Chapter 2

E-Preparedness of States in India

Having recognised that Information and Communication Technology (ICT) is a critical enabler of sustainable socio-economic growth and its use can empower people in developing countries to overcome development obstacles, it is, therefore, important to measure the e-preparedness levels of the states which would be dealt with in the following section.

At the global level, there have been a few attempts to measure the levels of e-readiness. One of the pioneering efforts in this direction was the study by Centre for International Development (CID) at Harvard University. This study developed the Networked Readiness Index (NRI) to make a broad and systematic comparison of the level of ICT development of the countries around the globe. The NRI analysis of national-level Networked Readiness included 75 countries from various regions of the world that covered about 80 per cent of the world's population and 90 per cent of its economic output. The United States was ranked first with an NRI value of 6.05 and Nigeria last with an NRI of 2.10 in 2001–02. India has been ranked 54th with an NRI value of 3.32 and is ahead of many developing countries such as China, Sri Lanka, Russia, Philippines, etc. In the latest published NRI (2002–03), which included 82 countries, India has improved its position and is ranked 37th ahead of many of the Asian and other developed countries.

One should exert restraint while comparing the NRI results for 2002–03 to that of the previous year. The NRI framework, 2002–03, is an evolution of the model used to compute the index last year. Further, the variables used to compare NRI vary due to model differences. For example, variables related to the readiness and adoption of ICT by governments is given a higher importance in the NRI framework.

The Networked Readiness Index as well as the ranking of a few selected countries is shown below:

Table 2.1: Network Readiness Index of Selected Countries

Country	Networked Readiness Index (20001-02)	NRI Rank (2001-02)	Networked Readiness Index (2002-03)	NRI Rank (2002-03)
United States	6.05	1	5.79	2
Singapore	5.47	8	5.74	3
United Kingdom	5.31	10	5.35	7
Japan	4.86	21	4.95	20
Malaysia	3.82	36	4.28	32
Thailand	3.58	43	3.80	41
India	3.32	54	3.89	37
Sri Lanka	3.15	62	3.45	54
China	3.10	64	3.70	43
Bangladesh	2.53	73	2.53	77

Source: Global Information Technology Report, 2002-2003.

India has states, which are nation like; hence, this kind of study could be replicated at the provincial level for India. Besides, Indian states are competing for attracting direct investments in industry and infrastructure by showcasing their governance achievements, level of infrastructure, provision of incentives, etc. Therefore, the index at the state level will be an interesting exercise to examine "success factors" in achieving e-preparedness at the state level.

E-readiness of the states has been through an empirical model-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. Given a set of explanatory variables, if we have to select the most important variable or a limited number of variables from the set, principal component analysis helps. The principle of this method lies in the fact that when different characteristics are observed about a set of events, the characteristic with more variation explains more of the variation in the dependent variable compared to a variable with lesser variation in it. Therefore, the issue is one of finding weights to be given to each of the concerned variables. Weight to be given to each of the variables is found out based on the principle that the variation in the linear composite of these variables should be the maximum. Once the weight to be given to each of these variables is decided, we can focus on constructing the composite index.

The main purpose of this modelling exercise is to quantify the levels of achievement of each state in terms of e-readiness index (composite) based on certain relevant characteristics. The logic of the exercise flows from the simple assumption that higher the levels of these characteristics, higher would be the levels of e-readiness.

Identification of the levels of e-readiness at the state-level requires a three-step procedure.

1. Identification of the most important characteristics that represent e-readiness.
2. Identification of appropriate measures of those characteristics.
3. A rating of states based on composite index which reflects the position of a particular state as indicated by the comparative position of important characteristics identified in step 1.

E-readiness is too complex a concept to present in a simple fashion. It includes a large number of enabling factors and all of them together should represent the levels of e-readiness of the states in a quantitative form to provide an understanding of the development levels of each state in terms of ICT. The CID model[1] (with minor modifications) has been adopted to construct an index of e-readiness of the Indian states. The CID model is perhaps the ideal model that suits the environment (in terms of e-readiness) of the India states to form a single index at the state level.

The e-readiness index is developed based on six broad parameters– Network Access, Network Learning, Network Society, Network Economy, Network Policy and E-governance. Each of these parameters is represented by a set of indicators and these indicators are again represented by a number of sub-indicators. Since many factors affect the level of advancement of a state in terms of information and communication technology, it is essential to form a composite index that incorporates a large number of relevant variables into it. There are different ways to form a composite index where all the selected indicators are represented by one single indicator that facilitates easier comparison of the states. The key issue in this integration process, however, is the identification of the weights that have to be assigned to each variable. As explained, the Principal Component Analysis has been chosen as the best known approach for constructing a single composite index out of a large number of variables with the help of a quantitative database. The weighting scheme of the variables through principal component analysis allows the model to determine weights based on the data itself and thus reduces the possibility of imposition of any external subjectivity in the composite index. The characteristics of the principal component analysis has been discussed in the methodology section of this chapter.

Data Sources

As mentioned earlier, the model considers six broad parameters (Annex II) to construct the e-readiness index at the state level. The variables representing these parameters are both quantitative and qualitative. The qualitative data was transformed into quantitative form for the purpose of the model.

Data for this analysis is collected both from secondary data sources like DoT Annual Statistics, Statistical Abstracts, Economic Survey, Census publication and various web sites and from the survey of the various departments of the state governments with a well structured questionnaire. The raw data was then transformed into variables representing indicators and sub-indicators wherever required using appropriate normalising factors. This transformation of the raw data into relevant variables is

essential to maintain the comparability of the indicators across the states.

Some of the indicators considered initially for the model were dropped due to non-availability of the data, i.e. those indicators were dropped where sufficient data points are not available (if the data is not available in case of more than 50 per cent of the states). Otherwise, the data has been adjusted through appropriate extrapolation norms in case of some of the variables for the states where the data is not available. Extrapolation norms are identified either through correlation with relevant explanatory variables or based on income criteria which are considered as the most effective means for this purpose. In some cases where extrapolation is not possible, the missing data has been replaced by an appropriate statistic.

