

**Achievement of Market-Friendly Initiatives and Results Program
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E-GOVERNANCE

A Review of E-Governance in India and Lessons Learned

Final Report

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EXECUTIVE SUMMARY

Mission Background

1.0 In accordance with the Statement of Work, Reg Miller traveled to India from May 17 to June 8, 2002, and visited five states: (i) Uttar Pradesh (New Delhi), (ii) Andhra Pradesh (Hyderabad), (iii) Karnataka (Bangalore), (iv) Kerala (Trivandrum), and (v) Tamilnadu (Chennai). The purpose of the visit was to review the E-Governance regime in India and meet with the key architects and decision-makers to assess how well and why the Indian experiment is working, and its relevance to countries in the Middle East particularly Jordan.

1.1 A number of countries in the Middle East are planning IT initiatives to support E-Services to their citizens. Additionally, these countries are hoping to attract foreign investment. The Government of Jordan, under the aegis of the Ministry of Information and Communications Technology--MoICT and USAID funded AMIR Program, is undertaking a major E-Government initiative that among other things, will involve a portal to deliver E-Services to Government employees, citizens, and businesses around the country. The initiative will involve a multitude of Jordanian Government ministries, departments and agencies with multivariate functions, information needs and data provisioning requirements. Bringing all these players together for successful implementation will require close coordination, planning and teamwork. Part of the effort will also involve communications and public relations to keep all stakeholders on the same page and to educate users --especially the public-- about the “why” and “how” of the overall initiative.

1.2 Designing the portal architecture will require an assessment of issues such as authentication, interoperability, web applications, E-Services, Government E-mail, design and operation of a Network Operations Center (or Data Center), and the equipment and software involved with these aspects of the system. Most of the technical work in these areas is almost completed, and the challenge is to make sure that all the pieces fit together in a coherent, cost-effective and sustainable manner. This is important because by necessity, the technology standards were developed *before* the process re-engineering was done at the various participating Ministries that will form the “Secure Government Network--SGN” of Jordan’s E-Governance architecture. It should be noted that the globally accepted paradigm for implementing successful E-Government solutions is that 45 percent level of effort is on *change management*, 35 percent on *process re-engineering*, and about 20 percent on *technology*. The technology design for the SGN is in compliance with international standards and similar to what India is doing, hence *technology* is not an issue. However, *change management* and *process re-engineering* should be carefully coordinated to make the current E-Governance initiative viable and sustainable.

1.3 Several countries have gone through roughly similar initiatives. Jordanian personnel have visited some of these countries, including most recently Singapore. Egyptian officials from the Ministry of IT visited India under a study tour sponsored by USAID in 2001. However, certain state Governments in India like Andhra Pradesh and Karnataka, present successful examples that Jordan, Egypt and other Middle Eastern countries could benefit from. In order to prepare for the full implications of E-Governance in Jordan, a review of some successful state E-Government examples in India was considered as being useful. The findings of this Report could serve as a preparatory step for a study tour or “orientation visit” to India by Government IT officials from countries such as Egypt, Jordan, Morocco, and perhaps others.

1.4 The Scope of the mission was to review the E-Governance regime in India and describe, among other things, the current situation in two leading Indian States, i.e. Andhra Pradesh and Karnataka, with respect to E-Governance. This Report will describe the process by which the current situation in India was achieved and comment on the extent of its applicability in the context of countries in the Middle East; and recommend approaches by which these countries could benefit from the Indian experience.

1.5 The mission interviewed Indian IT officials in New Delhi, Hyderabad (Andhra Pradesh state), Bangalore (Karnataka state), Trivandrum (Kerala state), and Chennai (Tamilnadu state). These officials were the pioneers who led the march and championed successful E-Governance applications in their respective states; the mission also had discussions with key private sector individuals who provided policy, planning, legal and technology services to support the Government's effort in implementing E-Government initiatives. (*Note, see Appendix for full list of officials visited*). The mission discussed the origins of the E-Government movement in India and the development of the "political will" to pursue implementation despite formidable odds. Key issues related to policy, legislation, planning, architecture and technology choices were discussed with regard to the roles of the State Governments and the private sector in India. The mission visited IT training institutions and reviewed their curriculums (e.g. Indian Institute of Information Technology and Management in Kerala, and the NIIT in Tamilnadu). An assessment was made on the receptivity in principle, of officials in the Indian State Governments and the private sector, to receiving IT delegations from countries in the Middle East. The mission found that the Indians are extremely positive about collaborating with Jordan and neighboring countries to share their experience in E-Governance, and provide advisory services if necessary.

Overview of the Indian IT Software and Services Industry

1.6 The first year of the new millennium has been a year of turbulence, tragedy, terrorism and slow-down in the world economy. The Indian IT software and services industry has weathered this storm well. It is creditable that the IT software and services industry in India has reasonably continued its robust growth of about 30% during the year 2001-2002. The Indian IT-enabled services sector has emerged as a key driver of growth for the Indian IT industry. This segment is poised to grow very rapidly, worldwide, over the next few years.

1.7 The IT software and services industry in India accounted for about 1.7% of India's GDP during 2000-2001. Indian IT software and services exports account for over 16% of India's total exports during 2001-2002; and it is expected that by the year 2008, Indian IT software and services industry will account for 7.7% of India's GDP and 35% of India's total exports.

1.8 India's expertise in emerging technologies actually helped the country to get new customers and thus to a large extent cushioning the impact of the slowdown in the US economy on the Indian software industry. It is expected to provide large opportunity, which would help India get more customers and expand its base. In the last few months, many US companies have shown increased interest in the Indian software industry. Also, companies in Europe and Japan are increasing their outsourcing to India. In addition, technology companies like Intel, Hewlett-Packard and others have also announced an increase in IT investment in India. Opportunities in E-Commerce software solutions are emerging as a major area of growth for the Indian IT software and services industry.

1.9 Indian software professionals have already created their brand image in the global market. A large number of Indian software companies have acquired international quality certification. Out of the top 400 companies, more than 250 have already acquired ISO-9000 certification. A majority of the multi-national companies operating in the area of Information Technology have either Software Development Centers or Research Development Centers in India.

1.10 India's IT software and services industry represents around 2% of the overall global software market. The Government and software industry, however, have set an ambitious goal for the software sector amounting to around \$50 billion of software exports by the year 2008 --- a share of 6% of the relevant global market.

1.11 However, it needs to be also kept in mind that India has a rapidly growing yet inadequate infrastructure base, unable to match the ever-increasing bandwidth demand. Its hardware industry is yet to come to terms with lack of global production skills, standards, technologies, inability to attract foreign investment and consequent erosion of competitiveness in price and quality for domestic and export markets. India has poor penetration beyond urban areas in terms of IT appliances, infrastructure and services (PC penetration in India is 0.002% or two PCs per thousand citizens; Internet access is 0.001 percent or one Internet connection per thousand citizens).

1.12 The bulk of India's exports are dependent on the lowest-price source, with person-hours being far lower than those commanded by developed countries. India has plans to re-position itself as a high-quality, high-productivity destination.

1.13 However, the software industry has emerged as one of the fastest growing sectors of the Indian economy with a CAGR (Compound Annual Growth Rate) exceeding 50 percent over the last five years and a turnover of US\$10.25 billion, and exports of US\$ 7.8 billion during 2001-2002. Today, all the renowned global brands have either established production facilities in the country, or are present in the market through technical/financial collaboration, thus giving the Indian consumer a wider choice in terms of product features, technology quality and competitive prices.

1.14 In order to facilitate growth of E-Commerce and E-Governance and accelerate induction of IT into critical sectors of the economy, the "Information Technology (IT) Act, 2000" was approved by the Government. It provides the legal and administrative framework for E-Commerce and E-Governance and places electronic records at par with paper based records through the use of digital signatures for electronic authentication. The IT Act spawned a number of initiatives such as Standardization of IT, Center for E-Governance in New Delhi, Government of India IT Ministry Department of Technology (DIT) web site, E-Commerce and Information Security, IT for the Masses to bridge the Digital Divide, Low Cost Multi-Media, E-Learning, etc.

E-Governance in India

1.15 One of the areas in which ICT is having a profound impact in India, is in the *way* the Government functions and the *manner* in which its services are made available to the citizens. The Government is in the business of handling and processing large amounts of information. The current Indian Government structures are characterized by vertically organized departments operating as separate silos unable to communicate with each other. This has led to inadequate

coordination between departments and the citizens having to approach different agencies in Government to get a job done or to get the desired information. ICT technologies are being used to break down the barriers between departments and bring about “*anytime, anywhere*” Government services to the citizens.

1.16 E-Governance in India is seen as having two basic components. The first component relates to the technology, which includes development of relevant application packages and building appropriate infrastructure. The second component relates to the diffusion of technology into actual use. While growth of technology is much faster, diffusion of technology into Indian society is rather slow as it is linked with the issues related to the mind set change, business process re-engineering and change management, to move from the present unstructured manual process to structured automated processes. In India, E-Governance is more than just a Government web site on the Internet. The strategic objective of E-Governance is to support and simplify governance for all, i.e. Government, Citizens and Businesses, and thus stimulate good governance for G2C, G2B and G2G interactions.

1.17 The Indian Government has adopted a four-phased E-Governance approach, which may be useful as a reference model for Jordan’s E-Governance strategy:

Phase-I: In the first phase, E-Governance means being present on the web, providing the public (G2C & G2B) with relevant information. Government information is publicly accessible; processes are described and become more transparent which improves democracy and service.

Phase-II: In the second phase, the interaction between the Government and the public (G2C & G2B) is stimulated through various applications. People can ask questions via email, use search engines, and download forms and documents any time of the day or night.

Phase-III: With Phase-III, complete transactions can be done without going to an office. Examples of Government online services are filing income tax returns, filing property taxes, extension and renewal of licenses, visa and passports, etc. Phase-III is more complex because of security and personalization issues, and digital signatures will be necessary to enable legal transfer of services. In this phase, internal (G2G) processes have to be streamlined or redesigned in order to provide efficient service, and the Government needs to pass new laws and legislation to enable paperless transactions.

Phase-IV: The fourth phase is when all the information systems are integrated and the public can get G2C & G2B services at one single counter. The complex aspect of reaching this goal is mainly on the internal side, e.g. the necessity to drastically change the culture, processes and responsibilities within the Government institutions (G2G). Government employees in different departments have to work together in a smooth and seamless way. In this phase, cost savings, efficiency and customer satisfaction reach the highest levels. (*Note, E-Governance projects need to start small, and scale up as benefits accrue and results start coming, in order to avoid any pitfalls and getting things right the first time.*)

1.18 The potential to serve 1.2 billion population is tremendous. With the commitment of the Indian Government to improving efficiency, coordination, responsiveness and service to the people, E-Government’s functioning is being extended all over the country. Community Information Centers and Techno-Parks are being set up as part of the Indian Prime Minister’s agenda for socio-economic development of the region; VSATs are being set up to provide

Internet connectivity. A National Resource Center has been set up for low cost, multilingual, multimedia content creation to promulgate its use for regionally diverse applications. Thrust is being given to E-Governance projects aimed at improving the lives of common citizens. An E-Governance Center has been set up in New Delhi for showcasing E-Governance applications and solutions. From railways to airlines, schools to offices, maintaining land records to crime records, computerized operations are bringing greater transparency and accountability, all aimed for the benefit of the masses. Technology development for Indian language programs is being encouraged, this will work towards bridging the Digital Divide with an increasing number of schools being put on the technology map. (*Note, details of the various State sponsored E-Government applications are provided later in this Report*).

Findings

- Many Indian states are now focussed on E-Governance, some have even begun to have a dim awareness of the possible political benefit of success.
- Many states have a vibrant IT industry, thanks to the IT boom, this has resulted in rich skilled human resource availability.
- Mushrooming growth of IT training institutions has led to ubiquitous (or omnipresent) training facilities, though of variable quality.
- Relatively inefficient existing Government systems imply very high efficiency benefit from use of ICT based solutions and anticipation of a high level of citizen acceptance.
- High levels of corruption lead to anticipation of a high level of acceptance by citizens of E-Governance even at significant transaction costs (however, this also implies a possible high threat of resistance from a section of Government employees).
- Transaction volumes for many Citizen-Government services are very high, thus vastly increasing the opportunity for transaction-fee based funding of projects even with relatively low per-transaction fee.
- Progressive State Governments like Andhra Pradesh and Karnataka have policies aimed at promoting E-Governance through transaction-fee based funding approaches.
- There are now many individual officers and personnel in Government who have the ability and inclination to play a leadership role in E-Governance at a departmental or sub-departmental level (these are called the “champions” and the “intrapreneurs”).
- Economic liberalization and fiscal meltdown in many Indian States has created an environment in which private funding for infrastructure projects is now accepted as an imperative.
- Recession in the US IT industry has led to increase of underemployed IT manpower in India.
- Globally, there is tremendous interest in E-Governance, but implementation is constrained by lack of skilled manpower, training resources and funding limitations.
- In short, India is uniquely placed to show dramatic progress in implementation of E-Governance - and there is a pot of gold at the end of that road for the citizen, the Government, the IT industry, and the financial institutions.

Summary Conclusions

- Success of E-Governance depends on the state of readiness of a society, e.g. enabling legislative environment, quality of training and support, software availability and spread; relative state of Government services (i.e. if Govt. is inefficient, any improvement would be seen in a positive light by the citizens).

- The mind-set of civil servants is a key factor (i.e. are they willing, are they mission oriented, are they “intrapreneurs” and “champions,” are they ambivalent, or do they have to be dragged “kicking and screaming”). Force-feeding is not a viable option since Government has to be responsive to democratic pressure.
- Although the huge Indian population was viewed as a disadvantage, running successful G2C/G2B applications in many States has turned out to be a windfall due to fee-based transaction volumes where E-Service became self-sustaining and took on a life of its own. This model has become quite successful in States like Andhra Pradesh and Karnataka, and has contributed millions of Indian Rupees into the State treasuries.
- The right balance has to be struck with regard to the social, political and economic milieu before implementing E-Governance. This is an intangible but important differentiation.
- The successful paradigm for E-Governance implementation effort is 45 percent on Change Management, 35 percent on Process Re-engineering, and 20 percent on Technology. The MoICT should revise their implementation strategy since the technology was done before process Re-engineering and Change Management.
- Identify “champions” in the key ministries and enlist their support to ensure successful implementation of the Secure Government Network. Back this up with continued skills development and training (see sections 3.11 to 3.13 on Capacity Building). A good start has been made with the recent Project Management training conducted at the MoICT by AMIR.
- MoICT should actively enlist support of the private sector in its E-Governance efforts. In India the costs of running most E-Government applications at the State levels are borne by the private sector; the Government has no overhead; the out-sourced contractors are paid based on transaction volumes (“by the drink”). Government provides the physical facilities and maintains sovereignty and security over the systems.
- Public Sector-Private Sector Partnership (PPP) should be stimulated in Jordan through an enabling legislative environment; E-Governance will not work without private sector support.
- Future E-Governance initiatives should start at the grass-roots level, and applications should be designed with the citizen in mind (“citizen centric”); and not for the convenience of Government only.
- Mass media campaigns on conveying the message clearly and showcasing E-Governance applications is an imperative in order to get the buy-in of the citizens (not just random newspaper articles). In India, this started at the village level, and worked its way up.

NOTE: *Detailed recommendations are found in the final section of the Report under “Conclusions and Recommendations.”*

Preamble

2.0 “ No longer can market forces be driven by objectives that are different from the demands made by the people from the Government they have elected. No longer can Government deliver the goods without using science and technology intelligence. Similarly, no longer can scientists and technologists pursue their objectives without harmonizing them with the needs of the market and the people.”

-- Honorable Atal Bihari Vajpayee, Prime Minister of India.

2.1 Leading economies of the world have recognized the importance of Information and Communications Technology (ICT) in catalyzing economic activity, improving governance as also the quality of life of citizens.

2.2 The ICT revolution that we are witnessing today has the power to unleash unimaginable opportunities to provide a better quality of life to the citizens. These possibilities are bringing new challenges to Governments to deliver better and more efficient services. Governments all over the world are, therefore, embracing ICT as an effective tool in catalyzing economic activity and providing effective governance so that citizens receive high standards of “customer care” from their Governments.

2.3 In the realm of E-Governance, we are at a stage where technology is not a major problem. Every “solution” is not a technological issue and it would be wise to leave the market and the private sector to take care of solutions for which technology is established. The role of the Government should be to facilitate “choice” to the industry and the user, and fill in the gaps where technology is too expensive to acquire on commercial terms, and a “variant” that is locally developed may be more useful.

2.4 The march towards E-Governance involves several public sector agencies led by the Government. Without a properly redesigned re-engineering of administrative procedures in the large number of agencies that touch upon the citizen, a “patchwork” of E-Governance could create more problems than it could solve.

2.5 With the emergence of IT on the national agenda of developing countries like India, and announcement of IT policies by State Governments, the “*convergence of core technologies and E-Governance*” have gained importance for good governance and sustainable development. In simple terms, “Convergence” can be defined as the convergence of “carriage and content” and involves convergence of terminals as well as integration of industries. Conceptually, the convergence of carriage and content, along with imaginative applications opens up tremendous possibilities for delivering a big basket to the consumer (or citizen), empowering him to choose multi-media information (e.g. voice and images) delivered through a common device. In India, the ICT sector has witnessed in the last five years a radical transformation from monopoly of operations, to a situation of vigorous competition with fast track liberalization of services and infrastructure.

E-Governance in Developing Country Context

3.0 Among the myriad wonders that the ICT revolution has ushered in, E-Governance is one of the most fascinating. It has become a buzzword in the media, Government and the IT industry. But what is the real potential of E-Governance? Is it, as some feel, a fantasy that State Governments and the Central Government have been pursuing with modest success? Or is it, as some others think, the magic “techno-wand” that can cut a swathe through the complex, sometimes unpredictable, maze that Government has become? To some, the ubiquitous spread of computers in Government offices is proof enough of the advent of E-Governance. To others, the availability of vast amounts of data at the fingertip or mouse tap, is evidence enough. To yet others, the ability to move vast amounts of Government information through computer networks almost instantly across huge distances, is a demonstration of the miracle that E-Governance has ushered in. To sceptics however, the lack of a measurable or tangible difference in the way Government relates to its citizens is a pointer to the irrelevance of E-Governance in real terms. The fragility of the infrastructure, particularly processing power, bandwidth and ISP infrastructure is also seen as a major stumbling block.

3.1 The following sections attempt to present certain perspectives on E-Governance. It is aimed at outlining the potential and pitfalls of E-Governance in a developing-world context. It is an attempt to look at E-Governance as a whole, not of a single department or line organization. It looks closely at the concept of E-Governance in which integrated Government services are provided through service centers cutting across departmental lines. This is not an attempt to pose questions and provide answers. Rather, it is an attempt to identify issues relevant to the adoption of E-Governance as envisaged above and present key insights. It is also an attempt to separate reality from myth.

The Role of Technology

3.2 Technological advances have made E-Governance possible. It is only natural that consideration of relevant issues begins with the role of technology. Today's technology allows speed and certainty in business processes. It also enables a transaction to take place both asynchronously and remotely. Technologically speaking, there are several options on how this could be done for any given transaction or process. These options have cost, security, speed, reliability and other implications. This section does not attempt to look at the technical issues involved. The idea is to look at certain implications of these choices when they are made. Most importantly, as different sub-systems within the Government get computerized and connected, the question is the degree to which subsequent technology options get constrained. Use of proprietary technologies, even if initially cheaper, in an unguarded fashion could result in a compulsion to follow the same technology route later resulting in higher costs and early technological obsolescence. This issue is particularly important because E-Governance is technology-intensive and is implemented in long drawn out stages. An adherence to open standards is therefore desirable. However, quite often there are tradeoffs between cost and openness (sometimes openness can be maintained only at high cost), and performance and openness. Sometimes there are de facto standards that are proprietary. Once one is locked in to a particular technology, the cost of maintaining it, upgrading it, replicating it and supporting it, can and do become prohibitive. So a careful balance has to be struck.

3.3 Another question is the extent to which the technical architecture of E-Governance needs to be determined in advance for the entire Government. Here the issues and problems are many. E-Governance is not so much a project as a process - a process of *changeover* from an older

system of functioning to a new one. Even if one were to view it as a project, it is a project that would be implemented over many years if one were to consider the totality of Government systems. Given the speed of technology evolution, any architecture that is laid down too much in advance has the potential of becoming both obsolete and an obstacle.

