

SECTION VI

Creating Enabling Conditions for the Development of the Private Sector

Throughout the book we have discussed the role of the private sector in alleviating poverty and providing dignity and choice to individuals at the BOP. It is useful to realize that all developing countries have a private sector. However, a significant portion of the private sector—the individual entrepreneurs and small enterprises—operates outside the law. The individual, self-employed vegetable seller in a shanty town is an entrepreneur, but he is outside the law. He operates in what has been called the “informal sector” or the “extralegal sector.” He is not part of the formal private sector because the cost to him of becoming a part of the formal sector is too onerous. Complex regulations for registering a microenterprise, bureaucratic corruption, and delays make the process very difficult for the individual. These entrepreneurs stay in the informal sector with little or no access to reasonable credit (other than from the local money lenders), and remain small. The cycle of poverty is inevitable. It is not corruption in “big-ticket items” such as letting out a \$2 billion defense contract that hurts the poor; it is the difficulty in renewing a license to operate a fruit stall without waiting in line for a day and giving “speed money” to the officials. Therefore, creating transparency, access, and speed of transactions for the BOP entrepreneurs, as well as others in the private sector, is critical for the rapid development of “trapped talent.”

The issue of corruption and its impact on the poor is well-documented, but very few attempts have been made to deal with this problem head on. The e-governance initiative in Andhra Pradesh is an attempt to clean up the transactions that impact the citizen on a day-to-day basis: paying utility bills, getting a birth or death certificate, renewing a license to operate a small roadside shop, or getting a “caste certificate” that allows individuals to enroll their children in a government school. The private–public partnership in providing e-Seva (essentially, electronic services) has the potential to fundamentally change the trust level that citizens have in their government.

This process makes it easier for citizens to learn that the cost of being within the system—the cost of being in the formal sector—is lower than the cost of being outside the system—being informal and extralegal. This process facilitates the development of the entire private sector system and a respect for commercial contracts.

Citizen Centricity: E-Governance in Andhra Pradesh

Have you ever wondered why most developing nations are plagued with disease, corruption, poverty, crime, and various other ills? Billions of dollars are poured into addressing these issues year after year in the developing world with little impact. How can a country break out of this unending vicious cycle when poor governmental practices are standard, when citizens do not trust their government, and when corruption is accepted as a part of daily life? Most countries are unable to escape the evils of bad governance. However, one Indian state, Andhra Pradesh, is in the middle of a bold experiment to fundamentally change the way it governs its citizens, by using information and communication technologies (ICTs). Government processes have become more transparent, government has become more accountable, and there is a growing belief among citizens that the future can be different and exciting for all. Highlighting the specifics of this bold initiative will give governments in both the developed and the developing worlds clear examples of how and why specific programs work.

THE INNOVATION...

The e-Governance experiment in Andhra Pradesh is a bold attempt to use ICTs to improve governance processes. The setting is one of poverty, illiteracy, and corruption. The experiment is motivated by the desire to transform the state as captured by the government's vision statement:

That Andhra Pradesh should be a state where poverty is totally eradicated; that every man, woman, and child in the state should have access, not just to basic minimum needs, but to all the opportunities to lead a happy and fulfilling life; and that we must emerge as a knowledge and a learning society built on values of hard work, honesty, discipline, and a collective sense of purpose.

—Vision 2020

Andhra Pradesh

Andhra Pradesh is the fifth largest state in India. It covers an area of 275,068 square kilometers and has a multiethnic population of 76 million, 48 percent of whom are illiterate. Seventy percent of the population earns a living through agriculture. The average annual household income is \$600, with 20 percent of the population below the poverty line of \$49 per year. Fifty percent of the homes have no electricity, and 69 percent do not have piped water. Only 8 percent of the population has completed high school.

Additionally, the state has 26 districts and three distinct geographical regions: Rayalseema, Coastal, and Telangana. Five languages are spoken in Andhra Pradesh: Telugu, Urdu, Hindi, Tamil, and English.

Nara Chandrababu Naidu, President of Telugu Desam Party, became Chief Minister of Andhra Pradesh in 1995. His governmental reforms and popularity helped to re-elect him in 1999. Naidu is often referred to as the CEO of Andhra Pradesh because of his atypical view of government and the state; rather than maintain the status quo and have Andhra Pradesh languish as other Indian states have, he wants the area to become India's Silicon Valley. Political will, tenacity, and courage are needed to push e-Governance issues through to fruition, and the government of Andhra Pradesh has a leader in whom all three are demonstrated.

In the late 1990s, Naidu employed McKinsey & Co. to guide Andhra Pradesh in developing a comprehensive vision for the future. *Vision 2020*, a forward-looking document, was the outcome. Covering everything including agriculture, health care, education, industry, and more, *Vision 2020* lays out

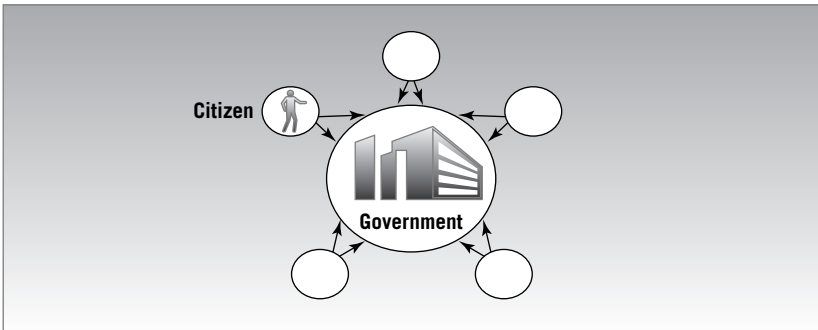


Figure 1 Institution-centered view of government.

what Andhra Pradesh will look like in 20 years and the hard challenges it must face to get there.¹ One notable, recent outcome from *Vision 2020* is the concept of a *simple, moral, accountable, responsive, and transparent* (SMART) government.² Each component of the SMART acronym can be reached easier through the state’s e-Governance initiatives.

Citizen centricity, at its most fundamental level, is a shift from an institution-centered (Figure 1) view of government to a citizen-centered (Figure 2) view of government.

The traditional mindset of government employees can best be described as not service-oriented. Anecdotally put, government workers make your visit to their office as difficult as possible because they can. There is little enthusiasm displayed in their work and, consequently, the citizen suffers. Why is this behavior evident predominantly in government settings?

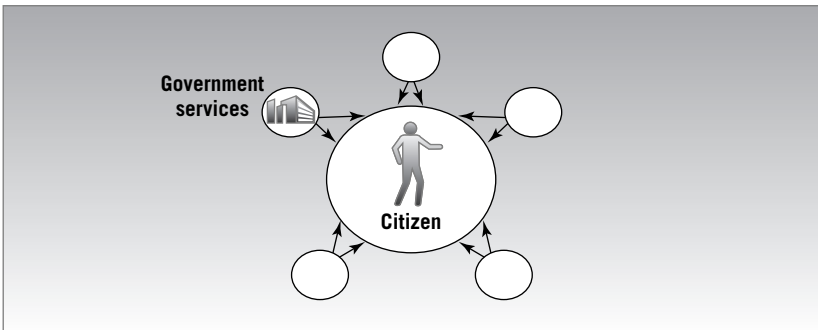


Figure 2 Citizen-centered view of government.

Pervasiveness of Government in Citizens' Lives

Government is a constant, pervasive influence on the lives of its citizens. For example, the government is approached first for a birth certificate, then a caste certificate when a child reaches school age. Later, the government presents itself in distributing scholarship funds for college. The final face a citizen's family is exposed to is when a death certificate is given. As one official put it, "The government is a club whose membership is compulsory. One can't choose to be a member and one can't choose to quit."³

People inside the state recognize that now is the time for change. "India, the country, is not poor. Our policies are no good. We are not able to implement our policies utmost efficiently," stated Naidu, the head of the state.⁴ It was also recognized that simple "band-aid solutions" will not work. The system needs radical change. More than one citizen told us that "corruption is 'sucking the blood' of the common man."

E-Governance and Good Governance

E-Governance⁵ simply harnesses the power of ICT to improve the interface with the government and provide tailored services to citizens. Four critical components must be in place for this to happen, and the government of Andhra Pradesh is intelligently pursuing all four:

1. *Sustainable and affordable infrastructure.* The state has established communications networks at the district, mandal, and village level. Further, it is building and refining the back-end and service delivery infrastructures.
2. *Well-architected and sustainable software development.* Andhra Pradesh has established core projects around such clusters as health, agriculture, education, and business.
3. *Human resources.* The state is actively recruiting recent ICT graduates and training existing staff.
4. *An implementation plan.* Initiatives have been rolling out since the late 1990s.⁶

According to an internal government document, "Andhra Pradesh will leverage Information Technology to attain a position of leadership and excellence in the information age to transform itself into a knowledge society." The government of Andhra Pradesh further envisions benefits to citizens and employees:⁷

- Benefits to citizens and businesses
 - Streamlined, standardized electronic information gathering and access.

- Electronic delivery of services to meet citizen expectations and requirements.
- Convenient, anytime, anywhere citizen services.
- Support for e-commerce initiatives (e.g., online filing, payments, etc.).
- Significant improvement in government-to-citizen (G2C) and government-to-business (G2B) interfaces.
- Benefits to government
 - Increased employee productivity.
 - Facilitation of information reuse across and within government departments.
 - Reduced system maintenance and training requirements by adopting standard systems and processes.
 - Cost-effectiveness in the operations of government agencies.
 - Improvement in government-to-government (G2G) interfaces.

These lists establish the crucial link between e-Governance and good governance. Using ICT allows the government of Andhra Pradesh to do things smarter, quicker, and more effectively—factors that facilitate citizen centricity and good governance.

Andhra Pradesh's E-Governance Framework

The government of Andhra Pradesh uses the following framework to guide its e-Governance strategy and circumvent challenges posed by management of technology, resources, and implementation:⁸

- Implementation framework: 6C model
- Resource framework: PPP model
- Technology framework: ICT architecture

Implementation Framework: 6C Model

The government developed the 6C model from the experience of implementing and coordinating several projects in its departments. The model incorporates features essential for successful implementation of IT projects.

1. *Content.* Developing application software content that translates end objectives into visible results.

2. *Competencies*. In place of hiring new employees, the government focuses on training existing top-, middle-, and cutting-edge-level employees. Specially hired CIOs (even at district levels) ensure the spread of IT skills.
3. *Connectivity*. Besides connecting its departments, the government is encouraging private operators to lay fiber-optic cable throughout the state.
4. *Cyberlaws*. Andhra Pradesh's Information Technology Act 2000 provides a legal framework for all projects. The law gives legal recognition to electronic records and to authentication through digital signatures. The law addresses issues such as data privacy, integrity, access control, nonrepudiation, and audit of electronic transactions.
5. *Citizen interface options*. Multiple interfaces are provided from citizen service centers, Internet kiosks, home PCs, set-top-boxes, and so on. Each e-Governance project defines the levels of interface.
6. *Capital*. The government actively partners with private enterprise to raise capital and bring its projects to fruition. The PPP model described next defines the framework for such a partnership.

Resource Framework: Public–Private Partnership Model

Computerizing all departments in central and state governments in India is estimated at an intimidating cost of Rs. 350 billion and an effort of 130,000 person-years.⁹ The public–private partnership (PPP) model was created to make the task of e-Governance in Andhra Pradesh less formidable. Imperatives to provide high-quality infrastructure, a shortage of public funds, and profit motives in privately managed areas are reasons for the PPP concept.¹⁰ PPP assumes a wide spectrum of models like build-own-operate (BOO), build-own-operate-transfer (BOOT), and build-operate-transfer (BOT), depending on the needs of both parties. The hope is to blend the appropriate amount of public-sector accountability with private-sector efficiencies while sharing the risk.¹¹

The Department of Information Technology and Communication's abstract on the PPP model concludes that e-Governance will involve implementing 1,500 applications across 160 departments at about 10,000 sites.¹² The government uses the following unofficial rule of thumb to identify bundles for e-Governance: "Anywhere citizens are standing in line or using paper, there is opportunity for e-government."¹³ Clearly, vast amounts of financial, managerial, and technical resources will be required. The abstract further cites the following factors enabling the rapid adoption of the PPP framework in Andhra Pradesh: a proactive government seeking administrative reforms, thriving IT skills in the private sector, entrepreneurship, increased connectivity, IT architecture and framework for security, and public key infrastructure (PKI).¹⁴ The Andhra

Pradesh Infrastructure Department, which uses the PPP model, notes that private investment is hampered by inadequate legal framework, cumbersome procedures, delay in obtaining clearances, inadequate administrative support, threat of public interest, and inadequate grievance-handling mechanisms.¹⁵ Andhra Pradesh is addressing each factor to make the investment environment easy for private companies.

Andhra Pradesh is extending the PPP model to every facet of development in the state, from biotechnology to education to international airports. Private enterprises are scurrying to lay fiber-optic cable through the entire state, and every village is scheduled to have Internet access within 12 months. Considering the initiatives that have begun, it is reasonable to assume that the PPP will drive the development of Andhra Pradesh in many ways. Already, the government is effectively using the PPP model to achieve what Chief Minister Naidu calls “leapfrog development through IT.”¹⁶

Reforms and E-Governance

e-Governance can, and should, be viewed as a much-needed governmental reform. In fact, it is one of the many substantial reforms that has occurred in the government of Andhra Pradesh during the last eight years. Many of the outcomes of the impact cycle of e-Governance, addressed later in the chapter, would be less substantial, if at all possible, had it not been for these other reforms. Likewise, if these reforms had occurred in the absence of e-Governance, it is doubtful their impact would have been felt as strongly.

Action

The approach to the reporting of the study of this complex social transformation through the use of ICT will be as follows:

1. We outline the changes that have been made to the routine transactions that individual citizens have to make, such as paying utility bills, getting a birth certificate, or getting a death certificate. We describe eSeva, the experiment in the capital city of Hyderabad and in the rural area Naagampally.
2. We recognize the alternate experiments in other major metropolitan areas of the state. The state is not prematurely settling on one model.
3. We describe in depth the back-end work required to get ICT going. We describe the water department in the capital Hyderabad. A similar experiment in the electricity department was studied in depth and an overview is presented here.

4. We then describe the additional demands imposed on the system when infrequent but large and complex financial transactions are involved, such as the acquisition or selling of land.
5. Finally, we describe the effects of this system on the citizens. The initial studies show great promise and some clear problems.

eSeva: Dealing with the Routine Interactions of Citizens with the Government

Among the many e-Governance initiatives being implemented, we studied the one with the greatest impact on citizens and businesses, eSeva (see Figure 3).

eSeva

In the words of Phani Kumar, the Director for eSeva, eSeva is a “killer app” that attempts to end the old system and a “halfway house that is relevant to all developing countries.”¹⁷ The government has converted its old offices into eSeva Centers and outsourced the day-to-day operations to private companies, as per the PPP model. *Seva* in Sanskrit means service; appended with an e- translates into “electronic service.” It offers a much-needed alternative not only to utilities-related interactions but also to a range of 45 different services. We visited three urban eSeva Centers: Khairtabad, Ramnagar, and Banjara Hills. Using a self-operated token system, citizens seek different government services. In addition to housing management offices, the Khairtabad center also operates the data centers that run eSeva across the city.

The eSeva centers operate from 8 a.m. to 8 p.m., making it convenient. The service itself operates 24 hours a day, 7 days a week over the Internet at www.e sevaonline.com. The centers have an average staff of 24 people with a

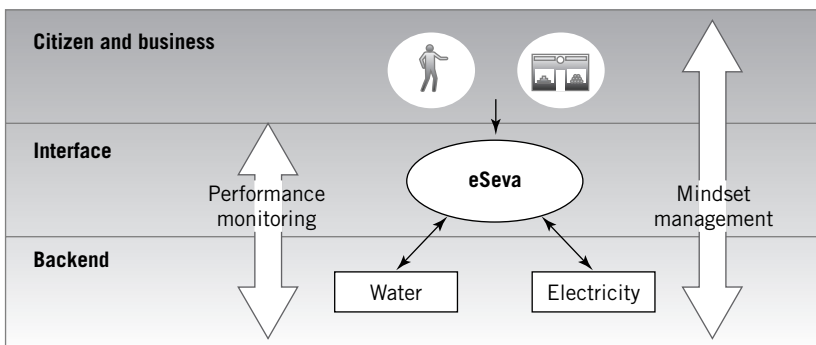


Figure 3 eSeva structure.

minimum of 16 and a maximum of 44.¹⁸ Citizens are not charged for using the service, but the utilities are billed Rs. 5 per transaction regardless of the transaction amount. Payment is accepted by check, cashier's check, cash, or credit card. The transactions update the department databases in real time. To pay over the Internet, eSeva has partnered with regional banks for direct debit transactions. eSeva is designed over a three-tier technology using the following hardware and software:¹⁹

- Sun E250 servers, Compaq ML 530 database servers.
- Oracle 9iAS, application server running on Sun Solaris.
- Oracle 8i R3 database server running on Microsoft Windows 2000.
- Firewall server.
- Network monitoring system running on Cisco.
- 10 KVA uninterruptible power supply (UPS) with one-hour backup and 5 KVA UPS for all servers in the datacenter.
- 10 client machines and 10 printers at each eSeva Center.