Methodology

To compare the states in terms of e-readiness, the relevant factors or variables have been reduced into one single measure or a composite index. A composite index can be defined as a linear combination of variables assigning equal or different weights to the variables. These weights can be determined subjectively or based on some statistical or econometric technique. In many cases, equal weights are used to form the composite index where it is assumed that each and every variable is equally important in explaining the phenomenon. Sometimes, subjective weights are used when the importance of the variables is known apriori and imposed externally.

A multi-stage Principal Component Analysis has been used to construct the e-readiness index of the states. In case of multi-stage Principal Component Analysis, the composite index formed at a lower level is used as a variable in the next step for computing the composite index and so on, when the variables are identified at various stages. The first principal component has been used to form the composite index that is characterised by the property of having the largest sum of squared correlations. This process is applied to each subgroup of the identified components of e-readiness. The first principal factors obtained from the different subgroups were treated as a set of new variables and composited at the second stage to obtain the index of the components. Similarly, the first principal components of the broad indicators of e-readiness were used to obtain the composite e-readiness index. This method alleviates the necessity of taking more than one principal factor, since the correlations among the variables in a sub-group are generally high and consequently, the first principal component explains an adequate proportion of variation in the data matrix. This method has been extensively used by regional scientists because of its optimality property. The complex procedure of the principal component analysis has been given in its simplest form in Annex 1.

Results

In this section, the results of the composite index of e-readiness and the six broad parameters-Network Access, Network Learning, Network Economy, Network Society, Network Policy and E-governance, considered for computing the composite index, which is a linear combination of these components, are presented. It is important to remember that the composite index computed through Principal Component Analysis is essentially a relative measure. An individual score only shows its relative strength compared to others and does not depict its e-readiness level in an absolute sense. Due to this, it is always advisable to analyse the scores in certain groups rather than considering them as single data points. In this analysis, the states have been placed in six groups-leaders, aspiring leaders, expectants, average achievers, below average achievers and least achievers, based on their strengths to participate in the networked world.

Indices of all the six parameters considered have been computed at the previous stage. The index of each of these six parameters has been considered for construction of the final composite index of e-readiness of the states. The statistical results are explained below.

In Table 2.2, the pair-wise correlation coefficients of the indicators used to arrive at the final composite index of e-readiness are shown. It is important to remember here that these correlation coefficients are not the result of any causal relationship, the variables are assumed to be independent of each other. The pattern of the correlation matrix suggests that all the variables included in the model reveal moderate to high correlation with other variables. Network Access shows high correlation with most of the variables except Network Economy. The correlation coefficients of Network Economy with other variables also can be treated as moderate. The pair-wise correlation coefficients of the variables– Network Learning, Network Society and E-governance– are also found in a similar range, it suggests of the fact that these variables might have relatively higher weights in the composite index.

Table 2.2: Correlation Coefficients between Broad Parameters

Variables	Network Access	Network Learning	Network Society	Network Policy	E-governance	Network Economy
Network Access	1.00	0.72	0.85	0.55	0.66	0.39
Network Learning	0.72	1.00	0.75	0.66	0.76	0.63
Network Society	0.85	0.75	1.00	0.63	0.71	0.55
Network Policy	0.55	0.66	0.63	1.00	0.74	0.51
E-governance	0.66	0.76	0.71	0.74	1.00	0.54
Network Economy	0.39	0.63	0.55	0.51	0.54	1.00

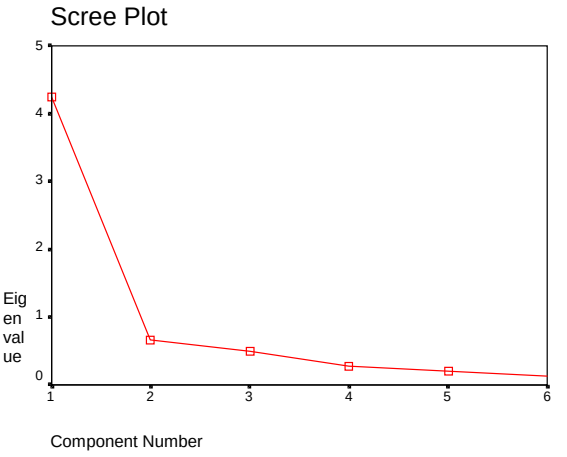
The statistical validity of inclusion of all these variables in our model through statistical tests has been confirmed. There are a number of ways of assessing whether a set of variables in the correlation matrix is suitable for factor analysis. Among these is a statistic called KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) that ranges from 0 to 1. One should be careful in selection of variables if this statistic is less than 0.7. In the model, the KMO statistic is 0.84, which suggests that the correlation coefficients, on the whole, are sufficiently high to make the analysis suitable.

Table 2.3: KMO statistic for the Model

Test	Values
KMO measure of sampling adequacy	0.841

As mentioned earlier, the first principal component of the model has been considered to form the composite index of e-readiness of the states. The model derived six principal components as there are six variables included in it. The strength of each factor in representing the model is computed by the corresponding Eigen Values. The Eigen Value is also suggestive of the explanatory capacity of a particular component. Any principal component with an Eigen Value of 1.0 and above may be considered as an important factor in explaining the model. The first component of our model has an Eigen Value of 4.24 and all the other principal components has an Eigen Value less than 1.0. The percentage of variance being explained by the first principal component is more than 70 per cent. These facts, along with the Scree Plot[2], are indicative of the fact that the first principal component is suitable enough to be used for computing the composite index of e-readiness.

Figure 2.1: Scree Plot



The final form of composite index depends a lot on the weight scheme derived by the model. The relative weights of the variables, presented in the table below, show that network learning and network society each contribute about 18 per cent of the total weight followed by e-governance. The lowest weight is contributed by network economy that is about 14 per cent of the total weight.

