# Executive Summary

- In an increasingly networked world, the nature of global relationships takes on a completely different dimension. Apart from the usual rankings of countries in terms of GDP and other social and economic indicators, it is now common to rank them according to some technological indicator. This could be e-Governance, e-Readiness, or a host of other variables.

- Less developed economies, in this set up, cannot afford to ignore the technological revolution. Indeed, they are in a much better situation as compared to today's developed countries when they were in early stages of development. They can employ the more advanced and productive technologies to their advantage.

- Contrary to the traditional belief that technology only favors the more advanced segments of society, numerous programs have shown its interesting possibilities for the marginalized and neglected groups in the society. It is now clear that ICT provides a unique window of opportunity to improve the status of the poor and achieve the Millennium Development Goals.

- In the last 20 years, India has been one of the fastest growing economies in the world. Its growth has been unique as compared to other less developed countries of today, on that it has leveraged its advantage in the services sector to achieve this growth. The role of technology has been crucial in its transformation into a knowledge economy.

- The Government of India has supported this transformation by introducing various initiatives in the field of e-Governance. Indian states are very diverse and many of them can be treated as separate countries in terms of area and population. It is, therefore, only natural to study them separately to get an idea of their e-Rankings.

- This is the fourth in a series of e-Readiness reports of Indian states that the NCAER has been preparing for the DIT. The basic analytical framework has remained the same since 2004, allowing a comparison of state rankings across years.

- However, the methodology is such that it allows only a relative ranking within a particular year. This is important while comparing ranking of states across years. The fact that the rank of a state has gone down in a particular year does not mean that its absolute level of e-Readiness has declined. All that it implies is that relative to the other states, its level is lower. This could happen, for instance, if other states were improving faster that one particular state.

- Given the dramatic growth in the IT sector, it is clear that its role in the macro economy is becoming more important. However, what is the extent of the impact – on output, employment and incomes. For the first time, NCAER's e-Readiness Report 2006, estimates the impact of the IT sector on the economy as a whole using the Social Accounting Matrix (SAM). The SAM framework allows us to study the impacts at a disaggregated level - by sectors and by socio-economic groups.

- Direct and indirect output generated in the economy by the IT sector was Rs 88512 crores in 1999-00. This translated into a value addition of Rs 40477 crores, which formed 2.2 per cent of the GDP. The comparable figure for 2004-05 was 5.6 per cent of GDP. Assuming a 30 per cent increase in production of the IT sector over 2004-05, the direct and indirect output generated in the economy would be Rs 457091 crore, an increase of Rs 105482 crore over 2004-05. In terms of value added, the increase would be to the tune Rs 48237 crore over 2004-05. This would translate into an increase of Rs 38788 crore in household incomes.
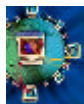
- While the major effect of this increase is on the affluent rural and urban classes, the poor households also get positively affected by the increase in IT sector production. The sector wise effect of this increase is maximum on the IT sector itself leading to an increase in output of Rs 36904 crore followed by Trade, Other transport services, Banking and food products. Total employment generated in all the sectors is 34.2 million person years as compared to 26.3 million person years in 2004-05, which implies that additional employment generated by increase in production within this sector would be in tune of 7.9 million person years

- Apart from output multipliers, SAM framework also allows us to obtain income multipliers. With the help of income multipliers we can derive the differential impacts of increase in production at factor cost on different factor services. The Income multiplier works out to be 1.51 implying that an increase in production by Rs 1 lakh in the economy will generate income worth Rs 1.51 lakh. Assuming production for the current year increases by 30 per cent over 2004 to Rs 138658 crore, this will lead to an income generation of Rs 209028 crore. We have also obtained household income multipliers for different rural and urban household groups classified on the basis of Rs per month per capita income. These multipliers trace out differential impacts on income generation for different household groups of an increase in production in the economy. For instance, most poor rural household group RH1 (Rs 000-225), income generated would be Rs 1796 crore given its income multiplier of 0.01. Similarly, most affluent rural household group RH5 (Rs 775 and above) benefit by Rs 34771 crore given multiplier of 0.25. Similar figures for UH1(Rs 000-350) and UH5(Rs 1500 and above) are Rs 1140 crore and Rs 31758 crore.

- After reviewing the macro picture the Report proceeds to the state-wise picture. As in the last 3 years, a composite index is created for each state to measure its e-Readiness. This composite index is then used to rank the states and compares their performance within and across years.

- e-Readiness is a multidimensional concept. It measures the state's ability to participate in an increasingly networked world. It can be viewed as the ability to pursue value creation opportunities facilitated by ICT. Therefore, it is not simply a matter of the number of computers, internet connections, telephones and mobiles, etc., in the state but also the ability or readiness to use technology skillfully at the level of the individual, business and the Government.