3.4 At the same time, unless some ground rules are clearly laid down, the possibility of the entire E-Governance process deteriorating into islands of information and processes that cannot interact with each other is very real. It is therefore a real challenge to lay down a minimal set of conditions which each implementation must comply with in terms of technology options, open standards and data structures. This has to be done so as to leave enough flexibility for each application to evolve as freely as possible with its own requirements in mind rather than be constrained by external or larger constraints. This is essential keeping in mind that different applications are developed, led and implemented by independent sets of people at different places and different points of time for completely unrelated activities each having its own objectives, compulsions and decision making process. What is that minimal set? It is quite possible that there may not be a perfect answer to this question. It would, however, appear that erring on the side of minimizing the set of ground rules with the hope of resolving any interconnectivity problems through appropriate technological intermediation subsequently, would be better than excessive specification to cover all possible problems envisaged in interconnectivity.

Process Re-engineering

3.5 The world over, ICT has led to flatter organizations and dis-intermediation apart from speed and certainty in transactions. E-Governance, therefore, offers immense possibilities of re-configuring Government and Government processes so as to increase speed, convenience, access, certainty and transparency from a citizen's point of view and optimizing the cost of Governance. A major question which implementers face in each application development is the extent to which the "look and feel" of the existing manual application, even if unnecessary in a computerized scenario, should be retained. Complete process optimization at the very first stage of implementation might seriously compound the problems of change management (see next section). The greater the change from what people are familiar with, the greater the degree of resistance to the change and the greater the investment needed in terms of time and effort to get people to agree to the changes proposed. On the other hand, unless some changes are incorporated to derive the best advantage that the new technologies afford, there may not be enough improvement from a citizens or user's perspective. Employees react favorably if they find that a new system is easy to learn and reduces their work or drudgery. *The right balance between too much change and too little change is one that every implementing group has to strike very carefully taking into account the totality of circumstances and all relevant factors including those mentioned elsewhere in this section.*

3.6 In the Government, processes are designed to first ensure accountability and control. Delegation is often the first casualty of these priorities in a manual system. E-Governance offers a unique opportunity in Jordan to combine a very high level of delegation/decentralization with complete accountability and control. Centralization of powers in order to ensure proper control becomes unnecessary. ICT based systemic controls and safeguards would ensure a much higher level of control than centralization. Even otherwise, developing-country Government systems and processes in general are archaic and have become complex over decades of evolution. Each distortion or misuse of the system, real or imagined, has produced a further tightening of the

procedure. Over a period of time, many of these procedures have become quite redundant and irrelevant. But rarely have these procedures been subjected to a searching review aimed at a clearly defined goal. A zero-based review of procedural requirements for every process in Government is thus a necessity in any event. E-Governance offers a unique opportunity and occasion to do just that, with the added bonus of being able to throw away most of the procedural fat without any detriment to accountability and control. It affords a great opportunity to cut a swathe through accumulated red tape.

Change Management

3.7 Managing the changeover to an ICT-based system in terms of winning the battle in the minds of the employees who will man the system is by far, the biggest challenge in E-Governance. If one were to hazard an estimate of the relative importance of change management vis-a-vis process reengineering and technology in successful transition to E-Governance systems, one would say that 45% of the task lies in effective change management, 35% in process re-engineering and hardly 20% in technology, per se. *It is precisely for this reason that in successful E-Governance projects, the preferred project leader has always been one who has been in the organization/department and who has a deep understanding of the processes and people in the organization.* Extensive domain knowledge is at least as important as the knowledge of technology or the potential of technology in relation to the line functions of the department/organization. The ability to motivate and enthuse the staff, the ability to communicate the purpose of the change, the ability to make employees see computerization as non-threatening to their own future and something that will make their own job easier, are vital capabilities needed in a team leader. Intense internal contact (for example, the Registration department computerization project in Andhra Pradesh-India, entailed over 250 internal meetings), positive media coverage, appreciation from top functionaries and colleagues -- all go a long way in achieving success.

3.8 In the Indian context in particular, it was important for managers to make sure that employees did not perceive E-Governance as a threat to their livelihood. A clear statement by the Government that existing employees will not lose their jobs was necessary to elicit their whole-hearted support. Sometimes corruption was also the fountainhead of various competing forces that see the high levels of transparency that computerized systems afford as a threat to the non-transparency and indefiniteness in Government that breeds corruption. However, from a tactical point of view, it was probably necessary in India to de-emphasize the impact that E-Governance has on corruption in order to minimize powerful, motivated opposition to computerization. In fact, an NGO that evaluated the performance of the G2C land./title registration CARD system in Andhra Pradesh noted that it had not greatly diminished corruption, though there had been a significant impact on it. This, the study noted, "was fortunate because it was probably one of the factors that enabled the project to succeed!" (because if corruption had been rooted out easily by the new system, its value would be diminished in people's minds and usage may have gone down). In general, the fine-tuning of a system to combat corruption should probably be a later innovation, after the system has stabilized. This is a judgement call that needs to be taken in each case with reference to the specific circumstances prevailing in that department/organization. In fact, this is believed to be a major reason for some of the notable failures in computerization.

Conveying the Objectives Clearly

3.9 It is vital to clearly convey the overall objectives of E-Government computerization of a particular activity to both the public and employees, in terms understandable to a layman. For

example, one could say that the objective of computerization of the transport department's driving license service is to issue a learner's license in twenty minutes. Or one could say that the objective of computerization of sales tax registration is to enable a person to get a registration in ten minutes, etc. This mission statement not only helps sell the concept to the general public, media and employees, but also forms the reference point for all the numerous decisions needed in the course of implementation with respect to technology, process changes, etc. For example, in India, the failure to make such an explicit statement in one of the states, created difficulties in the computerization of land records all over the state. Computerization was seen as a self-explanatory objective, which it is certainly not. There has to be some more convincing reason to spend the huge sums of money needed for computerization than simply to adopt new technology. If the objective was to ensure that a citizen could get his certified copy of his land record across-the-counter, then this should have been stated. In the old process in India, a farmer got a certified copy from his village officer at the village itself and then had to get it countersigned by a Deputy Collector at the District level. This would have been compared with the convenience (or inconvenience) to the farmer, if the computerized records enabling "instant delivery" entailed a trip to the village headquarters or not. The process may be instant, but the service from the standpoint of the farmer, is less convenient. *Clear objectives stated in non-technical terms, help retain a clear focus throughout the implementation cycle among all those involved in implementation.*

3.10 Such clearly defined goals will also help garner people's support for E-Governance initiatives. Quite often, E-Governance is either a competitive fad among Governments or a passion of particular individuals, be they political leaders or officials. E-Governance is too important for it to be perceived in that manner, or for it to remain so. It needs broader support among political parties, media and the public, much like the consensus that has emerged on liberalization, for example. A good way to start could be to make "service standard" as the sole criterion of assessment of success of E-Governance projects that provide services to citizens or firms. Further, mechanisms need to be evolved to critically analyze implemented projects in terms of achievement of initially stated objectives.

Capacity Building for E-Governance

3.11 E-Governance cannot be implemented entirely using external competencies. While key technical skills can and should be outsourced, E-Governance demands skills from people in the Government that they do not normally possess and that they are not required to possess. Some individuals acquire such skills or capabilities because of their own interest. But for E-Governance to be adopted on an extensive scale, it cannot depend on chance; i.e. a few individuals who happen to have acquired the requisite skills on their own initiative. They are too few anyway, and there could be gaps in their skills, which they may not even be aware of.

3.12 The question that arises is, what are the skills needed? Highly technical skills like complex programming or data base management techniques or communication system skills would obviously need to be outsourced. But if we turn our attention to the skills needed in Government itself, they can be categorized into four categories:

(a) *Simple computer operations*, like use of word processor, spreadsheet, database, power point, Internet access, etc. that could broadly be classified under skills needed by individuals to use the computer as a productivity enhancing tool or to access knowledge. All staff, except office

attendants need these skills. Proficiency levels needed and acquired would depend on the nature of a person's assignment and his aptitude;

(b) *Basic operational skills*, needed by departmental staff to operate a customized package to carry out line functions in a computerized environment;

(c) *Project leadership and management skills*, needed to carry a computerization project from conception stage to full scale implementation stage; and

(d) *Policy making skills*, that are needed to define and develop the policy environment in which E-Governance is adopted.

3.13 Each of these skill sets are needed at different levels and for different categories of employees, depending on the function that they are expected to perform in the E-Governance effort. *A systematic program to build the necessary skills that is very precisely dovetailed with the implementation plan is critical to successful implementation.*

Prioritizing & Financing Government Services

3.14 One of the key ingredients of success is to get a buy-in from all stakeholders. Prioritizing citizen services (including services to companies and other juridical entities) is the best way of achieving this. It also brings other benefits, in terms of various financing options and external stabilizing influences that are necessary to keep an E-Governance project on track in the early stages of its development and implementation, as well as to build public pressure for rapid replication. In a sense, it is a "critical national infrastructure." For example, applying some of the concepts of infrastructure financing for E-Governance can vastly speed up implementation by providing adequate funding while at the same time ensuring better targeting of IT spending (i.e. on projects where people are ready to pay for the service provided on a self-sustaining basis). Similarly, applying the concept of infrastructure project development for Public-Private Partnership (PPP) can help prepare an E-Governance project for funding as a bankable proposition. International organizations like the World Bank, ADB etc. and national organizations in India (like IDFC, ICICI, IL&FS), play a major role in accelerating the pace of change as well as the very paradigm of such change.

3.15 Budgetary funding does have its limitations both in terms of the quantum of resources that can be allocated for such purposes as well as the timing. Moreover, the budgetary process places a greater emphasis on expenditure than on the actual result, and this sometimes leads to distortions like heavy accent on hardware. In extreme cases, budgetary allocations could be driven by hardware industry pressure as happened recently in Japan. This reduces the optimality of resource utilization. External funding mechanisms based on "non-recourse" financing (i.e. repayment only through project revenues) also have the advantage of bringing in strong external forces that steer project implementation in such a way that the original objectives are not lost sight of. The importance of this aspect cannot be over-emphasized in an environment in which officials and political heads --and consequently objectives-- change during the course of project implementation. Operational costs of an E-Governance system are high when compared to a manual system if the possible saving in manpower costs is not factored in. Budgetary constraints or delays could kill a project through benign neglect. A project that is funded (at least in respect of recurring costs) from project revenues has built-in safety features that ensure continuity.

Role of the Private Sector

3.16 Technology, entrepreneurship and increasingly, financial and skilled human resources are found more abundantly in the private sector. E-Governance is cost, skill and quality intensive. It is evident for these reasons alone, that unless a suitable framework is evolved for the active participation of the private sector, the true potential of ICT cannot be tapped for E-Governance. This applies not merely to implementing projects, but also in conceptualizing projects. *An environment needs to be created in which the private sector can bring in super proposals which are self-financing, and be allowed to implement such ideas.* It is not difficult to create such a framework if the broad political mandate exists. This again, should not be difficult, given the broad consensus today in favor of private sector participation in infrastructure, and increasing marginalization of the public sector.

Issues of Sovereignty and Security

3.17 The involvement of the private sector in implementing projects that run core Government systems and that actually front-end Government citizen interface raises the question of the extent to which outside agencies can be involved in discharging sovereign functions. For example, with E-Governance, it is quite possible that a car sales agency could directly log in and register a vehicle ownership if the system were to be so designed, and the agency acquired the requisite permissions to effect such transactions. Some people are troubled by this prospect. They feel that such license should not be given to private agencies. But the bottom line is that the core computer systems and the data should remain in the custody and possession of Government, both legally and in actual practice. Connectivity to external agencies and authorizing them to carry out some transactions is possible with almost complete security. The key concept is that sovereignty lies in controlling the decision-making process and in taking the decisions and not in conveying them. Once this conceptual framework is appreciated, many irritants in providing convenient Government services could be minimized or eliminated. A major project in one Indian state had to be abandoned because this was projected as "privatization of Government" and "loss of sovereignty". While there are certainly security issues that arise when external entities are allowed to connect to Government computer systems, they can be suitably addressed during implementation.

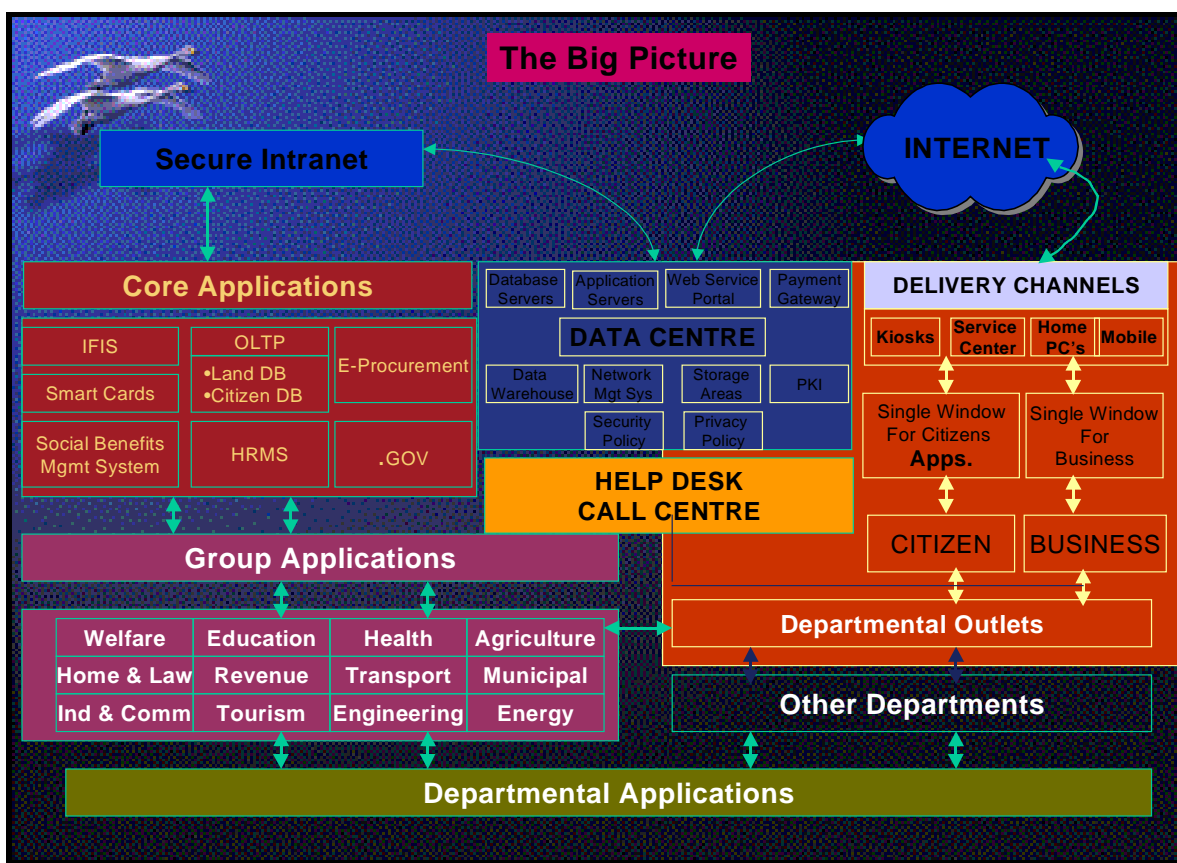
Three-tier Architecture

3.18 The de-linking of the point of provision and point of availability of a Government service, both in terms of location and time, is made possible through a three-tier (or n-tier) architecture. This consists of the *back-end* systems (computer systems running in a given department), the *middle ware* (consisting of computer networks, Value Added Networks, ISPs and so on) and the *front-end* systems (service centers, Internet kiosks, etc.). Such an arrangement enables various services to be provided in an integrated manner through a single service point. Crucial questions arise in the implementation of this model. What should be the role of the private sector in each of these three segments? What should be the role of Government employees at the front end? Who should control the middle ware? The most complex part of this architecture is the middle ware. It is most intensive in terms of technology and cost. The question is what the extent of private sector and Government participation in this middle ware should be. Also, since this cost is least scalable and most lumpy, the other question that arises is whether

exclusivity should be allowed to the service provider and on what terms. These are critical issues. There are good answers to these questions, but some amount of innovation may also be necessary. The front end raises another question. Should Government employees necessarily man it? In theory, obviously it is not necessary. In practice, however, that may need to be an intermediate stage before the private sector is allowed to man the front end.

3.19 Yet other questions that arise in this model are the nature of the organizational entities needed. The back-end could be a departmental resource, run by the private sector on a license or franchise. Various privatization options like BOO, BOT, BOOT, lease, etc. are possible. The middle ware could be a company with significant but minority Government share holding. The front end could be a franchise or a license or a single corporation. These are only possibilities. Various other options could be thought of, but the idea here is not to present the ideal option, but rather, to give a feel for the kind of issues that need to be considered before arriving at an implementation model.

3.20 Most importantly, whatever model is adopted, it has to take into account the fact that different departments would join in at different points of time in using a common front end to deliver services. These back ends would use different technologies and would be undergoing constant technological changes. The middle ware and the overall architecture has to be robust and flexible enough to cater to such a scenario.



3.21 “Convergence” is another major technology trend that alters the framework for E-Governance in a fundamental way. When technology is converging entertainment, education, e-commerce, telecommuting, communication etc. into a common pipe, it can be expected that E-Governance would also follow suit. Hence delivery of E-Governance services will need to use the same infrastructure, whether in the form of the same bandwidth pipe or the same service

outlets (kiosks) in order to derive the cost and spread advantages that the convergence engine will produce. If it fails to do so, the costs of E-Governance services will suffer in comparison to similar services by private sector. Is there any logical reason why the same converged pipeline should not be used by private entities like cinema halls, transport companies, travel agencies, consumer product distribution agencies and so on as well as E-Governance services? In a developing country scenario, it makes sense to recognize the inevitable, and use E-Government to provide the critical or base demand that helps drive the creation and spread of convergence infrastructure. This also opens up the possibility of unconventional revenue streams like on-line advertisement to cut costs of E-Government services and perhaps even offer them free of cost to the citizen. On-line education (E-Education) and on-line health and information services (like agricultural product prices) could have high potential in rural areas where access to high quality information and services is relatively poor. Some of these services are also bandwidth intensive and could lead to demand-driven Internet infrastructure creation.

Policy Formulation

3.22 The issues involved in realizing the dream of E-Governance are truly complex and innumerable. But unless the framework for a grand coalition between Government, the IT industry and infrastructure financial institutions is evolved that can concertedly work towards the goal, progress could be sporadic and unsustainable. The impetus for this has to come from the Government and that too, at the highest level. Developing countries that have made significant strides in this area have done so because of the strong thrust given by the leadership. Some of them, like Malaysia have faced problems because of lack of adequate skills within the country and the bureaucracy. India is uniquely placed because it has the competencies within the country to meet the challenge and in the process create a huge domestic opportunity for the IT industry as well as create a powerful Government-industry combination that is capable of rolling out the process in other countries. E-Governance could also accelerate the process of adoption of the new technologies by the private sector in the country and help them to take advantage of India's successful IT industry to improve their own competitiveness. Moreover, unless Government also adopts ICT-based systems, there are limits to the efficiencies that even the most progressive private sector company can achieve in their international transactions.

3.23 Creating such an enabling environment that allows the IT industry to bring to bear its competencies on the efficiency of Governmental processes needs a carefully thought out strategy and a mechanism that continuously corrects the strategy based on experience, technology trends and suggestions received from industry and experts. A suitable institutional framework for this purpose is absolutely inevitable. This institutional framework would not only evolve policy guidelines that create such an enabling environment, but would also lay down core standards in terms of technology and data structures that are essential for linking different applications and organizations at Central, State and local Government levels. Moreover, since Government consists of several departments and organizations each having its own decision-making mechanism, the institutional framework will have to evolve a collaborative method of achieving its goals. The institution will also need to evolve a system to ensure continuity of goals and the strategy adopted to achieve them. While some progressive states in India have already created structures within the Government to address many of these issues in a structured manner, some other states may need some help to do so. The apex decision making setup in Government, both at the State and Central level needs to be structured to deal with the complex issues involved. If a concerted strategy is not worked out, it is possible that experimentation may lead to unforeseen problems or expensive failures or modest successes that are not replicable or sustainable. The

danger of a perceived failure is that it may cause a wholly undeserved scepticism of the real potential of E-Governance.