Table 2.4: The weights of the Indicators for the Final Composite Index

Indicator	Weight	Relative weight (%)
Network access	0.197	16.6
Network learning	0.212	17.9
Network society	0.211	17.8
Network policy	0.191	16.1
E-governance	0.207	17.5
Network economy	0.166	14.0

Based on these weights, the variables have been combined linearly to arrive at the composite index. The composite scores have been classified into six groups based on the

Figure 2.2: E-Readiness - Indian States

standard deviation across the states. One should remember while interpreting the scores that these are relative in nature and should be interpreted as *higher the value, higher the e-readiness level of the state*. Due to the nature of the composite index, it is better to study them in groups rather than compare them in terms of the magnitude of the composite index. The E-readiness index of the states in India along with their profile is shown in Annex-III where as the categorisation of the states based on their level of e-readiness is presented in the following diagram (Figure 2.2).

This diagram shows that the southern and the western states are the leading states in terms of e-readiness. Delhi and Chandigarh also have a high level of e-readiness. The eastern and northern states are clearly lagging behind as compared to the southern and western regions. West Bengal and Uttar Pradesh, categorised in the expectant group, are the only states from eastern and northern regions showing a relatively higher level of e-readiness. Most of the states of the north-eastern region have been categorised as least achievers.

The following table presents a distinctive picture of the region-wise distribution of the states according to their status of e-readiness where the domination of the southern and the western states are clearly spelt out.

The relationship between e-readiness index and the broad indicators have been studied through graphical presentation (Figure 2.3 to Figure 2.8) and correlation coefficients (Table 2.6). A close comparison of the graphs of e-readiness index and Network Access suggests that these two are more closely associated at the lower level of e-readiness index than at the higher level. As a whole for about 25 states, the level of Network Access is near the level of e-readiness of the state. In case of Network Learning, one can notice that the top ranking states with respect to e-readiness are closer to the level of Network Learning. Overall, the distance between these two indicators is marginal in case of most of the states. The same is true in the case of Network Society except for the fact that no clear pattern emerges at the top

Table 2.5: Regional Distribution of the States/UTs in terms of E-readiness Index

Region*	Leaders	Aspiring leaders	Expectants	Average achievers	Below average achievers	Least achievers	Total
Central	0	0	0	1	1	0	2
East	0	0	1	0	2	2	5
North	0	2	1	1	3	1	8
North-east	0	0	0	0	3	5	8
South	3	0	1	1	0	1	6
West	1	2	0	0	2	1	6

North- Punjab, Uttar Pradesh, Uttaranchal, Jammu & Kashmir, Himachal Pradesh, Haryana, Delhi, Chandigarh
South- Tamil Nadu, Pondicherry, Lakshadeep, Kerala, Karnataka, Andhra Pradesh
Central-Chattisgarh, Madhya Pradesh
East-Andaman & Nicobar islands, Bihar, Jharkhand, Orissa, West Bengal
West- Dadar & Nagar Haveli, Daman & Diu, Goa, Gujarat, Maharashtra, Rajasthan
North-East- Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura

level or at the lower level. The graph showing the relationship between e-readiness and Network Policy reveals that for about seven to eight states, the distance between these two is substantial. Otherwise, the states are following the same direction. The level of e-governance and e-readiness are closely associated except in a few states. The distance between e-readiness and Network Society is clearly depicted through the graphical representation. The figure also suggests a cluster of states around the same level of network economy.

The observations from the visual representations are well confirmed with the correlation coefficients presented in the following table. Network Learning has the highest correlation of 0.9 and the lowest correlation is for network economy. The correlation coefficients of the rest of the variables show marginal differences.

Table 2.6: Relationship between E-readiness Index and the broad indicators

Indicator	Correlation coefficients with E-readiness Index
Network access	0.838
Network learning	0.900
Network society	0.897
Network policy	0.810
E-governance	0.879
Network economy	0.703