As of November 2002, the following costs were associated with eSeva:²⁰

- Pilot: \$200,000
- Site/building preparation: \$600,000
- Hardware/software/networking: \$1 million

Users consistently cite the main advantages of eSeva as shown in Figure 4.

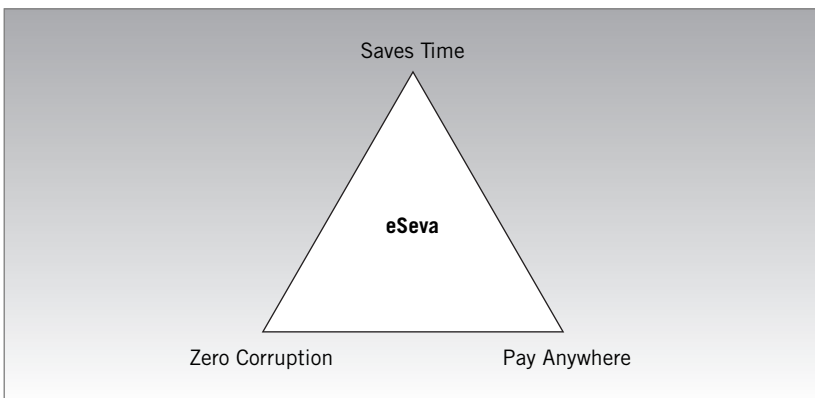


Figure 4 Main advantages of eSeva.

The services are used by an average of 1,000 citizens per day, ranging from 400 to 2,000.²¹ Because the eSeva is a networked system, citizens can pay their bills in any of the 34 locations in Hyderabad. A citizen is not bound by the region in which he or she lives or works.

The eSeva operators are provided with a secure Web browser that prevents any tampering with the system or accounts. The operators can only enter data and issue receipts. The software is cleverly designed to prevent operators from altering the system and it stores detailed transaction information, making every interaction completely transparent. Every customer we spoke to testified that there was no element of corruption.

From the urban to the rural eSeva centers, customers embrace the system because it saves an enormous amount of time. The government target is to complete each transaction in 90 seconds.²² A citizen can pay all his or her bills at one counter in a center instead of traveling all over the city trying to connect with various government agencies. If one so wishes, he or she can avail all 45 services in one sitting.

We found the time saved was more critical for the poor and the middle-class than it was for the elite; the middle-class miss work and the poor are kept from their hourly wages. An Institute of Public Enterprise survey showed that 40 percent of the users earned incomes ranging from Rs. 5,000 to Rs. 15,000 per month; 17 percent earned below Rs. 5,000 per month, indicating predominantly middle-class users.²³ The survey also found 78 percent of users to be educated.²⁴ Another survey conducted by the Administrative Staff College of India (ASCI) further asserted that 97 percent of the surveyed users were literate.²⁵ Our analysis found that of the 750,404 transactions in March 2003, the number of transactions that had a rupee value below Rs. 100 contributed 11 percent (presumably the poor), greater than Rs. 20,000, about 1 percent, and the middle segment, Rs. 100 to Rs. 20,000, the remainder. Considering the amount collected during the same period, the middle segment contributed 73 percent of the Rs. 4.3 billion. Further, during the eight hours we spent at the eSeva centers, we found the educated middle-class frequenting centers more. We believe that eSeva is helping the middle-class citizens the most.

When we asked J. Satyanarayana, the Principal Secretary for IT, how the government measures success, he said simply, "Transactions."²⁶ There have been 7.02 million transactions since its inception in August 2001 and Rs. 19.6 billion has been collected, an indication of the number of citizens who have benefited from the new system. Currently, the majority of the transactions is through utility bill payments. TRANSCO, the electricity organization, accounted for 67 percent of the overall transactions (Rs. 4.7 billion in collections), followed by the water department at 9 percent (Rs. 1.76 billion in collections). Our findings were further reinforced through the Institute of Public Enterprise survey that found 93 percent used eSeva for electricity bills, 77 percent for telephone bills, and 72 percent for water bills.²⁷

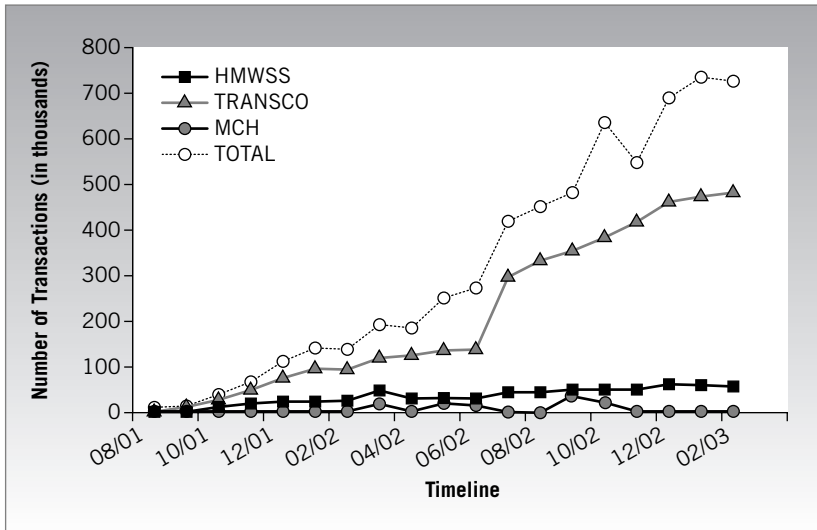


Figure 5 Number of transactions.

Interestingly, the Commercial Taxes Department (CTD), which was started in February 2002, contributed Rs. 16.2 billion. We also noted a high degree of variability in that certain centers had 585,845 transactions (collections of Rs. 4.4 billion) in March 2003, starkly contrasting with other centers with transactions as low as 286 (collections of Rs. 294,958) per month. Highlighted in Figure 5 is a graphical representation of the number of transactions for the following organizations: Hyderabad Metropolitan Water Supply & Sewage Board, TRANSCO, and Municipal Corporation of Hyderabad (MCH).

We also were interested in observing how citizens adapted to new services offered over eSeva and how the departments benefited in terms of collecting bills online. As can be seen in Figure 6 and Figure 7, collections and transactions spike when new services are offered. One observation can be made: The collections vary before settling constantly at a higher level (e.g., BSNL, the telephone service).

The low levels of comfort with the Internet were evident when we noted the total collections through citizens transacting online and on their own was Rs. 2.5 million over a mere 3,725 transactions since inception (0.05 percent of the total). We were further intrigued by the change in the number of transactions per day for the three predominantly used services of electricity (Figure 8), water (Figure 9), and payment of property tax (MCH; Figure 10). The number of transactions spiked on similar dates for the utilities but entirely different dates for MCH, thus causing irregular loads on the eSeva system. Differing payment cycles for each department cause this load imbalance. It is also important to note the spikes in transactions are not extreme on any given date; they are

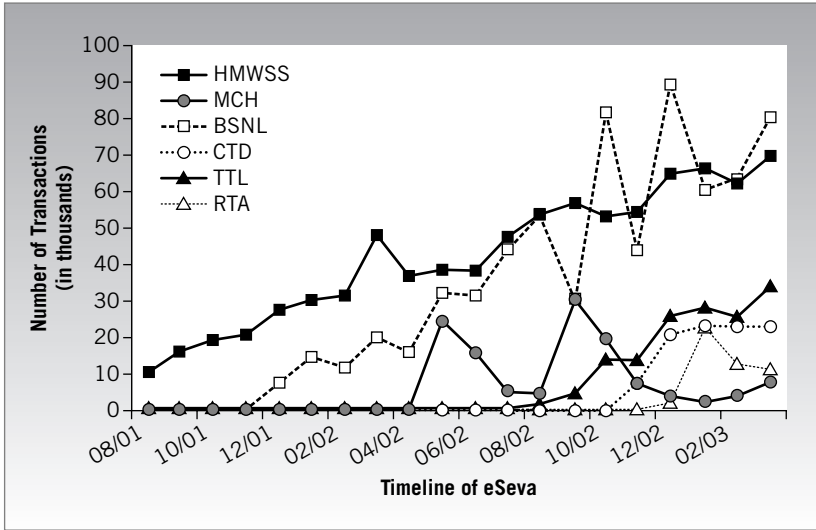


Figure 6 Number of transactions for new services. BSNL = Bharat Sanchar Nigam Limited; CTD = Commercial Tax Department; TTL = Tata Teleservices Limited (private phone company); RTA = Road Transport Authority.

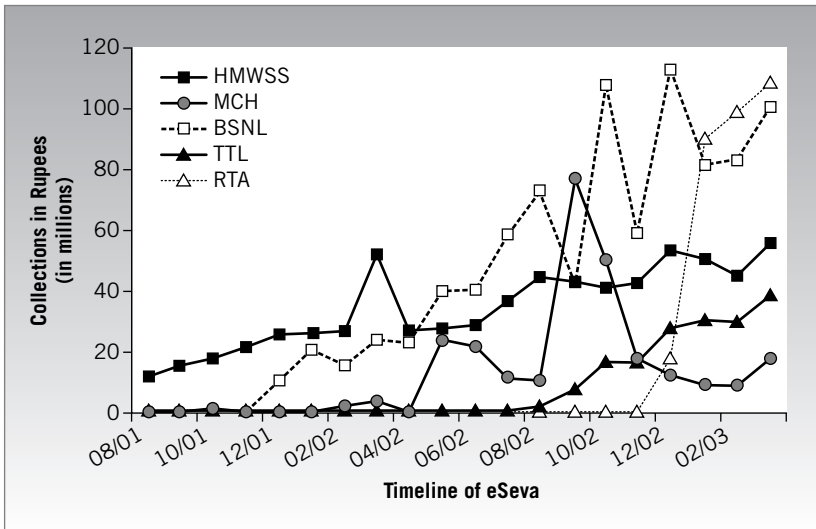


Figure 7 Collections in rupees for new services.

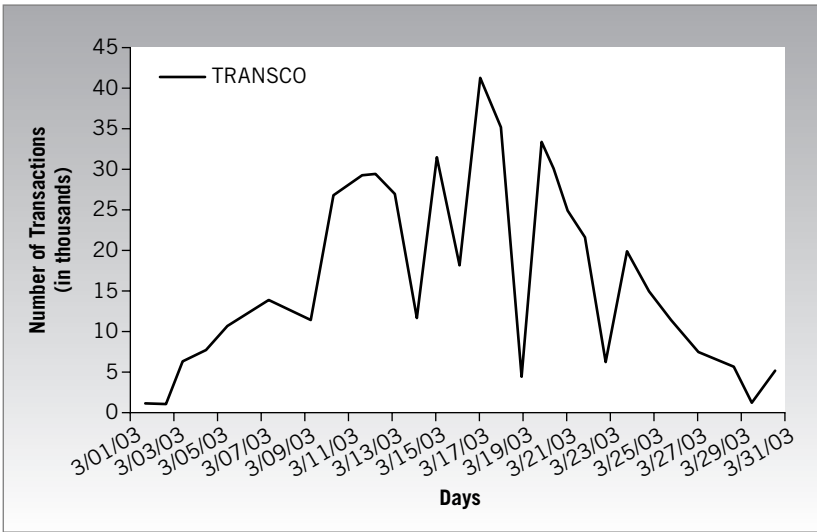


Figure 8 Number of electricity transactions per day.

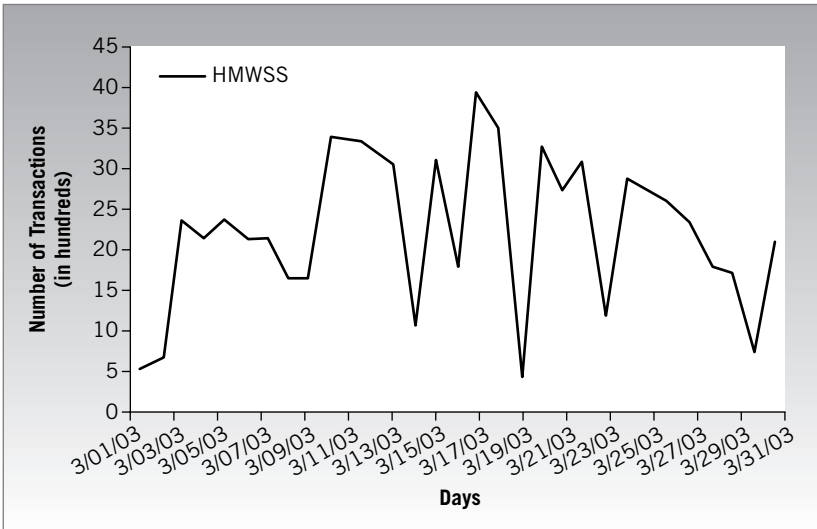


Figure 9 Number of water and sewage transactions per day.

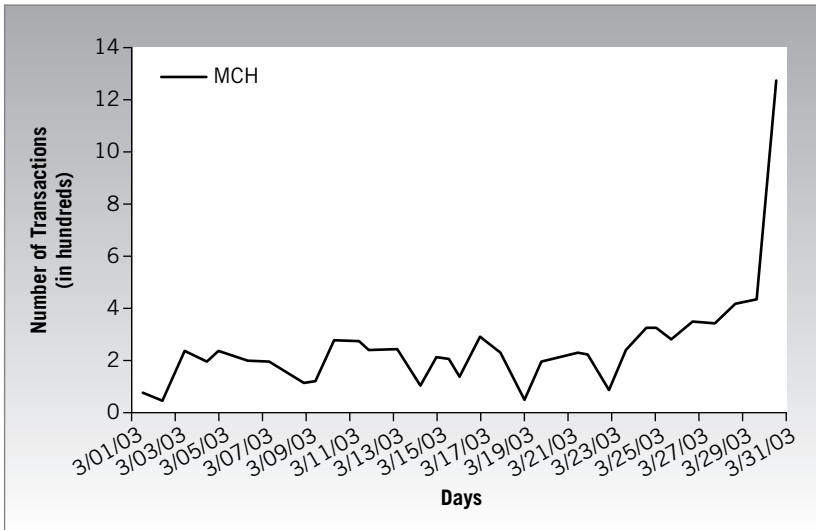


Figure 10 Number of MCH transactions per day.

distributed through the month. The departments manage the load on the individual systems by spreading the payment dates across the month.

Operational Hiccups

In its study of eSeva, the ASCI highlighted the following issue: The “normal” eSeva Center is designed to serve about 2,000 citizens per day. Assuming a normal eSeva Center has 10 counters, the number of citizens handled by each counter per day is 200. Given 12-hour operations, this translates to 16.6 customers handled per hour or one customer every 3.6 minutes. The ASCI found an average of 80 transactions took place per counter per day versus the planned 200 (assuming that 20,000 transactions occur per day in a sample of 25 eSeva Centers).²⁸

We observed that citizens living in housing complexes employed a single person to pay all their utility bills together. Citizens paying a large number of bills together created an unexpected bottleneck, especially for customers who came to conduct a single transaction. When customers paid their electricity bills after the due dates, the arrears still appeared on the next month’s statement, creating confusion among users and eSeva operators. Ravi Kumar, an eSeva operator, said, “The customer thinks we are not working properly. We’ve complained to the management about this issue.”²⁹ With respect to telephone bills, citizens who paid late had to return to the telephone company to clear their accounts.³⁰

eSeva Rollout

We asked Phani Kumar, the Director of eSeva, how they measure success. “Number of services offered” was the reply.³¹ Kumar recently received an award from the Computer World Honors Committee for the best e-Governance initiative [eSeva]. He envisions eSeva to be the only face of the government for most citizen interactions. He said, “There is a possibility to offer as many as 7,000 transactions over eSeva in the not-so-distant future.”³² Having achieved much success in the capital city of Hyderabad, eSeva was to be rolled out in 2003 to 117 municipalities through 229 centers. The rural eSeva Centers, described in the next section, go further to the submunicipality level. It is important to keep in perspective that eSeva never had a model; it is the first time in the world that a government has attempted to create such a system. The approach, therefore, is to build, test, and innovate continuously. Table 1 illustrates the current range of services offered at eSeva Centers.

