

Table 7.1  
Cases Included in the Chapter

<i>Title of the case</i>	<i>Brief description</i>
Bhoomi: Computerisation of Land Records	A printed copy of the RTC (a land title document needed for many tasks such as obtaining bank loans) can be obtained online in 15 minutes at any of the 177 computerised kiosks in Karnataka, India, on payment of a small fee.
Gyandoot: Community-Owned Rural Internet Kiosks	Rural citizens have the opportunity to access knowledge and a number of government services on payment of a small service fee. Thirty-nine privately owned kiosks connect with a district administration server through an intranet. The project is faltering after initial success.
CARD: Computer-Aided Registration of Deeds	Property deeds can be registered at 240 offices in a couple of hours instead of several days as in the manual system.
FRIENDS: Online Payments to the Government in Kerala	Utility bills and other payments to various government departments can be made online at service centres at district headquarters.
VOICE: Computerised Service Centres for Municipal Services	The VOICE system publishes information relating to municipal government services, permits and licences. It enables citizens to track the progress of their applications, thus making the entire system transparent.
Online Income Tax Administration	An interactive web site that contains basic information pertaining to tax laws and procedures, and permits tax-payers to file annual declarations and make tax payments electronically.
E-procurement: Experiences from the Developing World	These web-based procurement systems permit registration of vendors, display of request for bids by government departments, electronic bid submission by the vendors, reverse auctions and publication of results after suppliers are selected.
Indian Customs Online	Import/export documentation is now processed electronically through a workflow software. Cargo handling agents can file the documents from their own computers.
Computerised Interstate Checkposts in Gujarat	Use of computers/electronic devices at ten remote interstate border checkposts in Gujarat, India, collect fines from overloaded trucks. It has significantly increased the state's revenue, but has had a marginal impact on corruption.

(Table 7.1 contd.)

<i>Title of the case</i>	<i>Brief description</i>
SmartGov: Andhra Pradesh Sachivalaya E-Application	This has introduced a paper-less environment in the state Secretariat using workflow software. It has resulted in increased efficiency and transparency.
OPEN: Seoul's Anti-Corruption Project	The system exemplifies the impact on corruption of making transparent the decision-making processes and actions of individual civil servants. It publishes information and enables tracking of individual application for permits and licences issued by the local government.
Central Vigilance Commission Web Site: A Bold Anti-Corruption Experiment	To propagate the idea of zero tolerance for corruption, this web site publishes information such as the names of senior officers against whom investigations have been ordered or penalties imposed for corruption, performance of investigating agencies and procedure for filing complaints.

Most of these cases were initially documented in 2000–2001, about a year after the application had been implemented. They were updated in 2003 at the time of writing this book to incorporate recent data and information available from formal and informal evaluations. The purpose of including these cases is not to pronounce them as successes or failures. In fact, the degree of perceived success may change as time progresses, project implementers make way for new teams, and political support weakens or strengthens. These cases do not merely present facts at a point of time, but include analysis of the process of developing these applications to provide learning for those who will strategise and implement e-government in different contexts in the future. The cases are not intended to serve as best practice examples that can be replicated in other contexts. Readers are encouraged to seek more details in case a similar application is to be implemented in another context.

### Case 7.1: Bhoomi—Computerisation of Land Records

*The Department of Revenue in Karnataka, India has computerised 20 million records of land ownership of 6.7 million farmers in the state. Previously, farmers had to seek out the village accountant to get a copy of the Record of Rights, Tenancy and Crops (RTC),*

*a document needed for many tasks such as obtaining bank loans. There were delays and harassment; bribes had to be paid. Today, for a fee of Rs 15, a printed copy of the RTC can be obtained online at computerised land record kiosks (Bhoomi centres) in 177 taluk offices. In the next phase all the taluk databases are to be uploaded to a web-enabled central database. RTCs would then be available online at Internet kiosks, which are likely to be set up in rural areas.*

### Application Context

In the manual system, land records were maintained by 9,000 village accountants, each serving a cluster of three to four villages. Two types of records were maintained: (a) registers, which indicated the current ownership of each parcel of land, its area and cropping pattern; and (b) village maps that reflected the boundaries of each parcel. 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 updation of the land records was to be carried out by a revenue inspector if no objections were received within a thirty-day period. In practice, however, it could take up to years for the records to be updated. Landowners find it difficult to access the village accountant as his duties entail travelling. The time taken by him to provide RTCs has ranged from three to thirty days, depending upon the importance of the record for the farmer and the size of the bribe. A typical bribe for a certificate could range from Rs 100 to Rs 2,000. If some details were to be written in an ambiguous fashion, out of selfish motives, the bribe could go up to Rs 10,000. Land records in the custody of village accountant were not open to public scrutiny.

