done (79% of users), the documents obtained from the system had fewer errors (74% of users), if there were errors, they were easier to rectify using the system (93% of users), the waiting time for users was lower than before (79% of users) and the behavior of the staff was better than before (85% of users). In addition, most users (about 97%) did not have to pay a bribe to obtain the RTC certificate they wanted. Another study, conducted in 2003, showed similar results [3].

The only drawback that the Bhoomi system had for the users was that to obtain a certificate they had to travel to the taluk headquarters, which was, on average, a half day away from their village. Computed on the basis of the loss in wages, this was a problem for many, particular poor farmers who relied on daily wages, in their off seasons, for their income.

Overall the first order effects were positive. Farmers felt that this was a significant difference and improvement over the manual ways of obtaining the RTC certificates.

The second-order effects of Bhoomi are not significant. Given that RTC certificates are mainly used for obtaining loans (as reported by the PAC report and the second study) there is no significant impact on rural lending in Karnataka since Bhoomi was introduced. Acquiring agricultural loans in rural Karnataka is a complicated process and obtaining a copy of the RTC certificate is one step in it. Although access to RTC certificates was made much easier with Bhoomi, the processes of rural credit remained unchanged. RTC certificates are also used as surety in courts, for giving bail, for obtaining government grants for agriculture and education and for selling produce to government procurers. Economic indicators such as education enrollments, income and employment or health did not show any significant changes from the introduction of Bhoomi either.

CARD: The CARD system in Andhra Pradesh is also widely considered to have met its first-order objectives. By 2004, it had over 4.4 million registrations on record and also most of the supply-side stakeholders had expressed satisfaction with its functioning[5]. There are reports, though, that suggest that a negative first-order effect of CARD is that it has ‘computerized’ corruption also. Since reduction of corruption was one of the primary goals of CARD, it has fallen short of achieving this end [2, 7]. There do not exist any reports in the public domain to suggest if CARD has achieved any significant second-order effects.

Gyandoot: The first-order effects of Gyandoot are impressive; in a matter of months about 40000 users had visited the kiosks and had used the facilities. Grain was sold at higher prices as better market information was made available, complaints registered with the district headquarters were addressed quickly, cattle sales improved, computer literacy of the population as well as the lower bureaucracy improved. The symbol of ‘bullock carts besides computer kiosks’ became internationally recognized. However, the second-order effects are not reported at all. After the initial euphoria, which lasted a couple of years, the usage declined along with the government’s support.

eSeva: The system clearly improved upon the earlier methods of paying bills, taxes, obtaining forms etc. The first-order effects show significant saving on time, lesser interaction with government officials and reduced corruption and harassment. Till August 2005, 41.5 million transactions had been processed by the system amounting to Rs 104 billion worth of value. Since the eSeva kiosks represented alternate avenues for delivering the service the host departments were providing, an important second-order effect of eSeva is to force the host departments to streamline their services. The departments have set user-friendly counters of their own and are attempting to lure back the customers they had lost to eSeva.

Akshaya: In the initial phase of the project, whose focus was on e-literacy, over 5.6 lakh people were provided training. 65% of the people who came for the training were women. A second-order effect of this project was that several kiosks became hubs for starting informal clubs [8]. E-government services were not provided in the initial phases, but there existed the facility to download forms and information. Thus e-government services did not constitute a major portion of the impact of the kiosks.

Lokvani: A first-order impact of Lokvani kiosks was that about 29000 complaints had been filed through the system in the initial few months of operation. Of these about 25000 had been disposed off already (as stated by the district administration that maintains the facilities, on their website). The only visible second-order effect of Lokvani is that the state government has decided to replicate the system in all districts of the state.

SARI: By mid-2004 there were 51 kiosks of the Sari project operating in Madurai district under two different commercial entities. These kiosks offered various computing and information services besides e-government services such as application for certificates (birth, death, income, community, etc), property valuation, filing of petitions and information about schemes. The success of the kiosks, as the first-order effects, was quite high and many of the kiosk operators figured prominently in news reports across the world. Women entrepreneurs were particularly successful. E-government services were initially supported by the district administration, but declined after the administration changed. Corruption increased in certain offices, as the government officials demanded more bribes to process the applications that were now appearing manually [8].