- Given the multi-dimensional nature of what is being measured, the Report employs the use of composite indicators. These are used to compare performances in a given field between countries or states because of the practicality they present in measuring complex concepts through a single figure. They also lend themselves to interpretation by the general public, as it is easier to track the progression of a single composite indicator than study the trends of multiple variables. In particular, the report uses multi-stage Principal Component Analysis (PCA) to derive the composite indicator.

- To measure e-Readiness, 3 main sub-indicators are used:
    - the environment that promotes the spread and usage of ICT;
    - the readiness of different stake holders of the economy (the government - both the initiatives of the central government and the response of the state governments, businesses and the individual) to use ICT; and
    - the degree of usage of ICT by the three stakeholders.

- The data for computing these indices is obtained from both secondary and primary sources. Secondary sources included the Department of Telecommunication Annual Statistics, Statistical Abstracts of India, Economic Survey, Census publications and various Government of India websites. Primary data collection was through a survey of the various departments of the state governments using a well-structured questionnaire.

- In an effort to improve upon earlier reports, the questionnaire has been designed more comprehensively and includes some more relevant variables along with appropriate consistency checks. Addition of new variables is necessary to take account of recent and new developments in both public and private domains.

- Like the composite index, even the sub-indices are multi-dimensional and need more than one variable to accurately reflect what they are trying to measure. Thus, our e-Readiness composite index is basically a weighted average of a large number of quantitative and qualitative indicators organized into three basic categories: environment, readiness and usage.

- Environment relates to the conditions prevailing in the state like infrastructure and policies external to the players involved in making e-Governance effective. This includes the market environment, the political regulatory environment as well as the infrastructural environment.

- Readiness deals with those characteristics of the players (government, business and individuals) that enable them to respond to an environment that in enabling. Qualification or training of individuals in IT is an example of readiness.

- Usage is the actual utilization of information technology given a conducive environment and a positive state of readiness. Here again, we consider usage by all the three stakeholders. In this sense, a certain level of environment and readiness is a precondition to usage of a certain level. However, our methodology does not allow us make absolute comparisons of the three sub-components of e-Readiness, and only provides relative positions of states as the indices indicate relative positioning of the states.

- There are three steps involved in computing a state's e-Readiness index:
    - First, we use PCA to compress the minor category indicators under each sub–major category. So all the indicators measuring market environment are combined using PCA to give the market environment indicator. In a similar manner, indicators are obtained for political & regulatory environment, infrastructure environment, individual readiness, business readiness, government readiness, individual usage, business usage and government usage.

    - In the second step, PCA is used to combine these sub–major categories to construct indices for the next level of indicators, namely the environment index, the readiness index and the usage index.

    - Finally, again applying PCA the aggregate e-Readiness index is constructed by combining the environment, readiness and usage indices.

- In the ranking of states by their e-Readiness, the Report differentiates between different levels:
    - Leaders – Chandigarh, Delhi, Haryana, Karnataka, Punjab, Andhra Pradesh, Kerala, and Tamil Nadu.

    - Aspiring Leaders – Maharashtra, Gujarat, Uttar Pradesh and Goa.

    - Expectants – Rajasthan, West Bengal, Himachal Pradesh, Chattisgarh & Jharkhand.

    - Average Achievers – Mizoram, Orissa, Puducherry, Madhya Pradesh, Sikkim, Meghalaya, and Uttarakhand.

    - Below Average Achievers – Assam, Nagaland, Andaman & Nicobar Islands, and Lakshadweep.

    - Least Achievers – Bihar, Tripura, Manipur, Daman & Diu, Jammu & Kashmir, Dadra & Nagar Haveli and Arunachal Pradesh

- However, there is considerable variation in the ranking of states within the different sub-indices. For instance, while states like Haryana and Chandigarh are leaders in terms of the environment and readiness indices as well, states like Maharashtra and Gujarat which are leaders in terms of the environment index, are much lower (expectants) in terms of the readiness and usage indices. This again

brings to fore the fact that the ranking is a relative one.

- While comparing rankings of states over time (2004 – 06), recall that though the broad methodology of the e-Readiness index has not changed over the last four years, variables that have been used to construct indices have changed over a period of time. Thus, a comparison of ranks for states over different years has to be seen along with its limitations.

- Here again, there is a fair amount of variation. For instance, among the southern states, only Karnataka has improved its position with respect to the last year. All the other states have lost out in this year's index value, while maintaining a stable position between 2004 and 2005. On the other hand, the north western states have, registered a consistent increase since 2004 with the sole exception of Punjab.