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 had long been aware of the need to reform the land record system. The beginning of computerisation of land records in Karnataka goes back to 1991 when the first pilot was initiated through a centrally sponsored scheme, fully funded by the Government of India. By 1996 projects for computerisation of land records were sanctioned for all districts in the state of Karnataka. However, no provision was made to install computers at the *taluk* level where manual records were actually updated. The project fizzled out without achieving its objective of creating a clean, up-to-date database.

### A New Approach

Today, a computerised land record kiosk (Bhoomi centre) is operational in all the 177 *taluks* in Karnataka. At these *taluk* offices a farmer can obtain a copy of an RTC online by paying a Rs 15 fee. A second computer screen faces the clients to enable them to see the transaction being performed. Copies can be obtained for any land parcel in the *taluk* by providing the name of the owner or the plot number. A village accountant is available full-time at these kiosks.

When a change of ownership takes place through sale or inheritance, farmers can file for a mutation of the land record at the Bhoomi centre. Each request is assigned a number by the computer. The number can be used to check the status of the application on a touch screen provided on a pilot basis in three of the computerised kiosks. The computer automatically generates notices, which are then handed over to the village accountant stationed in the field who is responsible for servicing the particular village. Most village accountants stationed in the field visit the central *taluk* office once in two to three days to pick these papers.

The process of issuing notices by village accountants to the interested parties remains the same. And as before, the revenue inspector who is stationed in the field approves changes to the land record thirty days after the notices are served, provided that there are no objections. A significant change in the process makes it mandatory to stick to a first-come-first-serve discipline. It takes a few days for the approval to reach the Bhoomi kiosk, where it is scanned on the day of its arrival. An inward and outward register is maintained. The updated RTC is printed at the Bhoomi kiosk and handed over to the village accountant for her record. The new owner receives a copy on demand. Bhoomi kiosks create scanned copies of the original mutation orders and notices to avoid unnecessary litigation due to claims that the notices were not served.

With the computerised system, administrators can quickly determine the number of approved and overdue mutation orders. Information collected from one urban *taluk* indicates that 3,000 mutations were handled annually earlier. After computerisation, there has been a 50 per cent jump in the number of mutation requests. This change seems to indicate a level of approval of the new system by the citizens, and willingness to update changes in landownership that were previously left undocumented.

The Bhoomi software incorporates the bio-logon metrics system from Compaq, which authenticates all users of the software using their fingerprint. A log is maintained of all transactions in a session. This makes an officer accountable for her decisions and actions. The government also has plans to web-enable the database to make available to the farmer a copy of the land record locally through an Internet kiosk—although without a signature such a copy will only have an informative value.

A government order decentralising Bhoomi to the village level has been passed. There are plans for opening 1,000 kiosks state-wide, with public-private partnerships. In a pilot experiment, twenty tele-centres have been established in Mandya district by N-Logue<sup>1</sup> using the cordECT technology developed by the Indian Institute of Technology, Madras. These private kiosks can connect to the Mandya database through the N-Logue network and view, print and distribute the land records. The Internet printing model became functional in October 2003. These tele-centres will charge a fee of Rs 25 instead of Rs 15, enabling them to retain Rs 10 per RTC to cover their operational costs and provide a small return on the investment. Most of the users spend Rs 25 to 50 in travelling to a *taluk* kiosk. Some of the users, when questioned about the additional fee, indicated that an additional charge of Rs 10 would be totally acceptable to the farmer community if the RTC could be delivered through a rural tele-centre.

Other services, such as download of 100 important forms for services and beneficiary-oriented schemes, could be added to the content. Departments such as forestry, animal husbandry, sericulture and cottage industries could create content in their own domains for delivery to rural areas. A fee of Rs 10 per RTC collected by the owner will make 1,000 rural kiosks viable in rural Karnataka. User fee being collected by Bhoomi

<sup>1</sup> N-Logue Communications Pvt. Ltd is a private company promoted by the Telecommunications and Computer Networking Group of the Indian Institute of Technology, Madras.

is approximately Rs 100 million annually. If 50 per cent of the RTCs are issued from 1,000 rural kiosks that are proposed to be set up, each kiosk will earn an average annual revenue of Rs 50,000. Accounting for variability across kiosks, the floor earning could be in the range of Rs 30,000. At this level of earning a kiosk can be viable.