5 Detailed Discussion on Impacts

5.1 Framework

Development is not an end in itself but a means to an end [9]. The ends of development are achievement of freedom from hunger, poverty, illiteracy and deprivation. Most importantly the freedoms enable and are enabled by capabilities that citizens enjoy. Sen argues that the most important instrumental freedoms, required for development, are political freedoms, economic facilities, social opportunities, transparency guarantees and protective securities. Political freedoms allow citizens to choose their representatives and participate in setting the agenda for political discussions. Economic facilities are the freedoms citizens enjoy to transact in the market and to use available economic resources and entitlements. Social opportunities have to do with the facilities made available to citizens for health, education, and infrastructure that allow them to live healthily and participate in economic and political activities. Transparency guarantees have to do with the basic trust that citizens enjoy in their day-to-day transactions, with an assurance of disclosure and lucidity. Protective security is some measure of protection from basic deprivations such as poverty or unemployment or protection from natural disasters.

E-government projects are development initiatives that are best studied by the perspective of development proposed by Sen. Sen's ideas of substantive freedoms provide a framework by which to ask focused questions about the impact of e-government projects.

- As a development intervention, in what way did the project facilitate citizens' access to economic resources such as credit and their ability to access markets?
- In what way did the project improve the transparency guarantees to citizens related to documents about their dealings with government officials and government services?
- Did the project increase the political participation of citizens about governance by allowing them to be involved in setting policies and agendas for governance?
- Did the project enable or enhance protective security to citizens, against droughts or other natural disasters?

- Did the project enable citizens to have improved access, directly or indirectly, to education, information, health care or judicial procedures?

The following section discusses the issues raised by the above questions by considering data available for Bhoomi. This discussion is based on primary data collected by the author and some secondary sources. The other projects are not discussed as detailed project data was not available for such an analysis.

5.1.1 Economic Resources

The analysis of the first- and second-order effects clearly shows that although land-owning farmers were better off with Bhoomi in terms of their access to the RTC document, this fact by itself did not improve their ability to access credit. Owing to cumbersome procedures to access debt, the overall increase in rural debt in Karnataka cannot be attributed to the presence of Bhoomi. Bhoomi has no links with the agricultural procurement or marketing departments that could have enabled giving farmers information such as prices. Landless farmers are negatively affected by the Bhoomi system. Without support from the village accountant, and without RTC certificates, they are not able to sell produce to government buyers from where they could obtain higher rates. Bhoomi is beneficial to farmers who can travel to taluk headquarters easily, access RTC certificates quickly and use these for different purposes. Bhoomi also helps farmers who are interested in selling or re-apportioning parts of their land as the mutation process is controlled via the system. It is clearly the rich, land-owning farmers who benefit most from the system. Credit

One of the main reasons that farmers purchased the RTC certificate is to obtain loans from banks. About 40% of the usage (as reported by the PAC study) for RTC documents is for obtaining loans. A statistical analysis based on secondary data showed that there is no significant increase in rural credit in Karnataka since the introduction of Bhoomi. Although land-owning farmers were better off with Bhoomi in terms of their access to the RTC document, this fact by itself did not improve their ability to access credit. Credit obtained through formal means requires a set of documents that have to be presented to the banks, of which the RTC is one, and invariably has a lead time of a few weeks to months. Informal credit through traditional moneylenders, who charge usurious rates, is more prevalent as it requires less paperwork and is available instantly.

Landless farmers who don't have RTC certificates and who cannot officially apply for formal credit are unaffected by Bhoomi. Their abilities to access credit remains unaltered as they participate only in the informal market. Women from landholding families whose husbands have migrated to other places for work, or whose husbands are not available for some other reason, are affected by the Bhoomi system as now they have to leave their homes and travel to taluk headquarters to seek the RTC document.

Markets

Farmers who have RTC certificates can use these to sell their produce, in some cases, to government procurers at subsidized prices. RTC certificates are required to prove their status to the government department. This is an important application of RTC certificates but is not widely used, as it is only for specialized crops for which the government announces subsidies and then procures them. Bhoomi has no direct links with the agricultural procurement departments to transfer the relevant information via an electronic link; farmers have to provide an RTC certificate as evidence of their agricultural production.

