# Executive Summary

# Executive Summary

## ICT Planning for Improved Productivity and Development

ICT planning in both developed and developing countries has assumed significance; in the former, the accent is on the emergence of the "New Economy" – possibility of obtaining higher growth rates despite low savings due to increased productivity through capital deepening and improvement of labour productivity. In the context of developing countries, ICT planning could adopt a different approach to the development of ICT applications. One such approach could be *Sen's Capability Approach* which adopts a holistic and humane view of the goals of development by looking at the degree of integration the deprived segments of society attain after application of ICT as an e-governance tool. In a similar manner, *Brown's Information Based Approach* suggests that the change in the degree of linkage, coverage and direction of information through ICT application be used as an evaluative tool. It is these yardsticks which should be used to decide the resource allocation by the planners.

Following these new evaluation criteria, the present report attempts to measure the e-readiness of the States of India and Central Ministries/Departments by ranking them in terms of their preparedness for the networked world. This assessment is the first of its kind within India; so far, no systematic efforts have been made in this direction.

## E-readiness Assessments Elsewhere

Over the past few years, a number of e-readiness assessments have been carried out. In fact, India has been assessed 11 times at the global level. Some of them are given below:

- The July 2002 EIU ranking ranks India below Sri Lanka at 43rd out of 60 as E-business follower.
- The January 2001 IDC ranking found that 55 of the countries navigating the Information Super highway account for 98 per cent of all IT in 150 countries. It ranked India at 54 and Pakistan at 55 among the group of elite 55.
- The May 2001, Mc-Connell ranking of E-Readiness Assessment indicated that substantial improvements were needed in the area of Connectivity. Improvements are also required in the areas of E-Leadership, E-Business, Information security and Human Capital.
- The Global Information Technology report, 2002-03, ranked India 37, above China which is ranked 43rd, where as the 2001-02 report ranked India 54.

Each ranking/ assessment looks at e-readiness with a different perspective. The focus is most cases has been on E-economy. Therefore, the Government of India is doing its own assessment of comparing the different States and Central Ministries/ Departments in terms of their preparedness for the networked world

## Defining E- readiness

Various assessments have defined e-readiness in different ways depending on the objective of the study under taken. For this study, the e-readiness definition with respect to States, based on Sen's Capability Approach and Brown's Information Based Approach, is as follows:

> *"It is the preparedness of states to provide governance equitably and cost effectively and the capability reflected in the degree of integration the deprived segments of society attain after application of ICT as an e-governance tool. Apart from this, the ability of the state to provide business, the capacity to participate in the provincial level digital economy and further networking with the national level digital economy."*

With respect to the central ministries/departments, the definition of e-readiness focuses more on output and not on "outcome" of the e-governance initiatives:

> *"E-Readiness is the degree to which a country is prepared to participate in the networked world. It would demand the adoption of important applications of ICTs in offering interconnectedness between government, businesses and citizens."*

## E-readiness Assessment - State Level

### Model

For the assessment at the State level, the CID Model, with some modifications, has been adopted in preference to Computer System Policy Project (CSPP) and Network Readiness Index (NRI). For instance, in the CID model, e-government is considered as an indicator under network economy. However, taking the view on e-readiness as equipping the marginalised section of society with an information based tool to increase the level of well being, this model takes e-governance as a separate group. It envisages placing states in various stages in the following six groups: Network Access, Network Learning, Network Society, Network Economy, Network Policy and E-governance.

The states in India have been ranked using the multi-stage Principal Component Analysis. The principal component analysis is a multivariate choice method. This approach develops a composite index by defining a real valued function over the relevant variables objectively. In this method, composite index at each stage of the analysis is constructed and these indices will be used as a variable for the next stage. Ultimately, the final composite index for the broad indicators will be constructed and the states will be ranked based on the values of the final composite scores.

Various attributes such as network access, network learning, network society, network economy, etc. need to be combined for this purpose. Each of the attributes is again represented by a large number of indicators that could reflect the status of availability of that particular attribute. For example, network access is characterised through measures of information infrastructure, internet availability, internet affordability, network speed and quality, available hardware and software, service and support. Again each of these indicators are measured through a number of sub-indicators; information infrastructure is measured through indicators like teledensity, number of households with telephone connection, businesses with phone, number of cellular services provider, etc. Therefore, measuring the states' level of e-readiness is an involved process.