Conclusions and Recommendations

4.0 In India, the cost of E-Governance is passed on to the user (citizen) on a “not-for-profit” basis, creating a financially stable equilibrium or “local loop,” where “profits” are re-invested into upgrading and modernizing the E-Services. As IT applications proliferate, capital costs need to be refinanced due to the finite lifespan of mechanical devices (i.e. computer equipment), therefore E-Governance must be self-sustaining. Once costs are passed on to the consumers it serves as an “insurance policy” where Government can provide value-added services for which there are “takers.” A lot of innovation and experimentation is going in India; return on investment is not the only criteria but the Government requires that all States have a Business Plan behind any proposed E-Governance initiative. In summary, the following are encapsulated conclusions and recommendations:

- Despite the tremendous opportunity and even with all the advantages listed above, there are major hurdles to be crossed before unlocking the potential of E-Governance.
- Capital cost of E-Governance is high; cost of maintenance is also high. Private investment with user fees was the only solution in India. In Jordan it may be possible to have other financing options due to its small size in comparison to India -- the orders of magnitudes for E-Governance in Jordan are much smaller. Structuring E-Governance to enable private investment is also a complex undertaking – there must be confidence in the private sector that the Government is doing the right thing.
- If the ultimate objective of E-Governance is defined as “Government-on-line,” breaking up the task into manageable bite-sizes (E-Governance projects), each of which can be tackled more or less independently, is itself a major endeavor. Each such project would have technical, financial, management and risk-related issues. These need to be considered.
- In addition to the vast number of citizens or businesses who would be expected to interface with the Government as users through the E-Governance systems, each E-Government project would involve one or more departments, several external organizations, financial institutions, and so on; i.e. multiple stakeholders with different priorities.
- Apart from the multiple stakeholders/entities involved, if E-Governance is considered as provision of services through a remote single window, consideration should be given for disaggregating the project into the front-end, back-end and middle-ware, entity-wise; and structuring the technical, financial and managerial parameters in a self-sustaining and coherent manner.
- The MoICT should create and demonstrate a “value-proposition” to all the entities involved, getting their active participation in the effort rather than a passive concurrence (if not violent opposition!); this is essential for successful implementation.
- Considering that the starting point of E-Governance services is back-end computerization of Government departments, identification of specific Government departments and specific offices in each department is a pre-requisite (e.g. which department to start with, if it’s the finance department which sub-treasury should be done first). This process-reengineering analysis needs to be done through key individuals within the organization who can provide the internal leadership that E-Governance projects need.

- A concerted effort should be made to identify “*intrapreneurs*” and “*champions*” within the Government (as defined above); nurturing them and utilizing them is a prime requirement for success.
- The relative importance and thus level-of-effort for change management, process re-engineering and technology, for successful transition to E-Governance is:

*45 percent of the task is in change management,
35 percent is in process re-engineering, and
about 20 percent in technology.*

- Jordan cannot afford to lag behind this worldwide phenomenon and must carry forward its E-Governance initiatives in a concerted manner. The MoICT, as the chief architect of Jordan’s E-Governance movement, should work closely with state and local Governments and the private sector to build “citizen-centric” applications and appropriate models on a pilot basis to provide efficient and reliable service to citizens. The MoICT should set up a “Center of Excellence for E-Governance” with the objective of showcasing pilot E-Government applications and identifying best practices so that citizens can “kick the tires” before deciding to buy-in. This should be done through running the applications and conducting seminars on E-Governance technology, system architecture, data base design, E-Governance solutions, and mass media PR campaigns.
- India has a population of 1.2 billion, monopolistic Government services, resistance to IT induced transparency, rigid departmental barriers, fear of accountability and loss of “corruption benefits.” Still, India was able to find the “political will” to launch E-Governance reaching out to several hundred million people. This mission concludes that Jordan, with a population of 4.9 million (240 thousand times smaller than India), can easily and systematically adapt some of the successful Indian practices. Emphasis should be shifted from simply “automating the Government,” to developing “citizen centric” applications keeping the average citizen or farmer or small businessman in mind (i.e. grass roots level). The buy-in for E-Governance should come not only from participating Government Ministries, but more importantly from the citizens. This is what India had done and it seems to be working.
- Indian state government officials are receptive to hosting orientation visits and E-Governance seminars for the Middle East Region. However it must be kept in mind that most of the states have a very thin establishment for E-Governance and there would be practical constraints on the number of delegations that they could entertain in a year. Therefore the specific details should be worked out very carefully keeping the logistics in mind after consulting the states/ ministries in advance.

(end of main Report)

Major E-Governance Initiatives in Selected Indian States

ANDHRA PRADESH STATE

The edifice of the Government of Andhra Pradesh (AP) has E-Governance as one of its founding pillars. The state aims at developing a system capable of administrating with minimum controls and maximum efficiency. The state cherishes the vision of establishing a SMART (Simple, Moral, Accountable, Responsive and Transparent) -Government.

E-Governance is one of the vehicles used by AP in reaching the goal of SMART governance, which is an arduous task. The AP Government has adopted a pragmatic and graded approach in various G2G and G2C services. The following major IT Projects illustrate this:

Government to Government (G2G) Initiatives

- **APSWAN (Andhra Pradesh State Wide Area Network)**: The APSWAN connects the Secretariat, Hyderabad, with all the 25 district headquarters and two other important towns, Vijayawada and Tirupathi to meet the data, voice and video communication needs of the Government. A 2 Mbps optic fiber backbone has been laid connecting the Secretariat, Hyderabad with 25 cities/ towns across the State
- **Video-conferencing Facility**: The Government uses the video-conferencing facility to discuss topics ranging from the state's environment program, the farmer's bazaar (Rythu Bazar) schemes, price monitoring and implementation of road works to sanitation and public health schemes apart from the power generation and water levels with field functionaries from across the state. Inaugurated on November 1, 1999, it is capable of providing around 200 hours of conferencing facility per month
- **gov. (Secretariat Knowledge Information Management System)** The gov project was initiated with a clear objective of effectively managing the vast wealth of information and knowledge available within the Secretariat to increase employee productivity & satisfaction, automate the workflow in the Secretariat and patronize work areas. This is considered a world-class product designed to manage the knowledge and workflow in the Secretariat. Implementation is currently in progress.
- **IFIS (Integrated Financial Information Systems)** Automates the accounting needs of the Treasuries Department in the State at 25 district treasuries and 300 sub-treasuries and monitors the revenue and expenditure of the Government. The 25 District Treasuries and 300 sub Treasuries have been computerized under this project
- **APDMS (Andhra Pradesh Development Monitoring System)**: The APDMS is a GIS-based system, which has created base maps of all the 1,125 constituent revenue villages and habitations. Apart from basic data, a suite of application, which superimposes thematic data on the road network, community infrastructure, basic demographic data, soil and geomorphological data is also a part of the project. The information is available on the Internet and provides a good support to research, analysis, project design and monitoring in the area of development planning.

Government to Citizen (G2C) Initiatives

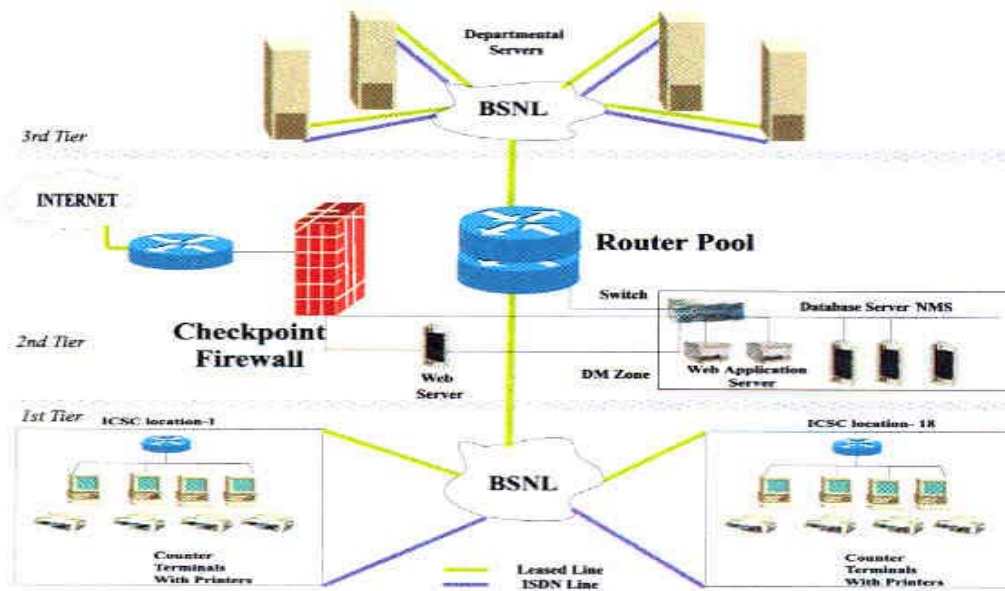
The Government of Andhra Pradesh has taken on a number of initiatives to promote the use of Information Technology for providing better services to citizens. Information Technology is used as a strategic tool that enhances efficiencies in Government very significantly. The Andhra Government has recently inaugurated its showcase E-Government application “CARD,” for the Registration and Stamps Department, and has made substantial progress in implementing the CARD Project. The project is one of the most important projects taken up for visibly demonstrating the benefits of Information Technology to the common citizen. The CARD system has accomplished the computerization of about 212 sub-registrar offices in the state in a short period of time.

In looking at the future, the entire paradigm of governance in Andhra Pradesh is likely to change in the next millennium. The delivery of Government services to citizens will be highly personalized and cost effective in the years to come. The Government of Andhra Pradesh is making significant efforts to prepare for the emerging challenges and opportunities of the Information Age. Projects like CARD will play a vital role in demonstrating the efficacy of using IT solutions at the point of contact between Government and citizens.

The Andhra Government believes that while Information Technology holds immense potential, it also calls for a change in the mindset of those using it. Implementation of IT based solutions have to focus as much on *humanware* as on software and hardware. Training of personnel and institution of proper procedures and systems for efficiently delivering services are being given as much attention as technological aspects. The Andhra Government has taken pains to develop necessary training literature which will help in enabling the success of the entire project. Following are some of the major E-Governance projects in Andhra Pradesh:

- CARD (Compute-Aided Administration of Registration Department): This project was introduced to quicken the process of registration of deeds. Under this system, citizens can complete the process of registration of their deeds within an hour. *Acclaimed as the best example of E-Governance in India*, the CARD project has registered more than 2.5 million documents in two years at the computerized centers in Andhra Pradesh. Around 214 registration offices have registered over 2.5 million documents in 2 years.
- E-SEVA (Electronic Services): The objective of the e-SEVA project is to provide integrated citizen services in a single window mode. It provides the citizens of the twin cities of Hyderabad and Secunderabad, selected services and information of departments and agencies of the State and Central Governments, including the payment of utility bills, issue of certificate and provision of information useful to the citizens. It is a one stop shop for over 30 G2B (Government to Business) and G2C (Government to Citizens) services. 30 services of several State/Central departments are offered at 16 locations. Shortly being extended to 150 centers in the State.

eSeva Network Architecture

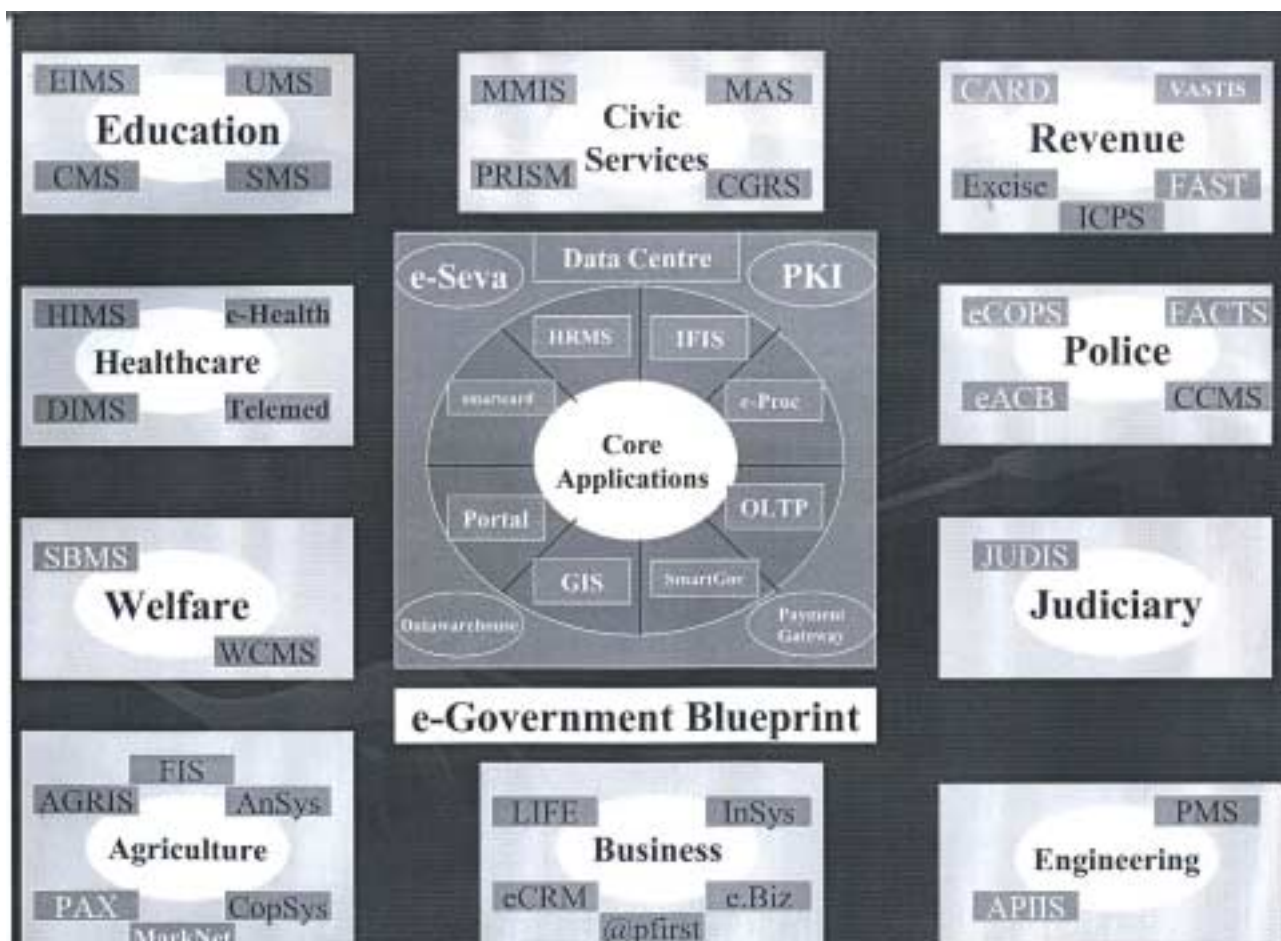


Employment of High-End Technology

eSeva is based on a 3-tier architecture. The transactions are done on a real-time basis. The servers of different departments are connected to the Data Centre located at Khairatabad, which is in turn connected to different **eSeva** centres. The leased lines, with a back-up of ISDN lines, connect the departmental servers to the **eSeva** Data Centre. Transactions done in the **eSeva** centres are recorded directly on the server of the department concerned, after duly processing or accrediting the same in the central server.

Security of Transactions on the Net

Multiple levels of high-standard security are followed while processing the transactions. Access is restricted to authorised users only. The Internet users have to be cleared by a 'firewall' before they can gain access to the database of the systems.



- **FAST (Fully Automated Services of the Transport Department):** The FAST project is aimed at providing all transport department services like issue of learner's licenses, driving licenses and registration of vehicles through a comprehensive, network solution. Pilot Projects implemented at three PTO offices at Secunderabad, Vijayawada and Chittoor. Over 80,000 transactions processed as of January 2001, being extended to 34 locations across the state.
- **OLTP (On Line Transaction Process):** The project is designed to vertically and horizontally integrate all departments and agencies of the Government. The project aims at streamlining all the information and service processes of the various departments from the village to the State level, with the village office as the focal point or hub, to enable easy access.
- **MPHS (Multi Purpose Household Survey):** MPHS has created a database of the socio-economic data of all citizens of the state. It provides services related to land records, citizen data, public distribution system, etc. It has been implemented at a cost of US\$20 million, at 1,125 villages – the grass root level of administration.
- **Andhra Pradesh Portal:** The Government of Andhra Pradesh is developing a comprehensive and web-enabled service portal with the assistance of Gartner Group, that would act as an electronic gateway into the Government's portfolio of services. The portal would provide a host of features which include:

- Information services
- Interactive services
- Payments
- Extension services
- Links to other Governments web sites
- E-Procurement.

The Portal is scheduled to be launched shortly.

Other Initiatives in Andhra Pradesh

- **Local Language Initiative:** A committee (headed by the chairman of the Official Language Commission) to design and develop standards for the use of Telugu (our local language) font on computers, have made a number of recommendations as the standards for using Telugu in computers. The government will implement the same to promote use of computers in rural areas.
- **Computerization of departments:** The state government has prioritized departments and agencies on a rational criterion for computerization to successfully meet the objective of its e-Governance project like:
 - Improve quality of citizen services.
 - Improve internal effectiveness of a Government department or agency.
 - Better enforcement of law
 - Promotion and Outreach activities
 - Education and Information
- **Collectorate 2000:** The Government is computerising all the 25 collectorates of the state by developing common software with the following objectives:
 - Provide computerised interface for citizens for all needs
 - Work flow automation of all standard licensing and permit procedures
 - Dissemination of Information useful to citizens
 - Monitoring of all development activities
- **Internet Policy:** The entire State Secretariat work-place comprising of 2,000 nodes has been brought into a LAN with a bandwidth of 10 Mbps to 622 Mbps over optic fibre cable.
- **E-mail Policy:** Presently all employees of the Secretariat have access to e-mail facility and the same would soon be available to all the offices at district level.
- **Data Warehousing:** The Data Warehousing project being jointly implemented by the Andhra Pradesh state Government and C-DAC, Pune, has two core objects: Person object and Land object.

The main source of data for these core objects is the MPHS data and land records data. The data has been loaded into PARAM, the Indian super computer. The Web-enabled data will be made available to all Government agencies for planning and analysis. The person object has information like name, father's name, sex, religion, caste, occupation, while the land object contains name of owner, extent of land, nature of land, nature of crops raised, type of irrigation source, etc. Different types of analysis can be made on both the objects with different permutations and combinations.

- **Electronic Kiosks:** The Government will encourage the setting up of a large number of kiosks on lines of public telephone booths for two purposes:
 - i) To serve the information needs of citizens
 - ii) To provide employment to large number of educated youth.The demand for such kiosks is assessed to be 50,000 in Andhra Pradesh.
- **Chief Information Officer Programme:** The Government of Andhra Pradesh in association with the Indian Institute of Management, Ahmedabad, and the Satyam School of Applied Information Systems, International IIT Hyderabad, has designed a unique Advanced Management Programme in Information Technology and Electronic Governance. The Program is unique, not just for its first-class pedigree, but also because it envisages a direct linkage with a live e-Governance project implementation in the State. The program contrasts theory and practice, academic rigor and pragmatic realism.
- **Center for Good Governance:** The Government has initiated a Center for Good Governance to be a focal point for the HRD required for good e-Governance projects and conducting research and training on methodologies and technologies appropriate for these projects. This project will be useful to other Governments too.
- **IT Architecture, security policy and PKI:** To meet the multiple objectives of evolving a common IT architecture for an integrated approach in IT implementation, defining a comprehensive security policy and catalyzing the establishment of Public Key Infrastructure (PKI) within the State. Price Water-House Coopers (PwC) has developed the overall IT architecture for implementation. They have used 56 principles, 156 best practices, 80 standards etc., for implementation e-Governance Projects.

Opportunities for Public Private Partnership

Considering the scope e-Governance has, the Government of Andhra Pradesh invites private sector participation in implementing various projects outlined in the IT Policy. The need for high quality service, pace of implementation, need for cost effective solutions and need for efficiency and accountability are some of the factors that have prompted the initiative for Public Private Partnership.

Scope and opportunities in this area are immense, as the environment for investment in these areas is highly profitable. These are many advantages like a pro-active Government, abundant IT skills in the private sector, inexpensive connectivity and administrative reforms. Opportunities exist in the area of IT Architecture, framework of security etc. The Government identifies many opportunities within the G2G (Government to Government), G2B (Government to Business) and G2C (Government to Citizens) interfaces. These are initiative already underway in these areas. The forms of Private Sector Partnerships that are invited, are in the form of concession contracts – Build, Operate, Own (BOO) Build, Operate, Transfer (BOT) and Build, Operate, Own, Transfer (BOOT) format, levy of user charges, joint ventures, partial privatization and partnership with strategic investors.