Bhoomi helps with the sale and transfer of agricultural land via the automated mutation system. Farmers can file a mutation request in the system and the queue maintained by the system ensures that their request is processed in the order in which it was received. Corrupt officials have tampered with the system to provide special access to certain customers who have paid bribes, but overall the system does enforce queue discipline. This has increased the transactions in land parcels in economically growing areas, such as in the periphery of Bangalore.

There is no market information provided to farmers about prices and commodity markets at the Bhoomi kiosks. This is a potential application Bhoomi designers are working on.

5.1.2 Transparency Guarantees

Bhoomi makes it easier for land-owning farmers to access RTC certificates and to ensure the queue discipline for their mutation requests. The system allows farmers to verify the status of their property. One respondent in Bidar district mentioned that the RTC certificate she had recently obtained showed a discrepancy in her land-holding. A part of her property had been removed. Upon verifying with a neighbor, she found that it had been annexed to his. They brought the matter up with the taluk authorities to correct the error. Another farmer in Kanakpura taluk mentioned that he checked his RTC regularly to see if any part of his large estate had been affected by land sharks operating in the area (Kanakpura is in the periphery of Bangalore). The transparency and easy access of RTC certificates is important for these farmers, something that was difficult in the manual system as the village accountant controlled all the records, as they can verify the status of their own lands and also check upon their neighbors properties.

However, this easy access comes with a price. Many respondents, across many districts, noted that with the new digital system the kiosk operators and taluk officials could introduce errors into the system, on the pretext of typographical mistakes, and then demand a bribe for the correction. With the manual system this was not possible as the underlying text would show the original text and the over-written error. Although, the Bhoomi system is protected by a bio-login process, and changes to the data can be tracked, kiosk operators are able to pretend that deliberate data manipulation are unavoidable errors.

Landless farmers, some of whom have an unofficial sanction to the lands they farm, do not benefit from the enhanced transparency of the new system. These farmers own a document called a Saguvali chit, and this is an official record that states the right to farm on the land. This document is not part of the Bhoomi database and so the farmers cannot check their status on the system.

The transparency in the mutation process helps farmers see the status of their pending requests. This transparency has exposed, to a certain extent, the ‘grease money’ corruption in the system. As some respondents noted, if someone bribes the officials to move their documents faster, those ahead of the briber in the queue are also moved faster. Some respondents noted a negative consequence of the queue system, where officials would reject applications on trivial grounds to push out applicants from the queue and process the one that they had been paid to process faster.

The larger issues related to transparency in the land records adjustment and updation process though remain unaffected by the new Bhoomi system. Many respondents noted that their title deeds, which is their official record of ownership of land and is a unique document, had not been updated in many years, sometimes stretching back by decades. The cadastral maps, maintained by the VA, had also not been updated and few knew the status of the maps. Other documents related to land ownership and transfer, such as the Mutation Register, the *Akarband*, *Tippani* register, remained unaffected by the Bhoomi system and also remained unavailable to the citizens for scrutiny. Bhoomi has computerized only one document out of many that are used for land administration.

5.1.3 Political Participation

For the design of the Bhoomi system, none of the stakeholders on the demand-side were included in requirements determination. Many respondents had not even heard of the system until their manual certificates were declared illegal by the state and new Bhoomi RTCs were given to them. The farmers could not participate in the agenda-setting and design exercise for Bhoomi. The entire system was designed and implemented by the supply-side stakeholders such as the Project Champion and the private partners who implemented the system. VAs were included in the data digitization and error removal phase of the project.

Many bureaucrats interviewed for the research mentioned that initially Bhoomi was quite actively resisted by many in the taluks and required the Chief Minister's personal intervention to help implement the system [4]. This resistance constitutes a different kind of political participation, albeit a negative one. Government officials resisted the system as it upset their existing ways of working as much as it was a new technology that they were not familiar with. Village accountants resisted the system as it reduced their authority by taking out of their control a document that had value to farmers.

Landless farmers rely on the VA for most of their needs related to documents about land. The VA is the principle sanctioning authority for their ability to farm land, and also the main person who is involved in confirming their rights to the land. Landless farmers were not directly affected by Bhoomi, but the reduced powers of the VA has affected them too. Several landless farmers mentioned that the VA is now harder to get as s/he is away at taluk headquarters and also the VAs services have become more 'expensive.' This latter aspect has affected land-owning farmers too.