The following list highlights the range of services that are soon to be offered:

- Railway reservations
- Sale of movie tickets
- Payment of traffic-related offenses
- Payment of degree examination fees of Osmania University
- Sale of Integrated Common Entrance Test applications
- Online reservation of Tirupati Temple tickets
- Collection of bill payments of Idea Cellular
- Collection of bill payments of HUTCH (cell phone service provider)
- Issue of land encumbrance certificate
- Market value assistance
- General insurance
- Reservation of tourism tickets for accommodation
- Reservation of tourism bus tickets
- Call center
- Indian Airlines ticket reservation
- Life insurance premium payment
- Issue of caste certificates
- Sale of Indira Vikas Patra savings scheme
- ATM services
- Collection of bill payments of Air Tel

- Renewal of drug licenses
- Issue of bus passes
- Collection of trade licenses of Labor Department

Rural eSeva

We traveled to Naagampally village (one hour from Hyderabad) in Shadnagar Mandal, one of the 64 mandals in the district of Mahaboobnagar. There are

Table 1 Services Offered at eSeva Centers

Payment of Utility Bills	Permits and Licenses
Electricity	Renewal of trade licenses
Water and sewerage	Change of address of a vehicle owner
Telephone	Transfer of vehicle ownership
Property tax	Issue of driving licenses
Filing of Commercial Tax returns	Renewal of driving licenses (nontransport vehicles)
Filing of A2 returns of State Tax	Registration of new vehicles
Filing of AA9 returns of State Tax	Quarterly tax payments of autos
Collection of examination fee	Quarterly tax payments of goods vehicles
Filing of IT returns of salaried class	Lifetime tax payments of new vehicles
Sale of prepaid parking tickets	
Certificates	Reservation and Other Services
Registration of birth	Reservation of APSRTC bus tickets
Registration of death	Reservation of water tanker
Issue of birth certificates	Filing of passport applications
Issue of death certificates	Sale of nonjudicial stamps
Internet Services	Sale of trade license applications
Internet-enabled electronic payments	Sale of National Games tickets
Internet-enabled electronic payments	Sale of entry tickets for Women's Tennis Association
	Sale of engineering entrance exam applications
Business-to-Consumer (B2C) Services	
Collection of telephone bill payments	
Sale of new AirTel (cell phone service provider) prepaid phone cards	
Top up/recharge of AirTel Magic cards	
Sale of entry tickets for Tollywood star cricket	
Sale of entry tickets for cricket match (RWSO)	
Filing of Reliance CDMA Mobile Phone connections	

Source: B. Das, eSeva HQ, Hyderabad India, email of April 14, 2003.

1,550 villages in Shadnagar. Andhra Pradesh conducted two pilot projects, one of which was in Shadnagar. Each pilot meant back-end networking of departments and setting up Internet kiosks in 10 villages. Naagampally, with a population of more than 2,200, was one such village. The Gram Panchayat or the main government building in the village, was converted to an eSeva Center. The operator, Ms. Indira, was recruited from a women's self-help group called Mahalakshmi and is from the same village. Indira was selected because she studied until 12th grade and was eager to use a computer. The center offered three types of services: agricultural and veterinary services, rural development and welfare services, and general services:³³

- *Agricultural and veterinary services.* Services for selection of crops, advice on farm practices, support for tackling pests and diseases, and televeterinary services. Availability of agricultural market prices and employment information.
- *Rural development and welfare services.* Self-employment, pension, and welfare schemes; transparency in government programs, engineering works, development schemes, and selection processes.
- *General services.* Registration of births and deaths; issuance of caste, income, residence, and nativity certificates; land record extracts; filing of grievances; payment of electricity bills; access to the Internet, e-mail, and messaging services.

The pilot, which was three months old at the time of our visit, generated a lot of curiosity among the villagers. Citizens came to the center to see their names and what a computer is. They are free to operate the system if they are comfortable doing so. An Internet interface in the vernacular, Telugu, makes it easy to use for everyone. Citizens typically apply for a caste certificate (required for subsidized admission into schools) by providing personal information at the kiosk. Data collected is transferred to the mandal office at various times of the day. The mandal office prints the certificate, signs it, and sends it back the next day via a messenger. With the advent of digital watermarking, the certificates can be printed and given directly to the citizens without the need for a functionary's signature. The government of Andhra Pradesh's IT Act 2000 accommodates electronic signatures.³⁴ Shared databases running on an Oracle 9i database enable departments to provide complex and integrated services. The horizontal and vertical integration of departments bridges the distance from the villages to the state headquarters. The villages are also provided with handheld devices to make transactions easy. The scope of the pilot was limited to integrating 16 departments and 10 villages in each mandal. The pilot project was implemented at a cost of \$200,000 per mandal through the PPP³⁵ model.

The future plan includes replication of the rural eSeva project in 1,125 mandals of the state in a phased manner.³⁶

eSeva is not a standalone success; various eSeva-like experiments are underway in different parts of the state, such as Saukaryam and the Vijayawada Municipal Corporation.

Alternate eSeva Models

The government allowed experiments to evaluate the benefits of alternate models of providing e-Governance services in the state. A project called Saukaryam (which means “facility”) was started in January 2001 in the seaside city of Vishakhapatnam. The online services include payment of municipal taxes, submission of water and property applications, issuance of birth and death certificates, updates on infrastructure development, and management of citizen grievances. Driving 382 kilometers farther from Vishakhapatnam to Vijayawada reveals the spread and diversity of the e-Governance drive in the state. Since the beginning of 2001, Vijayawada digitized its departments, but the challenge of transferring the benefits effectively to a population of 800,000 lay ahead. Vijayawada partnered with the local cable television corporation, Siti-Cable. Eighty percent of the citizens have access to TV in the city. Today, any citizen with access to a phone and TV can dial a number to get connected to the servers of the Vijayawada Municipal Corporation (VMC). Once the caller is connected, the phone instrument serves as a keyboard and the TV works as the monitor of a computer.

E-Governance Cannot Replace Inefficiencies in Law

The Computer-Aided Administration of Registration Department (CARD) was one of the first e-Governance initiatives implemented in Andhra Pradesh. The project, designed to eliminate the problems affecting the conventional land registration system, was the brainchild of J. Satyanarayana, now Principal Secretary for IT. The project was started with the objectives of demystifying the registration process and bringing speed, efficiency, consistency, and reliability to substantially improve the citizen interface.

The first phase of the project was successfully implemented and improved transparency and speediness of transactions. Using a sophisticated document management system with imaging technology, the department digitized 2.8 million land records dating from 1983 and implemented the project in 387 offices around the state.³⁷ A pilot was conducted in 1996 at a cost of \$55,000; the project, which was launched in 1998, cost \$6 million to implement.³⁸ Employees embraced the project wholeheartedly because eliminating drudgery was emphasized as a major priority. The pace of implementation quickened when employees realized that computerization did not threaten their jobs. In

the words of M. Veerabhadraiah, the Inspector General for the Registration and Stamps Department, his department “has now imbibed the technology.”³⁹ Six months following the launch of the CARD project, about 80 percent of all land registration transactions were carried out electronically.⁴⁰ Land registration now can be completed in one hour instead of 7 to 15 days as in the earlier system. Title searches over the past 20 years can be done in 15 minutes versus three days as before. Certified copies of documents can be obtained in 30 minutes versus three days in the conventional system.⁴¹

Unlike with other departments, most citizens use this department two or three times in their life. For such limited usage, they do not have the patience to understand the legal aspects of land registration, title transfers, or encumbrance certificates (ECs). ECs are mortgages, trusts, or deeds. Therefore, citizens rely on brokers or middlemen who have experienced the process many times over. According to Veerabhadraiah, “The department has a near-steady one million transactions every year.”⁴² He also feels the challenge now is to communicate to these fleeting one-time customers the benefits of the new system and to prevent them from using the middleman.⁴³ Further, the first phase of the project did not reduce corruption to a large extent. Employees embraced it because they did not see a large reduction in their “unofficial” income. The day we visited the Stamps and Registration Department, we were met by brokers outside the office. They wanted to help us register our “fictitious” land plot for Rs. 800. When we shared our experience with Veerabhadraiah, he told us about the next phase of the CARD project and its benefits.

The department is well on its way to integrating 148 offices in the state, which would empower citizens to choose any office for registering their land.⁴⁴ If one office demanded a bribe, the citizen can choose another. Further, time and money can be saved in traveling to a particular location to register land. For example, land in Vishakhapatnam can be registered in Hyderabad, which is 650 kilometers away. The integrated offices also will be monitored on the intranet, and it will be easy to identify the changes in numbers of registrations from office to office. A successful office will indicate it is either highly corrupt or very “clean.” Concerning employee resistance to the next phase (it will mean a definite reduction in their unofficial incomes), Veerabhadraiah said, “They are stuck in a loop. With the next version, they know they will not be able to take bribes. They can’t stop it because the government will encourage more private partnerships, compromising their own positions within their departments. The employees will lose the power of harassment.”⁴⁵

In spite of the clever ways the government is implementing e-Governance in land registration, basic reform is needed for societal change to result. A recent survey conducted by the Center for Good Governance (CGG), the think tank instituted by the government of Andhra Pradesh and the Department of

International Development, uncovered disappointing insights into the current registration process. Eighty-seven percent (90 percent rural and 80 percent urban) of all those registering land went to the CARD office with the help of a document writer or a middleman.⁴⁶ The average bribe paid was an additional 7.95 percent (2.85 percent urban and 25.81 percent rural) of the actual fees due.⁴⁷ Eighty-three percent (60 percent urban and 94 percent rural) of citizens share the view that the registration officer is corrupt, and 85 percent (64 percent urban and 96 percent rural) feel the land department is corrupt.⁴⁸ One hundred percent do not feel the government of Andhra Pradesh has done anything to tackle corruption in the registration department.⁴⁹ The study also observed that citizens and document writers consistently underdeclare the actual transaction price, and real market values are far higher than those kept on the CARD systems.⁵⁰ Rural transaction prices (Rs. 550,000 per year) are underdeclared on average by Rs. 48,000 each,⁵¹ and urban transaction prices (Rs. 450,000 per year) by Rs. 36,000 each.⁵² This adds up to potential revenue loss to the government of Andhra Pradesh of Rs. 4.5 billion per annum.⁵³ The think tank recommended privatization of the front office as one of the ways to reduce corruption; this would mean providing land registration services through the zero-corrupt eSeva environment.⁵⁴

Land registration traces its roots to India's colonial history; land records were prepared and maintained by the state governments primarily for revenue collection.⁵⁵ As per the Indian Registration Act of 1908, a land title does not ensure certainty of land ownership. The title, issued by the government, is only a public document recognizing a private transaction. It has been estimated that India loses 1.3 percent of its economic growth annually as a result of disputed land titles, which inhibits the supply of capital and credit for agriculture.⁵⁶ The millions of small, illiterate, backward, poor farmers in India, whose only evidence of title to their holdings is the entry in the record-of-rights in land maintained by the state governments, exacerbate the problem.

However, the entire exercise is drained of all significance if this entry in the record-of-rights in land has only superficial value. To clarify the presumptive nature of land registration, Veerabhadraiah said, "The government cannot stop a citizen from registering the Legislative Assembly in his name if he so wished. It is up to the civil court to handle disputes of such nature after the title registration is done."⁵⁷ A CARD project, or any other e-Governance project, will not help with resolving such a problem; however, it can drive reform change. With due credit to the benefits of making the registration process easy, computerization is only a means to an end and will not help in freeing up the dead assets in Andhra Pradesh. According to D. C. Wadhwa, who has been proposing his ideas to the Indian government for 13 years, the conversion of the present system of presumptive titles to land into conclusive titles to land is the only sensible solution for this problem.⁵⁸ If Andhra Pradesh were to truly

enhance the marketability of land and advance its agricultural and industrial development, bold reform must go hand-in-hand with CARD.

Varying E-Governance Initiatives

After the government developed its vision for e-Governance, department after department envisioned their own e-Governance plans. The Transport Department conceived the Fully Automated Services of Transport Department (FAST) project and actively supplements services offered through eSeva. The FAST project, partnering with private companies, was launched in 1998. Since then, more than 663,000 licenses have been issued, and 416,000 vehicles have been registered electronically.⁵⁹ According to A. Giridhar, the Transport Commissioner, “The computerization project was started with least procedural change so it will have the least employee resistance.”⁶⁰ The main objectives were to provide a safe and secure database that is accessible from anywhere and to facilitate interdepartmental transfer of data. The department was careful not to cite curbing corruption as a goal. Giridhar believed if curbing corruption were attempted at the outset, the employees would plan a “rearrangement of corruption sources,” which might be a bigger danger.⁶¹ Discretionary procedures have slowly been converted to a software-based model. The department is also trying to remove its monopolistic authority by offering its services through multiple channels, so a customer can pay his or her vehicle tax through FAST as well as eSeva.

Through a project called Multi-Purpose Household Survey, the Revenue Department created a socioeconomic database of all 76 million citizens in the state using citizen IDs.⁶² The database, which cost \$10 million, forms an integral back end for projects such as the rural eSeva.⁶³ We met with consultants from Tata Consulting Services (TCS), a major e-Governance partner for Andhra Pradesh. The company invested \$4.25 million in building a SMARTGOV framework to automate workflow within the Secretariat of the government of Andhra Pradesh.⁶⁴ The primary responsibility of the Secretariat is to formulate policies, procedures, rules, and guidelines that govern the implementation of various schemes and projects. TCS sells the framework to governments of other states and countries. At the time of our discussion, the project was implemented in Sri Lanka, Jammu, and Kashmir.⁶⁵ Because the government of Andhra Pradesh cocreated the original model, it receives a 20-percent royalty from TCS every time the project is implemented in another location.⁶⁶ The consultants were confident that TCS will recover its investment in the framework soon enough.

Another example of the government’s radical use of ICT is the Ku-Band Satcom Project, which uses satellites from the Indian Space Research Organization (ISRO) for distance education, telemedicine, and agricultural services.⁶⁷ The Chief Minister mentioned that he wanted to use the satellites to

monitor specific e-Governance initiatives in the state at a macro-level.⁶⁸ Other projects include Integrated Financial Information System for the Finance Department, eCOPS (Computerized Operations for Police Services), eProcurement to automate procurement procedures of the government, Human Resources Management System for use of all departments to automate administrative and human resources procedures, and the Social Benefits Management System for use of all welfare departments.⁶⁹

Back-End Implementation of E-Governance

A critical aspect of e-Governance involves understanding the back-end digitization required to make the front end of e-Governance possible. Randeep Sudan, Special Secretary for IT said, "The front end is just 2 to 5 percent. But the back end contributes 90 to 98 percent of the e-Governance drive in the state. Years of work were done in the back end to offer as simple a service as utility payment through eSeva."⁷⁰ For Andhra Pradesh governmental departments to offer bill payment through eSeva, digitization of customer databases had to be accomplished first. Connection to eSeva Centers via secure networks completed the conversion process. It is important to understand both the distinction between the citizen-facing e-Governance initiatives and the e-Governance initiatives taking place in these back-end departments and realize the crucial link between the two: Poorly constructed back-end schemes and institutions facilitate and encourage front-end, or citizen-facing, corruption.

Hyderabad Metropolitan Water Supply & Sewage Board

Since its inception in 1998, the Hyderabad Metropolitan Water Supply & Sewage Board (hereafter referred to as Water Board) has been the model of back-end "e-readiness" in the government of Andhra Pradesh. As early as the mid-1990s, the water board realized that efficiencies could be gained both in customer service and employee productivity by utilizing ITC. According to the Managing Director, M. G. Gopal, "The Water and Sewage Board is consistently two to three years ahead of every other government office in terms of our exploitation of IT."⁷¹ With this in mind, it is necessary to determine the impact of its IT leadership.

The Water Board is chartered to provide two basic services essential to life: an appropriate supply of potable drinking water and sewage collection and disposal. The water board has 406,659 customers, of whom 87.4 percent are residential customers. Leaky mains, broken connections, and disrepair describe the state of many of the water connections and the city's often overflowing sewage lines. Coupled with an exploding population that is demanding more water and recent severe shortages of water, it is plain to see that these exceedingly simple goals for a country in the Western world have become difficult, if not impossible, for the state of Andhra Pradesh to achieve.

Effect of eSeva

Three districts were chosen for analysis: one that houses predominantly elite citizens (Division 6), one with predominantly middle-class citizens (Division 5), and one where the majority of citizens are poor (Division 1). It is important to note these divisions were selected based on broad assumptions related to geographical locations of Hyderabad.

The eSeva Centers around Hyderabad have had a dramatic increase in the number of paying customers. Figure 11 displays the number of paying water board customers from August 1999 to February 2003.⁷² Prior to April 2002, the average number of customers who paid was roughly 60,000 across all districts. The spike in April 2002 can be attributed to a “critical massing” of eSeva Centers in Hyderabad. Starting in August 2001, the government was using TV, print media, computer advertising, and word-of-mouth advertising to spread the word of the new services. Since then, the number of paying customers has leveled off at around 100,000, a staggering increase of 66 percent.