(end of Andhra Pradesh)

KARNATAKA STATE

The Karnataka (“Millennium”) IT Policy

Karnataka is in the forefront of Information Technology and is called the Silicon State of India. In addition, the state capital Bangalore has shown tremendous growth in the IT Sector and is the IT Capital of India.

Karnataka was the first state to announce IT Policy in the year 1997. This policy has acted as an important catalyst for the growth of IT Industry in the state. The industry however is growing in leaps and bounds. The type and nature of business are rapidly expanding. Karnataka is becoming the center for more and more companies in sophisticated IT Products and Services. The value addition from IT Professionals of Bangalore is at the higher end of the spectrum. The cost of technology is dropping and technology itself is advancing exponentially. Thus, the prices of the new products are dropping rapidly and the same products are becoming more intelligent. IT usage is becoming more widespread and relevant. It is necessary to re-focus on the IT Policy and define it in a way that is most suited for the present. Hence the Government of Karnataka announced their “Mahithi,” which is called their “ Millennium IT Policy.”

Objectives

Objectives of the Millennium IT Policy are:

- To utilize the power of Information Technology in the overall goal of the Government of Karnataka in eradicating poverty and empowering women.
- To effectively reduce unemployment by absorbing the major share of educated youth into IT Industry.
- To promote the usage of Kannada (the Regional language) in Information Technology.
- To use e-governance as a tool and deliver a government that is more pro-active and responsive to its citizens.
- To unleash the Karnataka Incubation engine
- To encourage business with non-English speaking countries, and,
- To maintain the pre-eminent position of both Bangalore and Karnataka in the field of Information Technology.

Center for E-Governance

1. While substantial progress has been achieved in several departments, the Government has established a Center for e-Governance under the department of Information Technology. This Center facilitates the use of Information Technology for the common man, rapidly and effectively. It provides technical support to all the Government departments in their IT Projects. It plays a vital role in coordinating with Government departments as well as undertaking a few critical projects that are likely to be used in more than one department.
2. A few important initiatives in the e-Governance are:

“Mukhya Vahini” Project

3. Karnataka State has a decentralized set up in which people do not have to come to Bangalore (the capital) for their day-to-day routine business. Most decisions are taken at the village and district levels. It was however felt that an exhaustive database needs to be developed at a single point and be made available to all the decision makers in Karnataka. A comprehensive database is being developed and portions of the database will be made available to respective decision makers. It is also planned to analyze the data in an intelligent manner and provide a sophisticated decision support system for the use of the Chief Minister. The Government has already commenced a systems requirement study on the project.

Education Department

4. The Government of Karnataka's commitment to education shows up in the projects implemented here. The department already has a computerized payroll accounting system of all 250,000 teachers in the state. The details of over 180,000 students who take High School / Pre-University (SSLC, PUC) and university examinations have already been computerized and the results of are made available on the website. The department has used IT in Common Entrance Test for professional courses in an astounding manner. The Common Entrance Test is conducted by the Government of Karnataka for admitting students to professional courses in engineering, medicine, dental courses. Over 55,000 students appear for these examinations every year seeking admission to more than 128 colleges covering 27 courses. More than 20,000 students from outside Karnataka State also participate in the process. The examination is conducted in a most transparent manner. The students are admitted by computerized counseling process, the best ever designed in any education system in India.

Bhoomi Project

5. The record of rights (RTC) play a vital role in the life of farmers. The records are required for establishing ownership of land, for recording the succession of ownership, for recording the agricultural crop details and for obtaining loans from banks. The land records of all the villages in Karnataka have already been computerized. Immediate steps are being taken to make these computerized land records available to the villagers.

Nondani Project

6. This project is aimed at making land registration simple and easy for the citizens. People go to the sub-registrar offices for registering sale deed, mortgage deed, etc., as well as for an encumbrance certificate. This process requires a lot of manual operation and is extremely cumbersome. To simplify the procedures for citizens, the government has already initiated computerization of the department. The sub-registrar offices in Shivajinagar, Kengeri and Bangalore South have facilities to scan the registration deeds and return the registered documents. So far, over 100,000 documents have been registered in a computerized environment. For giving the encumbrance certificate the 13-year data needed to be incorporated into the computer. This process has already been taken up and is expected to be finished shortly. This will give relief to Bangalore citizens. Later, the project will be extended to entire state of Karnataka

Khajane Project

7. This project involves intensive computerization of the treasuries all over Karnataka. The treasury payment system handles over Rs.20,000 crores annually through 225 treasuries (approximately \$4 billion US). This system serves 470,000 pensioners of Government service, art and culture, sportsmen, journalists, freedom fighters etc. In addition, the system serves 131,000 lakh old age pensioners, the physically handicapped and destitute widows. The treasuries act as bankers to 4,500 village level (zilla panchayats, taluk panchayats, grama panchayats) municipal corporations and other funds. A comprehensive computerization is planned using the V-sat terminals. There will be a main data base center at Bangalore and a disaster recovery center at Dharwad.

Therige Project

8. The Commercial Taxes Department has already computerized several facets of its operations. The details of about 100,000 dealers are computerized by the department. In addition, important check posts are being computerized where the invoices will be scanned and the details of the transactions will be made available to the assessing officers to check evasion of taxes on certain commodities.

Karnataka Government Insurance Department (KGID):

9. Karnataka has the oldest insurance department which was started in the year 1891. It undertakes life insurance as well as vehicle insurance for its employees. The department offers life insurance policies for the employees as well as third party and comprehensive insurance for the vehicles. The motor branch of the department that offers insurance for vehicles is completely computerized. The computerization of life insurance business is under progress.

Reshme Project

10. Karnataka has introduced online transactions in the silk market. The cocoons are brought to the market, displayed and the trades are recorded online. This system has brought lot of transparency in market operations.

Agricultural Price Information

11. The Government of Karnataka has already got a system of recording and displaying the spot prices of agricultural commodities at APMC, Bangalore. It is proposed to expand the system to other APACs so that the prices of commodities are easily available for the farmers all over the state through manned kiosks.

Employment Department

12. Karnataka has computerized data on registration of candidates for employment, employment market information as well as the all India trade tests for the employment training wing.

Police IT 2000

13. Karnataka boasts of a peaceful law and order situation in the country. The Government is committed to maintaining the law and order for the benefit of its own citizens as well as citizens from outside and foreign nationals. The Police Department is already computerized to a large extent and has an ambitious project which will improve the state crime record bureau, connect the police stations located in Bangalore, enhance the capabilities of the intelligence wing, etc.

Environment

14. The Government believes in the protection of the State's natural environment and has used IT as a tool to do that. The Forest Department has already implemented computerized systems to track poaching and other forest offenses, track the land use data, improve the wild life management system as well as manage rare species under the Western Chats Program.

Saarige Project

15. Under this project, the Government has plans to computerize all the Road Transport Office (RTO) offices in Bangalore. Once implemented, the citizens will be able to get the driving licenses faster. Vehicle registration process will also be simplified. This project is already under implementation and is expected to be launched in the next few months.

Municipal Corporations

16. The Government has initiated action to computerise the Bangalore, Mangalore, Mysore, Belgaum, Hubli- Dharwad and Gulbarga Corporations. The project involves simplification of the payment of property tax, early issue of birth and death certificates and grievance redressal.

Small Scale Industries

17. The State has computerized the permanent registration of over 250,000 Small Scale Industries. All the districts as well as 26 village industries centers have been completely computerized.

Common System

18. The *Center for e-governance* plans to develop certain common systems in the areas of payroll processing **Vethana**, personnel information system **Sibbandhi** as well as GIS. Already many government departments have their own systems in place. The center for e-governance seeks to standardize them to enhance the scope and implement the systems uniformly and more effectively across the departments. The **Sibbandhi** system includes operation of an id Card that gives important details of employees. The Secretariat employees will have the benefit of receiving this card very soon.
19. In addition, the *center for e-governance* is expected to complete *Sachivalaya Vahini*, the Secretariat LAN System for intelligent sharing of information between the departments.

20. The center also plans to start an information network to connect all the district and village head quarters. Presently, all the districts as well as 140 villages out of 175 have already been connected via Fiber Optic Network. Video conferencing facility is in place in most of the district head-quarters facilitating direct interaction between the district level officers and the higher authorities at the State level

Unleash Karnataka Incubation Engine

21. The Karnataka Government is on the forefront of IT and a number of new ventures have come up in Bangalore recently. These companies are leaders in several core technologies such as VoIP, MPEG, WAP, GPRS, Home/RF, which are increasingly becoming focus areas. Many multi-national companies have applied for international patents; Bangalore recently applied for 115 patents and boasts of over 55,000 very highly qualified professionals in the area of integrated chip design, communications software, applications software and other services.

22. The Karnataka Government is committed to keep up the pace of such venture creation and unleash the Karnataka Incubation Engine. The State has the right environment for this to happen. A recent McKinsey/NASSCOM Report indicated that Karnataka has the critical ingredients, e.g. idea generation, anchor companies, research centers and universities.

23. The Government plans to encourage the Incubation Centers primarily with private companies (or venture capitalists--VCs) and plans to set up a few Incubation Centers that provide complete start-up facilities with computer centers and communications links for a limited time to the VCs. These entrepreneurs are expected to pay a reasonable rent for the premises and move out in a short period to commercial space.

(end of Karnataka)

KERALA STATE***Background for IT and E-Governance in Kerala***

Kerala is the only State in India with near 100% literacy. It has the highest density of science and technology in the whole of India. With advanced technological institutes like IIITM-K (Indian Institute of Information Technology and Management-Kerala), IIM-K (Indian Institute of Management-Kozhikode), CUSAT (Cochin University of Science and technology) and TCS (Tata Consultancy Services, Asia's largest software training facility, Kerala has no dearth of skilled manpower; and highest density of skilled professionals:

- Large pool of English speaking manpower
- Data base of readily employable graduates in the State
- Lowest attrition rates in the country at below 5%
- Seven universities and 32 engineering colleges.

Kerala calls itself "100% digital" with a strong datacom as well as telecom backbones, and it maintains communications standards that cater to international business. It is ideal for investments in the broadband sector with a primary international gateway (VSNL) located in the State, global standards in connectivity and bandwidth are assured:

- 100 % digital telephone exchanges
- 15 GBps bandwidth
- Optic fiber networks
- 98% of telephone exchanges are connected to the National Internet Backbone
- Dedicated satellite earth station for high speed online information.

Kerala houses Asia's largest IT park (called TechnoPark) with state-of-the-art IT enabling infrastructure which hosts 55 multinational companies and 5,000 IT professionals. Every single village in Kerala (1,468 in total) is within 3 kms of a digital exchange. All 14 District headquarters and 63 sub-districts are covered by a seamless network.

The Government's Information Technology Industry Policy Document (below) summarizes Kerala's emphasis in E-Governance, giving it the kind of priority it deserves. 34 Government offices were prioritized for E-Gov implementation, finalized on the basis of the degree of citizen interface and revenue earning capacity. "FRIENDS" (**F**ast, **R**eliable, **I**ntant, **E**fficient, **N**etwork for **D**isbursement of **S**ervices) application is the most prominent, which allows citizens access to Government services through a single window to pay bills, taxes and obtain information for the Government..

Kerala's Information Technology Industry Policy Document**1. Preamble**

1.1 This IT Industry Policy document endeavors to delineate a strategy for harnessing the opportunities and the resources offered by Information Technology for the comprehensive social and economic development of the State. This strategy has been conceived keeping in view the

fact that Information Technology Constitutes the primary instrument for facilitating Kerala's emergence as a leading knowledge society in the region.

1.2 This blueprint for IT development has been formulated in the context of emerging developmental trends and imperatives that are relevant to the growth strategy of the State.

The growth of Kerala in coming years will be increasingly driven by the knowledge and service-based sectors, where ease of information transactions will be a key determinant of success. Recent trends in the convergence of technologies have thrown up new opportunities and new services for the State, such as IT enabled services, e-commerce and multimedia.

Kerala has a large traditional agricultural and industrial sector; and the infusion of IT into these domains would be essential for its survival and growth in the face of imminent international competition.

IT has opened out new channels for service delivery in areas such as e- Governance, education, e-health and information dissemination. IT can serve as the platform for widening the reach of the advances made by the State in domains like health, education, and participative local governance.

1.3 Kerala offers fertile ground for the effective utilization of these new technologies; on account of its densely networked communities which possess high awareness and literacy levels, its superior telecom connectivity, and its propensity for quick technology absorption.

1.4 IT offers exciting possibilities for radically enlarging and improving human resource skills. Kerala's core competence is its near universal literacy and awareness levels, and this can be transformed into economically rewarding and employable skills by deploying the tools offered by IT.

1.5 The primary impetus for growth in IT has to come from private enterprise and community energies. The IT policy accordingly envisages the role of Government as being primarily that of a facilitator for creating an enabling environment where the energies of the private sector and of civil society can be most effectively developed. The Objective of the Government is to put in place a package of policy measures and incentives, which will make Kerala one of the most attractive investment destinations in IT.

1.6 The CII sponsored independent study of 18 Indian States 'How the States are Doing' placed Kerala at #3 in terms of overall composite score, #1 in Health and Education, #1 in Law & Order, #8 in Labour; #5 in investment attractiveness, and #13 in investment. These are not IT sector specific. Through the measures enunciated in this policy document the Kerala Government seeks to improve its relative position on both labour and investment into the top 3 ranks amongst States in the country, making it #1 in overall composite score amongst all States.

2. The Policy initiatives delineated in this document comprise a three pronged strategy aimed at:

- Creating an appropriate pro-business, pro-enterprise, legal, regulatory and commercial framework to facilitate the rapid growth of the IT industry in the State
- Establishing Kerala as a global center for excellence in Human Resources, through the creation of a large pool of diverse, multi-skilled, technically competent manpower in the State and

- Establishing an internationally competitive business infrastructure and environment for the IT industry in the State, on par with the best facilities and practices worldwide.

3. In line with this broad strategy, the Government have set the following immediate objectives for the promotion of the IT industry in the State.

1. To establish Kerala as a leading IT destination in the country within the next five years.
2. To provide a nurturing and enabling environment conducive to the vigorous growth of the local IT industry in the State.
3. To significantly enhance direct and indirect employment creation in the IT sector.
4. To attain a minimum growth level of 100% every year in IT.
5. To significantly accelerate the levels of investment inflows including foreign capital into the hardware, software and ITES sectors.
6. To aggressively promote the State as the destination of choice for emerging IT business opportunities including IT Enabled Services, new media products and E-services. To establish ITES as the definitive core competence of the State.
7. To develop Kochi as an international media and ICT hub.
8. To consolidate and expand the Technopark, Trivandrum as a leading software and HR Center in the region.
9. To provide the physical and institutional environment for the growth of SOHO and decentralized IT businesses.

4. Financial Incentives for the IT industry

4. The Govt. has formulated a comprehensive and unique package of incentives for the IT products, software and ITES industry in the State, which seeks to reward value creation, employment generation and enterprise excellence. The scheme called the Kerala IT Industry Incentive Schemes is enclosed as Annexure.

5. IT Infrastructure

5.1 The Govt. Parks Initiative

1. The city of Kochi will be promoted as an ICT hub where facilities offered will match the best available worldwide. A hi-tech park will be developed here, comprising an area of 200 acres. An IT Corridor connecting the new international airport at Nedumbassery with the city will also be established as part of the larger proposed Special Economic Zone continuum. These facilities shall be developed through Joint Venture partnerships with the private sector and shall endeavor to provide an international business infrastructure and environment at Kochi. Kochi has all the necessary enablers in place including virtually unlimited bandwidth on tap from the VSNL gateway, concentration of quality, technical and non-technical human resources, a cosmopolitan social infrastructure and environment, and excellent air connections. These advantages shall be leveraged to make the city amongst the most preferred IT investment destinations of India.

2. The Technopark, Trivandnim with about 1 million sq. ft of built up area, has established itself as one of the leading IT parks in the country. The campus is now home to several SEI -CMM companies and centers of HR excellence. The IIITM -K, which commenced functioning last year and which offers high-end training in emerging technologies is expected to move over to an independent campus shortly. In the second phase of expansion of the park, it is proposed to develop 26 acres with the participation of the private sector.
3. The total space availability for IT industry shall be augmented by a minimum of 750,000 sq. ft annually for the next two years. Thereafter, for the next three years a minimum of 1.5 million sq. ft space capacity shall be created annually. These additional capacities will be created through 100% private sector investments as well as Joint Venture projects between the Govt. and the private sector.
4. The IT Department shall shortly initiate, with the help of leading consultants, the exercise of preparing Master Plans for each of the designated IT parks/zones. These Master Plans shall delineate the blueprint for park development and framework for facilitating private sector participation.
5. The Govt. shall endeavor to maintain uniform, international quality standards for park infrastructure and services across all State promoted and managed IT parks. A professional Parks' Management team will be set up under the Kerala IT Department for ensuring this.
6. The built-up space for IT industry shall be classified under a new category "IT Industry" under the Kerala Building Rules with applicable FAR of 5. This classification shall apply only for newly built-up space that shall be used predominantly (at least 80% of carpet area) for a software industry for a minimum period of 5 years from the date of first occupation/commissioning.
7. The Govt. shall proactively encourage and facilitate the development of ancillary social infrastructure in a planned manner including hotels, restaurants, entertainment multiplexes, hospitals, schools, colleges etc. within and appurtenant to the IT parks.

5.2 Private Parks Scheme

1. To accelerate the process of private sector led IT infrastructure development, the Govt. shall, in association with reputed global IT parks' developers/consultants, announce a minimum set of standards to qualify as 'Parks' Standard' certified IT park. Compliance shall be assessed, on formal request, at the pre-construction/ design stage and thereafter on project completion. The State IT Parks' Management team shall serve as the nodal agency for compliance assessment and administration of the 'Private IT Parks Scheme'.
2. All 'Parks' Standard' compliant IT parks shall be entitled to the FAR classification as applicable to IT industry under Kerala Building Rules. For other compliant IT parks that are either entirely for IT hardware industry or for both IT hardware and IT software industry companies, classified under 'Industrial' category of the Kerala Building Rules, additional FAR of 50% shall be permitted (over currently applicable FAR of 1.5).
3. The Kerala State Electricity Board, the Kerala Water Authority, and the Office of the Chief Town Planning Authority shall each designate a Nodal Officer who shall facilitate the process of inspection, application processing and application closure, for their respective responsibility

areas. Response standards shall be announced by these agencies for the fast track clearance process.

4. A certified private IT park shall be governed by the same set of industry enabling regulations that are applicable for the State promoted IT parks.

5. A private park that qualifies for certification under this scheme shall be promoted by the State Govt. as an integral part of the State's IT Infrastructure, provided the promoter of the park so desires.

6. The scope of the 'Private IT Parks' scheme shall be restricted to projects that seek to provide a minimum of 50,000 sq. ft per project either through creation of fresh built up space or through conversion of existing space for use by IT industry. Projects less than the 50,000 sq. ft qualifying stipulation shall still have the benefit of FAR provided under point 1 provided they are otherwise compliant with the Parks' standard.

5.3 Leveraging Submarine Cable Landing at Kochi for Industry

Kochi has the unique connectivity advantage of being the landing point of two major international submarine cables linking to US, Europe and the Far East. All IT Parks partially or fully promoted by the State Govt. shall be connected by OFC to the Kochi gateway. Data communication bandwidth, a strategic input for the IT sector, shall be thus made available to IT industry through the SII with assured quality of service across the State.

6. State Information Infrastructure (SII)

The State Information Infrastructure, which is to be set up within the coming two years shall endeavor to provide robust and seamless connectivity to industry across the state.

a. Present Status

Kerala enjoys the highest telephone density in the country today. 100% of the 982 telephone exchanges in the State are digital, covering all 14 district headquarters, all 63 taluk headquarters, and all 1468 panchayats/villages. The BSNL telephone exchange is collocated with the panchayat headquarters in a majority of the panchayats, and the balance is within a maximum of 3 km from the nearest telephone exchange. 945 of the 982 exchanges are networked through optic fibre cable (OFC), and the balance 37 shall also be connected on the OFC backbone within 3 months. 266 exchanges currently support ISDN service. Further, another 100 digital telephone exchanges shall be commissioned by BSNL across Kerala this financial year.