In another pilot, around 200 village accountants have been given Simulators (locally developed handheld computers) costing about Rs 3.5 million. One round of crop updating for 600 villages was done using Simulators. The second round of crop updating was done in the last quarter of 2003. Teething problems such as maintenance and software bugs have been manageable. However, a further expansion has to wait until the cost of such handheld devices reduces appreciably.

### Implementation Challenges

Roll-out of the application to 177 locations was a challenge due to the poor quality of manual records and the enormity of the data entry task. In the first phase the project was implemented on a pilot basis in a controlled environment at four *taluks*. After gaining experience in data entry operations and implementation of the software, the scheme was extended to one pilot *taluk* in each of the twenty-seven districts. In the third phase the project was rolled out simultaneously to all the remaining 177 *taluks*.

Records in the field were not up-to-date due to poor work culture and lack of training amongst the revenue staff. Also, 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.

As revenue officials were not interested in data entry, private data entry agencies tackled the 20,000 man-months of work in an offline mode at the *taluk* level. A comprehensive software that accommodated all variations in manual records across districts was used. After the initial data entry, prints were validated against the original record books by the village accountants.

Many problems were encountered in offline 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 centre was not easily available as they were overloaded with other work. And 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 the *taluk* headquarters and delay in maintenance of computers at the *taluk* level by vendors were a problem.

Every district has been provided with a consultant to act as a bridge between the data entry agency and the district administration. After the system is operational, the consultant trains the *taluk* staff and helps the district administration in day-to-day work at the Bhoomi kiosk.

Operators have been provided for one year to handle online data entry at the Bhoomi kiosks. Village accountants will take over the work of these operators after a year. A comprehensive training module was designed jointly by the department and the National Informatics Centre (NIC), a software development agency of the central government) to train the accountants. Training lasted for seven days, 11 hours each day, followed by a paper-less test on the last day.

The village accountants who would be in charge of the new kiosks were chosen very carefully. Young persons fresh out of college were recruited and trained at the headquarters. These officials had not experienced the power that a village accountant could exercise over rural farmers. The project leader (additional secretary of the department) personally participated in the training given to every batch of accountants to ensure that they felt complete ownership and a sense of importance in being assigned to this new initiative. Accountants were encouraged to talk to the project leader either at his home or at his office. Nearly 500 officials, including all deputy *tahsildars*, were trained at the state headquarters and more than 1,000 officials were trained by the Bhoomi consultants at the district level.

### Challenge of Getting the Staff on Board

To allay the fears of field officials that their job descriptions would change in a major way, twelve state-level information seminars were organised for 1,200 senior and mid-level officers. Additionally, four division-level workshops were organised to train 800 officials. These seminars emphasised that maintenance of land records was only one of their many functions and that computerisation would remove the drudgery of maintaining these records manually. Revenue officials would continue to be responsible for field enquiry. Reducing corruption was not a key message at these gatherings.

The political executive was completely involved in the computerisation project. The state chief minister and revenue minister highlighted the

importance of the project publicly. The chief minister wrote regularly to all district deputy commissioners, exhorting them to get fully involved in the computerisation. He inaugurated a large number of land record kiosks. Meanwhile, the revenue minister regularly reviewed the computerisation process and also inaugurated a large number of kiosks. A committee of Members of the Legislative Assembly (MLAs) visited the kiosks and deputy commissioners invited MLAs of their districts to witness the functioning of kiosks. All this helped demonstrate that there was a strong political will for computerisation.

Selected field-level personnel were invited to participate in the software development process for various Bhoomi modules through a formal state-level Bhoomi committee. Meetings were held with participation from various levels in the department to elicit suggestions for improvement, and decisions taken at these meetings were incorporated into the software design. Nearly 125 person-months were spent on software development. A further effort of thirty person-months will be needed to upgrade to the next version.

Field supervision is critical to roll-out any new system. The project leader in charge preferred to appoint four independent consultants who could tour sites randomly in each division and report on the problems and progress of Bhoomi. Appointing consultants turned out to be problematic, as the central government project did not permit such a line item of expenditure. The expected cost was Rs 1.5 million.

### Evaluation of Bhoomi

Improving the land record delivery system has a significant social and economic impact in rural areas. Nearly 2,500 bank branches in Karnataka loan approximately Rs 40 billion to farmers as working capital every year. A copy of the RTC is absolutely essential for the farmer to procure the loan. Effective land record management can help banks in recovery. More than 70 per cent disputes in courts are land based. Adjudication of disputes can be faster if access to land records is made efficient. Bhoomi as a transparent land record system is a vast improvement over the manual system that it has replaced.

For a fee of Rs 15, a printed copy of the RTC could be obtained online in minutes at computerised Bhoomi kiosks in 177 *taluk* offices. The land records are in the public domain. Copies of RTC can be obtained for any land parcel in the *taluk* by providing the name of the owner or

the plot (survey) number. Any record can be viewed through a touch screen at a few kiosks.