Figure 12 provides data similar to Figure 11, except that it represents the three districts chosen.⁷³ The aforementioned spike in April 2002 is clearly seen for the rich and the middle class. A spike for the poor never really materializes, although there is a slight increase in October 2002. One possible reason, which often defies logic, is that the poor always pay a greater percentage of their bills when due than the other two economic groups. If this is true, we can assume the number of paying customers who are poor will not dramatically increase over time when additional eSeva Centers are rolled out.

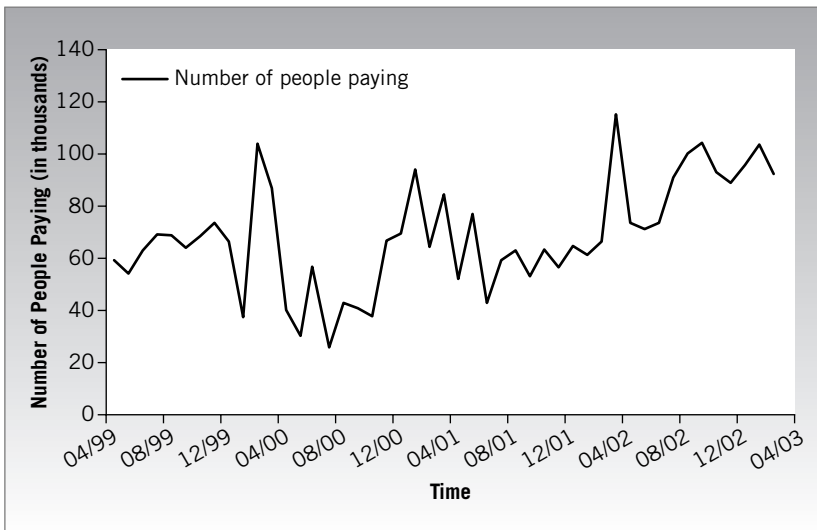


Figure 11 Number of paying Water Board customers.

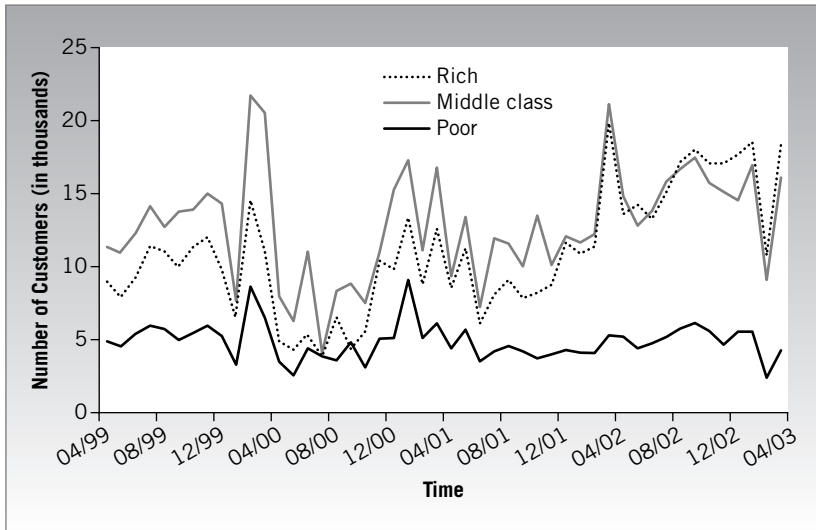


Figure 12 Number of paying Water Board customers in selected districts.

When pressed for an explanation for the increase in paying customers, Water Board Managing Director Gopal said, “Citizens are utilizing eSeva to pay their electricity bills, because an overdue bill in that department guarantees immediate cancellation of service. Because it was so easy and fast, while they were there, they decided to pay their water bills too.”⁷⁴

Figure 13 is a visual description of the amount of collections, in rupees, from August 1999 to February 2003.⁷⁵ The spike in the amount received matches the spike observed in the number of paying customers. As with the previous graphs, the increase in the amount received is beginning to level off 66 percent higher than before. Figure 14 details the rupees collected from the selected divisions in Hyderabad.⁷⁶ The trends in Divisions 1, 5, and 6 echo what is occurring throughout the city as a whole. Important to note again is the increased level of rupees that are being collected after the April 2002 jump.

The Water Board used Oracle technology for all its applications. Most of the software packages were developed internally with minimal costs.

Operational Improvement: Tracking Defaulters

Prior to the introduction of eSeva, the total amount owed by citizens in these three districts was Rs. 123,026,281 (see Table 2).⁷⁷ A total of 14,529 citizens was deemed never-paid customers (NPC) or defaulters. Total rupees owed in the 10 districts were 349,031,595 and total rupees collected were 60,486,858. Through the use of database-Governance, it is now possible for the Water Board to track the more than 400,000 customer accounts.

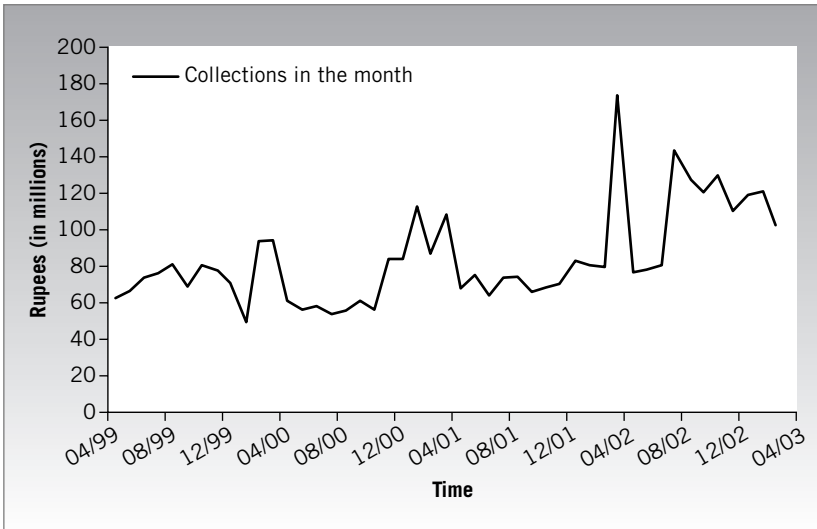


Figure 13 Amount of Water Board collections.

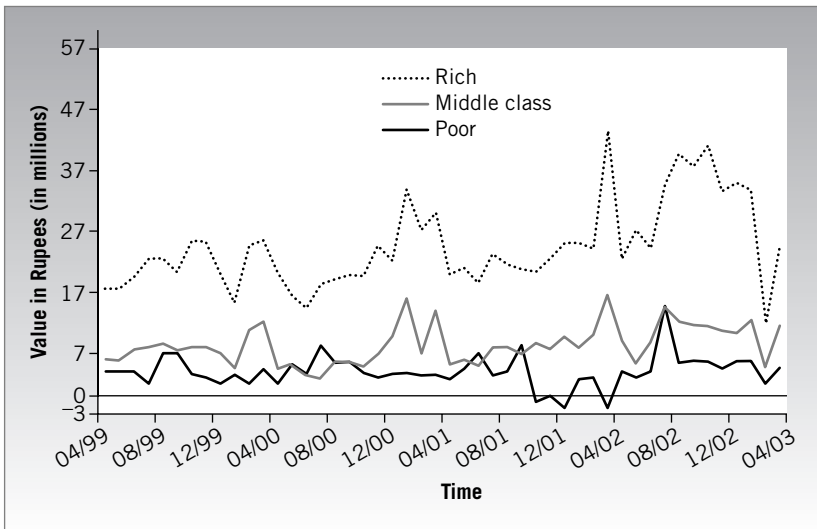


Figure 14 Amount of Water Board collections in selected districts.

Table 2 Total Amount Owed to the Water Board

	Prior to eSeva	Prior to eSeva	Post-eSeva	Post-eSeva		
	Rs. Owed	NPC '00-'03	Rs. Recovered	Paying Customers	% Rs. Recovered	% Gain Customers
Poor	66,021,275	8,134	7,160,910	2,239	10.85%	27.53%
Middle class	34,624,548	4,236	8,646,933	2,160	24.97%	50.99%
Rich	22,380,458	2,159	6,080,865	1,265	27.17%	58.59%
Total	123,026,281	14,529	21,888,708	5,664		

Greater access to account information allows the Water Board to track defaulters better and leads to increased revenue. For the three districts chosen, Rs. 21,888,708 have been “recovered” since eSeva’s inception, compared to Rs. 60,486,858 for the rest of Hyderabad.⁷⁸ Interestingly, the greatest percentage gains have come from middle-class and rich citizens. The most obvious conclusion is that these two segments have, on average, higher water bills, and any increase in the amount of rupees collected will have a greater impact on the total. If the Water Board can get one rich or middle-class citizen on the margin to pay, it is a much larger gain, both nominally and on a percentage basis, than having one additional poor citizen pay.

Gopal has been able to bring current commercial business practices to the Water Board to combat defaulters during his tenure. For instance, he offers his employees a 5-percent bonus of the rupee value received for getting past NPCs to finally pay. Plans such as this provide the needed incentive for employees to enforce Water Board policies and also lessen the need for employees to demand bribes.⁷⁹

When the number of defaulters is substantially reduced, the overdue or outstanding money will decrease and this is exactly what we observed. Figure 15 illustrates just how effective eSeva and Gopal’s practices have been.

Redressing Grievances

A key aspect of e-Governance initiatives in general is the increased transparency afforded to citizens. For the Water Board’s customers, one benefit has been in the area of resolving grievances. Historically, customers had to file a complaint at one of the Water Board offices in the city.⁸⁰ The only guarantee the citizen had was that someone would write the complaint down since management had no incentive or motivation to follow up. If, however, management did want to systematically track a specific individual’s complaint, it was nearly impossible. These two critical aspects of grievance solution were dependent on the interest of the government official (whose interest level often increased with the level of bribe paid).

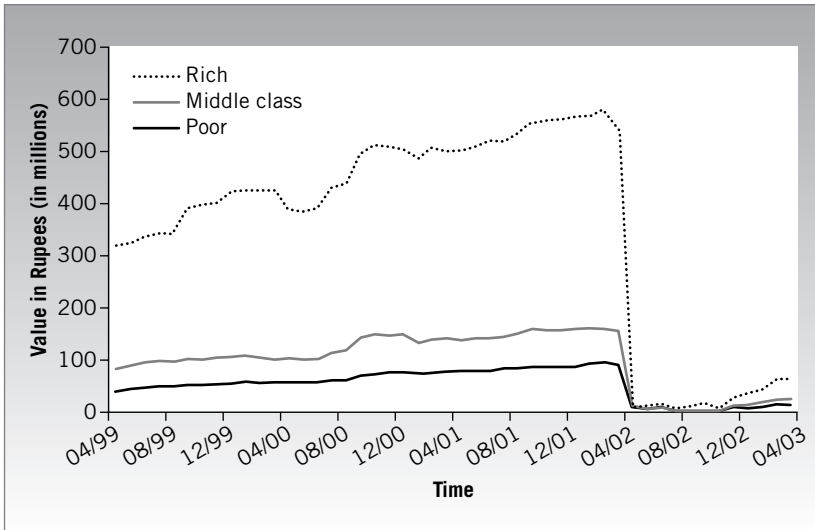


Figure 15 Decrease in outstanding balances owed to the Water Board.

In 1999 the Water Board launched the Metro Customer Care (MCC) program, hoping to increase customer service. Customers can call a toll-free telephone number and file water and sanitation complaints 24 hours a day, 365 days a year.⁸¹ Professor Jennifer Davis of Massachusetts Institute of Technology coauthored a paper dealing with water and sanitation in South India that outlines the MCC process: “The hotline is staffed at Water Board headquarters by 13 trained operators, who log each complaint in detail into a computer database and relay it directly to the section manager in whose jurisdiction the customer lives. Once the section manager resolves the complaint, s/he completes a compliance report, asks the customer to sign it and submits it to the MCC system.”⁸² A trend analysis also is being completed on which geographical zones receive the most complaints. Medium- and long-term funding decisions can be made in areas that need upgrading the most. Additionally, this performance information is available for everyone to see, so there is peer pressure for managers to perform. It is also possible for customers to lodge complaints via the Board’s Web site.

The Water Board Managing Director and other superior officers have immediate access to complaints and routinely monitor complaint status. If action is warranted on their part, often because of the inaction of a low-level manager, it is swiftly taken. In fact, customers themselves might receive phone calls from the Managing Director or other officers and be queried about the level of support they received and their satisfaction.⁸³

In the future, there is a plan to provide handheld devices to mobile unit managers. New applicants could be processed quicker and grievances solved faster. Plotting complaints on a digitized map, when coupled with the previously mentioned trend analysis, will enable system design improvements.⁸⁴ The initial success of the program is hard to argue with. According to the MIT paper, “40% more complaints are handled per month than before.” Also, the number of phone-in complaints is increasing at a rate of 10% per month.

Monitoring

Per its Citizen Charter, the Water Board has a list of categories and subitems it deems most essential to providing quick grievance solution. Because of the lack of a dedicated monitoring system, historical data is not available on complaints prior to the MCC's inception. Table 3 outlines the top eight complaints from February 1999 to November 2002 and the redressal efficiency. During this time, 246,080 complaints were lodged.⁸⁵

The Water Board also tracks the redressal efficiency of its nine divisions. The efficiencies of the three chosen divisions are shown in Table 4.⁸⁶

Prior to eSeva: Single Window Cell

In the late 1990s the Water Board was searching for a way to improve the performance of managers and employees while reducing the hassles customers had to deal with. Their creation was the Single Window Cell (SWC), a

Table 3 Eight Most Common Complaints to the Water Board, February 1999 to November 2002

Complaint	% of Total Complaints	Redressal Efficiency
Sewerage overflows	35.34%	64.0%
Chokage customer premises	30.27%	78.2%
No water for x days	17.53%	58.9%
Water leakage	5.23%	54.3%
Low water pressure	4.84%	58.8%
Replacement of manhole	1.04%	65.2%
Nonreceipt of water bill	.33%	55.4%

Table 4 Redressal Efficiency of Three Selected Divisions

Majority of Citizens	Division	Redressal Efficiency
Poor	1	38.6%
Middle-class	5	41.8%
Rich	6	59.3%

centralized process for customers to apply for water and sewage services. The SWC is similar to eSeva in that citizens interact with a Water Board employee in a nonthreatening environment.

In the past, a customer had to visit multiple offices to obtain the necessary documentation to receive a connection.⁸⁷ Anecdotal evidence suggests that customers were paying government officials bribes to facilitate this process. Now, information about new connections is computerized, allowing for greater access by management to information on the quality of employee service. For instance, if the water sanction is not completed within 30 working days, the Water Board is liable to pay Rs. 20 to the customer.⁸⁸ Additionally, time demands on the customer have been substantially reduced because everything is taken care of in one office. According to the MIT paper, virtually all new applications are completed within the requisite 30 days.⁸⁹

Linked to the SWC is the Green Brigade, a select group of Water Board workers who establish water and sewer connections for customers.⁹⁰ In the past, citizens were responsible for finding their own plumbers; quite often, a government official would have an “acquaintance” who was a plumber. If the citizen wanted his or her application processed quickly, he or she had to agree to use the “suggested” plumber.⁹¹

The benefits of SWC and the Green Brigade are numerous for customers: There is no need to obtain counseling and guidance from middlemen, no need for interaction with division or section offices, no need to engage multiple plumbers and labor for establishing a connection, and the Green Brigade lays the necessary lines and installs the meter.

Andhra Pradesh Central Power Distribution Company

Owing to new power sector reforms, the original Andhra Pradesh State Electricity Board was unbundled into Generation and Transmission Corporations APGENCO and APTRANSCO. APTRANSCO was further unbundled into four distribution companies (DISCOMS).⁹² We chose the Andhra Pradesh Central Power Distribution Company (APCPDCL) that distributes power in seven districts, including the capital city of Hyderabad, as a representative sample to understand the e-Governance initiatives implemented under the electricity umbrella.

We visited the main datacenter that resides in the busy APCPDCL office. The servers and networks effectively handled the ever-increasing load of online bill payers through eSeva and have had minimal problems to date. Given the success through eSeva (see Figure 16), the company is systematically shutting down its own Electricity Revenue Offices (EROs).