VSNL has made substantial investments in its Kochi gateway where two submarine cables-SEA-ME-WE-3 and FLAG land. Kochi is one among two locations nationwide which has submarine cables landing. With 10 GBPS bandwidth supported, it currently handles about 70% of the nation's data communication traffic. Sourcing bandwidth from VSNL at Kochi and Thiruvananthapuram provides significant savings vis a vis most other locations in the country.

Subsequent to the 'Rights of Way' policy announced in 2001, a number of telecom companies have come forward to establish OF based data/voice networks in the State.

b. Purpose of the SII

The Govt. has identified target beneficiaries of IT led development as (i) citizens/ individuals (ii) industry (iii) academic institutions and (iv) the different bodies of Government. For the benefits

of IT to be exploited in full measure, but at minimal cost, the Government recognizes the need for a communication infrastructure backbone -the State Information Infrastructure -that spreads across the State and reaches out to all targeted beneficiaries. Further, there is the critical need to ensure that a minimum grade/ quality of service is available from the SII so that the target beneficiaries can in turn plan software applications and hardware deployment based on the availability and quality of the SII.

The industry shall benefit from direct Optic Fibre Cable Connectivity into the Kochi gateway from most towns within the State, and that at a significant cost advantage.

This would drive IT enabled services that are bandwidth intensive and which require reliable, failsafe operations including Business Process Outsourcing operations, Multimedia call centers, and Multimedia Content Development/Processing centers. Schools and colleges within the State as well as the Panchayats can today look forward to an era of seamless connectivity for communication within their communities as well as the world at large. Finally and most importantly, the SII would enable the ushering in of a new era of transparent, efficient, citizen-responsive governance from the Kerala government.

c. Quality of Service (QOS) Definition for Data Communication Services

Service providers within the State shall be urged to maintain and transparently share quality of service data with their consumers. This minimum grade of service shall apply irrespective of the location within the State. This step is expected to ensure uniform quality of internet access and community level intra-networking across the State. Further, this shall prepare the State for an era when 'voice over internet protocol' (VoIP) communication shall be permitted in India. Appropriate mechanism shall be established to measure, report, analyse and provide feedback to service providers to maintain/ improve network performance. The QOS requirement shall be reviewed with concerned service providers and consumers, on an annual basis to reflect changes in network capabilities as well as consumer requirements.

7. Ancillary and Support Infrastructure

7.1 Power

IT industry units are entitled to tariff under HD I industry and LT IV industry depending on the supply of and connected load to the IT industry. This classification shall be maintained even in the case of IT software industry units brought under the purview of the Kerala Shops and Commercial Establishments Act 1960.

7.2 Roads

The Govt. shall ensure that access roads from the nearest city or airport to designated IT Parks/zones shall be of the highest quality and designed/upgraded to minimize travel time. This is recognized as a basic need of industry. Such activity shall be encouraged on a build-operate-transfer basis with the private sector.

8. Thrust Areas in IT

8. IT Enabled Services

1. The Govt. shall endeavor to promote Kerala as a favoured ITES destination in this part of the world and to aggressively market ITES as the State's core competence. The focus domains in this sector shall be Business Process Outsourcing (BPO), Customer Interaction Centers, Multimedia Content Creation and E-services. Kerala already has the basic enablers in place to make this

vision a reality -best in class communication infrastructure to support bandwidth intensive ITES operations, a large pool of English speaking personnel, low cost of operations and low employee attrition. The Govt. is also putting in place a regulatory framework, which would address the specialized employment requirements of the industry.

2. To leverage the natural advantages the State has in this sector, focused training inputs shall be delivered throughout the State to create a large pool of trained manpower for Business Process Outsourcing Centres, voice and non-voice based ITES centers, including voice/web/email based call centers, Geographical Information Systems, and Animation/Content Creation. The content shall be created with the help of experts from the ITES industry and delivered using innovative methods.

3. English is the universal language of business. Kerala Govt. realizes that its front runner advantage in universal coverage and reach in the State's education network can be leveraged to ensure frontline status in the use of English for enhanced employability of its people. To improve the communication skills of the local populace in English, Colleges and Universities in the State shall be encouraged to upgrade the quality of English language courses to accepted international standards. Further, the Govt. shall also encourage the introduction of Japanese, French and German language courses in a phased manner in Colleges so that a pool of manpower trained in these languages is available within the State.

4. Kerala shall host an annual International Business Process Outsourcing Conclave each year. This event, the first of its kind in India, shall be the lead and definitive event for the Indian and regional BPO industry.

8:2 Supply Chain management Operations

The Govt. recognizes it as an imperative to attract global IT Products companies to Kerala. Kochi offers several natural advantages to become a choice location for Supply Chain Management Operations (SCM). Kochi has an all-weather port, an international airport well connected into the Far East through Singapore and into Western Europe/

USA through the West Asian countries. Further, Kochi is home to one of four Special Economic Zones of the country that provides a flexible, fast track environment for running predominantly export oriented SCM operations. Special incentives have been announced for such SCM units. The IT products companies based at designated IT parks in the State have enjoyed harmonious labour relations over the last several years in addition to high productivity levels. The new labour regulatory framework shall lay the foundation for such operations to proliferate. The Govt. commits itself to playing a strong enabling role in this regard.

8.3 Establishment of a Global HR Center in Kerala

In view of Kerala's peaceful, salubrious and cost competitive setting, the State is a natural location of in-house training facilities for IT companies. The State Govt. shall focus on this comparative advantage by promoting the Technopark as an attractive global HR center. As point of this endeavor, the Govt. shall encourage leading IT corporations to set up HRD centers in Kerala.

(end of Kerala)

TAMILNADU STATE

IT initiatives in Tamil Nadu

Policy:

- One of the first States in the country to announce a separate "IT Policy" (www.tn.gov.in/policy/itpolicy.htm)
- All enabling executive orders (www.tn.gov.in/gorders/it.htm) to make the policy operational issued.
- Newly constituted high power "Tamil Nadu IT Council" chaired by the Chief Minister (www.tn.gov.in/gorders/it-e-14.htm)
- One of the first States in the country to have a comprehensive policy for non-exclusive use of the public right of way by organizations in the private/public sector for laying high bandwidth optic fiber cables throughout the State (www.tn.gov.in/gorders/it7-e.htm)
- Software companies (including services and training) in Tamil Nadu are assured uninterrupted power supply, and exempted from Pollution Control regulations. Factories Act (www.elcot.com/relaxwind.htm) and Chapter II of the Tamil Nadu Shops & Establishment Act. (www.elcot.com/sinotification.htm)

Status of IT Industry

- More than 860 Companies today
- More than 40,000 professionals employed
- The growth of the software industry in Tamil Nadu has been spectacular
- Hardware exports from Tamil Nadu during 2001-2002 have been Rs 482 crores (about \$90 million US).
- Studies by Harvard University, USA, in October 1999 and January 2001 (Papers # 728, 729 and "Readiness for the Networked World: A quiet Information Revolution in Tamil Nadu) at www.cid.harvard.edu/india/papers.htm have predicted that Tamil Nadu is well poised to emerge as the top IT State in India as well as a gateway to SE Asia.
- The "**Watts Humphrey Software Quality Institute**" (www.watts-sqi.org) established at Chennai in 1999- the only one of its kind in India
- The Chennai Chapter (www.tie-chennai.org) of **The IndUS Entrepreneurs (TiE)** was established in Jan 2000 and is active.
- Media Lab Asia -a collaborative effort of the Ministry of Communications and Information Technology, Government of India and Massachusetts Institute of Technology -will set up a Regional Research Laboratory at Chennai.
- The Confederation of Indian Industries (CII), Tamil Nadu and the Government of Tamil Nadu organized a successful International Conference & Exhibition on IT, Communication Technologies and Bioinformatics at Chennai during 13-16 September 2001 called "**Connect 2001**". The venue was the **Chennai Trade Centre** of the Tamil Nadu Trade Promotion Organization at Nandambakkam www.ciionline.org/seminar/connect2001
- Based on the success of "Connect 2001", it has been decided to hold "**Connect 2002**" at the same venue in partnership with CII Tamil Nadu during the period 12-15 September 2002.
- Government of Tamil Nadu co-sponsored a very successful Third National Conference on IT Enabled Services at Chennai on 30-31 May 2001 organized by NASSCOM.

- The Technology Information, Forecasting and Assessment Council (TIFAC) of the Department of Science & Technology, Govt. of India had organized ICNC- 2001, an International Conference on Nanocomputing Technology Trends at Shanmuga College of Engineering, Thanjavur during December 16-18, 2001 (www.sce.ac.in/icnc2001).

Team in IT

- Organized "TamilNet '99," an International Conference and Seminar on Tamil in IT, at Chennai in Feb 99 (www.tamilnet99.org) with experts from India Singapore, Malaysia, Mauritius; Sri Lanka, Western Europe, and North America that resulted in achieving universally acceptable technical standards for using Tamil in IT.
- Based on "TamilNet '99" recommendations, the layout for Tamil keyboard has been standardized (www.tamilnet99.org/keystand.htm) and notified for the first time.
- Coding schemes for Tamil monolingual and bilingual scripts have been finalized (www.tamilnet99.org/enstand.htm) and notified (www.elcot.com/gonol7.htm).
- A certification mechanism (www.tamilnet99.org/certify.htm), supported by the Tamil software industry, put in place to certify compliance of hardware and software offerings with the standards referred to above.
- So far 26 software and hardware offerings have been certified which conform to the standards and have been authorized for use in Tamil Nadu Government and its institutions.
- Government of Tamil Nadu is a member of the international "Unicode Consortium" (www.unicode.org) from April 1999 to deal with issues regarding the coding of Tamil characters.
- A "Tamil Software Development Fund" (www.elcot.com/tamilswfund.htm) with a corpus of Rs.5 crores has been set up to encourage the development of innovative Tamil software -the fund has supported seven projects till date.
- A "Center for Research and Applications of Tamil in Internet" (www.elcot.com/tiam.htm) has been set up and is supporting research projects in cutting edge areas of Tamil in IT.
- The three reputed Universities, i.e. Anna University, Chennai, Bharathiar University, Coimbatore, Regional Engineering College, Tiruchirapalli; authorized to set up one endowment Chair each for Tamil in IT.
- The "Tamil Virtual University" (www.tamilvu.org) has become operational from February 2001 at Chennai. This will promote the learning of Tamil by interested students anywhere in the world through the Internet. It will also function as a facility for creating multimedia teaching content in Tamil for both IT enabling of education and for training of teachers. The TVU will also be responsible for dealing with all technical aspects of Tamil in IT including interaction with the Unicode Consortium.
- The Government of Tamil Nadu has played an active role in the creation of INFITT -the International Forum for IT in Tamil (www.infitt.org) -during the course of the Tamil Internet 2000 Conference at Singapore during 22-24 July 2000.
- The Tamil Internet 2001 Conference (www.tamilinternet.org), organised jointly by INFITT and the Malaysian Indian Congress, was opened by the Malaysian Prime Minister Dato Seri Dr Mahathir Mohamed on 26 August 2001 and was successfully held over three days till 28 August 2001 at the Putra World Trade Centre, Kuala Lumpur; Malaysia.

IT in Education

- Computer Science syllabus for Classes 11 and 12 of the State Higher Secondary Board has been completely revised and updated, the necessary textbooks printed in English and Tamil and distributed.
- As a first step to make all our students "digitally literate", an innovative public -private partnership program was launched in 1999 to make Computer Science available as an option in all Government Higher Secondary Schools in the State. By 2001, all 1197 schools in the State have been covered, producing 40,000 students per year with computer and Internet skills, During 2001-2002, 127 more Higher Secondary Schools that have recently been upgraded are proposed to be covered, Further, 5 teachers per school per year in each of these schools including the Principal, are also imparted computer literacy skills. This program is fully operational.
- Based on the success of the school program, a one-year computer literacy program for students in all 60 Government Arts and Sciences Colleges; all 11 Medical colleges, the only Dental college and in all 5 Law Colleges in the State was launched in 2000. This will cover about 30,000 students every year. This program will also include Internet skills. The program is fully operational.
- From the year 2000, five thousand graduate/diploma holders from the backward classes and most backward classes are being provided a one year training program yearly to impart computer skills equivalent to a post graduate diploma level.

IT in Government (E-Governance)

- A State Government web site, www.tn.gov.in has been created to provide information of relevance to the citizens.
- All State level Govt. tenders in English and Tamil are included in this web site as well as in other private web sites that host this content free of cost, This includes www.chennaionline.com, www.aaraamthinai.com, www.southindia.com, www.webulagam.com and www.thegovt.com
- Orders issued by every Secretariat Department in Government that are of direct relevance to the public at large are being included in this site (www.tn.gov.in/gorders/Default.htm).
- The web site has a wealth of documentary and statistical information about the State. In additions it has more than 100 application forms in English and Tamil for use by citizens (www.tn.gov.in/appforms.htm). In addition, these forms are also being made available at www.formsindia.com
- A comprehensive database of all land records throughout out the State has already been created. A set of application software for use at Taluk (Sub-District) and District level has been created; tested, finalized and has already been installed in all 206 Taluk offices.
- 2 Pilot projects in four Taluks of the State for digitization of the cadastral maps have been completed. The different technologies used have been evaluated and specifications finalized, Depending on availability of funds, a statewide project can be taken up for creating a database of digitized land maps.
- Comprehensive guidelines for development of Geographic Information Systems (GIS) in Government and the public sector have been issued by the Planning & Development Department (www.tn.gov.in/gorders/pndgo.htm)
- Application software has successfully been developed, tested and commissioned for the Sub-Registrars' offices and District Registrars' offices ([URL http://registration.tn.nic.in](http://registration.tn.nic.in)). This

system has been made operational in 25 such offices (16 Subregistrars and 9 District Registrars) and has recently been extended to 100 more offices, A further 184 offices will shortly be covered, Meanwhile, data entry work in these offices has been taken up and is expected to be completed shortly.

- Application software has been developed and tested for the Regional Transport Offices (RTOs), Zonal RTOs and the Transport Commissioner's office, This has been commissioned in 17 offices so far, and the balance 65 offices throughout the State will be covered in 2002.
- Testing of application software for assessment circles in the Sales Tax department (www.tnsalestax.com) is almost complete and this system has been implemented in 140 assessment offices in Chennai and Coimbatore circles that account for about 80% of the sales tax collection in the State.
- A pilot project for Tele- medicine between a State level tertiary hospital -Govt. General Hospital, Chennai -and a rural hospital- Walajah Taluk Hospital- has become operational.
- An IT project at the Police Station level is under examination_ and will be proposed for consideration in 2002.
- A "Video-Conferencing: facility has been set up between the State headquarters and all District headquarters where ISDN is available.

IT Infrastructure

- Six agencies have already been permitted on a non- exclusive basis to create high bandwidth optic fibre cable networks that will cover every single district in the State. These are M/s BPL Broadband, DishnetDSL, Bharti Telesonic, Macronet Private Ltd. (subsequently renamed as Reliance Infocom Ltd.), Estel Communications Pvt, Ltd, and Bharti Telenet Ltd, This will make Internet access possible in every corner of the State. Reliance Infocomm, DishnetDSL and Bharti Telesonic are in the process of physical implementation of their projects.
- We estimate that as many as 30,000 PCs are today available across the State in browsing centres/cyber-cafes for providing public access to the Internet.
- Tamil Nadu has the highest rural telephone connectivity in the country with nearly 86% of all its villages in Tamil Nadu covered.
- Software Technology Parks of India, Chennai (www.stpc.soft.net) has been given financial assistance on 2000-2001 in the form of interest free loans and grants to set up international data links at Madurai, Tiruchirapalli, Tirunelveli and at NSIC/Guindy/Chennai. This is in addition to the STPI and VSNL facilities already available in Coimbatore, The facility at NSIC/Chennai has become operational. The facilities at Madurai, Tiruchirapalli and Tirunelveli have also become operational. This will facilitate the spread of the IT industry, including software and IT enabled services and will create employment opportunities in all parts of the State.
- STPI proposes to set up an IT Incubator Park for small and medium IT companies at Coimbatore and has started the preliminary work for this project.
- A pilot project called "Sustainable Access in Rural India (SARI)" -is being implemented in Madurai District for providing both telephone and Internet access in every village through "Wireless in Local Loop (WLL)" technology developed by the Telecom and Network Group at IIT Madras. This project is sponsored by the MIT Media Lab. Center for International Development, Harvard University and IIT Madras and is supported by the Government of Tamil Nadu (www.tenet.res.in/sari)

- A similar project has been launched by IIT Madras in association with EID Parry group of companies in 271 villages in Nellikuppam in Cuddalore District.
- "TIDEL Park" a one million square feet IT park (www.itparkchennai.com), has been inaugurated on 4 July- 2000, All 100% of the available space in TIDEL already stands marketed, It is estimated by real estate consultants that there is need for 2 million sq.ft. of additional space for IT Companies in Chennai in the next two years, TIDEL- II is being planned for which a Detailed Project Report is being prepared.
- A 1000 acre IT park has been developed by the State Industries Promotion Corporation of Tamil Nadu (www.sipcot.com/siruseri.htm) in Siruseri villages 20 km south of Chennai for allotment of land to IT Companies, who wish to build their own campuses. Several IT companies have already booked land in this facility.
- The 1700 acre Mahindra Industrial Park (www.mahindrapark.com), a joint venture of TIDCO, IL&FS and Mahindras, 25 km south on the Chennai Airport on the National Highways is also being developed to meet the need of both IT and logistics industries.
- The "Tamil Nadu Infotech Fund", a Tamil Nadu specific venture capital fund (www.elcot.com/fund.html) jointly promoted by the Tamil Nadu Industrial Development Corporation (TIDCO – www.tidco.com), IL& FS Venture Corporation and SIDBI, has funded several innovative projects.
- 2 companies, DishnetDSL and Bharti Aquanet Limited (a Bharti Telesonic- SingTel joint venture), have initiated steps to lay submarine optic fibre cables from Singapore to Chennai with a total capacity in excess of 11 terabits per second to ensure the availability of international bandwidth on demand. These are likely to be fully operational during 2002.
- M/s Bharti Aquanet Limited has been given permission by the Government to use the public right of way on the Chennai Beach and along the roads of the Corporation of Chennai to bring their submarine cable to their landing station in Chennai. This project is considered to be the largest of its kind in the world today.

IT issues in Tamil Nadu requiring Government of India action

- Rapid implementation of the Information Technology Act 2000 and Rules.
- A strategy for assuring universal Internet access together with domestic bandwidth on demand
- Speeding up the progress of Telecom deregulation, particularly, opening up the local loop
- Creating a new policy regime to enable delivery of low cost telecom and Internet services in rural areas through "Rural Service Providers"
- Establishment of an "Indian Institute of Information Technology and Management" at Chennai by the Ministry of Human Resources Development
- Making available ISDN / DSL facilities in every District headquarter.

(end of Tamil Nadu)

APPENDIX-1: PRE-REQUISITES FOR E-GOVERNANCE

(*Source: "Report on the Working Group on Convergence and E-Governance for the Tenth Five Year Plan, 2002-2007, Government of India Planning Commission, November, 2001.*)

1. Evolution of E-governance is a complex process requiring provision of hardware, networking, software and re-engineering of the procedure for examination of cases and decision-making. A truly "e-governed" system would require minimal human intervention and decision on cases would be 'system driven' rather than 'individual driven'. Human intervention and the scope for subjective interpretation would have to be minimized in the process of disposal of cases. This will, no doubt relate to a stage that will come after the systems of delivery of information and other routine services has been established in an effective manner.

2. Before e-governance can be implemented as a national level initiative, some key systems and processes will need to be put in place. These in fact are important prerequisites for e-governance and could include, the following:

- **Large-scale computerization:** The introduction of computers in every department/ministry of the central and State governments and their subordinate organizations is the starting point of E-government. This would involve huge investments for the acquisition of hardware and software. *One possible way of reducing and distributing costs is that the Governments enter into arrangements for leasing of computers and gradually acquire them over a period of time.*
- **Capability of Use of local languages in the IT systems:** The access of information would have to be made available in the language most comfortable to the public user, generally the local language. There are existing technologies available in the country such as GIST and language software by which transliteration from English into other languages can be made. Other tools for local language can also be developed as progress is made of their use in the systems of government.
- **Awareness:** Perhaps the most important aspect of e-governance, computerization and spreading of IT, is the bringing of a *change in the mindset* of the government functionaries who have been accustomed to work only in the manual mode. It will be necessary to train all employees in basic computer usage.
- **Infrastructure:** Adequate and appropriate Infrastructure for Information Technology has to exist across the country with sufficient bandwidth.
- **Standardization:** E-governance demands standards in all areas. Some of the key areas are: data encoding (ISCII or UNICODE), application logic for common horizontal applications, user interfaces, data dictionaries, etc. These standards will need to be put in place before E-governance can effectively be implemented.