- However, comparison of ranks, has an inherent limitation. The relative distance between the different states is not taken into account. To overcome this problem, the range equalisation method was used to compare the relative positions of the states. Nonetheless, the modified series will only measure relative positions of the states and not the absolute changes. Thus, positive and negative deviations do not indicate absolute decline or improvement in the state's position with respect to e-Readiness or its constituent components. They only imply a relative decline or improvement of the state's position with respect to a common maximum or minimum.

- Once again the state experience is varied. Most states have improved their relative range equalized scores. Even less developed states like UP, Chattisgarh, and Jharkhand, as well as the N-E states have improved their relative range equalised scores. This is indicates, that even states that were not very high in the 2006 rankings, have improved their relative scores over 2005.

- The 2006 e-Readiness report takes the analysis one step further, by evaluating the e-Readiness of certain central ministries. The performance of government ministries is relevant since one of the major purposes of e-Readiness is to strengthen e-Governance.

- Nine Central Line Ministries/Departments that have direct interactions with the public have been chosen in order to analyse the extent to which the central government is applying ICT techniques to improve the quality and quantity of its services.

- These Ministries/Departments are:
    - Ministry of Corporate Affairs (MCA)
    - Ministry of External Affairs (MEA)
    - Council of Passports and Visas, Ministry of External Affairs (CPV)
    - Central Board of Excise and Customs, Ministry of Finance (CBEC)
    - Central Board of Direct Tax, Ministry of Finance (CBDT)
    - Directorate General of Foreign Trade, Ministry of Commerce and Industry (DGFT)
    - Directorate General of Supply Division, Department of Commerce, Ministry of Commerce and Industry (DGSD)
    - Department of Pension & Pensioners Welfare, Ministry of Personnel, Public Grievance & Pensions (DPPW)
    - e-Committee, Department of Law and Justice, Ministry of Law and Justice (DLJ)

- Like states, ministries were also evaluated in terms of their environment, readiness and usage of ICT. Unlike the states however, the ministries are not directly comparable to each other since each has different responsibilities and offer different services. This incomparability means that ministries cannot be ranked in order of e-Readiness, they can only be judged according to the applicability of ICT to their work and the efforts they invest to achieve it.

- The data is primarily based on a questionnaire circulated in the selected Ministries. However, this
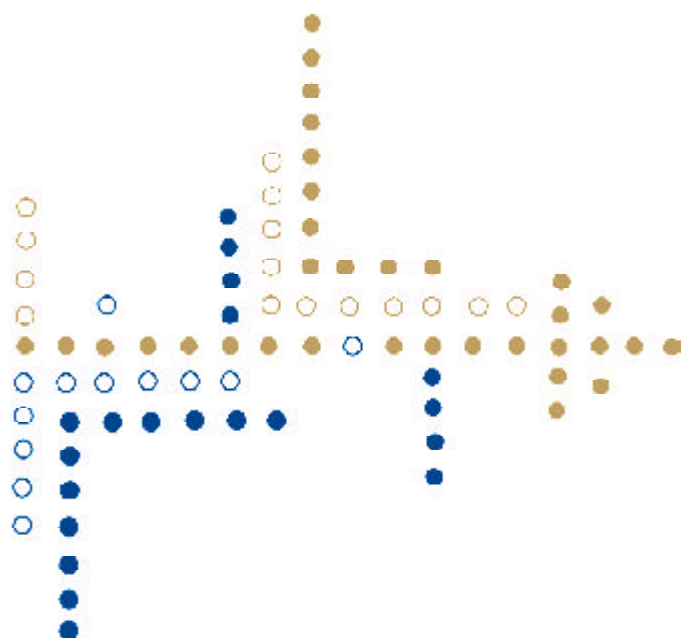
data cannot be quantified. The small sample seriously limits statistical analysis and this is exacerbated by the responses being fairly patchy.

- In most ministries, infrastructure is not a major problem. However, facility of intranet is absent in two of the nine selected cases. Also, access to existing infrastructure to the lower level staff appears to be a problem in some cases.

- Most of the bottlenecks are concentrated around efficient usage of existing infrastructure. For instance, transaction of official documents or use of digital signatures is not common in spite of intranet availability. Apart from English, the only language in which information is provided to general citizens is Hindi. Unless there are efforts to provide information of the central ministries/departments in other scheduled languages as well, full potential of e-Governance will remain unrealised as far as outreach of the information is concerned.

- Also, the major constraint in promoting ICT usage is that of shortage of qualified human resources. In particular, incentives for Information Technology staff have to be introduced in order to retain the existing talent within the government system.

Introduction