Figure 2.3: Relationship between E-Readiness and Network Access

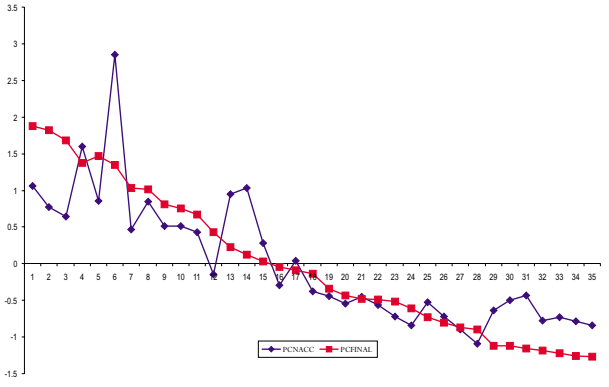


Figure 2.4: Relationship between E-Readiness and Network Learning

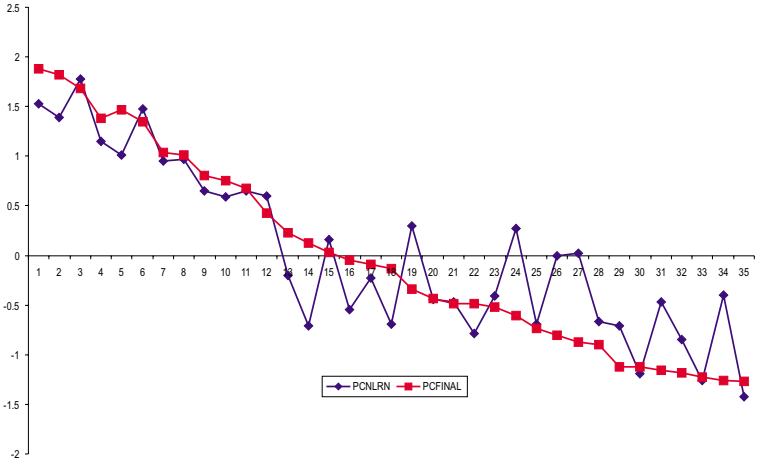


Figure 2.5: Relationship between E-Readiness and Network Society

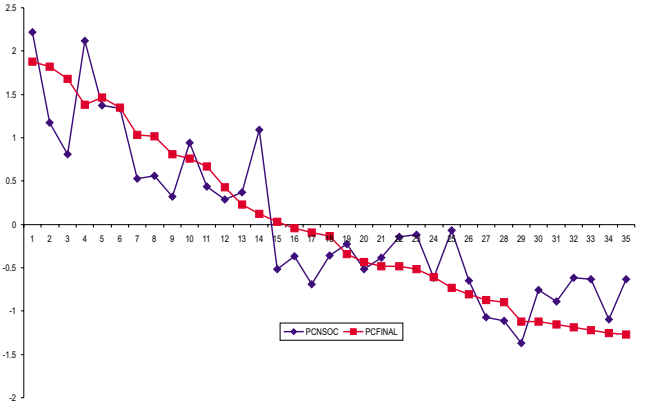


Figure 2.6: Relationship between E-Readiness and Network Policy

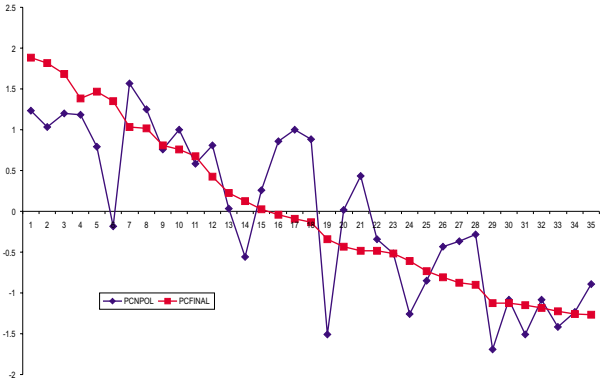


Figure 2.7: Relationship between E-Readiness and E-governance

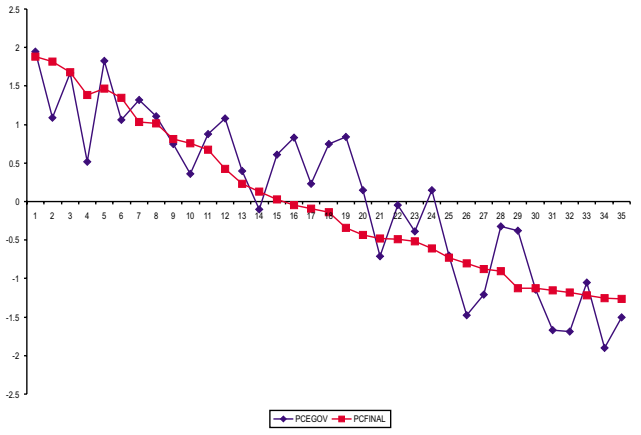
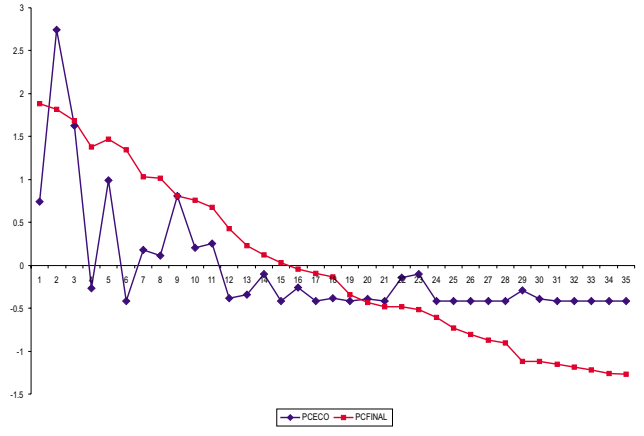


Figure 2.8: Relationship between E-Readiness and Network Economy



Another interesting analysis would be to probe into the relationship between e-readiness and its major components with the development levels of the states. Though there could be various indicators for determining the development levels of the state, the most representative of them is income. To maintain the comparability between states, per capita State Gross Domestic Product (SGDP) has been considered as the indicator of development of the states. This relationship has been studied with the help of a scatter diagram and correlation coefficients. The scatter diagrams are presented in Figure 2.9 to 2.14. The trend of the scatter suggests that there is a positive relationship between the per capita income of the states and the e-readiness index. Though there are a few outliers on both sides of the trend line, generally the e-readiness status follows the income level of the state. In case of network access, the relationship is stronger than overall e-readiness. Except one state, most of the states lie within close proximity of the trend line. A close look at the indicators representing network access suggests that most of them reflect the ability of the population of the state to reap the benefits of ICT development. The observed trend suggests that higher the income level of the state, higher is the capability of the residents to utilise the ICT facilities. The relationship of the income level with network learning and network society are similar. A positive relationship is noted with a large number of outliers that is suggestive of a less stronger relationship. The trend of the scatter between income and e-governance also reveals a weak relationship. The same is true in case of the relationship between income and network society also. The trend line and the outliers clearly depict a weak response of network economy to income level of the states.