- **Certification Authorities:** Public Key Infrastructure and Certification Authorities to provide digital certificates that help create an on-line identification and security system for the Internet allowing individuals, corporations and government organizations to conduct transactions and communications is an important requirement for E-governance and E-business.
- **Knowledge Networking for better governance:** Good Governance rests on the pillars of knowledge and recognition of this knowledge by the decision-makers. Digitization of the entire set of knowledge within a network which links every individual including the decision-makers and gives democratic freedom to everyone to access and make use of this knowledge paves the way for Digital Governance.

3. The widening use of Information and Communication Technology (ICT) is leading to distributed Knowledge and Power structures. It has the potentiality of changing the political scenes and reshaping the way citizens interact with the Government. E-governance is part of the Government's strategy to use Information Technology to help enhance people's lives.

4. Introduction of E-governance is a key to making information technology (IT) relevant to ordinary citizens where a large numbers of population are poor and a digital divide is a significant problem. E-governance will allow ordinary people to constantly interface with the government in both local and central level on various matters. E-governance must be a high priority, as it is the only means of taking IT to the masses. Additionally, this is a smart and economical process of building the domestic software market. For example, the e-governance market in India is expected to earn \$6 billion in 2007-08. In 2000-01 alone, the Indian Government expenditure on IT is expected at about \$556 million.

5. The challenges in processing, transmitting, and storing information in a manner which protects its authenticity, integrity and confidentiality have been well publicized and have become part of the public debate on the future of communications in general. The Government must meet these challenges while supporting the goal of modernizing government business processes by conducting these processes electronically. Accomplishing these objectives requires the proper and timely use of security services so that businesses and the public operate in a trusted environment. One element has now emerged as the foundation for secure distributed applications, including supply chain management, secure messaging, e-commerce and intranet applications -- that element is **Public Key Infrastructure (PKI)**, which envisages the use of Digital Certificate, and, is the key to ensuring authenticated private and non-repudiable communications & transactions over un-trusted networks.

APPENDIX-2: CHECK LIST FOR E-GOVERNANCE MASTER PLAN

(Source: "Report on the Working Group on Convergence and E-Governance for the Tenth Five Year Plan, 2002-2007, Government of India Planning Commission, November, 2001.)

The Master-plan of E-governance planning should be guided by the following principles:

- A clearly focused vision of what is the objective of introducing E-governance.
- The range and standards of delivery of information and services to the people must be defined with time frames within which they are to be attained.
- Any plan or scheme for E-governance should have sustainability; it should not be a mere novelty at Government expense only for the sake of doing something that is in fashion.
- Standardization should be started without any delay otherwise confusion will ensue that would negate the advantages of use of IT.
- Areas of public funding should be clearly spelled out.
- The situation in various Regions/Districts/States should be gone into in details and appropriate plans and schemes suggested suited to different States.
- Interactivity must be built into all schemes of E-governance otherwise it will only remain as a labor saving device for the government functionaries.
- In the matter of E-governance, G2G, G2C, G2B functionality have necessarily to be developed. E-Governance is to be understood in the sense also of governance even of public and private corporate bodies, Municipal Corporations and even local bodies. If e-Governance is to be ushered in an effective manner, it is necessary to create set of 'flash pictures' of the state of E-governance in the country.

APPENDIX-3: E-GOVERNANCE INITIATIVES IN INDIA

(Source: "Report on the Working Group on Convergence and E-Governance for the Tenth Five Year Plan, 2002-2007, Government of India Planning Commission, November, 2001.)

1. The National Task Force on IT and Software Development, constituted by the Prime Minister's office, has envisioned India emerging as an IT Superpower in the world by 2008. The Task Force has already submitted its report in three parts. Task Force has set a target of US\$ 50 billion for software export from India by 2008. Domestic software industry is targeted to reach the level of US\$ 30 billion by this time. A number of initiatives recommended in this report have already been implemented by the concerned ministries/departments. The Task Force has also identified Citizen-IT Interface as one of the key areas to service the information requirements of citizens through deeper penetration of IT in society and through the extensive use of latest tools in the networked society. Information Technology applications can be used in everyday administration to make the quality of life of the citizen better, by removing hassles.

The IT Task Force has made certain recommendations and it would be greatly relevant to recount the main points, as below:

Government-wide Information Infrastructure

- 1). Government-wide electronic information infrastructure should be created to simplify service delivery, reduce duplication, and improve the level and speed of service to the public. This would provide the public (business and individuals) with the opportunity to send and receive, over electronic terminals, the information that currently passes between them and the government on paper.
- 2). Nation-wide National Information Infrastructure is essential for carrying the services/information from government to citizens. Government and the private sector have to invest to develop this infrastructure.
- 3). The government should encourage the establishment of Internet Service Providers (ISPs) which will provide access to the Network based services from even the most remote locations in the country.
- 4). The government and the private sector would need to collaborate to put in place Electronic Fund Transfer (EFT) system, since this is critical to the successful implementation of Electronic Commerce, as well as direct service delivery to citizens.
- 5). It is necessary that computers should be cheaper to increase their penetration. The possibility of procuring cheaper second-hand computers available elsewhere should also be explored. These can be channelized through Indian organizations like ET &T, and NICS I by proper coordination with groups of Non-Resident Indians abroad.

Re-engineering of Government Processes

- 6). Re-engineering of the existing government processes and procedures is essential to bringing about transparency in working, reducing bureaucratic controls, increasing efficiency and productivity, reducing cost of service delivery, etc. Integration of projects across various departments to provide a single point of contact for citizens for delivery of services electronically is essential.
- 7). There should be complete transparency in governance. Citizen Charter of each and every government department should be available to citizens over the Net.
- 8). The Freedom of Information Act to be enacted which shall ensure right of every citizen to have access to information.
- 9). State Institutes of Public Administration shall be reengineered to help bring about IT - Responsible State Governments. (Recommendation No.98) Study of BPR will be an essential element in these institutes. Alignment of IT and business requirements of Government Departments, and focus of citizen as a customer to deliver one-stop integrated services will be essential. The institutes will need to be reengineered to orient their thinking on the Citizen-IT Interface.
- 10). A National Institute of Smart Government should be set up to focus on all issues concerning IT-supported governance (Recommendation No.97). Electronic Governance Institutes throughout the world are concerned with public policy, cyber law, economic development, delivery of services to citizens, constituency relationships and replacing industrial age institutions with the electronic art of governance, i.e. through digital age technologies and networks.

Service Delivery to Citizens

- 11). Delivery of services should be on "Transaction fee" basis. Private sector should partner with government in electronic delivery of services. In view of the enormous capabilities of the private enterprises, they should be involved in public funded projects as far as possible.
- 12). A Business Model for joint partnership of government and private sector to electronically deliver services on a sustained basis, so as to ensure that the government does not incur any expenditure, while the private sector invests initially, and recovers money on transaction fee basis, has been proposed. This may be taken as a model and tailored by government departments, state governments for their individual needs.
- 13). Service Delivery Points (SDPs) should to be set up at convenient locations for citizens to access services. Information Kiosks may be set up in public places such as shopping centers, post

offices, railway stations, libraries etc. All the Phone/ISD booths should be converted into IT booths through whatever necessary steps required to do the same. They will operate as PTICs (Public Tele Info Centres.).

14). For service delivery to citizens in rural areas the logistics and infrastructure difficulties in the way of use of computers in the rural areas, e.g., non-availability of trained manpower for maintenance, need for involvement of NGOs etc., should be given attention.

15). For rural areas, the following services could be delivered:

- Information and advice on agricultural problems, crop diseases, availability of seeds, marketing support, price of commodities etc.,
- Weather forecasting at the district level for short term and medium term
- Education and training opportunities
- Employment Exchange Registration
- Public Grievances Registration and Tracking in written form

16). Wherever the government chooses to do this on their own, care must be taken to ensure completeness of data in back-end databases through appropriate commitment of data entry resources. Mission Oriented Projects to be selected on the basis of criteria, such as benefit to a population of at least one quarter million or population below poverty line or people in underdeveloped areas.

Service Delivery on Commercial Basis

17). Utilities Billing/Payment is a major problem area for citizens in urban areas. This also holds the potential of being taken up on a commercial basis with the help of private sector using the Business Model. Projects may be taken up for the following utilities:

- Electricity Bills
- Telephone Bills
- Water Bills
- Property Tax Payments
- Road Tax

18). Smart cards, stored-value cards, Credit/Debit cards could be integrated in the framework of National Electronic Payment Systems for affecting payment of bills to Utilities.

19). Government Tendering/ Procurement should be taken up as mission mode project. Electronic procurement and settlement system to eliminate the need for duplicate departmental systems. Government-wide single system will take advantage of data once entered in buyer's system, as it is re-usable several times in the supply and settlement chain. The processes and data

of buyers and sellers have to be integrated to implement a fully electronic procurement system which will enable informed, and transparent decision to be made with uniform terms and conditions. The following will be integrated:

- Supply Database
- Procurement Database
- Financial Systems integrated with Payment systems
- Electronic Catalogs
- Price, performance, delivery details, payment mechanism
- Transaction set standardized
- Electronic Bulletin Boards and E-mail lists to support E-procurement

20). The process of filing income tax return should be simplified and made electronic. A project in the area should be taken up with the active participation of the private sector.

21). Study the systems already implemented by the Central Government, and State Governments such as Andhra Pradesh, Tamil Nadu, Punjab, Karnataka, Haryana, Maharashtra etc. where impact on citizen services has been felt. Best practices of implementation systems should be collected and disseminated to all governments for replication.

Citizen Identification Cards

22). In the long run citizens must have unique identification Cards -the Citizen ID. The usefulness of the card needs to be driven home by making it a multipurpose card, which will help the citizen receive a number of benefits and services. A single card should help the citizen interact with the Services, make payments, vote electronic, obtain ration card, passport, driving license and so on. A smart card citizen ID with multi-functions should be launched. The private sector should be actively associated by ensuring a business angle in the project.

HRD Requirements

23) There is a strong HRD contact in making the Citizen-IT interface successful. Citizens at large have to be trained in addition to training the government officials in launching their respective systems.

- Citizens need to be trained in operating the user interface at SDPs. The mouse, touch-screens, keyboard, IVR, filling forms in regional languages.
- Government officials have to be trained in operating their databases, updating and maintaining them.

Initiatives of the Department of Administrative Reforms and Public Grievances for E-government/E-governance in Central Government Initiatives

24. At the central level, the government has extensively promoted the use of Information Technology in managing its internal process through the agency of the National Informatics Centre (NIC) which was set up in 1975. A High Powered Committee constituted under the

chairmanship of the Cabinet Secretary took a decision in February 2000 to direct all ministries/departments of the central government to designate a senior officer as IT Manager to act as the focal point for promotion of IT. Subsequently, a 12-point 'Minimum Agenda of E-governance' was drawn up, comprising provision of basic infrastructure and training and use of IT for certain G2G operations as well as G2C transactions. A five-year 'IT Vision' and annual 'Action Plans' are also required to be prepared by every ministry/department. A recent review shows that three items of the Minimum Agenda have been implemented by 60% or more of the ministries/departments and another six items have been covered by 20-25% of them. A program for training/capacity building of IT Managers is also being formulated.

25. Certain other IT initiatives at various stages of development/implementation in central government include: India Portal (a user- friendly portal of all government websites for providing information and delivery of services), National Institute of e-Governance, Central Repository of Data, Citizen Service Centres for one-stop non-stop delivery of public services, dissemination of information relating to best practices/innovations in e- Governance (including a documentary series entitled 'IT in the Service of People'), and awards for best web sites and innovative use of IT in the delivery of public services.

APPENDIX-4: E-GOVERNANCE AT THE STATE LEVEL IN INDIA

(*Source: "Report on the Working Group on Convergence and E-Governance for the Tenth Five Year Plan, 2002-2007, Government of India Planning Commission, November, 2001.*)

1. Several State Governments have taken various innovative steps to promote e-governance. One of the most popular as well as significant measures has been Chief Minister's Information System (e.g. Andhra Pradesh, Madhya Pradesh and Rajasthan), which monitors a range of activities from developmental programs to redressal of public grievances. The Andhra Pradesh Development Monitoring System (based on a multipurpose household survey) has a database - with spatial as well as non-spatial parameters -of the entire population (75 million) of the state. Similarly, *Vikas Darpan* (mirror of development) of Rajasthan envisages GIS-based planning and decision support system. Andhra Pradesh has also introduced APSWAN (Andhra Pradesh State Wide Area Network), a state-wide network for voice, data and video communication, which is the basic information highway for improving government-citizen and government-industry interface. The Secretariat Knowledge Information Management System (SKIMS) of Andhra Pradesh efficiently manages information in the Secretariat. The Disaster Management System in Gujarat maintains communication during natural disasters. In Karnataka, computerization of Treasuries captures every single transaction at all district and sub-district treasuries. In Gujarat again, VIDYUTNET, India's first VSAT-based communication network supports real- time data applications for power generation and distribution. The Government of Kerala has introduced the RD Net project (Information Kerala Mission) to connect all the 152 block offices in the state with a view to transform local bodies into genuine institutions of self-governance. In Kerala again, Office of Controller of Entrance Examinations has been automated to bring about transparency in allocation of colleges to successful students. In Maharashtra, the Connectivity Project has networked 3000 offices.

2. In terms of delivery of public services, several states -such as Andhra Pradesh, Kerala, Maharashtra, Rajasthan and Tamil Nadu- provide online registration of property transactions. Some of the other areas addressed for use of IT are: registration of vehicles and issue of driving licenses (e.g. Andhra Pradesh, Delhi, Gujarat and Tamil Nadu), land records (e.g. Andhra Pradesh and Tamil Nadu), and single-window/one-stop delivery of public services (e.g. Andhra Pradesh, Kerala, Madhya Pradesh, Maharashtra and Tamil Nadu).

3. Use of IT in the delivery of public services in the states has several success stories. The TWINS project of the Government of Andhra Pradesh enables the citizens of the twin cities of Hyderabad and Secunderabad to access 18 services of six departments through a one-stop single window. As regards the rural areas, the *Warana* project of NIC in Maharashtra has set up facilitation booths to provide information about employment and agricultural schemes and government procedures, automated assistance in completing applications for government certificates such as ration cards and birth and death certificates, crop information on bus and railway services, medical facilities, water supply details etc. Similarly, the *Gyandoot* (knowledge messenger) of Madhya Pradesh provides information regarding rates of grains, and vegetables; dispenses land records; and issues income, domicile and caste certificates. *Gyandoot* won the Stockholm Challenge IT Award 2000. The smart card based driving license project of Gujarat has equipped all the Regional Transport Offices with state-of-the-art enrolment and issuance centers. The Bhubaneswar Development Authority of the Government of Orissa has set up

kiosks at its offices that map the city using GIS. This has made life easier for citizens as they can check on existing schemes for housing, commercial and industrial projects without depending on middlemen. The Tele-medicine project of Tamil Nadu allows doctors in remote areas to consult experts on special cases or for referral purposes through a direct ISDN link. In West Bengal, WEBEL (West Bengal Electronics Industry Development Corporation) has implemented a map-based GIS project in Maharashtra municipality to act as a one-stop access for all information pertaining to the area. The West Bengal government has also designed a web and kiosk-based education information system to cater to the needs of the student community regarding career counseling and educational institutes. In the context of lingual diversity of the country, special mention needs to be made of Tamil Internet Research Centre, which has been set up for funding projects promoting the use of Tamil on the Internet to maximize access to the citizens. Similarly, the Vernacular Interface Project of the Government of West Bengal aims to facilitate the use of computers in rural and semi-urban areas for access to information on tax payments, telephone bills etc.

4. A model has been developed in Pune district of Maharashtra state, which attempts to deliver the Citizen's Charter of the district administration through innovative use of information technology. By integrating backroom processes, it provides for single-window delivery of public services. The documentation of the performance of this single-window delivery of public services shows that during the period October 1998 and November 2000, out of the total number of 936,737 applications for public service delivery received, 919,408 (98%) were attended to the satisfaction of the citizens, and out of these 907,708 (99%) adhered to the service quality standards prescribed in the Citizen's Charter.

5. As a major step in bringing in E-governance, the National Informatics Center (NIC) headquartered in Delhi with branches all over the country has been implementing the following "**minimum agenda**" of E-governance, as announced by the Central Government:

- Internet/Intranet Infrastructure (PCs, Office Productivity Tools, Portals on Business of Allocation and Office Procedures) up to Section Officers level
- IT Empowerment of Officers /officials (Training)
- IT enabled Services
- G2G - Government -to-Government Portal
- G2B -Government-to-Business Portal
- G2C - Government -to-Citizen Portal: Community Information Centre, AGMARKNET Nodes, Passports, Courts, Central Excise & Customs, Land Records, Property Registration, etc.
- IT Plans for Sectoral Development
- Business Process Re-engineering
- Video-Conferencing
- Replication of ICT Application: G2C operational in Fatehgarh (Punjab), ST ARICARD/PRISM/PEARL, Ruralsoft, in other States
- "India-Image" Portal: A G2C Portal to be a state-of-the-art-portal of the Country

- G2G Portal, G2B Portal and G2C Portal in Central Government Departments and its Apex Organizations in the following areas of activities to begin with:
 - ✓ Central Excise and Customs
 - ✓ Registrar of Companies
 - ✓ Courts -Supreme Courts, High Courts and District Courts
 - ✓ Passports
 - ✓ Road Transport
 - ✓ Banks and Financial Institution
 - ✓ Agriculture
 - ✓ Water Resources
 - ✓ Women and Child Development
 - ✓ Health and Family Welfare
 - ✓ Rural Development
 - ✓ Higher Educational Institutions
 - ✓ Energy
 - ✓ Industry and Commerce.
 - ✓ Parliament

- Development of an "Informatics Model" based "business process re-engineering methodology" and the features of the Information Technology Act 2000, to get maximum ROI (Return On Investment) as well as increase in productivity and delivery of services in government (i.e. Design and development of an "IT Governance" Model in Government) in the Central Government, State Government and District Administrations.