For most farmers, the VA is a representative of the government they have easiest access to. Almost all matters of government documentation and recording is handled by the VA. Political leaders recognize this power and often try to include VAs in the campaigns during elections. VAs are thus able to impact agenda-setting for the parties to a certain extent. Some respondents argued with the new system in place the VAs role has changed somewhat, as some of the power has shifted to the taluk offices.

5.1.4 Protective Security

Bhoomi RTC certificates are required for crop insurance, but they are not primarily used for that purpose. Farmers have to purchase insurance when they apply for loans, as this is a requirement imposed by banks. Thus insurance is purchased as an indirect requirement for loans. To this extent Bhoomi has ensured some protection against crop failure for land-owning farmers. Under conditions of drought, which some districts of Karnataka have suffered repeatedly over the last few years, loans are not granted easily by banks, and the crop-insurance that is needed under these conditions are also not purchased. Landless farmers do not have the facility of insurance available to them, and in cases of drought work as farm laborers to earn a living.

The data from Bhoomi is not used by the government to plan for and provide any sort of insurance or other protective package to farmers of Karnataka. This is a possibility that some supply-side officials have considered but have not been able to deliver as Bhoomi data is still not consolidated at the state level.

Some agents, who help with buying and selling of land (also known as document writers), in the Bangalore periphery region, said that Bhoomi data, since it was not protected and anyone could have access to it, was being used by land sharks to identify properties that were vulnerable (as the farmers owning them had suffered repeated droughts and many loans had been taken against them). Directed queries in the database were used to identify those farmers in the taluk who had not paid land taxes (usually a nominal sum) and such farmers were targeted. The sharks would then manipulate and bribe taluk officials to grab control of the land. Very little data could be collected as to the extent of this activity but several document writers corroborated this story. This data points to the reduced security of farmers that is helped by the Bhoomi system by the facility of database queries.

5.1.5 Improved Access

Bhoomi kiosks were not designed to offer a portfolio of applications similar to what is available in other states, where kiosks were designed to offer basic facilities in computer literacy, information about weather, prices of crops, markets, provide health care through tele-medicine arrangements and allow users to browse information on the Internet. So far Bhoomi has the largest reach of all the

kiosk-based e-government systems implemented in India and a portfolio of applications would have greatly enhanced its appeal.

One significant second-order impact of Bhoomi, that we learned from interviewing people from diverse backgrounds, was the knowledge and awareness of computers and the value that they can have. Bhoomi kiosks and the technology of touch screen interaction, instant printing, bio-login procedures and computerized queue-lists, have informed citizens, who were not aware of such things, of the immense power of information technology. We found that citizens who are the most deprived in terms of the digital divide have learned about such technology and are beginning to examine the various possibilities of these devices.

Bhoomi certificates are used to apply for and obtain government grants for education. These certificates are also used obtain bail from courts and for adjudication by courts in cases of dispute. Very few respondents had used RTC certificates for these purposes, but the uses are possible (as many admitted).

6 Community and Empowerment

6.1 Participation

A review of e-government projects shows that barring in the case of Akshaya, none of the projects included participation by the demand-side stakeholders in the design of the system. In the case of Akshaya, since the need for the kiosks was expressed initially by the panchayats, they were included in the discussions with the state as to the nature of the kiosks and the manner in which they would be set up. Some commentators attribute this to the particular characteristics of Kerala, where literacy rates are very high and citizens are highly motivated to participate in their own community upliftment.

All the other projects were supply-side driven where the district administration officials typically led by technically qualified Indian Administrative Service officials. In the Gyandoot case, the officials made some attempts to include some villagers in Dhar in the requirements gathering phase to understand the particular aspects of their interactions with the government and their expectations of governance services.

6.2 Dominant Stakeholders

The supply-side stakeholders completely dominated the e-government delivery process. In the case of Bhoomi, for instance, the project champion doggedly pursued the project objectives over many years with the tactic of directly extracting loyalty and support from the district officials to complete the project on time. Both for the Bhoomi and CARD projects, the state Chief Ministers got personally involved to persuade reluctant state officials to support the projects. The eSeva project was driven especially by the Chief Minister of Andhra Pradesh who had made it a political agenda to usher in e-governance in the state and showed eSeva as an exemplary project.