Figure 2.9: Relationship between Per capita Income and E-Readiness Index

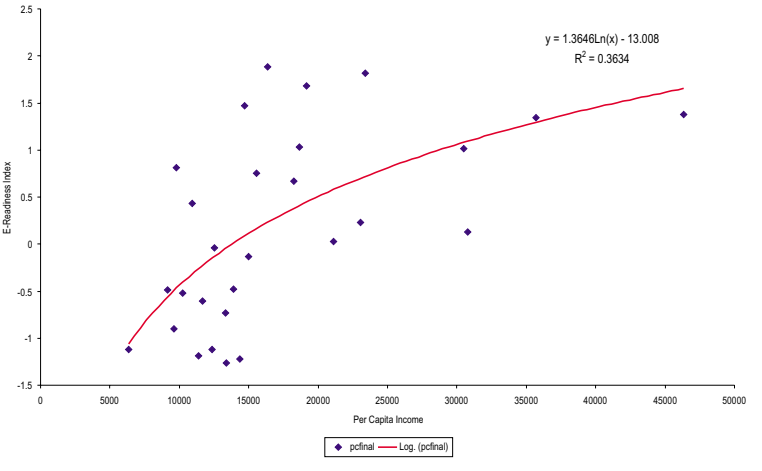


Figure 2.10: Relationship between Per Capita Income and Network Access

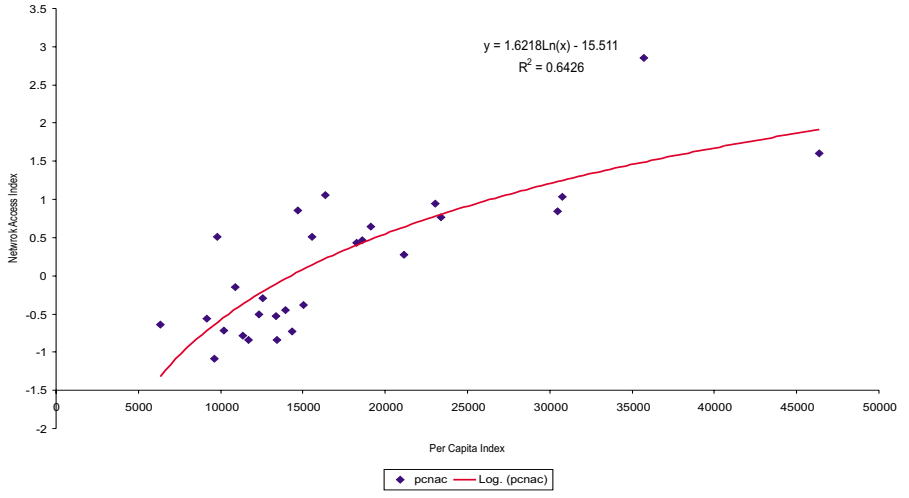


Figure 2.11: Relationship between Per Capita Income and Network Learning

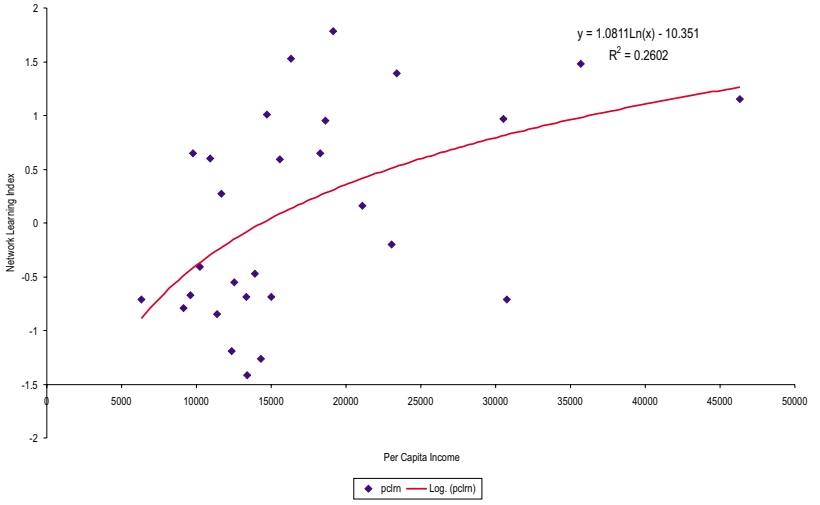


Figure 2.12: Relationship between Per Capita Income and Network Society

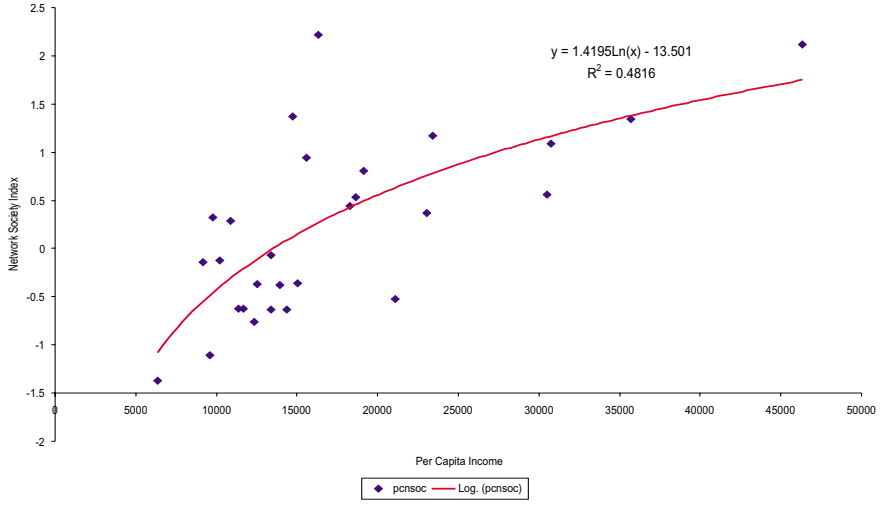


Figure 2.13: Relationship between Per Capita Income and E-Governance

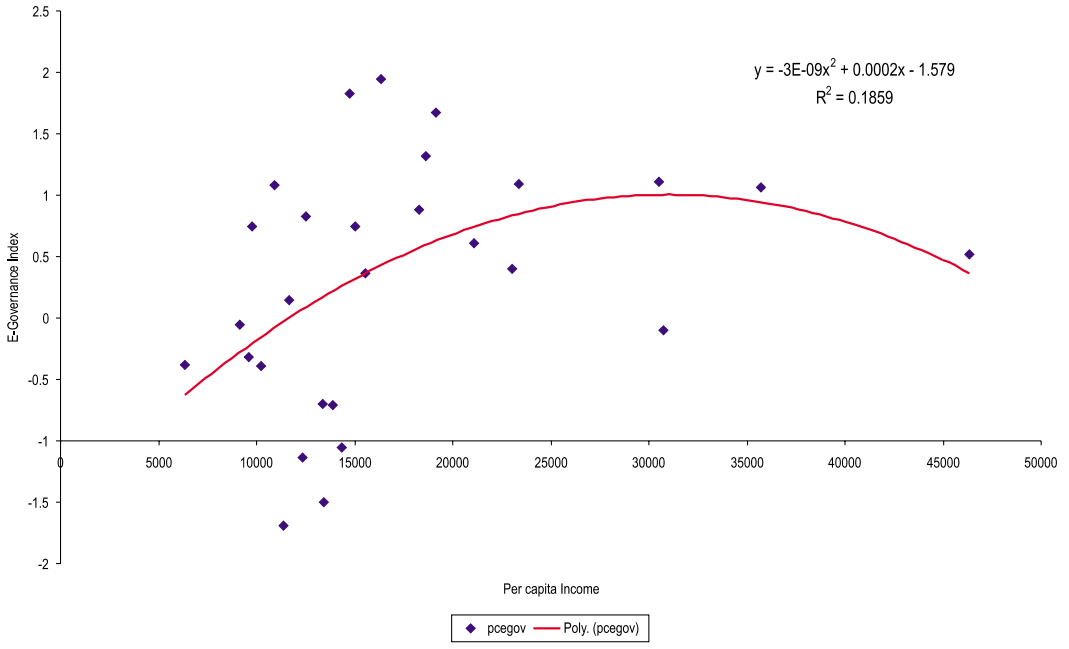
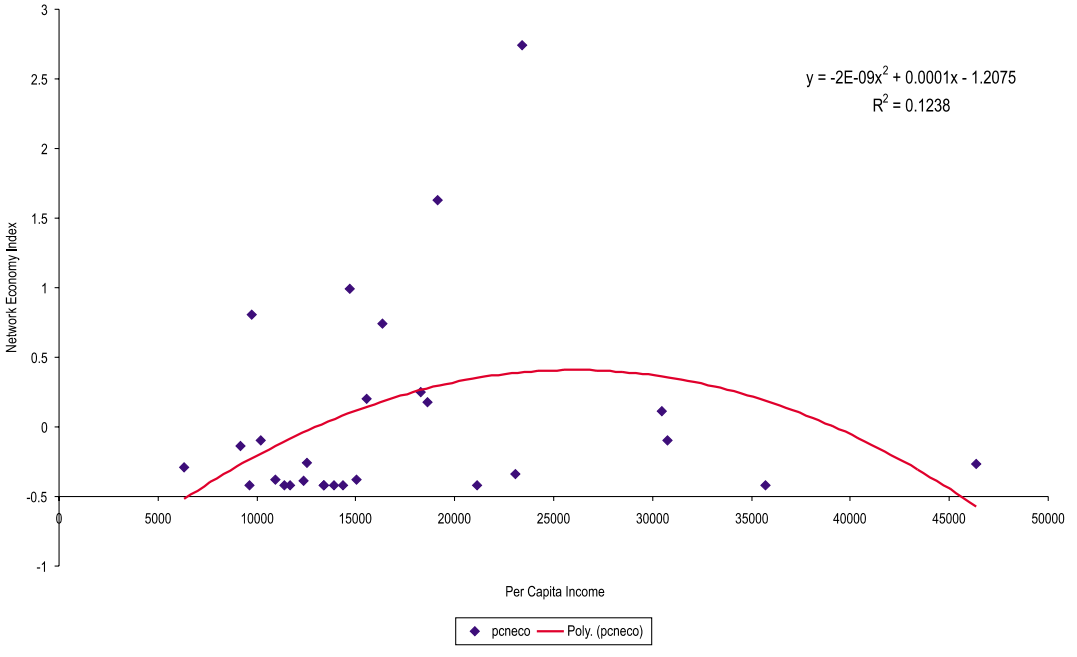


Figure 2.14: Relationship between Per capita Income and Network Economy



The correlation coefficients confirm the trends that emerge from the scatter diagrams. The e-readiness index has a moderately high coefficient with per capita income. Network access has a high correlation (0.80) and network economy has a very low correlation with per capita income.

Table 2.7: Relationship between Income and E-readiness Index and broad indicators

Indicator	Correlation coefficients with per capita income
E-readiness index	0.53
Network access	0.80
Network learning	0.45
Network society	0.68
Network policy	0.32
E-governance	0.27
Network economy	0.07

After discussing the levels of e-readiness in terms of the overall composite index and its implications in detail, the levels of development in terms of all the six broad ICT components considered for e-readiness index have also been presented. The states have been divided into six levels based on the composite index values of these parameters. Level 1 represents the best performance and level 6 represents the poorest performance. The results have been discussed below. The status of the various states according to their overall e-readiness and its components is given in Annex IV.

Network Access

The composite index for Network access has been computed based on four indicators- Information Infrastructure, Internet Affordability, Hardware and Software and Service and Support. The sub-indicators of these indicators of network access are shown below:

Table 2.8: Indicators for Network Access

Group	Sub-group	Characteristics
Network Access	Information Infrastructure	• Teledensity
		• Percentage of households with phone
		• Percentage of households with cable TV connection
		• Cellular phones per 100 fixed lines
		• Internet connections per 1000 persons
		• Percentage of villages covered by VPTs
	Internet Affordability	• Average price per hour of internet use in main cities
		• Number of cellular operators in the state
	Hardware and Software	• Hardware PC penetration-households (Nos.)
	Service and Support	• Telecom staff per 100 lines (Nos.)

The categorisation of the states based on Network Access index is given below.

Table 2.9: Categorisation of the States/UTs Based on Network Access

Levels	States	Number of States
Level 1	Delhi	1
Level 2	Chandigarh	1
Level 3	Karnataka, Pondicherry, Punjab	3
Level 4	Andhra Pradesh, Goa, Maharashtra, Tamil Nadu, West Bengal, Uttar Pradesh, Gujarat, Kerala, Haryana	9
Level 5	Rajasthan, Himachal Pradesh, Madhya Pradesh Andaman & Nicobar Island,	4
Level 6	Assam, Uttaranchal, Lakshadweep, Meghalaya, Nagaland, Dadra & Nagar Haveli, Manipur, Arunachal Pradesh, Jharkhand, Tripura, Bihar, Orissa, Chattisgarh, Sikkim, Jammu & Kashmir, Mizoram, Daman & Di u	17

The region-wise distribution of the states according to their status of Network Access is shown below:

Table 2.10: Regional Distribution of the States/ UTs based on Network Access

Region	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Total
Central	0	0	0	0	1	1	2
East	0	0	0	1	1	3	5
North	1	1	1	2	1	2	8
North-east	0	0	0	0	0	8	8
South	0	0	0	3	0	1	6
West	0	0	0	3	2	1	6

The table shows that Delhi and Chandigarh represent the first two levels respectively. Most of the states are categorised in the last three levels. It is notable from the table that all the southern and western states have figured in level 3 and level 4. All the north-eastern states come under level 6.

Network Learning

The composite index for network learning was based on two indicators– institutions' access to ICT and developing ICT at the work place. The sub-indicators are shown in Table 2.11.