### Composite Indices

On the basis of the e-readiness composite index calculated, the states have been classified into six categories- Leaders, Aspiring Leaders, Expectants, Average Achievers, Below Average Achievers and Least Achievers. The classification is as under:

| Categories | States |
|---|---|
| Leaders | Karnataka , Maharashtra, Tamil Nadu, Andhra Pradesh |
| Aspiring Leaders | Gujarat, Goa, Delhi, Chandigarh |
| Expectants | West Bengal, Uttar Pradesh, Kerala |
| Average Achievers | Madhya Pradesh, Punjab, Pondicherry |
| Below Average Achievers | Haryana, Rajasthan, Himachal Pradesh, Uttaranchal, Chattisgarh, Orissa, Mizoram., Tripura, Meghalaya, Andaman & Nicobar Islands |
| Least Achievers | Assam, Jharkhand, Lakshadweep, Bihar, Jammu & Kashmir, Sikkim, Arunachal Pradesh, Nagaland, Daman & Diu, Manipur, Dadra and Nagar Haveli |

The e-readiness Index permits policy makers to investigate the reasons leading to a State's ranking and relative performance. It captures the key factors relating to the environment and the readiness and usage of the three stakeholders in ICT (citizens, businesses and governments), and can be used to understand the performance of a State with regard to ICT applications in governance and creating a facilitating environment. The composite index and sub-index rankings serve to identify the key areas where a state is under- or over performing. Though ranking is useful as a relative indicator of a State's ICT readiness, there are a few limitations to the analytical process. There are also a few problem areas in enlisting all relevant data, although tremendous effort have been put in by the field teams to ensure accuracy and consistency in data.

### Validation by Case Studies

The categorisation of IT achievements of the states have also been corroborated by the use of case studies. Case studies illustrate the 'outcome' of ICT initiatives while the 'output' is shown by the composite index. Different IT initiatives that have improved the level of well being of the under privileged sections of society in the Indian context are sketched below:

The state of Karnataka has been successful in tackling the widespread problem of unproductive rent seeking in land registration processes called 'Bhoomi' which serves the under privileged section of the state. This has been done by developing 'state of the art' facilities in land registration. The "information village" in Pondicherry has proved to be an important information hub for farmers, fishermen and the general village population. This has been achieved through the updated and accurate market prices obtained through ICT. The Gyandoot project in Dhar, Madhya Pradesh, has had a similar impact on marginalised sections of the people.

The FRIENDS project in Kerala has improved the administrative process through the use of ICT. Computerised payment of bills has reduced corruption while at the same time improved the image of the government as a service delivery institution. The CARD project, Andhra Pradesh, has transformed Government to citizen interaction through application of ICT in delivery of citizen services. In fact, Andhra Pradesh has been a pioneer in this field.

The inter-state transport system in Gujarat has been revolutionised by the setting up of computerised inter state check post which have reduced harassment faced by the transporters while reducing the arbitrariness that existed earlier in the imposition of excise duty.

These are but a few cases, which have been researched, in the limited time of the project. Stakeholders familiar with other initiatives need to communicate these with the editorial team for wider dissemination in the subsequent report.

## E-readiness Assessment – Central Ministries/ Departments Level

### Model

The P- cube I– cube model was developed to assess the overall level of e-readiness within the central ministries/ departments. According to this model, various criteria have been evaluated as the factors affecting e-readiness. The six broad criteria identified are: IT /e-governance preparedness, IT Policy, People, IT Infrastructure, Process and IT Benefits/ Competence. These criteria are again divided into sub-criteria which would be both subjective and objective. Appropriate weights were assigned to each criteria and accordingly macro index scores were calculated for the 69 central ministries/departments studied. The assigned weights essentially define the quantum of impact of the criteria on the overall e-readiness. In order to achieve this, multiple regression analysis was done to identify a dependant variable and then measure the impact of the other variables. This procedure estimates the coefficients of the linear equation, involving a set of independent variables, that best predicts the value of the dependent variable.

### Similar Size Groups

The Ministries/Departments have wide variance due to their nature of functioning. There may be some small ministries, who have taken some big initiatives, but will get low scores as they would get eclipsed by a few large ministries. Thus, there is a need for a comparison across groups formed according to some distinct properties of the Ministries and Departments. Therefore, the ministries have been categorised into Similar Sized Groups (SSGs) according to variables like, the predominant process (G2C, G2B, G2G) or spread (number of offices), or size (number of employees) or affluence (annual budget allocation for the ministries/departments) that would classify these ministries into distinct, independent and mutually exclusive groups. Cluster analysis has been used to classify them into three categories: SSG I (less number of employees, few offices), SSG II (large number of employees, less number of offices) and SSG III (large number of employees and large number of offices).

The members of these groups along with the overall ranking (on the basis of macro index scores) of the ministries and departments is shown below:

## SSG I – Small

| Rank | Name |
|---|---|
| 1 | Department of Administrative Reforms and Public Grievance |
| 2 | Cabinet Secretariat |
| 3 | Ministry of Steel |
| 4 | Department of Bio technology |
| 5 | National Commission for SC/ST |
| 6 | Department of Women & Child Development |
| 7 | Department of Tourism |
| 8 | Ministry of Civil Aviation |
| 9 | Ministry of Textiles |
| 10 | Department of Atomic Research |
| 11 | Ministry of Food Processing Industries |
| 12 | Ministry of Coal |
| 13 | Department of Chemical and Petrochemicals |
| 14 | Ministry of Mines |
| 15 | Department of Fertilizer |
| 16 | Department of Official Languages |
| 17 | Ministry of Food and Consumer Affairs |
| 18 | Ministry of Disinvestment |
| 19 | Department of Public Enterprises |
| 20 | Ministry of Law and Justice Legislative Department |
| 21 | Ministry of Shipping |
| 22 | Ministry of Power |
| 23 | National Security Council |
| 24 | Ministry of Tribal Affairs |
| 25 | Ministry of Information & Broadcasting |
| 26 | Department of Legal Affairs |
| 27 | Department of Ocean Development |
| 28 | Ministry of Land Resources |
| 29 | Ministry of Small Scale Industries and Agro and Rural Development |
| 30 | President Secretariat |
| 31 | Department of Drinking Water Supply |
| 32 | Ministry of Petroleum and Natural Gas |
| 33 | Department of Scientific and Industrial Research |
| 34 | Ministry of Parliamentary Affairs |
| 35 | Department of Commerce - Supply Division |
| 36 | Ministry of Youth Affairs and Sports |
| 37 | Department of Indian Systems of Medicine and Homeopathy |

## SSG II – Medium

| Rank | Name |
|---|---|
| 1 | Ministry of NCES |
| 2 | Ministry of Defence - Supply and Production Division |
| 3 | Department of Telecom |
| 4 | Department of Industrial Policy and Promotion |
| 5 | Planning Commission |
| 6 | Department of Science and Technology |
| 7 | Ministry of Social Justice and Empowerment |
| 8 | Department of Food and Public Distribution |
| 9 | Department of Finance and Economic Affairs |
| 10 | Ministry of Environment and Forests |
| 11 | Department of Rural Development |
| 12 | Ministry of Road Transport |
| 13 | Department of Secondary and Higher Education |
| 14 | Department of Urban Development |
| 15 | Department of Personnel and Training |

## SSG III – Large

| Rank | Name |
|---|---|
| 1 | Department of Commerce |
| 2 | Department of Information Technology |
| 3 | Ministry of Small Scale Industries |
| 4 | Department of Company Affairs |
| 5 | Department of IT and Revenue |
| 6 | Department of Posts |
| 7 | Department of Agriculture and Co-operation |
| 8 | Ministry of External Affairs |
| 9 | Department of Family Welfare |
| 10 | Ministry of Labour |
| 11 | Ministry of Statistics and Programme Implementation |
| 12 | Department of Health |
| 13 | Department of Agricultural Research and Education |
| 14 | CSIR |
| 15 | Ministry of Railways |
| 16 | Department of Culture |
| 17 | Department of Animal Husbandry |

### Macro Index

The Macro Index evolved has been able to capture their movement towards e-governance. However, the Macro Index is not a stand-alone indicator developed in isolation. In fact, it is a complex integration of various micro indices- IT / e-Governance Preparedness, IT Policy, People, IT Infrastructure, Policy and IT Benefits.

The top five ministries and departments on the basis of the macro index scores are presented below:

**E-Readiness scores for the Ministries and Departments**

| Rank | Name |
|---|---|
| 1 | Department of Administrative Reforms and Public Grievance |
| 2 | Cabinet Secretariat |
| 3 | Ministry of Steel |
| 4 | Department of Bio-technology |
| 5 | Department of Commerce |

## Gap Analysis- Central Ministries/ Departments

The Gap Analysis technique has been used to benchmark the respective ministry's performance against the best one within the SSG, against the average performer and on an overall basis. This technique understands and measures various gaps existing in the department when compared with the benchmarks. This analysis is done on all six critical aspects of e-readiness, which are IT/e-governance preparedness, people, process, infrastructure, policy and IT benefits.

The advantage of the above analysis is that the factors critical to the success of an e-readiness programme can be identified in a much efficient way. The contribution of each of the criteria to the overall performance of the department can also be understood easily. This analysis is the best tool for understanding the department's weaknesses and strengths against the benchmarks, which in turn would give them adequate learning as to which factor should be given importance while documenting the next IT policy and which aspects can be leveraged towards achieving an adequate level of e-readiness for the department.

The Gap analysis technique also assists in studying the underlying inter-linkages between the various factors so as to ascertain which ones are the key factors that are impacting the e-Readiness of the ministry/department.

## Action Plan

On the basis of the gap analysis, the bottleneck factors as well as the success factors have been identified for the Central Ministries/Departments. For the State governments, action plan has been derived based on both quantitative/qualitative analysis. From the quantitative analysis, the variables, which are highly correlated with the composite index, have been identified in order that activities in these areas are prioratised. The case studies indicate a three-fold classification of IT initiatives, which call for specific strategies targeting each. For instance, it is suggested that those initiative that become financially viable over a longer time period, but have tremendous social profits, need to be subsidised. The learning from the case studies brings forth the necessity of adopting the best practices of the success stories and avoiding the mistakes of failed initiatives.