Farmers can apply for mutation and expedite the process by reviewing the status of their request online, presenting documentary evidence to supervisors in the event that their request is not processed within the stipulated time period. With the computerised system, administrators can quickly determine the number of approved and overdue mutation orders. Information collected from one urban *taluk* indicates that earlier 3,000 mutations were handled annually. After computerisation, there has been a 50 per cent jump. This change would seem to indicate a level of approval of the new system by the citizens, and willingness to update changes in landownership that were previously left undocumented.

By the end of May 2002 the annual revenue generated through issuance of RTCs was Rs 40 million, and the monthly collection had stabilised to about Rs 7 million. It is estimated that between Rs 90 and 100 million will be collected each year from charges for RTCs. Nearly 78.3 per cent of all Bhoomi users take an RTC whereas 17.2 per cent apply for a modified RTC (involving mutation) and 4.5 per cent collect a copy of the mutation order. The users of Bhoomi collect these documents for a variety of reasons. The largest proportion of users (51 per cent) collect the RTCs for applying for loan from a bank. Nearly 14 per cent use an RTC to verify the outcome of a mutation request. About 16 per cent use the documents in courts or to verify details of adjoining property.

Bhoomi is one of the few e-government applications that have been evaluated by an independent agency. An evaluation conducted by the Public Affairs Centre, Bangalore, in July 2002 showed significant impact on efficiency in delivery and corruption<sup>2</sup>:

<sup>2</sup> The report card on the Bhoomi initiative sought to assess benefits derived by users of Bhoomi centres in relation to improved quality of service and satisfaction. A sample survey was carried out among citizens who have used Bhoomi kiosks as well as a control sample of those who have used non-computerised land record providers. Quality of service and user satisfaction was compared across these two groups to derive conclusions on the impact and benefit from the Bhoomi initiative. Data was collected from six districts reflecting geographic regions of Karnataka, and two Bhoomi kiosks were selected through sampling (weighted by intensity of use) among the kiosks operating in each district. A total of 198 respondents were interviewed across the Bhoomi kiosks. For the non-computerised facility user sample, four *taluks* were selected and fifty-nine respondents interviewed. A team from A.C. Nielsen and ORG-MARG carried out the field survey and preliminary analysis. (Source: Public Affairs Centre, Bangalore, 2002, [http://www1.worldbank.org/publsector/egov/cvc\\_cs.htm](http://www1.worldbank.org/publsector/egov/cvc_cs.htm).)

1. **Ease in use of the Bhoomi kiosks:** Many users (66 per cent) were able to utilise the Bhoomi kiosks with no help, in contrast with 25 per cent in the case of the manual system. Most users of the Bhoomi system (78 per cent) found the system to be very simple. Many Bhoomi users (68 per cent) had also made use of the manual system in the past; a majority of users (78 per cent) who had past experience with the manual system found the Bhoomi system more simple.
2. **Complexity of procedures:** Most users (79 per cent) of Bhoomi kiosks did so without having to meet any official except the counter staff. In contrast, in the earlier manual system, users had to meet a minimum of one official (19 per cent). The extent of complexity is reflected in the fact that 61 per cent users of the manual system had to meet two to four officials for their work. Legacies of the manual system have not completely faded away. About 18 per cent of Bhoomi users reported that their document was not signed by the appointed village accountant operating the kiosk; 6 per cent reported that they filled out an application form for the issue of an RTC.
3. **Errors in documents received:** Users indicated that the Bhoomi kiosks provided error-free documents to more users (74 per cent), in contrast with 63 per cent in the case of the manual system. Among those reporting errors, wrongly spelt names were the most frequent (81 per cent in case of manual system and 53 per cent in the Bhoomi system). However, major errors in land details were noticed by 31 per cent of those who reported errors in the manual system, in contrast with 4 per cent in case of Bhoomi users.
4. **Rectifying errors:** Given that errors are not unusual at this stage of development of the Bhoomi system, how efficient are the response systems? Almost all users of the Bhoomi system had confidence to complain and sought rectification (93 per cent) as compared to less than half (49 per cent) in the manual system. Half the complainants (58 per cent) got timely response in case of Bhoomi, while such response was reported by only 4 per cent of those using the manual system.
5. **Cost of service:** All users of the Bhoomi facility who wish to receive a hard copy of the RTC are to pay a fee of Rs 15 each and receive a receipt for the same. A large segment of users

(66 per cent) reported that they did not get a receipt for the payment they made.