Table 2.11: Indicators for Network Learning

Group	Sub- group	Characteristics
Network Learning	Institutions Access to ICT (Educational Institutions)	• Percentage of colleges having access to internet
		• Percentage of schools having access to internet
		• Percentage of schools with computer labs
		• Percentage of colleges with computer labs
		• Percentage of universities offering ICT courses
		• Percentage of universities/institutes with online courses
		• Percentage of colleges with websites
		• Percentage of schools with websites
	Developing ICT at workforce	• Number of registered training centers in State
		• Percentage of government employees covered under online training programs • Percentage of IT qualified teachers to total teachers • Percentage of students passing out with ICT courses to total students (general and technical)

The categorisation of the States based on index of Network Learning is presented in the following table.

Table 2.12: Categorisation of the States/UTs Based on Network Learning

Levels	Network Learning	Number of States
Level 1	Chandigarh, Maharashtra, Delhi, Karnataka, Tamil Nadu	5
Level 2	Andhra Pradesh, Goa, Gujarat	3
Level 3	Meghalaya, Uttaranchal, West Bengal, Madhya Pradesh, Kerala, Uttar Pradesh	6
Level 4	Andaman &Nicobar Islands, Punjab, Jharkhand, Lakshadweep, Haryana	5
Level 5	Orissa, Bihar, Pondicherry, Himachal Pradesh, Sikkim, Assam, Rajasthan, Mizoram, Daman & Diu, Chattisgarh, Tripura, Dadra & Nagar Haveli	12
Level 6	Manipur, Arunachal Pradesh, Jammu & Kashmir, Manipur	4

The following table presents a distinctive picture of the region-wise distribution of the states according to the status of Network Learning.

Table 2.13: Regional Distribution of the States/UTs based on Network Learning

Region	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Total
Central	0	0	1	0	1	0	2
East	0	0	1	2	2	0	5
North	2	0	2	2	1	1	8
North-East	0	0	1	0	4	3	8
South	2	1	1	1	1	0	6
West	1	2	0	0	3	0	6

The above table clearly reveals the domination of the southern and western states along with Delhi and Chandigarh at the top level. A large number of states are concentrated in level 5. Again, the states figuring at the lower level of Network Learning are from the northern, eastern and north-eastern regions.

Network Society

The composite index for Network Society was based on three indicators– people and organisation online, locally relevant content and ICT in everyday life and work place. The sub-indicators are given below:

Table 2.14: Indicators for Network Society

Group	Sub- group	Characteristics
Network Society	People & Organisations online	• Number of companies online (e-Commerce) • Households accessing internet as a % of households with phone • Households accessing internet as a % of households with computers
	Locally Relevant Content	• Number of government websites • Does Local Language Interface exist? • Percentage of total websites in local language
	ICT in Everyday Life & workplace	• Households having PC, phone & internet as a % of total households

The categorisation of the states based on the index of Network Society is presented in the following table.

Table 2.15: Categorisation of the States/UTs Based on Index of Network Society

Levels	States	Number of states
Level 1	Karnataka, Chandigarh	2
Level 2	Delhi, Andhra Pradesh	2
Level 3	Goa, Tamil Nadu, West Bengal, Pondicherry, Maharashtra	5
Level 4	Sikkim, Madhya Pradesh, Uttar Pradesh, Punjab, Kerala, Gujarat	6
Level 5	Jammu & Kashmir, Andaman & Nicobar Islands, Jharkhand, Arunachal Pradesh, Nagaland, Manipur, Meghalaya, Chattisgarh, Haryana, Mizoram, Rajasthan, Himachal Pradesh, Uttaranchal, Orissa, Tripura	15
Level 6	Bihar, Assam, Dadra & Nagar Haveli, Lakshadweep, Daman & Diu	5

A clear picture of the region wise distribution based on their status of Network Society is shown below:

Table 2.16: Regional Distribution of the States/UTs based on Network Society

Region	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Total
Central	0	0	0	1	1	0	2
East	0	0	1	0	3	1	5
North	1	1	0	2	4	0	8
North-east	0	0	0	1	6	1	8
South	1	1	2	1	0	1	6
West	0	0	2	1	1	2	6

Karnataka and Chandigarh have been identified as the best performing states in terms of Network Society followed by Delhi and Andhra Pradesh. The other important states identified with a higher e-readiness index come under level 3 and level 4 of the network society index. Again, a large number of states (15) are categorised in level 5. The trend of inclusion of northern, eastern and north-eastern states at the lower levels is true for Network Society also.

Network Policy

The composite index for Network Policy was based on sixteen indicators. These indicators are listed below.

Table 2.17: Indicators for Network Policy

Group	Sub- group	Characteristics
Network Policy	Telecommunication Regulation, ICT Trade Policy	• Have the state level telecom issues been addressed? • Have taxation issues in E-Commerce been addressed? • Does an IT Policy Exist? • Is there a section on Enabling policy? • Is there a section on Regulatory policy? • Is there a section on Legal policy? • Frequency of IT policy revision? • Is the issue of Intellectual property rights (IPR) addressed in ICT policy? • Have Sales Tax concessions been given to telecom/ICT companies? • Is there any provision for deferred taxes? • Is there a dedicated infrastructure for ICT firms? • Do Cyber laws exist? • Is recruitment of expert IT professionals feasible? • Are special rates available for internet access? • Are subsidised utilities provided to ICT firms? • Have incentives been given to Software Companies? • Number of Initiatives taken for the telecom regulation, ICT trade policy?

The categorisation of the States based on the index of Network Policy is presented in the following table.

Table 2.18: Categorisation of the States/UTs Based on Index of Network Policy

Levels	States	Number of states
Level 1	Maharashtra, Chandigarh, Tamil Nadu, Karnataka, Goa, Gujarat	6
Level 2	Kerala, Uttar Pradesh, Andhra Pradesh, Madhya Pradesh, Rajasthan, Himachal Pradesh, Andaman & Nicobar Islands, West Bengal	8
Level 3	Chattisgarh, Punjab, Haryana, Mizoram	4
Level 4	Pondicherry, Tripura, Jharkhand, Lakshadweep, Orissa, Assam, Delhi	7
Level 5	Jammu & Kashmir, Manipur, Nagaland, Sikkim	4
Level 6	Bihar, Uttaranchal, Daman & Diu, Arunachal Pradesh, Meghalaya, Dadra & Nagar Haveli	6

The following table presents a picture of the region-wise distribution of the States according to the status of Network Policy.