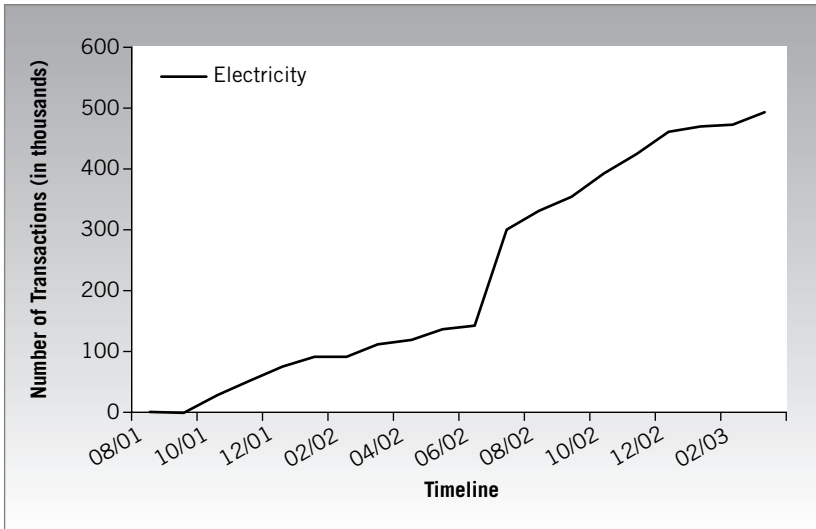


Figure 16 Electricity bill payments through eSeva.

E-Governance Initiatives

The various e-Governance initiatives underway are described here.

1. The company uses a Customer Analysis Tool (CAT), a data-mining tool, to grade defaulting customers. Inspections carried out by four dedicated personnel across 10 sections based on targeted reports over two months resulted in recurring revenue impact of approximately Rs. 10 million by focusing on consumption, billing, and metering irregularities. Further, additional collections of Rs. 3.6 million were made using the focused reports generated by CAT.⁹³
2. Another ITC tool used to identify loss and theft of electricity is the Monitoring and Tracking System (MAT). CAT and MAT generate various reports used by vigilance staff to track defaulting customers and by executives to measure internal efficiencies.
3. The company built a software tool that reduces the failure of distributed transformers, saving on distribution losses and maintenance costs.⁹⁴ The package, called Transformer Information Management Systems (TIMS), was deployed in all DISCOMS. TIMS helps in inventory management by increasing visibility of assets.⁹⁵ The system has a built-in database that captures every transformer erection, failure, repair, and replacement.⁹⁶ The company is also making use of microcontrollers to trip transformers from power overloads and to log activity at every installed transformer.⁹⁷

4. A similar tool which the company uses to monitor electricity-measuring meters is called Meter Information Management System (MIMS). Yet another tool, called Performance Review and Monitoring (PRMS), monitors financial performance indicators, operational statistics, and customer complaints. The tool provides a single view of both financial and operational information and allows drilling down to the lowest level.⁹⁸
5. The Supervisory Control and Data Acquisition System (SCADA), the microwave communication-based network, provided us a glimpse into the future. With the help of four engineers working at any given point in time, SCADA automatically controls power transmission through unmanned transformers. The facility that covers an area of 1,550 square kilometers, ensuring power supply to 1 million customers, was established at a cost of Rs. 320 million.⁹⁹ We witnessed the engineer-in-charge receive a phone call concerning a power outage and saw him resolve the issue in four minutes by opening an alternate neighboring power tap, allowing electricity to flow into the area with the outage. The facility, which covers 24 unmanned substations, will soon ramp up to 300 substations.¹⁰⁰
6. Any consumer in the city of Hyderabad can dial 1912 and be connected to the Trouble Call Management System installed in the SCADA office. The system, which was developed in UNIX/Sybase, will soon be using Geographic Information Systems (GIS) technology to provide mapped directions to a customer location when calls arrive. The system also was being migrated from manned to unmanned control. The call center serves 1.35 million consumers.¹⁰¹
7. Finally, electronic spot billing through handheld computers using GSM cellular technology was introduced in Hyderabad and Secunderabad.¹⁰² Although no data was available, S. S. Rambabu, the Assistant General Manager for IT, ascertained that considerable improvements in cash flows occurred through the new system.¹⁰³ Bills now are issued on the spot. Apart from bringing transparency into bill generation, this system also helps in generating staggered due dates for bills, thus avoiding crowds at the eSeva Centers.¹⁰⁴

Andhra Pradesh's e-Governance initiatives seem to move together, one influencing the other all the time. Just as the Water Board saw spikes in its collections because of electricity bill payments through eSeva, the electricity companies are catching up with the Water Board in automating their back-end processes. We further observed that the e-Governance mantra was consistent in every department. We observed varying versions of cutting-edge technology being applied cleverly and effectively to catapult the departments into the future.

Performance Monitoring

In large organizations it is often possible for mid- and low-level managers and employees to not comply with the large, sweeping changes enacted by their superiors. The CGG is a quasi-governmental office of approximately 50 employees whose main role is to act as a government think tank. According to P. K. Mohanty, Principal Secretary and Executive Director of CGG, “Government employees are too busy handling their day-to-day responsibilities to think strategically and creatively about the future.”¹⁰⁵ As such, government executives lean on the organization to provide such a service. The following are the objectives of CGG:¹⁰⁶

- To translate government goals, objectives, and priorities into tangible reform actions.
- To identify core issues and areas for change that will have the most impact in improving performance and enable it better to respond to needs of citizens.
- To work with functionaries to analyze key issues in governance, identify solutions to plan actions, and support implementation of administrative reform.
- To identify and codify best practices in administrative reform for wider implementation.

To develop an integrated performance tracking system, CGG leaned on the expertise of Subbarao Ghanta, State CIO and Officer on Special Duty to the Chief Minister. Ghanta had a team of bright employees exhaustively study the aspects of successful performance-monitoring systems. Their vision is based on a simple idea: “To each unit of power given by the People to Government, there must be a commensurate accountability of Government to the People.”¹⁰⁷ This is illustrated in Figure 17.¹⁰⁸

This vision provides a link among performance measurement, accountability, and results-based management in the government of Andhra Pradesh.¹⁰⁹ A traditional government, through public audit, adheres to an idea of

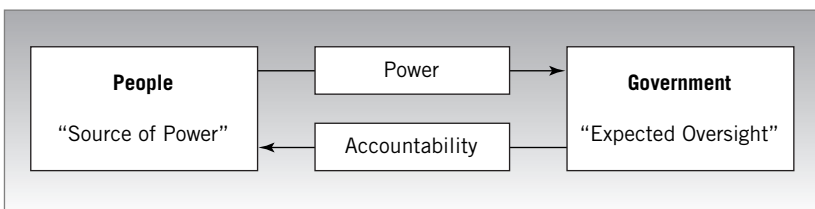


Figure 17 Power and accountability flows.

Table 5 Guiding Principles of CGG's OLPTS

Guiding Principles	Explanation
Consultation	Public consulted regarding service level and quality.
Service standards	Educate public on level of service entitled.
Access	Equal access regardless of societal position.
Courtesy	Treat people with courtesy and consideration.
Information	Give public full and accurate information about service.
Openness and transparency	Inform public about government operations and budget.
Redress	Apologize and redress if promised service is not given.
Value for money	Public services are provided economically and efficiently.

“accountability for compliance”; that is, the government ensures the public that money is being spent in ways that comply with both laws and regulations.¹¹⁰ The Andhra Pradesh government, however, wants to move beyond this mode of thinking and achieve an idea of “accountability for results”; outcomes are now monitored, as is the impact of particular policies and actions, which still includes, as a subset, the idea of accountability for compliance.¹¹¹ The Online Performance Monitoring System (OLPTS) created by Ghanta and his team focuses on the outcomes and impacts of specific actions, leading to a results-based management approach to governance.¹¹² In addition to this simple, yet powerful, vision, CGG's OLPTS is centered on eight guiding principles, illustrated in Table 5.¹¹³

These principles give rise to the performance monitoring system's strategic objectives:¹¹⁴

1. Create a performance culture with shared values, outcome orientation, and best practices.
2. Empower citizens to generate pressure for change and transformation at various levels.
3. Promote accountability of employees and organizations.
4. Guide capacity building development.
5. Contribute to overall development agenda.

Monitoring Performance of the Andhra Pradesh Government

The OLPTS is a relatively new phenomenon. A beta version was rolled out in April 2002 with the initial results made available to the Chief Minister in July 2002.¹¹⁵ Currently, CGG is using the third version of the OLPTS, with the fourth in development.¹¹⁶ Continual trial and error and feedback from various functionaries are the main drives in upgrading the system.

According to Mohanty, the OLPTS was developed as a “hexagonal model.” In other words, it can be used to rate a department against six things: relative performance compared to last year, relative performance compared to peers now, relative performance compared to peers last year, relative performance to benchmarks, relative performance to targets, and relative performance compared to government as a whole. This model presents a complete picture of a particular department over time, allowing senior officials to get to the root cause of problems that arise.¹¹⁷

The Andhra Pradesh government comprises more than 200 separate departments. To ease the monitoring burden, CGG grouped these departments into eight synergistic groups, consisting of around 30 departments each:¹¹⁸

- Group 1: Primary Economic Development—Agriculture, Fisheries, Animal Husbandry
- Group 2: Secondary Economic Development—Public Enterprise, IT, Tourism
- Group 3: Human Development—Education, Housing, Family Welfare, Medical
- Group 4: Welfare—Social, Youth, Minority
- Group 5: Local Bodies and Self-Help Groups—Rural, Urban
- Group 6: Infrastructure—Roads, Transport
- Group 7: Revenue Generation—Taxes, Revenue-Generating Activities
- Group 8: Governance—Regulatory and General Services, Police

The premise of the system is to add accountability from the bottom to the top of an organization. For instance, Figure 18 details the levels of organization in a typical Indian governmental office.

A feedback loop is created throughout the governmental organization, where goals and objectives are determined, progress is monitored, performance evaluation occurs, and actions for improvement are implemented. This level of accountability has never before been attempted in Indian government.

Every functionary in every department is graded on two sets of indicators: performance (weighted 70 percent) and process (weighted 30 percent).¹¹⁹ Performance indicators, generally speaking, are the deliverables and outputs of each department. The Andhra Pradesh government’s fiscal year runs from April 1 to March 31; therefore, annual targets are set and agreed on in the first three months of the new calendar year with discussions between department heads and government executives. Averages from the last three years’ targets plus a certain growth percentage also are used in generating performance indicators.¹²⁰ There is no set number of performance indicators. Process indicators are specific

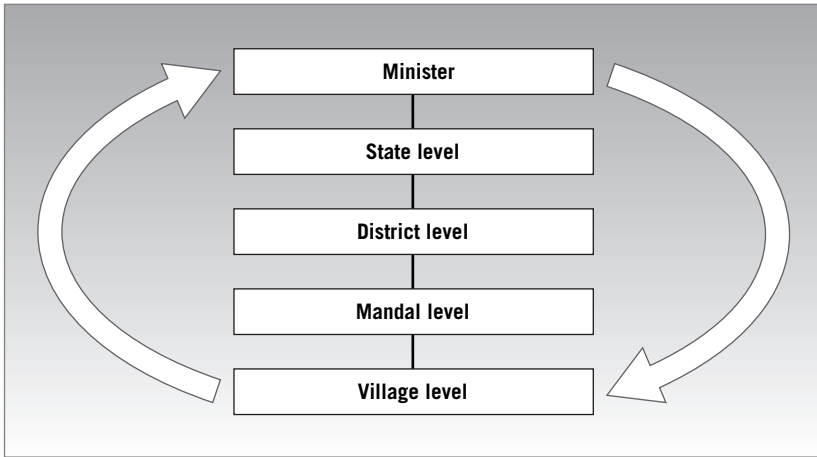


Figure 18 Levels of organization in a typical Indian governmental office.

to each functionary and are based on three items: tours and inspections, file disposal, and action in important matters.¹²¹ File disposal refers to closing out any file that has been generated. Action in important matters is a very nebulous category that can include, but is not limited to, vigilance cases, department inquiries, and audit reports.¹²² Little negotiation, if any, takes place in these determinations. Quarterly and midyear reviews are conducted for both performance and process indicators.¹²³

Implementation

Typically, results are entered once a month, although the Chief Minister might ask for results sooner. Once the numeric results are input and transferred to the CGG office, an algorithm generates appropriate letter grades.¹²⁴ One can imagine how detailed this process can get when the sheer number of processes is considered. A large number of reports are generated from this data.¹²⁵

If one department or functionary consistently receives poor marks, an analysis is undertaken to determine which indicator is causing the problem.¹²⁶ It is possible the indicator needs to be tweaked for that particular area; this is a good barometer for usage by the CGG. If more departments are asking for an analysis, that means more departments are using the system as it is intended.

A management committee has been charged with reviewing the aforementioned performance and process indicators. This group will ensure that every indicator is tied back to *Vision 2020* and will help the state achieve those goals. This committee also will tweak the current grading system. The plan is to introduce stratification within each letter grade (i.e., B+, B, B-). This will provide greater transparency into a department’s actual performance.¹²⁷

Performance Monitoring System in Action

We witnessed firsthand the OLPTS in action. The Chief Minister holds monthly, sometimes weekly, video teleconferences with all 26 district collectors. The Chief Minister is located in the state's capital, Hyderabad, and each district collector is located in his or her respective district headquarters. Each collector had a room with more than 50 support staff personnel with him or her. The press was given full and open access to this meeting; in fact, they recorded the entire five-hour meeting.

Various subjects were covered throughout the meeting, with the Chief Minister driving the discussions. Significant time was spent on the issue of drought remediation actions taken by the mandals, particularly the drilling of additional bore wells. The Chief Minister was using data from the OLPTS and demanding that the district collectors explain any negative trends. It was very evident when a particular district collector was not familiar with the data that had been entered. What the reader must realize is that this was taking place in front of more than 1,000 government employees across the state, plus the press. The pressure to perform in front of peers is a huge motivational factor for the district collectors.

The Chief Minister also used this forum to discuss public opinion numbers. Each district collector was again asked why things were going poorly in his or her mandal and what he or she planned to do about it. It was evident during the meeting that many figures that had been input into the system were not the "actual" numbers, but simply placeholders that were entered by the cut-off time, four hours before the meeting. Staff scrambled to present the Chief Minister with appropriate numbers, especially when the new numbers were better than the fictitious ones. Transparency such as this, in front of the press, is forcing government officials to embrace the OLPTS. Also, they must now pay attention to the citizen and perform only actions that are really important.

During these meetings the Chief Minister chose a random subject to drill down into. At this particular meeting, commodity prices were picked. The officer in charge of this was caught and subsequently embarrassed, because he had simply entered data to enter data. Quite often his commodity prices were off by a factor of 10 or 100. There is no doubt this particular individual will input proper data from now on. No doubt seeing one's peers publicly embarrassed will have district collectors ensuring that their staff input proper data.

Everyone from Mohanty to Chief Minister Naidu believes the OLPTS is having the desired affect. According to the Chief Minister, "The employees know that someone is watching their performance like never before."¹²⁸ One particular department in Group 1 (Primary Economic Development) improved their grade from a C to an A in the span of 10 months.¹²⁹ This is not a small feat, considering the numerous processes and interactions that take place on a day-to-day basis.

Challenges

As with all the e-Governance initiatives the Chief Minister has driven through, employee resistance is still the largest challenge facing the OLPTS. According to Manish Agarwal, a CGG employee who oversees the OLPTS, initially only 50 percent of the departments were inputting data.¹³⁰ This trend quickly reversed itself when the Chief Minister started “cold-calling” various government officials in front of their peers.

Another challenge highlighted earlier is simply entering data for the sake of entering data, or entering better scores than were actually received. Anticipating this, Ghanta’s team incorporated a series of checks and balances in the system. For instance, the Education Minister will enter certain data about elementary schools that should check with information reported at the village, mandal, or district level. If it doesn’t, it is possible to uncover where the discrepancy occurred.¹³¹ Also, the Chief Minister will go on field reviews throughout the month. If he doesn’t see in person what is being presented in a spreadsheet, the problem is quickly uncovered and dealt with.¹³² The last thing being done to curb improper data entry is a relaxation of the cut-off time. Currently, data for a video teleconference must be in by noon, and the meetings start at 4 p.m.; this will be moved to 3:30 p.m. Unfortunately, numbers will still be entered carelessly—it’s a given considering the magnitude of this initiative. However, it will only take getting caught once for a person to never enter false data again.

Dr. Jayaprakash Narayan, the Founder and National Coordinator of Lok Satta (People’s Power) believes it is precisely this kind of monitoring that creates centralization of power within a government. Lok Satta is an organization dedicated to political reform. Narayan said, “We are a power-centered society, and information is power. Monitoring more will not empower district level employees, but will curb innovation.”¹³³

Mindset Management for E-Governance

The success of the e-Governance initiatives outlined earlier, as with all the others, depends on whether mid- and low-level government employees will embrace and accept computer technology. How does a government executive convince one employee, much less 1 million employees, to accept radical new ways of completing his or her everyday, mundane office tasks? This is especially true when these initiatives require them to relearn familiar tasks and take away two of the greatest “perks” of a government job: the power of harassment and additional income that comes from bribes. It is altering this mindset that most senior government executives find to be their biggest challenge. The government also has to deal with the mindset of the very citizens it serves. In people’s minds, the image of government is as a corrupt, bureaucratic, and

humiliating beast. A middle-class citizen we spoke to shook his head in disdain when talking about the government and said, "It will never change. India will never change."¹³⁴ Surprisingly, that very citizen was an avid user of the eSeva system in Hyderabad. Mindset management for e-Governance is about finding innovative ways to change and influence the mindsets of government employees and citizens. We highlight some of the unique ideas that the government of Andhra Pradesh is incorporating to make its e-Governance vision successful.