6. **Hidden costs:** Citizens also incur hidden costs of time and effort to secure these certificates. Most Bhoomi users (79 per cent) reported a minimal waiting time in the queue of 10 minutes or less, in contrast with 27 per cent who could meet the concerned official in such short time. The bigger issue is the number of times a citizen had to visit these offices to get the certificate. While most users got the RTC (72 per cent) one visit to the Bhoomi kiosk, only 5 per cent got it that fast in the manual system.

7. **Reduced corruption:** The most serious issue is that of corruption and bribery. Two-thirds of the users of the manual system paid a bribe and 66 per cent of them reported having to do so very often. In contrast, only 3 per cent of the users of the Bhoomi system reported paying bribes.

8. **Staff behaviour:** While the technical capacity of the system plays an important role in its success, the approach of people who handle these task is of critical significance, too. Most Bhoomi users (85 per cent) rated staff behaviour at the Bhoomi kiosks as 'good'; none of the users of the manual system rated staff behaviour as 'good'.

Bhoomi empowers the small rural farmer in many ways. Their relationship with lower rungs of civil servants can be on a more equal footing. Armed with genuine certificates, farmers can raise loans for a variety of purposes and cannot be easily harassed by bank staff. Mutations became an instrument for rural corruption, exploitation and oppression. In case of disputes, landowners simply bribed the officials to get the records changed to favour their position. Now the records are in the public domain and can be easily verified by anyone.

## Benefits and Costs

The expenditure on data entry operations for about 2 million RTCs in twenty-seven districts was Rs 80 million. The unit cost of providing hardware and construction of computer rooms and kiosks was of the order of Rs 0.64 million for each *taluk*. Thus, the total out-of-pocket expenditure on the project was Rs 185 million. This does not include the cost of software development done gratis by the NIC.

The cost of processing an RTC has been roughly estimated at Rs 13, assuming a life of five years for the hardware and an activity level of 2 million RTCs issued from all the kiosks (10 per cent of all holdings). This cost includes an assumed operational expenditure of Rs 2 for stationery, cartridges and electricity. The current user fee of Rs 15 seems sufficient to cover these costs. However, if the scheme is extended to 700 sub-*taluk* offices, then there would be an additional expenditure of Rs 0.25 million per kiosk on hardware (1 PC-Rs 45,000; printer-Rs 20,000; UPS-Rs 5,000; generator-Rs 30,000) and site preparation, raising the unit cost of processing above Rs 15 per record.

By the end of November 2001, Rs 5 million had been collected through user fees for the distribution of 330,000 RTCs through 140 kiosks operational for periods varying from three to twelve months. An additional 12,000 RTCs were issued for official purposes.

The benefit in terms of person-days saved is approximately 1.32 million per annum, leading to savings of Rs 66 million per annum in wages. The weighted average value of bribe paid in the manual system was Rs 152.46 per person, while that in Bhoomi was Rs 3.09. Even if we reduce the saving by the fee that they have to pay, of Rs 15, the net saving is Rs 134.37, and translates to a saving of over Rs 806 million annually.

## Potential Future Benefits

There are plans to use the Bhoomi kiosk for disseminating other information, like lists of destitute and handicapped pensioners, families living below the poverty line, concessional food grain card holders, *mazandi* rates and weather information. Such information is already available at one *taluk* on a pilot basis.

The system generates various types of reports on landownership by size, type of soil, crops, owner's sex, etc., which would be useful for planning poverty alleviation programmes and supplying agricultural inputs. Banks and other lending institutions could be provided electronic access to the database for processing requests for crop loans, and conduct some advance planning on the quantum of lending required. Similarly, the high court, district and *taluk* courts could access the database for resolving legal disputes surrounding land. The system could also lead to better administration of the Land Reforms Act, such as enforcing a ceiling on landholdings.

## Key Lessons

Implementation of land records computerisation has been difficult in India. Bhoomi succeeded because there was a champion who worked a 15-hour day for over a year, devoting 80 per cent of his time to the project. Minimising resistance from staff by harnessing political support was an important contributory factor. Extensive training coupled with a participatory style also helped to diminish resistance.

Project managers need to balance the potential benefits against the risk of implementation failure in deciding how much reform (re-engineering) to tackle at any one time. 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 has not necessarily reduced. 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 behaviour. Still, supervisors must examine the reports and take appropriate action. In remote areas operators can turn away citizens by telling that the system offering online service is down. Strict field supervision is needed (through empowered citizens committees and NGOs) to curb such behaviour. 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 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 *taluk*. 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* centres, and 330,000 people have paid the fee without grumbling.