6.3 Participation by Women and Dalits

It would be best to examine participation by women and dalits (the most marginal caste groups in India) from the perspective of first-order and second-order participation. First-order participation would entail examining the direct participation in e-government activities and drawing benefits (or suffering) from them, whereas second-order participation would mean examining the effects of participation, or exclusion by others, on the groups in question.

For the property and land registration and certification services like Bhoomi and CARD, there is no significant first-order benefit to women or dalits more than their representation in the population as property holders. Women are minority property holders (farming property) in most states in India, including Karnataka and Andhra Pradesh (in Karnataka, women own only about 10% of the rural household landholdings [1]). Thus they benefit only in proportion to their access to property.

However, of the rural women in Karnataka, 55% are engaged in cultivation and 41% work as agricultural labourers. This implies that women are indirectly impacted by the men's (the title owners) abilities to secure credit and other facilities for farming using their titles.

Bhoomi, in particular, has had a negative impact on landless farmers, many of whom belong to the dalit communities. Many landless farmers in Karnataka farm land that is granted to them as *Begar Hukum*, or without order. The facility is typically accorded to them by the village accountant (usually for a small consideration). With the installation of the computerized land records system, the freedom to mark on paper titles is lost by the village accountant and this has in turn affected the landless farmers too. As this method of access is barely legal, respondents of surveys are reluctant to talk about this and data is sparse.

The highest participation by women at the first-order level is evident in the Akshaya project. In Akshaya the e-literacy component was heavily subscribed to by women (65%). Malappuram, where Akshaya is located, is a largely Muslim area and the participation along religious groups was also dominated by Muslims.

For the SARI project there were quite a few kiosks that were operated by women. The impact of operating the kiosks on these few women was positive and substantial. They achieved a recognition in their village as they talked to officials in taluk offices and interacted with professionals such as doctors and veterinarians [11]. The second-order effects for the women operators were significant, as their status in their families as well as their communities grew. SARI kiosks were not only a means of livelihood for them (a first-order effect) but it opened unforeseen avenues also. For the women users of SARI, the usage levels have increased as more (mostly young) women have started visiting the kiosks for training. But barring the first-order impacts of greater literacy, the availability of kiosks has not had much impact. Women belonging to the dalit communities have rarely used the facilities.

For the Lokvani project the participation by women, in the form of registering complaints, was about 10%. In the context of Sitapur district where the literacy rate of women is 12.4%, this figure cannot be considered low.

In Dhar district, for the Gyandoot project, women's turnout is slightly higher with about 20% of the users being women. In this case younger women, below 18 years of age were the heaviest users (about 38%) and the other high-user categories being those above 40 (21%) and above 60 (21%) [10].

7 Conflict and Resolution

Conflict in the Bhoomi system is evident along the following points: (1) Historically, land records in Karnataka state were maintained in five different languages and the formats for the records were in the hundreds. In one particular region each land-owner practically had his own land record format. The issue of conflict here is that when computerization was attempted there was an expectation that the details available in the various formats and languages would be preserved in the new format (in Kannada, the official language of Karnataka). However, in many cases this was not done and much of the details were lost in the current data format. (2) At the initial stages there was immense resistance to the implementation of the Bhoomi system as it threatened to destabilize the power bases of village accountants and taluk officials. The project champion had to personally persuade senior officials in many districts to help implement the system. He even recruited the Chief Minister of the state to help by writing individual letters to district officials. The project champion overcame part of the resistance from the field officials by hiring an entirely new set of accountants who would man the kiosks and from whom he could obtain loyalty. (3) One of the consistent problems that leads to much conflict is that of updating of records in the database. When the records were entered, some errors crept in and initially, at the beginning, of the project these were corrected upon request. Later however, corrupt kiosk officials deliberately started introducing errors that they would charge a fee to correct.