Employee Resistance

To employees, most e-Governance projects appear quite harmless in the beginning. When starting an initiative, the government stresses how the project will reduce drudgery in work and how the employees will be able to go home early. It constantly emphasizes that employees will not be laid off but will be redeployed. Curbing corruption and removing discretionary power are never communicated as objectives; however, government executives stated that those were in fact the primary objectives. One executive even told us that CARD, a project touted as a highly successful e-Governance initiative in the media, is not yet successful because it did not reduce corruption. Initially, there was resistance in the form of noncompliance and sabotage. However, when the employees did not see the government laying people off, but instead rewarding them for implementing e-Governance projects, they started embracing technology.

It was interesting to note that the Transport Department prepared a minimal amount of documentation and never revealed its complete ideas to employees. The Transport Commissioner, A. Giridhar, said, "We keep everything under wraps. We keep things fuzzy. That's our strategy."¹³⁵ Therefore, every major initiative appears undisruptive in the beginning. After reaching a certain stage in implementation, the department bulldozes its way through to closure, totally removing discretionary powers of the employee. We were able to relate this trend in other projects as well. The PPP model creates an element of caution in employees' minds. Employees know if they don't comply, the government will bring in a private company to share their job. Once a private partnership is set up, the employees lose whatever little positional power they could have had by walking the path alone. Needless to say, the potential to make the "extra" money disappears.

Chief Minister Naidu noted, "The employees have a traditional mindset. They enjoyed the power of position for many years. This older generation has lost the creative track and is not adaptable to technology."¹³⁶ So even if employees were convinced that technology brought no harm to their positional power and livelihood, they feared using computers. Further, what was the incentive to learn the new technology? To motivate its employees, the

government of Andhra Pradesh revamped its training institute, the MCR Human Resources Development Institute, and launched a State Training Initiative.¹³⁷ The Institute partners with one of India's top management schools, the Indian Institute of Management in Ahmedabad, to offer training to 500,000 functionaries in SMART and e-Governance every year.¹³⁸ Management training in leadership skills and motivation, negotiation skills, management of change, communication skills, team building, and even courses on stress management aim to motivate the employees to work with passion.¹³⁹ The Institute imparts decentralized training at the district level and even through DVDs.¹⁴⁰ IT training is given to everyone and extends from basic to advanced courses.¹⁴¹ The Institute was gearing itself to seek ISO certification in quality by the end of 2003.¹⁴² We were fascinated to note the business-like attitude the government of Andhra Pradesh held with regard to employee training. According to Chitra Ramachandran, the Commissioner for MCH, "Andhra Pradesh has crossed the hurdle of employee resistance to technology. Employees are comfortable with using technology."¹⁴³

Citizens' Mindset

Ramamohan Meda, who is in charge of SCADA, the automated electricity monitoring unit, described the attitude of citizens toward electricity: "People think electricity must be free because they already pay property tax for their house."¹⁴⁴ Jaya Surya, a small shop owner we spoke to outside of the eSeva Center in Ramnagar, reflected this attitude. He said it was unfair for the electricity department to penalize him for stealing electricity from his neighbor, who was also his brother. He couldn't understand how it could amount to stealing.¹⁴⁵ Additionally, citizens have experienced humiliation at the hands of government employees for many years, so they are averse to whatever initiative the government takes up. It was the same when the government launched SCADA or the Call 1912 grievance center. The electricity company works hard to change the attitude of its customers through effective communication and results-oriented action. For example, the department communicates upcoming power cuts before they occur on its Web site.¹⁴⁶ When a customer calls 1912, precise answers are given on when power will be restored. The department also uses media to communicate its plans and market itself well to its consumers. The mindset of citizens described earlier and the way the electricity department is changing it can easily be extended to other areas of governance.

"Self-assessment" of property taxes (described in greater detail in the next section) is another example that succeeded in radically changing the mindset of citizens. E-Governance initiatives will be successful only if citizens use it. Citizens will adapt to e-Governance only if they see a benefit and understand that benefit. Therefore, apart from building applications that are useful to citizens, the government must communicate its goals and strategies well.

Another interesting challenge is occurring in the rural areas. A majority of the villagers continue to travel great distances to the main government office to apply for various certificates in spite of having an eSeva kiosk in their village; we witnessed long lines of villagers at the Mandal Revenue Office (MRO). The villagers are satisfied only if they hear the thump of a stamp on their certificates and see a functionary sign it for them.¹⁴⁷ To change this, the office is enforcing a rule that certificates that can be processed through the kiosks will not be processed at the MRO. We expect to see a greater challenge when certificates are issued using digital signatures and watermarking technology.

Outcomes

The previous section detailed how e-Governance initiatives have resulted in good governance. Be it through eSeva, the electricity company, the Water Board, or Vishakhapatnam's Saukaryam, the e-Governance initiatives have clearly made the government function in a SMART¹⁴⁸ manner. Now we must ask if good governance is leading to positive outcomes, such as state development and investment inflow (see Figure 19). Are the initiatives ultimately leading to improved quality of life for the citizen? This section explores answers to these questions.

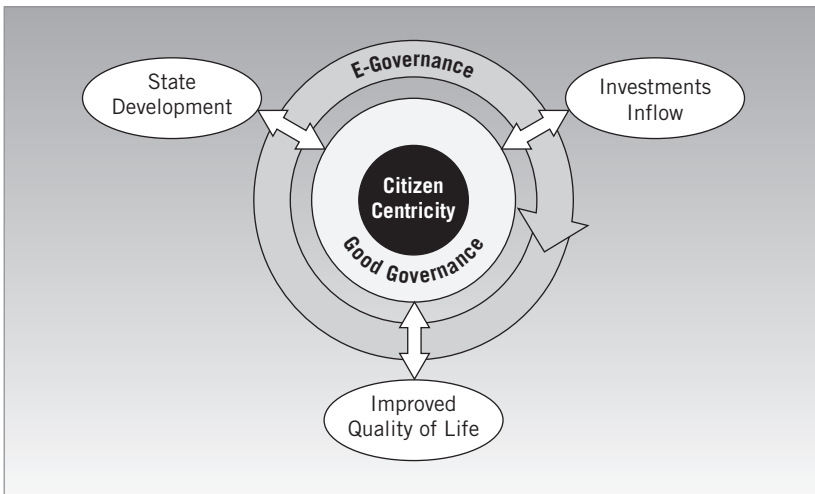


Figure 19 Impact cycle of e-Governance.

State Development

We focus our exploration on Hyderabad where most of the e-Governance initiatives have played out. The capital city comprises two subcities, Hyderabad and Secunderabad, together known as the Twin Cities. Hyderabad is rapidly emerging as a center of commerce, education, biomedical research, and IT; in other words, it is evolving as a “knowledge” hub in the country.¹⁴⁹ The MCH is the statutory civic body entrusted with civic affairs in the Twin Cities.¹⁵⁰ The city competes with Bangalore for the unofficial title of India’s IT capital and is often addressed as Cyberabad because of its innumerable IT ventures. Without question, Hyderabad is achieving what the Chief Minister calls “leapfrog development through IT.”¹⁵¹

MCH, which received an AA+ credit rating from the credit rating agency CRISIL for its municipal bond issue of Rs. 1 billion, has had a number of achievements in the past few years.¹⁵²

The performance on a range of government activities is shown in Figures 20 and 21.

Notice the sudden increases in revenue collection from 1999–2000 onward and the similarity in the trend with the other major revenue sources. We explored further expenditures by the corporation, again during the same period, as shown in Figure 22.¹⁵³

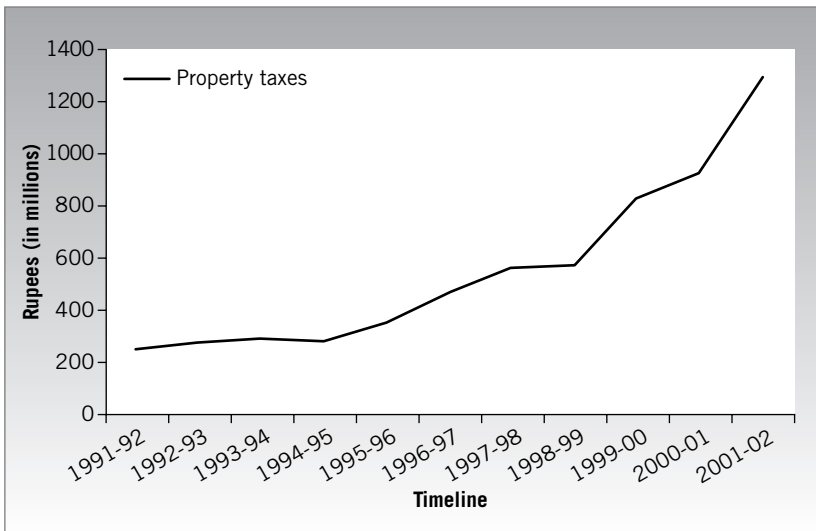


Figure 20 Collection of property taxes by MCH.

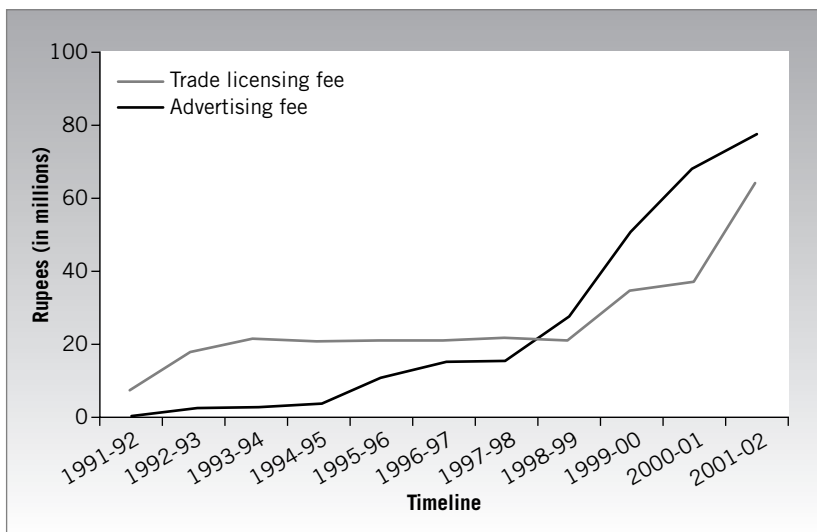


Figure 21 Other collections by MCH.

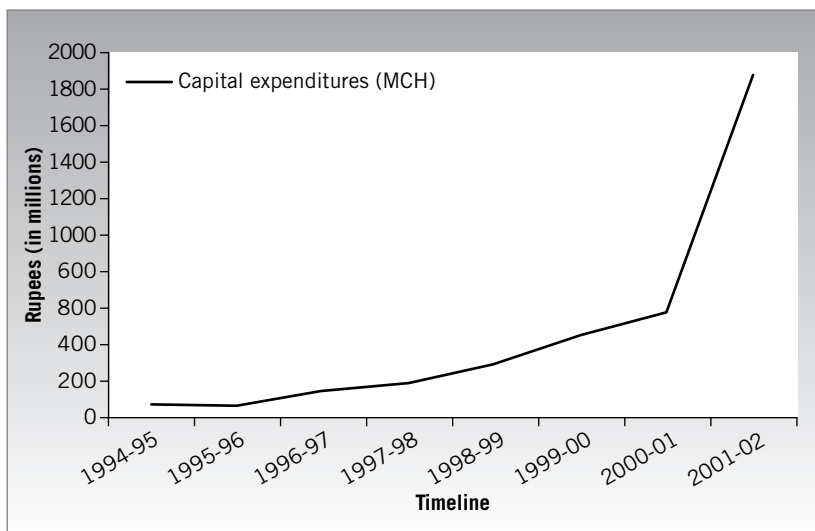


Figure 22 Capital expenditures by MCH.

There is a definite upward trend. Clearly, the revenue generated was utilized in city development. We researched property taxes further to identify what led to the sudden spikes in revenue. In 1999–2000, MCH introduced an innovative program called self-assessment.¹⁵⁴ The program put the onus of assessing, declaring, and paying taxes on the citizens. Further, a computerized property tax database was introduced. Each property in the Twin Cities was assigned a unique property tax identification number, which eliminated discretion in the levying and collection of taxes; computerized records were made public through the Internet for the first time.¹⁵⁵ The transparency provided by the self-assessment program was phenomenal. Citizens began to believe in MCH and began trusting the corporation with their tax money. MCH went on a massive media campaign with the slogan, “MCH trusts you for the future of your city and your children.”¹⁵⁶ City development went hand-in-hand with the initiative. As seen previously, the results were dramatic. Changes were ubiquitous; citizens believed they were getting value from the taxes they paid.

About the time when *Vision 2020* was published, the e-Governance initiatives played out. A number of factors lend support to an increased improvement in state development during that period, starting with the GDP (shown in Figure 23).

In addition to engineering schools and graduation, we noted the International Institute of Information Technology (IIIT), established in 1998 with investments from IBM, Motorola, and other multinational corporations, shown in Figure 24.¹⁵⁷

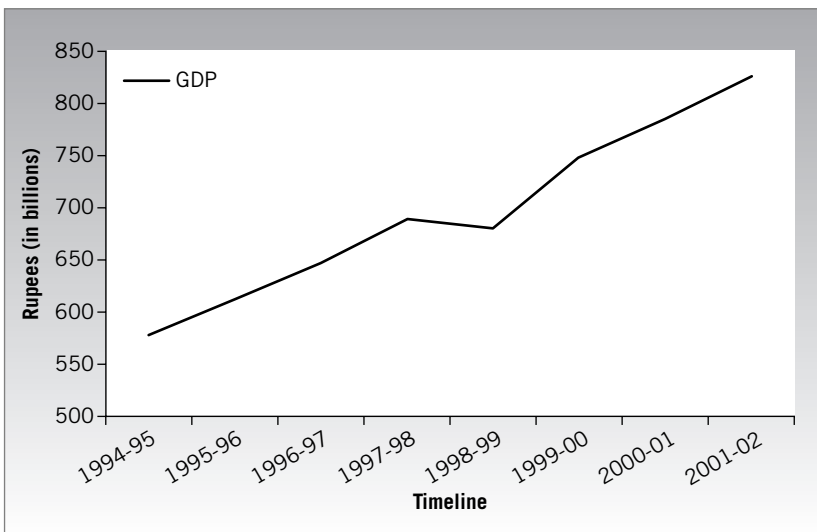


Figure 23 Andhra Pradesh's GDP.

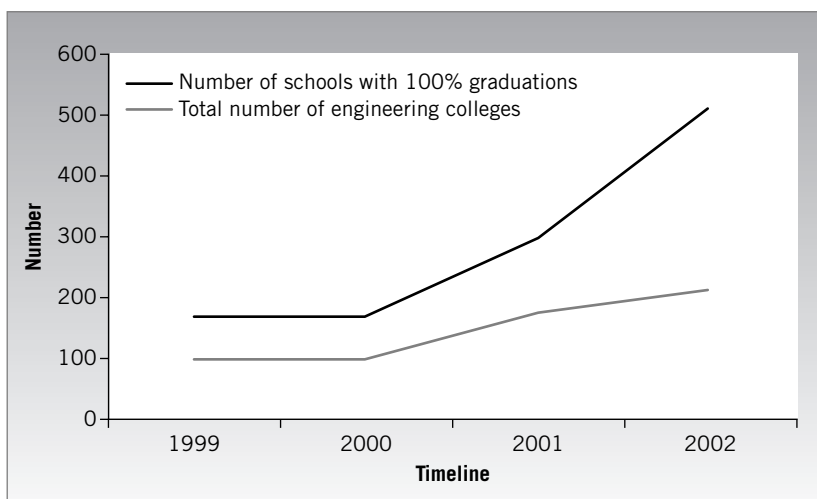


Figure 24 Education indicators.

We further looked into the trends during the same period for Hyderabad's most successful sector, IT. Figures 25 and 26 illustrate the results.¹⁵⁸

Sustained investments in infrastructure can be seen all over Hyderabad. We visited HiTec City, a good example of how the government is investing for the future. HiTec City, started in 1998, has created office space of 580,000 square feet attracting investments from Microsoft, Oracle and GE Capital. Another 860,000 square feet infrastructure efforts are well underway.*

What we observed is a new belief and a new force in governance during the period of e-Governance initiatives that has pushed development in Hyderabad and Andhra Pradesh to new levels.