Soon after the initial success, elected representatives, district officials and farmers made demands that Bhoomi be extended to the sub-*taluk* level. Presumably, the project was considered an unqualified success. However, this expansion would have increased the costs without necessarily increasing the number of RTCs that would have been issued. The department did well to resist the temptation as it would not have been able to monitor and support a geographically spread out operation. In any case, systems should be allowed to stabilise and prove their sustainability over a two-year period before attempting any replication. Many years ago, a District Rural Development Agency computerisation project called CRISP was replicated in 500 districts in a hurried manner. The expansion turned out to be a failure.

The department did well to explore other possibilities, short of direct expansion, that could make RTCs available at sub-*taluk* level. Plans to allow private rural kiosks to issue unsigned copies may never have come about if a hurried expansion of the Bhoomi system had been made. If such copies can be accepted by banks and verified by accessing the departmental database, the need for signed copies will be reduced. A solution may emerge through wider consultations with the ultimate consumers of these documents.

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## Case 72: Gyandoot—Community-Owned Rural Internet Kiosks

*In awarding the Gyandoot project the Stockholm Challenge IT Award 2000 in the Public Service and Democracy category, the jury described it as 'a unique government-to-citizen intranet project... with numerous benefits to the region, including a people-based self-reliant sustainable strategy. Gyandoot is recognised as a breakthrough in e-government, demonstrating a paradigm shift which gives marginalised tribal citizens their first ever chance to access knowledge, with minimum investment.' The project also was awarded the CSI-TCS National Award for Best IT Usage for the year 2000. Subsequent evaluations carried out in 2002-3 indicate that the project has begun to falter.*

### Application Context

Dhar district in central India has a population of 1.7 million; 60 per cent live below the poverty line. The goal of the Gyandoot project was 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 agriculture produce auction centre rates. Consequently, farmers were unable to get the best price for their agricultural produce. Copies of land records also were difficult to obtain. A villager had to go out in search of the *patwari* (village functionary who maintains all land records), who was often difficult to get hold of as his duties include extensive travel. To file complaints or submit applications, people had to go to the district headquarters (which could be over 150 km away), resulting in a loss of wages/earnings.

### A New Approach

The Gyandoot project was launched on 1 January 2000, with the installation of a low-cost rural intranet covering twenty village information kiosks in five blocks of the district. Later eleven more kiosks were set up. Villages that function as block headquarters or hold weekly markets in tribal areas or are located on major roads were chosen for establishing

these kiosks. Seven centres were located in towns (urban areas), eight in large villages with a population of 5,000 to 6,000, another seven in medium-sized villages with a population of 1,000 to 4,000, and the rest in small villages with population of less than 500. Each kiosk caters to about twenty-five to thirty villages. The entire network of thirty-one kiosks covers 311 panchayats (village committees), over 600 villages and a population of around half a million (nearly 50 per cent of the entire district).

Kiosks have been established in the village panchayat buildings. Information kiosks have dial-up connectivity through local exchanges on optical fibre or UHF links. The hub is a remote access server housed in the computer room in the district panchayat.

User fees are charged at the kiosks for the services provided. Local rural youth act as entrepreneurs, running these information kiosks along commercial lines. At the inception of the project it was decided that further expansion of kiosk centres would take place only when local youth come forward to start new centres as private enterprises.

A local person with a ten-year schooling (matriculate) can be selected as an operator. He/she needs only maintenance, limited typing (software is menu driven) and numeric data entry skills. For the initial kiosks, village committees each selected three candidates to receive training at the district council. At the end of the training the best trainees were selected to run a kiosk.

The following services are offered at the kiosks:

1. **Agriculture produce auction centres rates:** Prevailing rates of prominent crops at the local and other recognised auction centres around the country are available online for a nominal charge of Rs 5. The volume of incoming agricultural produce, previous rates, etc., are also provided on demand.
2. **Copies of land records:** Documents relating to land records, including *khazra* (record of rights), are provided on the spot at a charge of Rs 15. All banks in the district have agreed to accept these kiosk documents. Approximately 0.2 million farmers require these extracts at every cropping season to obtain loans from banks for purchasing seeds and fertilisers.
3. **Online registration of applications:** Villagers had to make several visits to the local revenue court to file applications for obtaining income/caste/domicile certificates. Now they may send the application from a kiosk at a cost of only Rs 10. Within ten



days notification about the readiness of the certificate is sent via e-mail to the relevant kiosk. Only one trip is needed—to collect the certificate.

4. **Online public grievance redressal:** A complaint can be filed and a reply received within seven days for a cost of Rs 10. These can include complaints regarding drinking water, quality of seed/fertiliser, scholarship sanction/disbursement, employee establishment matters, functioning of schools or village committees, etc.