The CARD system of Andhra Pradesh (a neighboring state of Karnataka) is similar in concept as the Bhoomi system but underwent a somewhat different trajectory. One of its key design goals was to maintain the number and scope of officials in the registration office as demanded by the employees. This was incorporated in the design of the system but was later objected to by the demand-side stakeholders as it retained the levels of corruption in the system. Citizens resisted this and went back to using document writers, or agents, who would act as intermediaries for them for a price. The expressed objective of the CARD system was to remove such intermediaries and hence to reduce corruption [2].

In the Gyandoot system, one of the main differences in the perceptions of the demand-side and supply-side stakeholders was the duration of the engagement of government officials. From the documents it appears that the initial design by the supply-side was to set up a facility with e-governance services included but it was to become an independent service kiosk by itself, economically surviving by providing digital services to the local population. The citizens on the other hand were expecting the increased access they had to senior district officials via email and other means to continue but this did not happen. Further, the economic and administrative support that the government had initiated was also pulled away, against the expectations of the village residents.

The conflict in eSeva arose from the following: 1) Many departments initially refused to participate in the eSeva program, owing to departmental rivalry and a perceived shift in power bases. One department, Income tax, initially joined the scheme but later withdrew its participation. 2) Employees of the different departments also resisted the e-government system as it threatened to deprive them of their corruption income. 3) Many managers and employees were deputed to eSeva centers, something they resented as it removed them from their familiar place of work. 4) There was resistance to the selection of the sites for the kiosks, as local politicians and bureaucrats tried to influence the decision. 5) Employees at eSeva counters attempted to embezzle funds and also extract bribes from customers by pretending to have problems with computer facilities.

For the Akshaya project the resistance came primarily from government departments that refused to first allow the internet connectivity to be implemented and then turned down services that were demanded by kiosk operators. Commentators attribute this to resistance and lack of cooperation between government departments. For the SARI project, the conflict arose along similar lines. When the district administration that had supported the project changed, and a new set of administrators took charge, the latter refused to provide the services demanded by the kiosk operators, and increased their demands for bribes.

8 Capacity Gaps

Digital Divide

The digital divide is defined as the difference in access that groups of people have to information and communication technology resources. This divide results from income differences, urban-rural differences, language differences, developed nation or developing nation differences and so on. This relative measure is a proxy for digital resource access, and it points to the capacity gaps in groups of people.

All the projects addressed the needs of populations that are on the deprived side of the digital divide. The projects help to bridge this divide, and some have this as an explicit goal, by providing distributed access to government and other services via digital means. There is direct evidence that widely distributed projects such as Bhoomi create awareness about computers and computing facilities within the demand-side population. People are able to understand the nature of these services and then in turn demand more and express more precisely their requirements for services.

The SARI project also demonstrates that the kiosk-operators who learned how to offer services as entrepreneurs also learned how the technology is limited and solves only part of the problem. The

women operators were able to articulate the deeper problems with providing government services and their own role in the service chain.

Political Access

The issue of political participation raised by Amartya Sen also points to an important capacity gap. People in rural areas in India are not able to participate as equals in political agenda setting. This stems from historical conditions, the caste system being the most prominent, and others such as the status of being ethnic minorities, or religious minorities or low-income groups and so on. For e-government systems deployment, most politically backward communities are not able to participate in the requirements analysis exercise or in the later deployment.

For a system like Bhoomi, which centralized government services, moving the delivery of RTC certificates from the village level to the taluk level, the aspect of reduced political participation is of importance. Marginal groups, such as *begar hukum* farmers, who rely on political clout of their representatives are further distanced from the land management agenda-setting by the Bhoomi system. Village accountants form the closest link of marginal groups to the machinery of the state. Bhoomi, to an extent, dis-empowers village accountants and by extension dis-empowers marginal populations also.

E-government systems in India tend to provide services that are deemed important to the supply-side designers. Participatory approaches to design are few and so the systems tend to reflect the priorities of the administration rather than that of the citizens.