Investment Inflow

Another outcome that results from the impact cycle of e-Governance is attracting investments from multinational corporations and international development organizations. India, and specifically Andhra Pradesh, has always been a steady recipient of international aid. However, international development organizations such as the World Bank and the United Kingdom's Department of International Development (DFID) have recognized the shift to good governance in Andhra Pradesh and are increasing the amount of funds to the state. Andhra Pradesh has invested considerably in itself to attract

*Satyanarayana, J. *Andhra Pradesh: Leadership in the Information Age*. IT Communication Department, Andhra Pradesh, India, September 8, 2002.

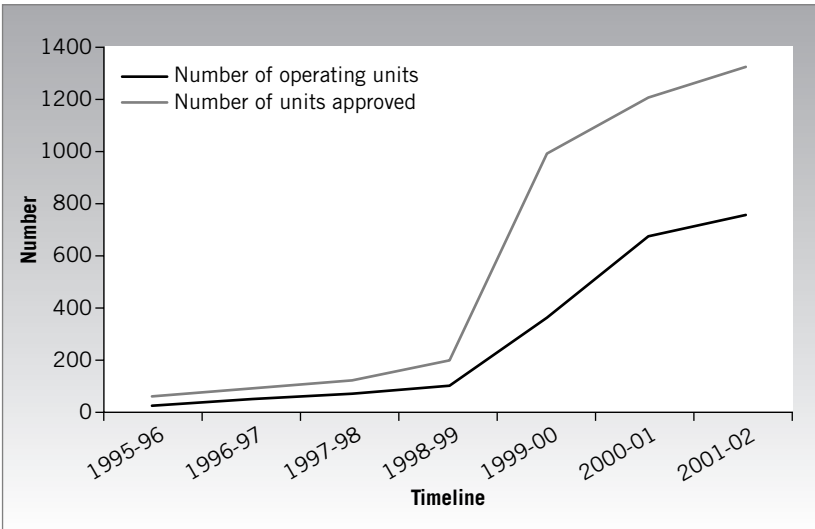


Figure 25 Number of software technology parks.

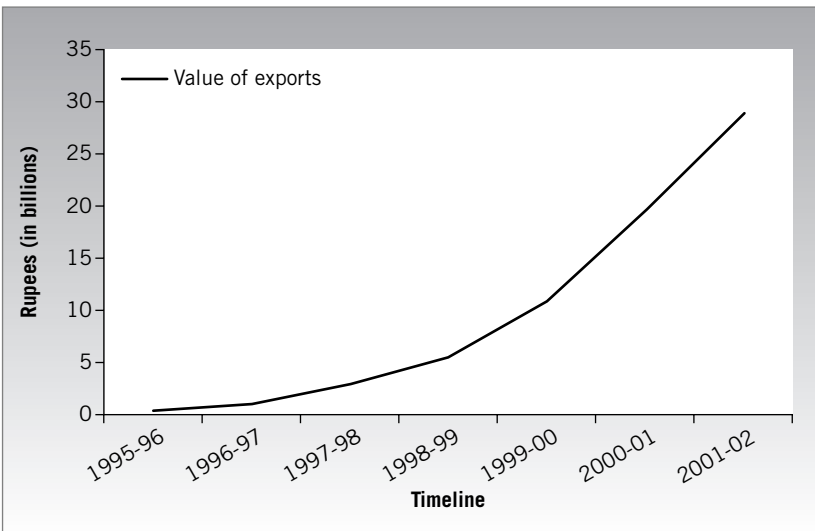


Figure 26 Value of software exports.

Table 6 Notable World Bank Investments in Andhra Pradesh

Period	Amount	Project
February 1999	\$210 million; first in a series of loans totaling \$1 billion	Power sector restructuring
April 2003	\$150 million	Poverty reduction benefiting 20 million households
May 2003	Target of \$1 billion by 2004	Infrastructure, housing, microfinance

multinational investments, with many positive results, illustrated by the fact that Andhra Pradesh has become the fourth-largest destination of private investment in the country.¹⁵⁹

International Development Organizations

“Under Chief Minister N. Chandrababu Naidu, Andhra Pradesh has shown a strong commitment to reforms and has taken important steps to address pressing fiscal and sector difficulties.”¹⁶⁰ As such, Andhra Pradesh continues to receive money from the World Bank.

Since the e-Governance initiatives began, the World Bank has invested each year. Some notable investments are listed in Table 6.^{161, 162, 163}

DFID

Since 1929, the United Kingdom has closely worked with governments of developing economies on issues of trade, conflict prevention, debt, the environment, and child labor. UK’s Department of International Development (DFID) wants to ensure that the money it donates is used efficiently and effectively. Speaking to this, Andhra Pradesh did not start receiving DFID aid until 1998—when massive reform change began under Mr. Naidu. Interestingly enough, Andhra Pradesh is one of only four states in India to receive assistance from DFID and the only state in south India to do so.¹⁶⁴

Impressed with what the government of Andhra Pradesh was doing, DFID established a local office in Hyderabad in 2000. In fact, DFID was a key component in the development of the Center for Good Governance (CGG) that was described previously. Working with GoAP on areas where it requests assistance allows the organization to provide back-end action with increased resources.

A noteworthy example of DFID’s commitment to governance reform in Andhra Pradesh is the SCADA electricity monitoring project. DFID funded the entire \$6.4 million project.¹⁶⁵ Handheld digital systems, effective billing, and remote meter reading are a few of SCADA’s functions.¹⁶⁶ These functions will

lead to a steady electricity flow with no voltage fluctuations and cut transmission and distribution losses to 10 percent from 31 percent.¹⁶⁷

Multinational Corporations and Institutions of Excellence

Equally as impressive as the rise in international aid, and maybe more so, is the exponential rise in the number of multinational corporations that have offices in Andhra Pradesh. This notable testament to the impact cycle for e-Governance is all the more striking because local Indian and international corporate investment was virtually nonexistent in Andhra Pradesh prior to the e-Governance initiatives of the government of Andhra Pradesh. When making investment decisions, companies want to reduce their risk exposure as much as possible; good governance, facilitated by e-Governance, mitigates investment risk significantly for firms. Compare Andhra Pradesh with a third-world country that is riddled with corruption, has questionable law enforcement, and makes no attempt to better the lives of its citizens, and the level of risk mitigation provided by good governance is clear.

Multinational Corporations

The most publicized multinational corporation in Andhra Pradesh is Microsoft. The company’s investment in the state has not been solely business-related; it feels a strong social responsibility towards the state and has pledged investments proving this. Table 7 outlines Microsoft’s business and social investments in Andhra Pradesh.¹⁶⁸

Table 7 Microsoft’s Business and Social Investments in Andhra Pradesh

Period	Business	Social
1997		\$500,000 for computer education center
September 2000	\$50 million in Microsoft Indian Development Center (Microsoft IDC)	\$1 million per year for five years to promote rural IT education
November 2002	\$400 million for product development \$100 million for Microsoft IDC \$1 million for Media Lab Asia	\$200 million for AIDS research \$25 million for Hepatitis B vaccine

Outside Andhra Pradesh, Microsoft is donating another \$20 million to increase computer literacy in India with the hope of helping 80,000 teachers and 3.5 million computer-literate students in the next five years.¹⁶⁹

Table 8 Firms with Offices in Andhra Pradesh

Amazon.com	Deutsche Bank	Ford	United Airlines
Phoenix-Global	Citibank	DuPont	State Farm
Daimler-Chrysler	Siemens	Singapore Airlines	AXA
Royal & Sun Alliance	Dell	Delphi	GE
e-funds	Aventis	TRW	Conseco
Abu-Amro	Fluor Daniel	Bay Systems	Bell Northern
AsiaTV	Bechtel	Ansset Australia	HSBC
Sietel Corp.	Keane Inc.	Bose Corporation	Catalytic Software

An impressive list of Indian and non-Indian companies is calling Andhra Pradesh home and many are using office space in HiTec City. Table 8 lists a selected group of firms and the list is by no means exhaustive.¹⁷⁰

Improved Quality of Life

Perhaps quality of life in the impact cycle is the single most difficult aspect to define in a succinct and tangible manner. You can't measure the satisfaction a poor construction worker feels when he receives the same level of service as an elite citizen, possibly for the first time in his life. You can't measure the humiliation a housewife no longer faces when she pays her utility bill. You can't measure the job security a young professional experiences because of the immense career potential in the state. You can't measure the pride a native feels when he returns home to find incredible changes. You can't measure the fulfillment of a family walking in a park and breathing clean, fresh air. You can't measure the contentment of a government employee when he knows that citizens respect his contribution to the state. You can't measure the thrill a political party experiences in knowing that citizens will re-elect its candidates because it delivered results. You can't measure the amazement a first-time visitor from the developed world faces when he doesn't see what he expects in a developing country. You can't measure the exultation in a village when the citizens see a computer for the first time and access email. You can't measure the confidence in citizens when they know their state is marching ahead to the future. Quality of life is about these unending intangible feelings and experiences.

We are not implying that Andhra Pradesh has reached its goals yet. When we asked Jayaprakash Narayan about e-Governance, he said,

E-Governance can only be successful if the following are done. One, process re-engineering of the various government processes. Two, dramatic redeployment of personnel. The government needs to create more decision makers with a skeletal

*support system. Three, substantial vertical decentralization that will empower employees at the mandal level. In the absence of these three, e-Governance will merely be a layer over the old systems.*¹⁷¹

Although he admitted that the government of Andhra Pradesh was headed in the right direction to help its citizens, he said, "Change is not happening quickly enough, and replication of best practices is not happening fast enough."¹⁷²

What we are trying to imply, however, is the spiraling of the impact cycle of e-Governance if the existing momentum in Andhra Pradesh continues. E-Governance, a necessary condition, but not sufficient alone, is clearly leading to good governance. Good governance has been the primary progenitor for state development and investment inflow, ultimately improving the quality of life for Andhra Pradesh's citizens. Improved quality of life feeds back into the impact cycle when citizens democratically vote for a results-oriented government. The re-elected government recognizes the importance of good governance and uses e-Governance to ceaselessly improve itself and offer better service to citizens, thus solidifying the impact cycle of e-Governance.

Future

Andhra Pradesh is in the midst of a great social transformation as it attempts to fundamentally alter the way it governs its citizens. Legacy systems and organizational inertia in the government of Andhra Pradesh are working against new processes; however, the friction they create is diminishing every day. The government of Andhra Pradesh, not quite the uncomfortable burden it once was, is slowly beginning to build trust and credibility with the citizens it serves. The impact of e-Governance will be experienced internally by government employees, be increasingly evident in citizen-government and business-government interfaces, and be a dominant motivator for change in outside governments. Today e-Governance in Andhra Pradesh is a molehill whose full impact is yet to be witnessed; this hill will quickly become a mountain that cannot be ignored. We cannot predict the future of e-Governance in Andhra Pradesh, but we can definitely imagine it.¹⁷³

E-Governance-Driven Re-engineering

To facilitate employee buy-in, the government of Andhra Pradesh has decided to limit the amount of process re-engineering done while deploying the various e-Governance initiatives. Soon, there will be no turning back for employees; technology will be used to perform every possible function. In a typical business, to realize the efficiencies (both procedural and fiscal) technology provides, it

would cut redundant and non-value-added processes and personnel. A project such as SMARTGOV, which automated file clearance in the Secretariat, does not lessen the required steps for clearance—21 approvals among seven bureaucrats. To fully grasp the advantages of e-Governance, the government will be forced to re-engineer its processes. Limiting non-value-added steps will empower mid- and low-level bureaucrats, making them more accountable.

Although the government can reduce processes, it cannot cut its workforce due to the guaranteed nature of government service. Hand-in-hand with process re-engineering will be a large-scale redeployment of low-level workforce employees. Rather than performing meaningless jobs such as carrying files from office to office, these employees will be retrained to deliver real value, facilitated by the education level of all permanent government employees. For example, Andhra Pradesh needs more teachers and health care workers. Demand-driven redeployment will fill these necessary gaps.

Implications of Connectivity in Rural Andhra Pradesh

The fiber-optic cable laid throughout the state will enable Internet connectivity for every village. Further, the government initiative to convert the thousands of standard telephone dial booths to Internet-enabled kiosks will result in dramatic increases in Internet access. Among the obvious benefits of creating a computer-literate society, this level of access will facilitate communication among pockets of citizens as never before witnessed.

These “cybercommunities” will hold the immeasurable power of information. Citizens in Naagampally village (central Andhra Pradesh) will learn about the developments taking shape in the distant Machilipatnam (eastern central Andhra Pradesh). If, for instance, more bore wells are dug in Machilipatnam when Naagampally is suffering worse from a drought, people will demand justice. Consider what would happen if the villagers in Naagampally further learn their mandal has been given less funds than a comparable village or their mandal is misappropriating allotted funds. Cybercommunities will create a true democracy—a powerful force that the government must heed.

Spread and Demise of eSeva

Increased connectivity will considerably affect urban Andhra Pradesh as well. The eSeva timeline can be envisioned as a four-stage demise (see Figure 27). eSeva kiosks will mushroom all over Andhra Pradesh: in banks, malls, grocery stores, and gas stations. The government of Andhra Pradesh will reach its citizens wherever they are and whenever they want.

Initially, eSeva operators will be required to run the machine and help customers with transactions; down the road, these kiosks will be void of attendants. At this point, customers will not want to spend the time traveling

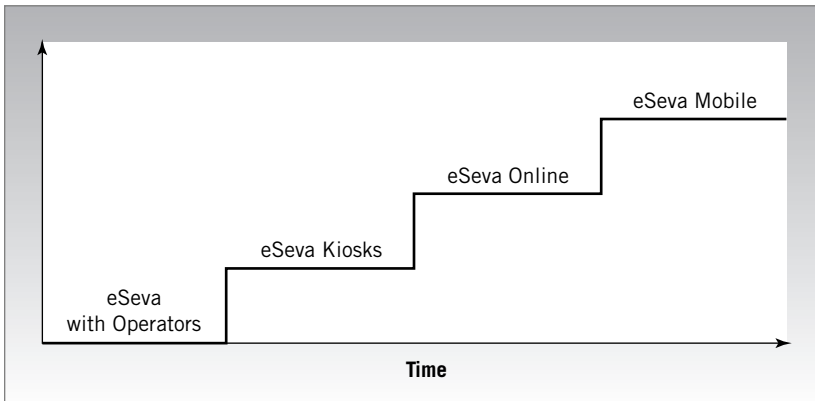


Figure 27 The four-stage demise of eSeva.

to eSeva Centers; they will be comfortable transacting over the Internet on their own. One example is citizens using bank ATMs to both withdraw cash and apply for a passport. A driver that will make an eSeva Center redundant is digital watermarking technology coupled with a suitable legal framework. The eSeva kiosk will print out legal documents such as caste certificates at the click of a button. Digital watermarking ensures that the certificate is generated from an authorized government server. An upward swing in technology coupled with increased eSeva adaptability will result in mobile transactions over eSeva. These four stages might take place simultaneously and in pockets, but Figure 27 suggests significant momentum in the method of eSeva usage at every stage.

Ultimately, the eSeva initiative will cease to exist by realizing what it hoped to achieve: reducing the interface between the citizen and the government.

Outsourcing the Government

Through PPP, the government of Andhra Pradesh is experiencing the efficiencies of private enterprise in its operations; eSeva is the quintessential example of how government and citizens can benefit from outsourcing transaction-oriented operations. Citizens' refusal to use traditional government channels will drive rapid front-office outsourcing. In the near to medium term, one of two things will happen: Either the government of Andhra Pradesh will outsource noncritical citizen-facing interfaces of the government, or every noncritical service that requires direct interface with a government employee will be offered through eSeva. Either way, traditional interfaces will cease to exist and citizens will not let a new political party erase the gains that have been achieved.

PPP creates opportunities for the government of Andhra Pradesh to generate revenue through royalties. As with SMARTGOV, the government can sell its e-

Governance models to other state and international governments through the respective private partners. For example, the eSeva concept is directly geared toward developing countries whose situation in computer and Internet penetration is similar to that of India.¹⁷⁴

E-Governance will allow the government of Andhra Pradesh to monitor its performance to the lowest level in various arenas once the OLPTS is mature as a system. The government will notice wide discrepancies in the performance of its various departments and organizations. Over time, the government will realize its limited capacity to improve the underperforming entities and this will lead to privatization. In the future, the government will become a leaner organization, focusing on its core competencies.

Networked Governance

At this time, the government of Andhra Pradesh is attempting to connect its various departments through the Andhra Pradesh State Wide Area Network (APSWAN).¹⁷⁵ The system is fast becoming the backbone for statewide voice, data, and video communication.¹⁷⁶ The use of PKI in APSWAN allows secure transfer of sensitive government information.¹⁷⁷ While APSWAN facilitates data exchange, it cannot force it. As e-Governance initiatives become ubiquitous, intra- and interdepartment data exchange is bound to happen.