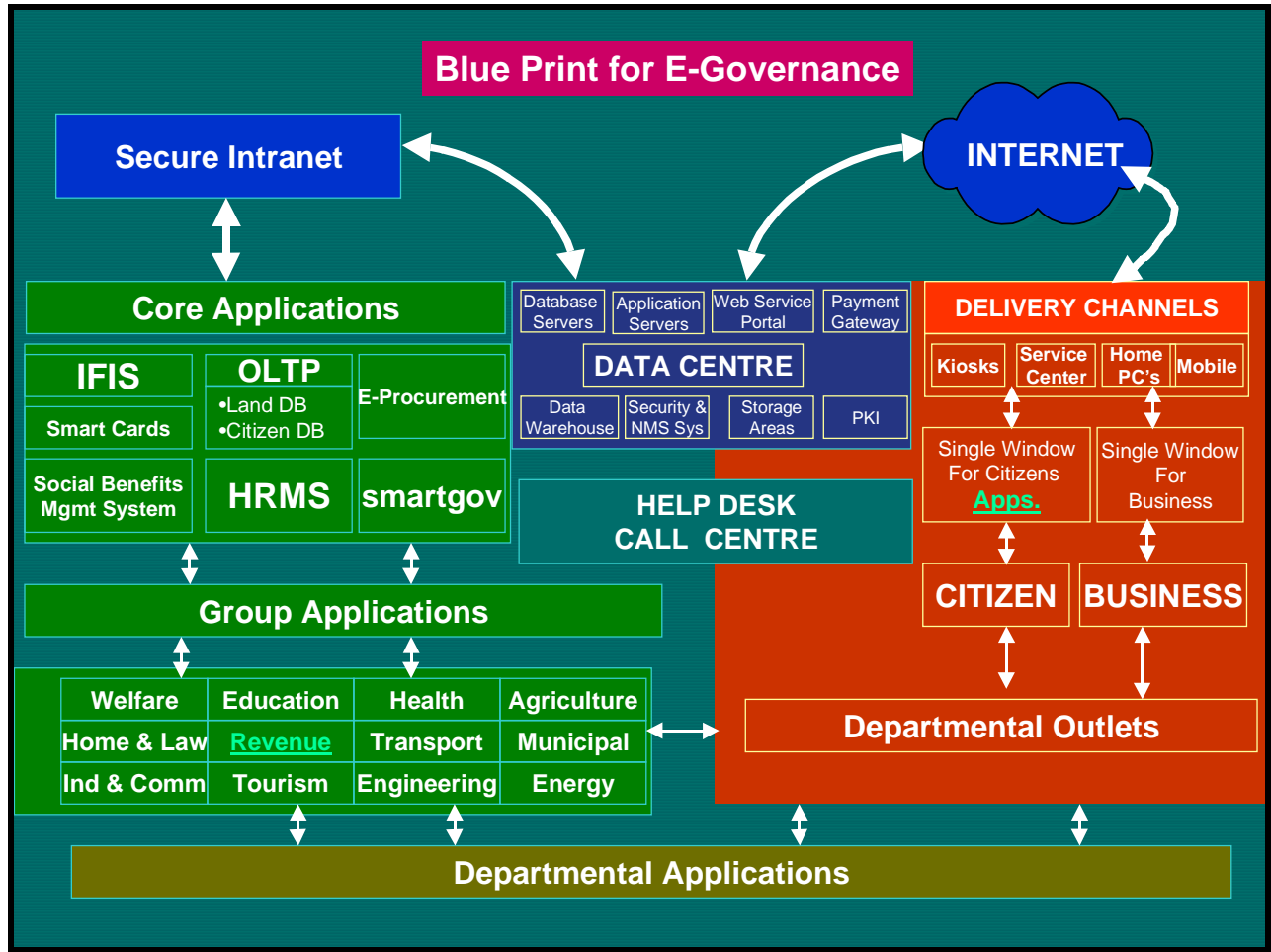
- Expansion of NICNET to cover all developmental blocks (~6500 in Nos.) to facilitate G2C access through CIC, in the country.

6. In view of the propensity for IT-led development in Government, the NIC plays a catalytic role in the area of "informatics for development", which include:

- Data warehousing (Data Bases & Model Bases) and Mining
- IT Training for Government Employees -IT empowerment, and
- NICNET Video Conferencing, and
- Total-IT solution

7. In view of its expertise in government informatics, and also to avoid coordination by a web of agencies in the Government, it has been suggested that NIC should continue to function as the nodal agency for E-governance" in the Central Government. Government of India's strategies on "development of information systems and utilization of information resources" initiated since 1975, have proved the existence of the relationship between communication system and information system: the "Communication System and Information System reinforce commitments to productivity" holds good. Starting as a small program under an external stimulus by an UNDP project in 1975, NIC has grown incrementally and later exponentially as one of India's major programs, which has helped to usher in the required transformation to cope with the trends in the new millennium. (*End of Appendix-4*)

APPENDIX-5: FIGURE - BLUE PRINT FOR E-GOVERNANCE



(Add explanatory text here)

APPENDIX-6: COPY OF ORIGINAL LAND RECORD DEED IN ANDHRA PRADESH DATED JULY 1868 AS AN EXAMPLE OF PAPER RECORDS VOLUME PRESERVED IN INDIA

Serial No. 3

Date of Registration. - 4th July 1868.

Description of Deed &c..... Bond -

Names of parties to do where residing &c..... } Gaugarau Dholee
Baukappa & Narasingh
Residence of Basaars -

Names of Witnesses entered on do. } Srijai etc.
Gajeswar Saune

Parties having appeared & stated that the mortgage attested by this document has been deemed true at a day of May 1872.

Abstract of Contents of Instrument Registered,

Gaugarau Dholee mortgages his house to Baukappa & Narasingh & borrows Rupee 200 two hundred. The house in question is to remain in charge of the mortgagees - No rent for the house and no interest for the money borrowed - He promises to repay the amount within five years - should he fail to do so, he says, that he will either mortgage it or sell it to pay & liquidate the debt - Repairs for the house should be done by the mortgagor himself.

Justice

Copy of the original land deed recorded in 1868

APPENDIX-7: BUSINESS CARDS OF OFFICIALS INTERVIEWED

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Department of Information Technology

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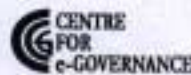
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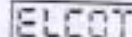
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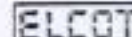
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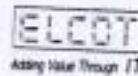
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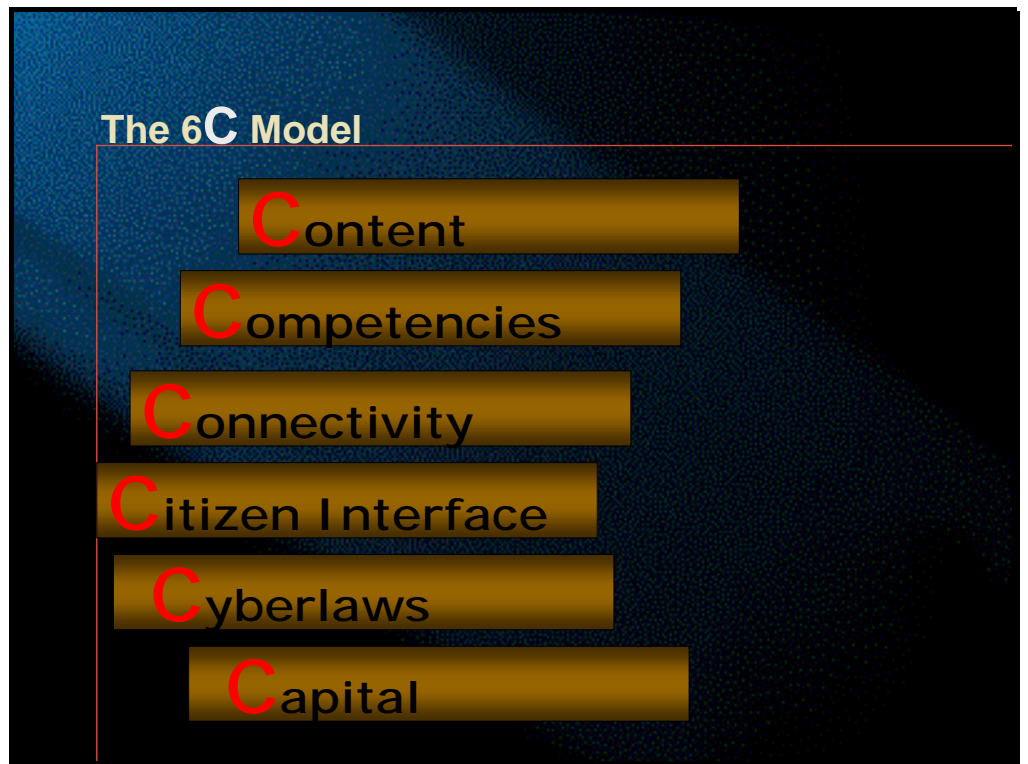
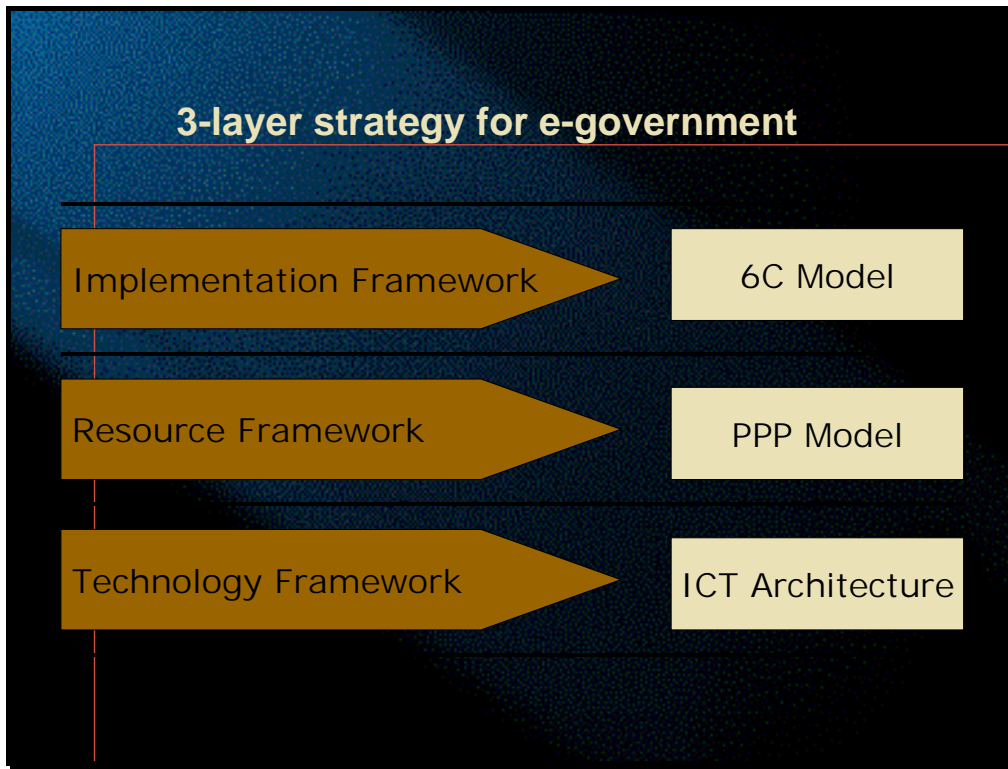


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APPENDIX-8: FIGURES ON E-GOVERNANCE MODELS & ARCHITECTURE



Imperatives of PPP for e-government

- ◆ Need to provide high quality services
- ◆ Shrinking budget support
- ◆ Pace of implementation
 - Risk of Technology Obsolescence
- ◆ High efficiencies in private sector
- ◆ Need for Cost-effectiveness
- ◆ Need for efficiency + accountability

Forms of PPP

- ◆ Concession Contracts
 - BOO, BOT, BOOT ..
 - User Charges,
- ◆ Joint Ventures
- ◆ Partial Privatization
- ◆ Partnership with Strategic Investor

Pre-requisites for success of PPP

- ◆ Proactive Government
- ◆ Abundant IT skills in Pvt. sector
- ◆ Entrepreneurship
- ◆ Inexpensive Connectivity
- ◆ Penchant for Administrative Reforms
- ◆ IT Architecture for e-Governance
- ◆ Framework of Security
- ◆ PKI
- ◆ CIO's as Champions
- ◆ Andhra Pradesh has all these

INFRASTRUCTURE FOR e-GOVERNANCE

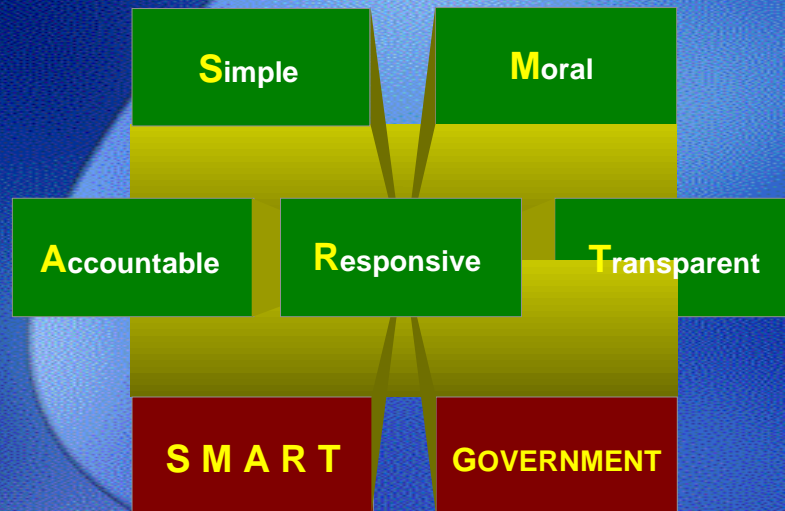
- ◆ **AP State Wide Area Network**
 - Connects Hyderabad to 25 cities & towns in AP
 - Provides connectivity for data, voice and video
 - Video-conferencing – enables close interaction
- ◆ **Citizens database** with 76.7 million records
- ◆ **Land records database** with 12 million records
- ◆ **Data warehouse** (on PARAM super-computer)
- ◆ **IT Architecture, Security Policy** in place

What is e-Government ?


e-Government is the use of IT, in particular Internet, to deliver public services in a much more convenient, customer-oriented, cost-effective and altogether different and better way.

Douglas Holmes
(e.gov)

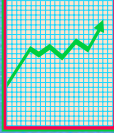
e-Governance Vision




e-Governance Key Benefits




Improved quality of citizen services




Improved internal efficiencies



Better enforcement of law



Promotion & outreach activities



Education & information

*Just as e-business is transforming the private sector, e-government will transform the governance.
However, the e-government transformation is costly and fraught with political, operational and technology risks.*

Key Governance Imperatives

Service related	<u>Accessibility</u> Width of reach	<u>Affordability</u> by common man/ target customers	<u>Communicability</u> in People's Language
Service related	<u>Availability</u> of Information across multiple delivery channels	<u>Reliability</u> of transactions across multiple delivery channels	<u>Viability</u> Economic and political returns
Implementation Related	<u>Re-engineering</u> of Processes within Government	<u>Collaboration</u> among the servicing departments	<u>Trustworthy</u> Adequate security and auditability

Creating stakeholders buy-in through internal/external communications

How big is the e-Govt ?

Item	AP	All States	Federal Govt	Total
Depts	150	2250	200	2,450
Sites	10,000	170,000	1,000	170,000
Applications	1500	25,000	500	26,500
Effort (Man-years)	7600	1,36,000	1,000	136,000
Cost (Bil US\$)	0.4	5.6	2.2	8.2

Can WE do this?

3-layer strategy

Implementation Framework

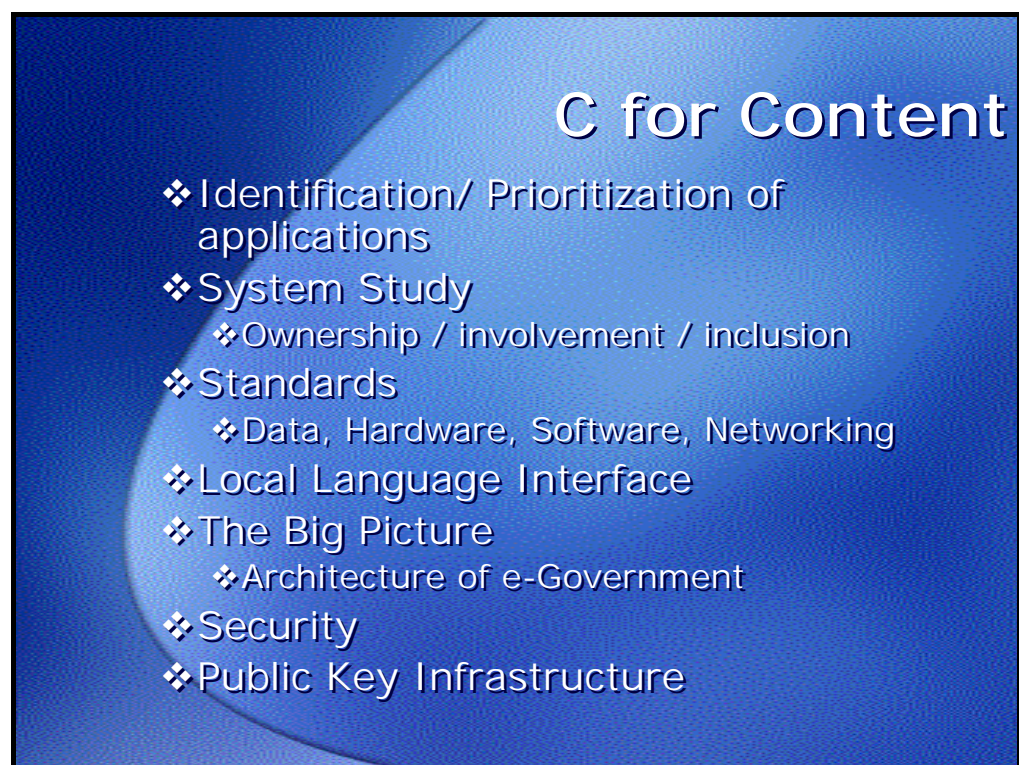
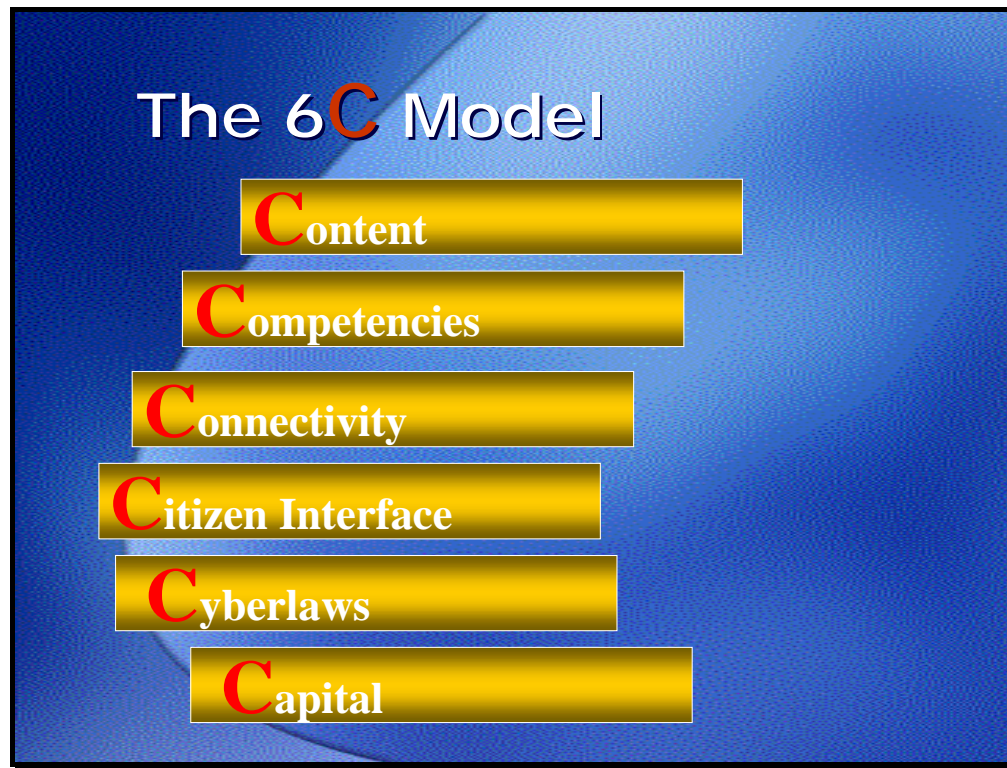
6C Model

Resource Framework

PPP Model

Technology Framework

ICT Architecture



C for Competencies

- ❖ Top Leadership
- ❖ Competencies at 3 levels
 - ❖ Chief Information Officers
 - ❖ Data Processing Officers
 - ❖ Data Entry Operators
- ❖ Change Management

C for Connectivity

- ❖ National / State backbones
 - ❖ Optical Fibre Cables
- ❖ Satellite-based communication networks
- ❖ Campus Area Networks
- ❖ Affordable Access

C for Cyberlaws

- ❖ IT Act 2000
 - ❖ Digital Signatures
 - ❖ Encryption
 - ❖ Evidentiary value of electronic records
- ❖ Privacy issues
- ❖ Need for specific legislation / rules
 - ❖ e.g -Registration Act & Rules

C for Citizen Interface

- ❖ Integrated Citizen Service Centres
- ❖ Internet-based applications
- ❖ Community Internet Infrastructure
- ❖ Smart Cards
- ❖ Electronic Payment gateways
- ❖ Government Portal

C for Capital

- ❖ Budget Support
- ❖ Public Private Partnership
 - ❖ BOO, BOOT
- ❖ Leasing Vs Purchasing
- ❖ Sustained stream of revenue
 - ❖ User Charges
 - ❖ Subscription model

Public Private Partnership for e-Government

Imperatives for PPP

- ❖ Need to provide high quality services
- ❖ Shrinking budget support
- ❖ Pace of implementation
 - ❖ Risk of Technology Obsolescence
- ❖ Need for Cost-effective solutions
- ❖ Need for efficiency + accountability

Pre-requisites for success of PPP

- ❖ Proactive Government
- ❖ Abundant IT skills in Pvt sector
- ❖ Entrepreneurship
- ❖ Inexpensive Connectivity
- ❖ Administrative Reforms
- ❖ IT Architecture for e-Government
- ❖ Framework of Security
- ❖ PKI
- ❖ IT Champions