8.1 Shortcomings of Capacity Building Exercises

E-government systems principally address the problem of the digital divide. From a perspective of capacity building they fall short for the following reasons:

- The supply-side designs fail to include key requirements of citizens. Kiosk-based systems that are built up from citizen requirements, such as Akshaya, can deliver on some of the needs expressed by citizens. However, most e-government efforts are focused more on the needs of the government agents and departments than on citizen needs.
- System roll-outs fail to educate or make literate citizens as to the nature and role of the proposed projects. Citizens do not participate in either discussing the governance issues or in the nature and problems of governance delivery. Even in situations where citizen participation is possible (in cities such as Hyderabad) this exercise is not undertaken.
- E-government systems tend to favour centralization of government services, as opposed to de-centralization, and this detracts from the capacity building exercise. For instance, all the systems dealing with governance in rural areas emphasize the central, the district or taluk, offices as nodal points rather than the village. Even kiosks located in villages have to ultimately rely on the district offices for services.
- Deployment of e-government services is typically done by individual government departments that don't communicate or coordinate the exercise with other departments. Even though there may be no duplication of services (as there is in some cases), the larger picture is missed. Portfolios of services cannot be offered and the significant externalities that digital kiosks can offer is missing.
- One aspect of capacity building for government services is also building institutional memory. It is well known that in state and government departments officers are rotated frequently and often, with the result that the memory of decisions taken is lost, unless recorded in text. It is also well known that decisions are based on a complex set of factors and after a complex negotiation process; what is recorded finally are only some of the issues that were brought up and considered for the decision. When similar decisions have to be made again later, or decisions that are based on the same criteria set (such as governance issue related to land), this memory cannot now be invoked as the people concerned are not

available. Some respondents in the primary survey conducted by the author argued that local people who are affected by projects (and who participate in them some manner) do recall details of decisions taken and activities conducted. Their tacit and explicit knowledge is rarely included in decisions that are made by the supply side. Further, with the introduction of e-government systems and the systematic de-politicization of grassroots officials (as in the case of village accountants), this institutional memory is further eroded.

9 Conclusions

9.1 Summary of Key Points

This paper considers seven e-government projects that have been implemented in India. Each project is an attempt by various state governments to use information and communication technology for development, a goal that includes poverty reduction and improved access to government services. These particular projects were selected because they addressed the needs of a fairly large population, have sustained for a period of time exceeding that of their roll-out, and have been used by a significant portion of the target population. Further, the projects were studied with a clear delineation of the issues pertaining to demand-side and supply-side stakeholders. The former are the consumers of the services of an e-government system and the latter are the main providers of the services (such as government departments).

The framework used for the analysis of the projects is based on an assessment of first- and second-order effects. All the projects showed positive and significant first-order effects. For example, Bhoomi is used by about 800,000 people a month to access land records, eSeva has registered over 41 million transactions since inception, and even a small project like Lokvani has registered almost 30,000 transactions in a few months. Few of the projects have shown any significant second-order effects. eSeva has had a small impact in terms of forcing participating departments to streamline their activities.

A deeper analysis of the developmental impact of e-government systems is undertaken by using Amartya Sen's fundamental freedoms approach. This analysis was conducted for the Bhoomi project in particular, for which detailed data was available. The analysis shows that for landless and poor farmers and for women, a system such as Bhoomi has been of marginal relevance. Poor farmers are adversely affected by Bhoomi as it enables, for example, in the Bangalore periphery region, land sharks to identify and target them. Tenant farmers use records that are not covered by the Bhoomi system. Farmers do obtain some benefit from RTC certificates by being able to obtain credit and insurance, but a portfolio of applications is missing.

In the SARI, Gyandoot and Lokvani projects there is direct evidence of participation by women. Women used the Akshaya kiosks for computer literacy, and this is the highest recorded participation by women (65%). There is very little evidence of participation by dalits and other marginal groups in these projects.

Many projects experienced conflict and resistance at the time of implementation. Both demand- and supply-side stakeholders resisted and contested the powerful e-government systems that disrupted their existing ways of working. Although this was overcome by the project managers, it left an impact on the outcome of the projects.

9.2 Recommendations

1. Participatory approaches to requirements determination from the target population. E-government systems design has to include inputs from the demand-side stakeholders and the best approach for this is participatory design. People have to be trained on the concepts and ideas of ICT and then encouraged to express their needs in terms that can be used for system design.