Table 2.19: Regional Distribution of the States/UTs based on Network Policy

Region	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Total
Central	0	1	1	0	0	0	2
East	0	2	0	2	0	1	5
North	1	2	2	1	1	1	8
North-east	0	0	1	2	3	2	8
South	2	2	0	2	0	0	6
West	3	1	0	0	0	2	6

E-governance

The composite index for e-governance is based on six indicators– Special Efforts, E-services, Government Preparedness, Infrastructure, Data System and Leadership and Awareness. The sub-indicators of these indicators are given in the table below:

Table 2.20: Indicators for E-governance

Sub-group	Characteristics
Special Efforts	• Rural connectivity • Has there been application of ICT in the following areas (i) Agriculture (ii) Health services (iii) Transportation (iv) Energy (v) Trade
Government Preparedness	• Has Government process reengineering been carried out? • Is there political stability in the state? • Does a PERT* chart for new ventures exist? • Have the government employees records been computerised? • Number of e-governance projects successfully completed & in operation for 1 yr (Nos.)
E-Services	• E- procurement in existence • Are the following facilities available online (i) Land registration (ii) Stamp paper registration (iii) Utilities billing (iv) Crime registration (v) Municipality Administration
Infrastructure	• Does a Government Intranet network exist?
Data Systems	• Have the land records been computerised? (Yes/No) • Number of movable property records (vehicles) computerized (Nos.)
Leadership and Awareness	• Does a separate ministry for ICT exist? • Is Interest shown for ICT consultation by other departments? • Is there any computer training programme for top Civil servants? • Total funds of HRD on computerisation

* Programme Evaluation Review Technique

The categorisation of the States based on the index of E-governance is presented in the table below:

Table 2.21: Categorisation of the States/UTs Based on index of E- Governance

Levels	States	Number of States
Level 1	Karnataka, Andhra Pradesh, Tamil Nadu, Gujarat	4
Level 2	Himachal Pradesh, Uttar Pradesh, Rajasthan, Uttaranchal, Kerala, Delhi, Madhya Pradesh, Maharashtra, Goa	9
Level 3	West Bengal, Punjab, Chandigarh, Haryana	4
Level 4	Tripura, Bihar, Assam, Pondicherry, Orissa, Chattisgarh, Meghalaya, Andaman & Nicobar Islands	8
Level 5	Lakshadeep, Jammu & Kashmir, Arunachal Pradesh, Mizoram, Sikkim	5
Level 6	Dadar & Nagar Haveli, Manipur, Daman & Diu, Nagaland, Jharkhand	5

The following table presents a distinctive picture of the region-wise distribution of the states according to the status of e-governance.

Table 2.22: Regional Distribution of the States/UTs based on E-governance

Region	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Total
Central	0	1	0	1	0	0	2
East	0	0	1	3	0	1	5
North	0	4	3	0	1	0	8
North-east	0	0	0	3	3	2	8
South	3	1	0	1	1	0	6
West	1	3	0	0	0	2	6

The table above suggests that almost 50 per cent of the States are categorised under the first three levels of e-governance performance. Apart from the important states as seen in the previous tables, Himachal Pradesh, Rajasthan, Madhya Pradesh, Uttaranchal, Punjab and Haryana are among the notable states to be mentioned in level 2 and level 3. The north-eastern and the eastern states are again found at a lower level of performance in terms of e-governance.

Network Economy

The composite index for Network Economy was based on five indicators– number of IT parks in the State, Floor Area of IT parks, Sales Turnover of companies in IT parks, Employment in IT parks, Number of Companies using the facilities provided by IT parks as shown below:

Table 2.23: Indicators for Network Economy

Group	Sub- group	Characteristics
Network Economy	ICT Employment Opportunities	• Number of IT parks in the state • Floor area of IT parks • Sales turnover of companies in IT parks • Employment in IT parks in state • Number of jobs that require ICT skills • Number of companies using facilities provided by IT parks

The categorisation of the States based on index of Network Economy is presented below:

Table 2.24: Categorisation of the States Based on Network Economy

Levels	States	Number of states
Level 1	Maharashtra	1
Level 2	Tamil Nadu	1
Level 3	-	0
Level 4	Karnataka, Uttar Pradesh, Andhra Pradesh	3
Level 5	Kerala, West Bengal, Gujarat, Goa, Tripura, Pondicherry	6
Level 6	Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Haryana, Jharkhand, Lakshadweep, Manipur, Meghalaya, Mizoram, Nagaland, Delhi, Sikkim, Uttaranchal, Daman & Diu, Dadra & Nagar Haveli, Chattisgarh, Jammu & Kashmir, Himachal Pradesh, Madhya Pradesh, Punjab, Bihar, Chandigarh, Rajasthan, Orissa	24

A region wise distribution of states based on Network Economy clearly indicates that most of the states are clustered at level 6.

Table 2.25: Regional Distribution of the States based on Network Economy

Region	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Total
Central	0	0	0	0	0	2	2
East	0	0	0	0	1	4	5
North	0	0	0	1	0	7	8
North-east	0	0	0	0	1	7	8
South	0	1	0	2	2	1	6
West	1	0	0	0	2	3	6

The categorisation of the States based on Network Economy shows that only two States (Maharashtra and Tamil Nadu) figure in first two levels and none of the states come under the category of level 3. Number of states in level 6 is as high as 24. Non availability of data for many of the states for various variables related to Network Economy has influenced the model and has resulted in the concentration of states in a single category (level 6). This also confirms the observation made while discussing the relationship between Network Economy and E-readiness Index.

[1] "Readiness for the Networked World: A Guide for Developing Countries", Center for International Development, Harvard University, 2000.

[2] A scree plot shows the contribution of the components in the model. It suggests that the components have less contribution to the model from the point the curve becomes smooth.