The PPP methodology

- ❖ Identify a partner for Project Development & management
- ❖ Establish project development processes
- ❖ Identify 5 core & 50 pivotal projects
- ❖ Invite proposals
- ❖ Shortlist
- ❖ Develop Prototypes
- ❖ Enter into appropriate partnerships
- ❖ Evaluate results thru' 3rd party audit

ICT Architecture

IT Architecture

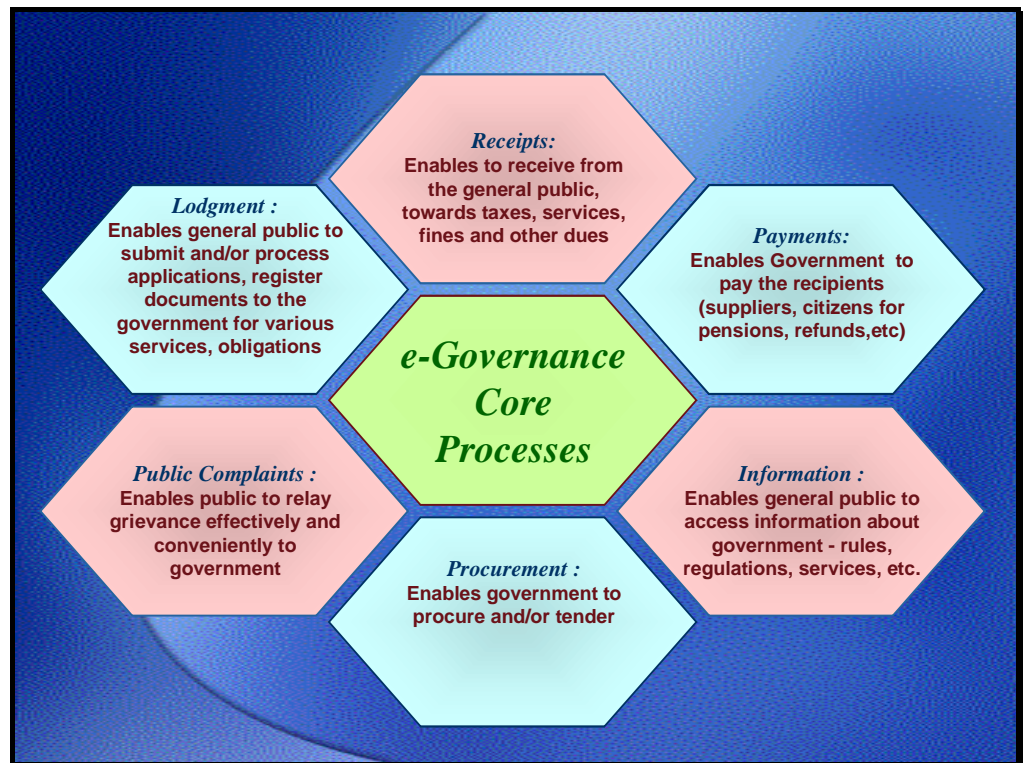
- ❖ Intensive effort with PWC on
 - ❖ IT Architecture
 - ❖ Security
 - ❖ Public Key infrastructure
- ❖ Recommendations on Architecture contain..
 - ❖ 56 Principles
 - ❖ 39 Technical Topics
 - ❖ 156 Best Practices
 - ❖ 31 Guidelines
 - ❖ 80 Standards
- ❖ Available on the Internet at..
 - ❖ www.ap-it.com

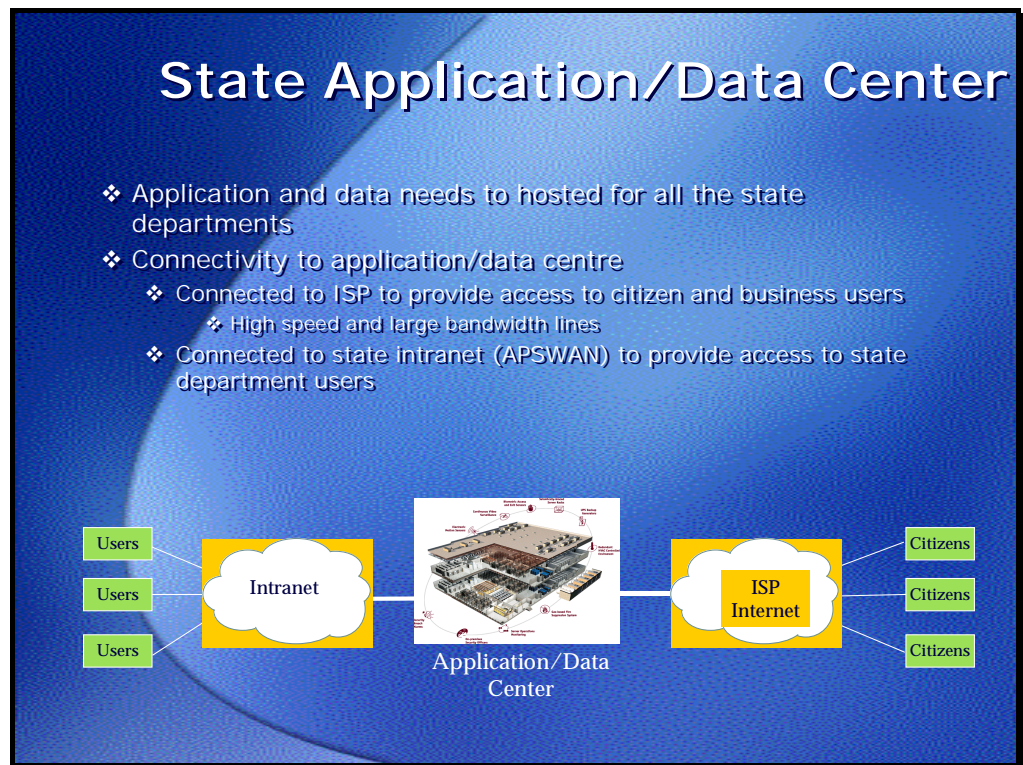
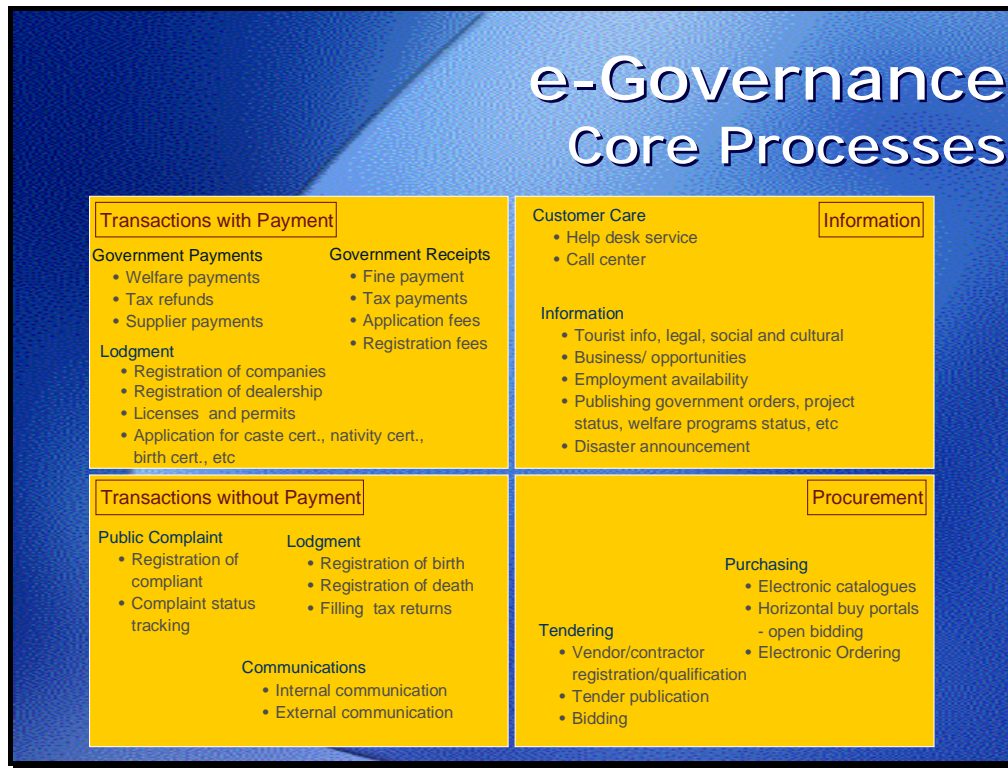
ICT Architecture enables us to ..

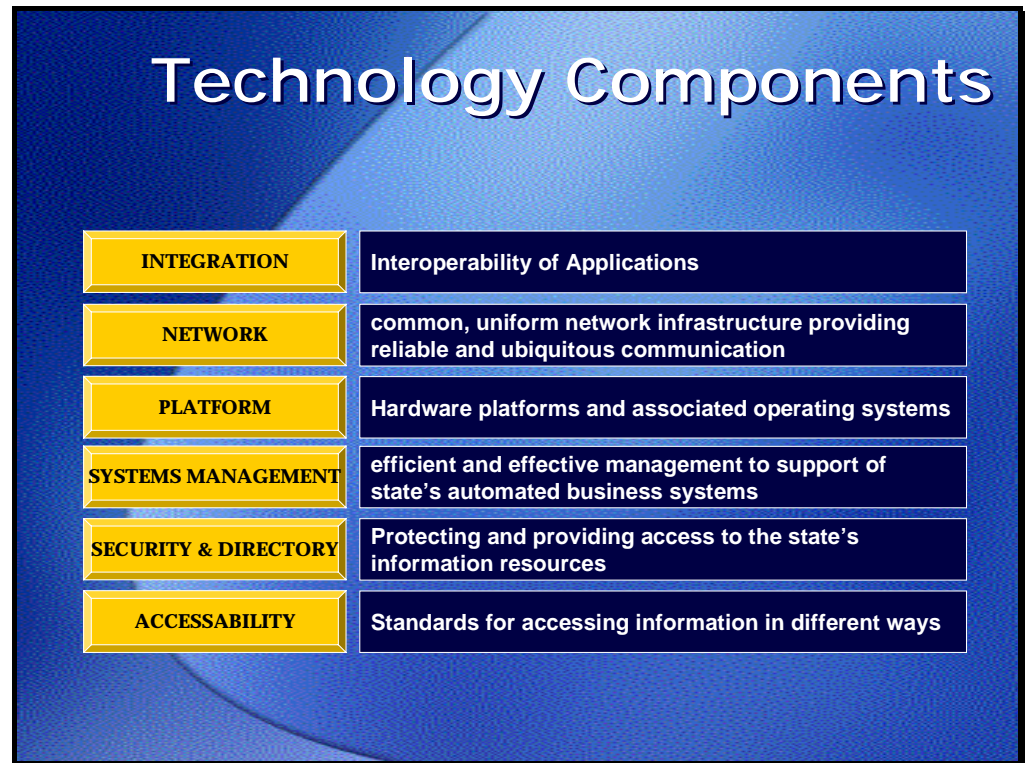
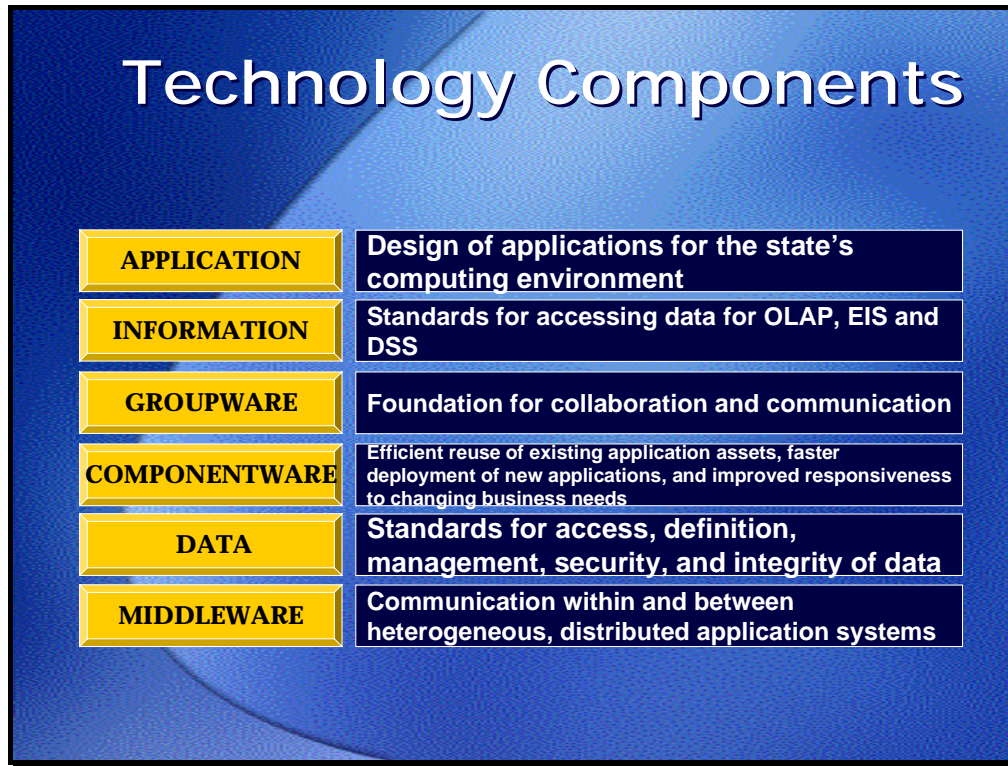
- ❖ Draw the Big Picture
- ❖ Prioritize
- ❖ Implement in phases
- ❖ Avoid duplication
- ❖ Ensure interoperability
- ❖ Enable PPP
- ❖ Achieve sustainability

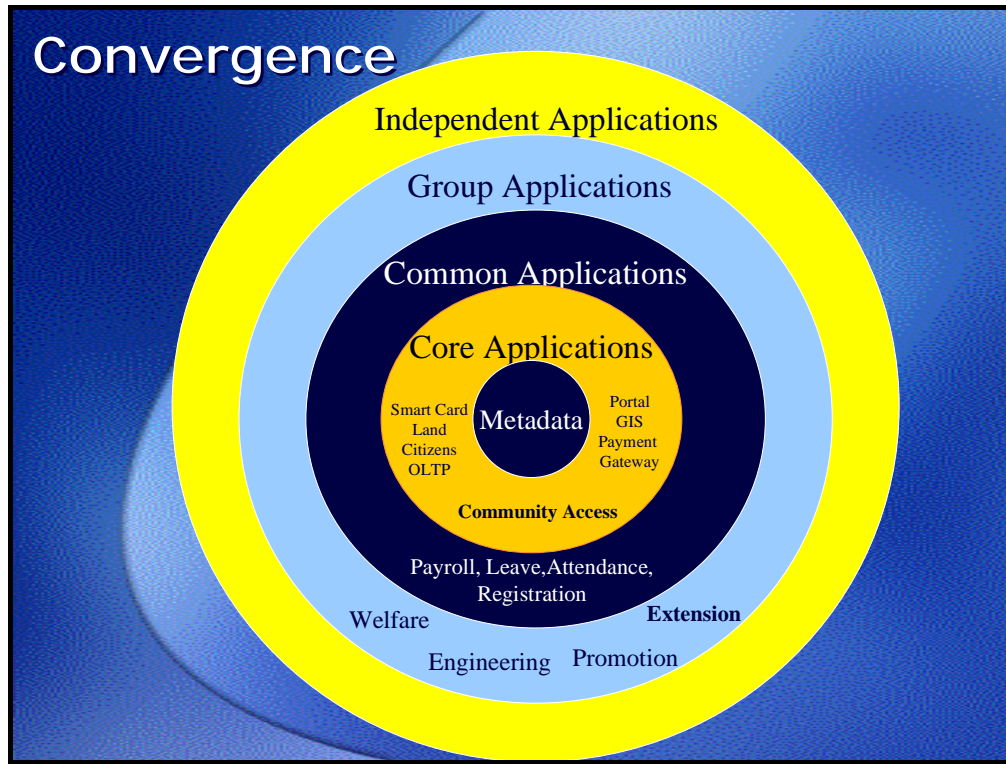
Key Learnings

- ❖ Architecture & Technology
 - ❖ Adoption of n-tier architecture
 - ❖ Electronic service delivery raises expectations and technology needs to be fast and robust
 - ❖ Electronic Services must be, and must be seen to be, suitably secure
- ❖ Application
 - ❖ Successful front-line applications depend upon robust and reliable 'back office' capability
 - ❖ Re-usable components
- ❖ Application/ data center
- ❖ IS Organization



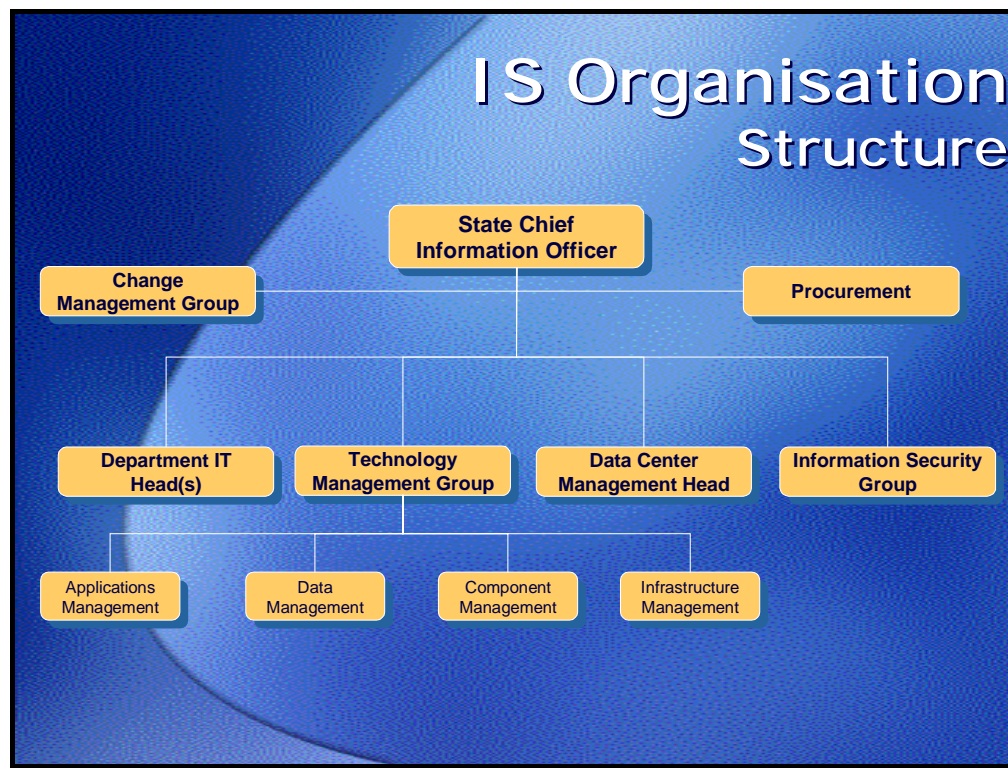






IS Organisation Guiding Principals

- ❖ Government Departments and IS Organisation must share a common vision
- ❖ IS organisation will provide leadership and guidance in implementing IT solutions across the state
- ❖ The size of the IS organisation - minimum required to deliver the objectives
- ❖ Outsource standard activities where ever possible



Why measure ?

- ❖ Accountability
- ❖ Validation against objectives
- ❖ Sustained operations
- ❖ Reality check
- ❖ Healthy competition

What to measure ?

- ❖ From Citizen / Business perspective
 - ❖ Convenience
 - ❖ Cost reduction
 - ❖ New Services
- ❖ From Government's perspective
 - ❖ Figure out where we stand
 - ❖ % of agencies / services 'computerized'
 - ❖ Volume of transactions
 - ❖ Length of sustained operations
 - ❖ % of constituents impacted
 - ❖ Digital divide
 - ❖ Cost reduction

How to measure ?

- ❖ Project-level
 - ❖ Key Performance Indicators
 - ❖ Service levels, costs, 'hit-rate'
 - ❖ Citizen's Charters
 - ❖ Opinion Polls
 - ❖ Independent survey
 - ❖ Degree of self-financing
- ❖ State-level
 - ❖ Validate against core objectives
 - ❖ Quality of life of citizens
 - ❖ Reduction in corruption
 - ❖ Cost reduction
 - ❖ Develop a Statistical model (EGDI)