2. Explicit inclusion of marginal populations such as dalits and women via intermediaries such as civil society groups in the requirements analysis exercise. Intermediaries have experience in working with marginal groups and also carry the institutional memory of policies and practices that is important for understanding the existing conditions.
3. Deployment of multiple, sample systems in various parts of the country on an experimental basis also to collect requirements. Multiple systems with different designs and localized objectives would help in the overall design of systems across large populations. This would help towards understanding diverse requirements of the people.
4. Emphasize government process re-engineering as suggested by the population. Although government processes are sought to be re-designed by e-government systems, in many cases, owing to conflict and resistance, the systems often replicate the manual processes. Suggestions from the target population should be used to design the new processes, where the value of the existing manual processes could be understood and re-designed in an acceptable manner.
5. Use of existing grassroots officials as partners in deployment, through literacy and education programs. Most e-government projects do enact this, but often power is shifted to the central locations in the district. Power should be maintained at the grassroots level as much as possible, as this enables the marginal populations to access this source of power.
6. Broad-based, inter-departmental approaches to design and deployment with support from the highest echelons of the government. Most projects that are deployed by a single department would benefit from inputs from and participation with other departments that have a stake in the results of the system. This has to have support from the highest levels of the government.

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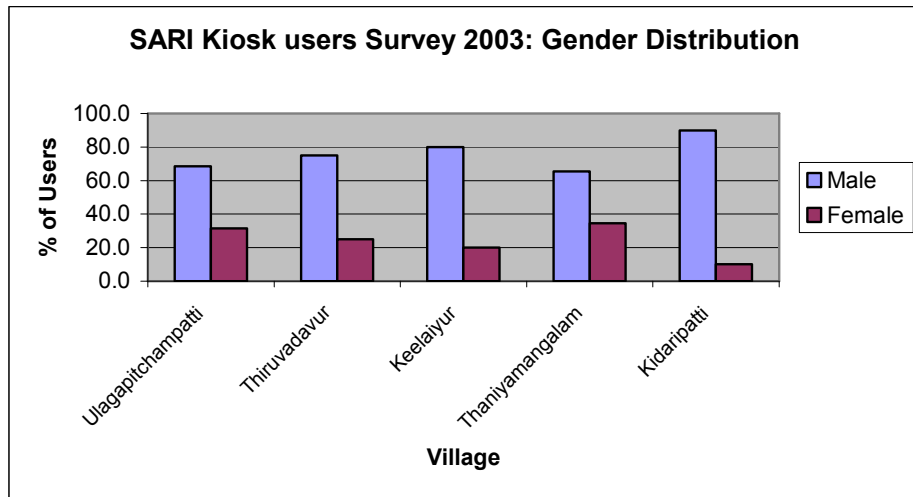


Figure 1:Community distribution of kiosk users – Male and Female (Source: Srinivasan, 2004).

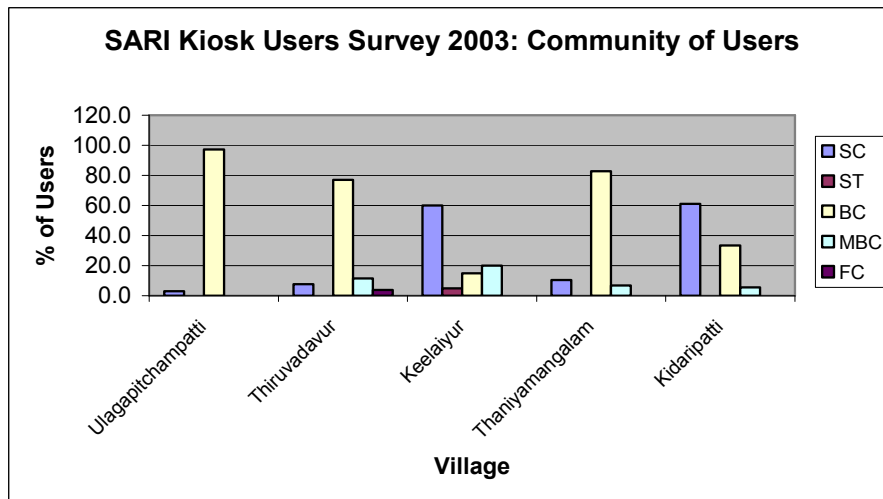


Figure 2:Community distribution of kiosk users (SC-Scheduled Caste, ST-Scheduled Tribe, BC-Backward Castes, MBC-Most Backward Castes, FC-Forward Castes) (Source: Srinivasan, 2004).