5. **Village auction site:** This facility began in July 2000. It makes auction facilities available to farmers and villagers for land, agricultural machinery, equipment and other durable commodities. One can put one's commodity on sale for a charge of Rs 25 for three months. The list of saleable commodities can be browsed for Rs 10.

6. **Transparency in government:** Updated information regarding beneficiaries of social security pension, beneficiaries of rural development schemes, information regarding government grants given to village committees, public distributions, data on families below the poverty line, etc., are all available on the intranet, which makes government functioning more transparent.

Other services offered at the kiosks include online matrimonial advertisements, information regarding government programmes, a forum for school children to ask questions and talk to an expert and e-mail (free for information on child labour, child marriage, illegal possession of land belonging to Scheduled Tribes, etc.). Some kiosks also have added photocopy machines, STD, PCO and horoscope services. In January 2000, the first month of operation, the kiosk network was accessed 1,200 times for a variety of services. That number reached nearly 9,000 in July. During the first eleven months, the thirty-one Gyandoot kiosks were used nearly 55,000 times.

Twice each day, the person managing the server prints the complaints, applications and e-mails received and sends them to the appropriate authority. The collector responds to certain queries and complaints. If a complaint cannot be addressed, a reply is forwarded to the kiosk manager.

of putting up a local area network (LAN) connecting major departments (health, education, tribal development, revenue, food, agriculture, public health engineering, district council and district magistrate) to the Gyandoot server. This will eliminate the manual handling of papers.

### Implementation Challenges

In the initial phase there were reliability problems with the dial-up connection. Most of the local rural telephone exchanges (LRTTE) did not operate with optical fibre cables. Now the telecommunications department has upgraded the connections of all LRTTEs to which Gyandoot kiosks are connected. Poor or no connectivity reduces the economic viability of the kiosk and decreases the motivation level of the kiosk manager to be a partner in the project. Telephones have not reached many parts of the hinterland, and expansion of the project to these locales may require other technologies such as wireless.

Senior politicians have been convinced of the merits of the Gyandoot project through demonstration of the facilities provided. The Member of Parliament (MP) from the district allocated 25 per cent of the developmental funds (Rs 20 million) at his disposal for an e-education project in the district. However, small-time politicians and the lower-level bureaucracy have attempted to scuttle the programme as they perceive a loss of power when the delivery system bypasses them. The success of the project depends on the motivation of the kiosk manager, which has been maintained at a high level through regular contact/training.

Although complaint filing has been structured through a menu, numerous complaints are sent using the e-mail facility in local languages, which make them difficult or impossible to address. To enhance the economic viability of kiosks, they are being given licences to vend government judicial stamps and delegated powers to write petitions. In addition, a public awareness campaign has been launched in the district to promote the kiosks. From the funds available with Gyandoot, two scholarships of Rs 1,000 each will be awarded each month for five years. Only those students of the district who motivate ten or more villagers to use Gyandoot facilities during a specified time window will be eligible. School students of senior classes are being taken to the

initiated to discuss Gyandoot and its services. Incentives in the form of cash awards (Rs 2,000 to 5,000) are being offered twice a year to the three best performing kiosks, with a certificate of appreciation given to the head of the village committee.

### Benefits and Costs

The entire expenditure for the Gyandoot network has been borne by panchayats and the community with no expenditure burden for the state or national government. The network has been set up at a total cost of Rs 2.5 million (Rs 50 = US\$ 1 approx.). The average cost incurred by the village committee and the community in establishing a single kiosk was Rs 75,000.

The funds for the Gyandoot network have come from existing united funds available to the village committee, private investment, annual State Finance Commission share of revenues and National Social Aid Programme allotment available to the district council. The district-level coordination committee of bankers has approved a loan scheme for setting up kiosks under the central government's self-employment scheme. Three loans have already been sanctioned.

Each kiosk has a computer, modem, printer, UPS (4-hour rating), furniture and stationery. The first twenty kiosks established by the village panchayat have been turned over to a manager/owner after executing an initial agreement for one year. The village panchayat maintains the building and the fixtures, while the manager is responsible for all the operational expenses and revenue collection. The manager does not receive any salary. He pays 10 per cent of the income from the kiosk as commission to the district council for maintaining the intranet. For the eleven centres started as private enterprise, the owner pays Rs 50,000 as licence fee for one year to the district council.