Intradepartment information-sharing grants increased exposure to customer accounts. For example, if the four DISCOMS and TRANSCO were to share customer information about a particular citizen who migrates from Vishakhapatnam (eastern Andhra Pradesh) to Hyderabad (central Andhra Pradesh), they will know his or her payment and default history.¹⁷⁸ This will help the DISCOMS monitor poor customer behavior and direct the appropriate resources in preventing further loss in revenue.

Interdepartment data exchange will extend this level of customer monitoring. Perhaps more striking, the government of Andhra Pradesh can generate payment histories for citizens. These histories will be especially useful for poor citizens. Typically, the poor are forced to deal with harassment and high interest rates when seeking a loan because they do not have valid proof of their payment capacity. Payment histories reduce the default risk which financial institutions feel when loaning funds to poor citizens; lower interest rates and better payment options will result.

Future of Doing Business with Andhra Pradesh

As indicated in the impact cycle, citizens are not the only group to benefit from e-Governance. Local and global businesses will find transacting with the government of Andhra Pradesh less burdensome. Dealing with a SMART government quickens the time required to start in-state operations. Speed will

be of the utmost importance to a multinational corporation when you consider the race to expand in emerging global markets; never before has the phrase “time is money” taken on such importance. Driving the urgency is a limited amount of prime real estate and quality employees at an affordable wage. Multinational corporations that establish back-end operations in Andhra Pradesh will be in a perfect position to exploit a largely untapped customer base. As in a developed market, brand loyalty is the key to increased sales and revenue.

Local businesses will greatly benefit from multinational corporations entering the state. Organizations such as AP first have the capacity to make these companies aware of the unique capabilities and technologies of local companies. Local firms, who have yet to compete in the global market, will develop relationships with global players. Increased demand for local services and products will spur a thriving business climate, creating a greater number of local multinational corporations. Technologies such as PKI and digital watermarking, which make secure contract approvals possible, will further facilitate the creation of local businesses.

Scalability of E-Governance

Currently, the e-Governance initiatives in Andhra Pradesh are receiving enormous amounts of media coverage. The buzz surrounding the government of Andhra Pradesh as a leader in e-Governance is pressurizing Karnataka, a neighboring state, to rapidly scale its own e-Governance operations. Citizens will drive their state governments to provide the same levels of service as those in Andhra Pradesh. If governments do not respond, they will witness the migration of their citizens to states that meet their demands. Quite possibly, these governments will watch these migrations from the sidelines because they will have been voted out of office.

E-Governance in Andhra Pradesh will even scale to other countries in the developing world.¹⁷⁹ These countries will possess political will and courage, urgency and willingness to change, and citizens who are tired of being harassed by their governments. What will stun other governments is how quickly Andhra Pradesh catches up with countries in the developed world through e-Governance.

Citizens in developed countries do not require their governments to act with the same sense of urgency as the government of Andhra Pradesh. The Internet will bridge the knowledge gap between citizens in developed and developing countries. For instance, a U.S. citizen will wonder why she cannot get her birth certificate online when someone in Naagampally can. Governments in the developed world will be forced to take notice of the revolutionary changes occurring in Andhra Pradesh.

Andhra Pradesh is on its way to being the model state for regions all over the world. In the future, when one looks back on how the state catapulted itself from a dull, southern Indian region to a completely developed hub of global activity, it will be apparent the elements of the impact cycle of e-Governance drove this change.

Endnotes

1. *Vision 2020*. V. Anandarau, 1998.
2. Ibid.
3. Interview with Chandrababu Naidu, Secretariat, Andhra Pradesh, March 28, 2003.
4. Ibid.
5. World Bank defines E-Government as the use of information and communications technologies to improve the efficiency, effectiveness, transparency, and accountability of government. <http://www1.worldbank.org/publicsector/egov/>. Date accessed: July 15, 2003. We prefer to use the term "e-Governance" as it refers to a broader relationship between the political system and society. The terms e-governance, e-government, or e-democracy are sometimes used alternatively.
6. "E-Government Strategy Presentation," Department of Information Technology and Communications, February 2003.
7. "Vision of E-Government in Andhra Pradesh," Department of Information Technology and Communications, April 2002.
8. "E-Government for the New Millennium," Department of Information Technology and Communications, April 2002. www.ap-it.com/principlesegovernment.pdf.
9. Ibid., p. 4.
10. Ibid., p. 8.
11. Ibid., p. 9.
12. IT&C Department: *Framework of a Policy for Public Private Partnership for Electronic-Governance*, March 29, 2001, p. 1.
13. Ibid., p. 7.
14. Ibid., p. 2.
15. "Status Report on State Infrastructure: A Presentation to International Construction Industry Conference," March 21, 2002.
16. Interview with Chandrababu Naidu, Secretariat, Andhra Pradesh, March 28, 2003.
17. Interview with Phani Kumar, March 25, 2003.
18. Somayajulu, G., Vanka, Sita, Vedula, V., & Kumar, P. 2003. *Demand Driven and Customer-Oriented Government Initiatives in India-The eSeva Model of Andhra Pradesh*, p. 13.
19. Administrative Staff College of India, Hyderabad. 2002. *Study on the eSeva Scheme in Twin Cities*, p. 3.

20. Department of Information Technology and Communications. 2002. *Profile of E-Government Projects*, p. 5.
21. Somayajulu, G., Vanka, Sita, Vedula, V., and Kumar, P. 2003. Op. cit., p. 14.
22. Interview with Phani Kumar, March 25, 2003.
23. Somayajulu, G., Vanka, Sita, Vedula, V., and Kumar, P. 2003. Op. cit., p. 20.
24. Ibid.
25. Administrative Staff College of India, Hyderabad. 2002. Op. cit., p. 4.
26. Interview with J. Satyanarayana, Secretariat, March 21, 2003.
27. Somayajulu, G., Vanka, Sita, Vedula, V., and Kumar, P. 2003. Op. cit., p. 12.
28. Administrative Staff College of India, Hyderabad. 2002. Op. cit., p. 6.
29. Interview with Ravi Kumar, eSeva Operator, Khairatabad, Hyderabad.
30. Ibid.
31. Interview with Phani Kumar, March 25, 2003.
32. Ibid.
33. Rural eSeva brochure available at Mandal Revenue Office, Shadnagar.
34. "E-Government for the New Millennium," Department of Information Technology and Communications, April 2002. www.ap-it.com/principlesegovernment.pdf.
35. Public-private partnership.
36. Department of Information Technology and Communications. 2002. *Profile of E-Government Projects*, p. 14.
37. Interview with M. Veerabhadraiah, Registration & Stamps Department, March 25, 2003.
38. *Land/Property Registration in Andhra Pradesh*. The World Bank Group. Subhash Bhatnagar. November 16, 2000.
39. Interview with M. Veerabhadraiah, Registration & Stamps Department, March 25, 2003.
40. *Land/Property Registration in Andhra Pradesh*. The World Bank Group. Subhash Bhatnagar. November 16, 2000.
41. Ibid.
42. Interview with M. Veerabhadraiah, Registration & Stamps Department, March 25, 2003.
43. Ibid.
44. Ibid.
45. Ibid.
46. *CARD Review Final Report Project S001*, Centre for Good Governance, November 12, 2002, p. 5.
47. Ibid., pp. 5-6.
48. Ibid., p. 5.
49. Ibid.

50. Ibid., p. 6.
51. Ibid.
52. Ibid.
53. Ibid.
54. Ibid, p. 8.
55. Wadhwa, D. C. 2002. Guaranteeing title to land. *Economic and Political Weekly*, 4, p. 702.
56. Ibid., p. 699.
57. Interview with M. Veerabhadraiah, Registration & Stamps Department, March 25, 2003.
58. Wadhwa, D. C. 2002. Op. cit., p. 722.
59. Department of Information Technology and Communications. 2002. *Profile of E-Government Projects*, p. 8.
60. Interview with A. Giridhar, Road Transport Authority, March 25, 2003.
61. Ibid.
62. Department of Information Technology and Communications. 2002. *Profile of E-Government Projects*, p. 3.
63. Ibid.
64. Interview with Bala Ravirala, Tata Consulting Services, March 31, 2003.
65. Ibid.
66. Ibid.
67. Department of Information Technology and Communications. 2002. *Profile of E-Government Projects*, p. 24.
68. Interview with Chandrababu Naidu, Secretariat, Andhra Pradesh, March 28, 2003.
69. Department of Information Technology and Communications. 2002. *Profile of E-Government Projects*.
70. Interview with Randeep Sudan, Secretariat, Andhra Pradesh, March 24, 2003.
71. Interview with M.G. Gopal, Hyderabad Metropolitan Water Supply & Sewerage Board, March 29, 2003.
72. Data provided by Hyderabad Metropolitan Water Supply & Sewage Board.
73. Ibid.
74. Interview with M.G. Gopal, Hyderabad Metropolitan Water Supply & Sewerage Board, March 29, 2003.
75. Data provided by Hyderabad Metropolitan Water Supply & Sewerage Board.
76. Ibid.
77. Ibid.
78. Data provided by Hyderabad Metropolitan Water Supply & Sewerage Board.
79. Interview with M.G. Gopal, Hyderabad Metropolitan Water Supply & Sewerage Board, March 29, 2003.

80. Davis, J., et al. 2001. *Good Governance in Water and Sanitation: Case Studies from South Asia*. New Delhi: Water and Sanitation Program, p. 19.
81. *Presentation on MIS in HMWSSB*. V. L. Praveen Kumar. October 22, 2002, Slide 22.
82. Davis, J., et al. 2001. Op. cit., p. 20.
83. *Presentation on MIS in HMWSSB*. V. L. Praveen Kumar. October 22, 2002, Slide 24.
84. Ibid., Slide 25.
85. Ibid., Slide 24.
86. Ibid., Slide 26.
87. Ibid., Slide 33.
88. Ibid., Slide 34.
89. Davis, J., et al. 2001. Op. cit., p. 20.
90. Ibid.
91. Ibid.
92. *Presentation on MIS in HMWSSB*. V. L. Praveen Kumar. October 22, 2002, Slide 36.
93. www.hyderabadwater.gov.in.
94. www.aptranscorp.com,
www.aponline.gov.in/apportal/departments/departments.asp?dep=05&org=54
95. Ibid.
96. AP Transco software for transformers. *Business Line*. November 26, 2002. www.securities.com.
97. Ibid.
98. Ibid.
99. "IT-Initiatives PowerLine Session I." APCPDCL. S. S. Rambabu.
100. Ibid.
101. DFID-funded power supply control centre commissioned. *Business Line*. www.blonnet.com/2002/06/01/stories/2002060101521700.htm
102. Ibid.
103. Interview with S. S. Rambabu, APCPDCL, March 31, 2003.
104. "IT-Initiatives PowerLine Session I." APCPDCL. S.S. Rambabu.
105. Interview with Dr. P. K. Mohanty, Center for Good Governance, April 3, 2003.
106. Ibid.
107. *Performance in Government: Measurement and Tracking*. Centre for Good Governance, Hyderabad.
108. Ibid.
109. *Manual on Performance-Based Management in Government*. Centre for Good Governance, Hyderabad, p. 2.
110. Ibid.
111. Ibid., p. 3.

112. Ibid.
113. *Performance in Government: Measurement and Tracking*. Center for Good Governance, Hyderabad.
114. *Manual on Performance-Based Management in Government*. Center for Good Governance, Hyderabad, p. 9.
115. Interview with Subbarao Ghanta, Center for Good Governance, March 21, 2003.
116. Ibid.
117. Interview with Dr. P. K. Mohanty, Center for Good Governance, April 3, 2003.
118. Interview with Manish Agarwal, Center for Good Governance, April 3, 2003.
119. *Integrated Grading System for Secretary, HOD, District Officer, Mandal Officer and Below Mandal Level Functionary*. Center for Good Governance, Hyderabad, p. 3.
120. Interview with Manish Agarwal, Center for Good Governance, April 3, 2003.
121. Ibid.
122. *Integrated Grading System for Secretary, HOD, District Officer, Mandal Officer and Below Mandal Level Functionary*. Center for Good Governance, Hyderabad, p. 3.
123. Interview with Manish Agarwal, Center for Good Governance, April 3, 2003.
124. *Integrated Grading System for Secretary, HOD, District Officer, Mandal Officer and Below Mandal Level Functionary*. Center for Good Governance, Hyderabad, p. 1.
125. Interview with Manish Agarwal, Center for Good Governance, April 3, 2003.
126. Ibid.
127. Ibid.
128. Interview with Chandrababu Naidu, Secretariat, Andhra Pradesh, March 28, 2003.
129. "PTS Dpts Grade & Score." Excel spreadsheet provided by Mr. Manish Agarwal, April 3, 2003.
130. Interview with Manish Agarwal, Center for Good Governance, April 3, 2003.
131. Ibid.
132. Ibid.
133. Interview with Dr. Jayaprakash Narayan, Lok Satta, March 28, 2003.
134. Interview with Shyam Sunder Reddy, March 24, 2003.
135. Interview with A. Giridhar, Road Transport Authority, March 25, 2003.
136. Interview with Chandrababu Naidu, Secretariat, Andhra Pradesh, March 28, 2003.
137. www.aponline.gov.in/apportal/departments/departments.asp?dep=13&org=86
138. Ibid.
139. Human Resource Development Institute of AP, www.brdiap.gov.in.
140. Ibid.
141. Ibid.
142. Ibid.
143. Interview with Chitra Ramachandran, Municipal Corporation of Hyderabad, April 1, 2003.

144. Interview with Ramamohan Meda, SCADA, March 31, 2003.
145. Interview with Jaya Surya, April 1, 2003.
146. Interview with S. S. Rambabu, APCPDCL, March 31, 2003.
147. Interview with Mandal Revenue Officer, Shadnagar, March 26, 2003.
148. Simple, Moral, Accountable, Reliable, Transparent.
149. Mohanty, P. K. 2002. *Reforming Property Tax: The Approach of Municipal Corporation of Hyderabad*. Center for Good Governance, p. 1.
150. Ibid.
151. Interview with Chandrababu Naidu, Secretariat, Andhra Pradesh, March 28, 2003.
152. Mohanty, P. K. 2002. Op. cit., p. 1.
153. Ibid., p. 19.
154. Ibid., p. 10.
155. Ibid., p. 11.
156. Ibid., p. 16.
157. www.iiit.com.
158. Slide deck provided by Centre for Good Governance, Hyderabad.
159. DFID Pledges Rs.250 crore to Andhra for poverty removal. *The Financial Express*, June 21, 2001. www.financialexpress.com/fe20010612/an4.html.
160. World Bank Approves Package for Human Development in Andhra Pradesh, India. DevNews Media Center. web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,contentMDK:20020697~menuPK:34459~pagePK:34370~piPK:34424~theSitePK:4607,00.html
161. World Bank to Support Power Sector Overhaul in Andhra Pradesh, India. The World Bank Group. www.worldbank.org/html/extdr/extme/2103.htm
162. www.securities.com.
163. Ibid.
164. *DFID Historical Background*. HM Government. UKOnline: www.dfid.gov.uk/AboutDFID/files/historical_background.html.
165. DFID Pledges Rs.250 crore to Andhra for poverty removal. *The Financial Express*, June 21, 2001. www.financialexpress.com/fe20010612/an4.html.
166. DFID-funded power supply control centre commissioned. *Business Line*, June 1, 2002. www.blonnet.com/2002/06/01/stories/2002060101521700.htm.
167. Ibid.
168. Widening windows. domain-b.com. December 21, 2002. T. Radhakmshina. www.domain-b.com/companies/companies_m/microsoft/20021221_windows.html.
169. Ibid.
170. *Andhra Pradesh. The emerging IT IS destination*. Interactive CD.
171. Interview with Dr. Jayaprakash Narayan, Lok Satta, March 28, 2003.
172. Ibid.

173. Prahalad, C. K., & Hamel, G. 1994. *Competing for the Future*. Boston, MA, Harvard Business School Press, 1994.
174. Interview with Phani Kumar, March 25, 2003.
175. www.ap-it.com/apswanguide.html.
176. Ibid.
177. www.hindu.com/2001/01/29/stories/06290007.htm.
178. Distribution Companies, Transmission Corporation.
179. During 2003, one of us adapted Andhra Pradesh's e-Governance model to help jumpstart development in Iraq, where it is possible today to have a zero-based view on governance. The feasibility study received tremendous support from the Iraqis, including the Prime Minister of Iraqi Kurdistan, Dr. Barham Salih. It was clear to them that this was exactly the path they needed to take for development through democracy.

This report was written by Praveen Suthrum and Jeff Phillips under the supervision of Professor C. K. Prahalad. This report is intended to be a catalyst for discussion and is not intended to illustrate effective or ineffective strategies.