Each kiosk was expected to earn a gross income of Rs 4,000 per month (50 per cent from Gyandoot services, 25 per cent from training and the remainder from job work like typing). The operational costs are Rs 1,000 per month. The net income of Rs 3,000 must cover investments and provide a profit to the entrepreneur. In practice, the gross income has ranged between Rs 1,000 and 5,000 per month, depending upon the skill and zeal of the manager.

Agricultural produce rates, land records and grievance services are the most popular features of the kiosks, accounting for 95 per cent of

the usage. The following examples underscore the benefits of the kiosks to the rural population:

1. A complaint costing Rs 10 brought drinking water to a tribal hamlet of thirty-nine households. The villagers' previous complaint to local authorities had not yielded results for six months. To the surprise of the villagers, their complaint filed through the kiosk brought a handpump mechanic to the hamlet within two days, and he repaired the pump in a matter of hours.
2. Kalsingh, a milk farmer, wanted to sell his cow. He registered with the auction facility of Gyandoot (which enables trading of commodities like milch animals, cultivable land, tractors and agricultural tools). He received four trade enquiries and finally sold his cow to the highest bidder for Rs 3,000.
3. Upon receiving an e-mail from a kiosk that an epidemic had broken out amongst the milch cattle of the village Kot Bhidota, a veterinary rescue team was dispatched the same day. Haemorrhage septicaemia was detected, and the team promptly started curative treatment and vaccinated the rest of the animals against the disease. They also conducted a search in neighbouring villages for signs of the disease and carried out preventive vaccinations. Two hundred and fifty-six milch animals were vaccinated in one day. No deaths were reported.
4. Access to market rates leads to better deals for farmers in Bagati village. They were quoted a rate of Rs 300 per quintal from local traders for their potato crop. The kiosk was used to get the prevailing market rate in a town 160 km away, which paid Rs 100 more. Consequently, their potato produce was sold in that town. The prices paid to farmers have increased approximately 3 to 5 per cent, keeping about Rs 200 million from the pockets of middlemen and traders.
5. There has been increased awareness about computers and IT in rural areas. New private computer training institutions have opened and enrolment in these institutions has increased by 60 per cent. Around 120 rural youth are receiving training in information kiosks in the remote areas. Gyandoot also has affected political decision making in resource allocation. The local MP has allocated Rs 2.5 million to set up information kiosks in thirty schools to develop a new model of e-education. And after recognising the increased awareness about computers

and IT in the district, the Indira Gandhi National Open University (IGNOU) has opened a study centre for undergraduate and post-graduate courses on computer applications in its distance education programme. The Government of Madhya Pradesh instituted an annual Gyandoot cash award of Rs 200,000 for the project that best takes IT to the state's poor.

### Key Lessons

The Gyandoot system helped in filing complaints not just because a communication system was installed, but due to the involvement of the collector (project champion) who closely monitored the manual processes of handling complaints at the back end and made sure that district offices were responsive. The first individual to receive the complaint is a private functionary (kiosk operator) 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 delivery of local content. Regulations have prevented this from happening through the private sector as the government has guarded against losing control over a powerful media. Some fundamental issues need to be resolved before 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.

The awards that the Gyandoot project has received are one sign of its success. But how can the success of such experiments be measured? Will the scheme be viable in the long run? At no stage were all kiosks viable, but within a short period of one year attendance at the kiosks has dwindled sharply to less than one user per kiosk per day, putting a question mark on the viability of the project. Many tele-centres were forced to diversify into unrelated services. District administrators are busy people: the collector chairs sixty to seventy committees. How much energy should be put into technology-based systems? What kind of priority should such projects get in the overall developmental plans of the district? As the district's chief executive officer noted in an e-mail to the author: 'How can one talk about computers when the district is facing severe drought?' There are no simple answers. Perhaps feedback

(through focus group discussion with users and non-users by an external agency) from the people themselves is the best way to assign priority to such projects.

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### Case 7.3: CARD—Computer-aided Registration of Deeds

*Land registration offices throughout Andhra Pradesh now operate computerised counters to help citizens complete registration requirements within an hour, instead of several days as earlier. The lack of transparency in property valuation under the old system resulted in a flourishing business of brokers and middlemen, leading to corruption. Antiquated procedures such as manual copying and indexing of documents, and storage in paper forms in ill-maintained back rooms have all been replaced. This case illustrates some of the key implementation issues faced by state and national governments in their efforts to use IT to improve citizen-government interfaces.*

### Application Context

Registration of document changes in ownership and transactions involving immovable property is governed by the Indian Stamp Act of 1899. Deeds of various kinds are required by law to be written on stamp paper of prescribed value. Certain transactions require a fixed duty. For others the ad valorem method is used, whereby the stamp duty is a percentage of the property value or loan that is the subject of the instrument.