3.1 e-Government and e-Governance

3.2 Scope of E-Governance
   3.2.1 Government to Citizen
   3.2.2 Citizen to Government
   3.2.3 Government to Government
   3.2.4 Government to Business

3.3 Objectives of E-Governance

3.4 Advantages of E-Governance

3.5 E-Government Initiatives in India: An Overview
   3.5.1 Emerging Areas For E-Governance

3.6 ICT Growth in India

3.7 Measuring the Impact of ICT

3.8 ICT Development Ranking of Select Countries

3.9 Digital Natives

3.10 Constraints and Challenges

3.11 E-Governance - the Kerala Experience
ICT AND GOVERNANCE

With the rising awareness among the citizens and their better experiences with the private sector – the demand for better services on the part of government departments became more pronounced. The application of Information and Communication Technology (ICT) has played a prominent role in strengthening such a demand. Public Administration, governed by bureaucratic structures built on certain so called ‘rationale’ principles, has failed to respond to the changing needs of the present times. It is so because it tended to be rigid; laid too much emphasis on red-tapism; sap creativity; thwarted initiative; wore out dynamism and denied justice as of resultant delays. In addition, the focus was more on following procedures and keeping records. Consequently the government moved at snail’s pace, that too, after guzzling scarce public resources. This criticism seems to be harsh and overstated, but it brings the sordid and murky picture of the system to light. The clarion call is, revamp the government and the archaic governance system which result in technology enabled governance.

E-governance is a paradigm shift over the traditional approaches in Public Administration, means rendering of government services and information to the public using electronic means. This has brought about a revolution in the quality of service delivered to the citizens. It has ushered in transparency in the governing process; saving of time due to provision of services through single window; simplification of procedures; better office and record management; reduction in corruption; and improved attitude, behavior and job handling capacity of the dealing personnel.

3.1 e-Government and e-Governance

The two terms- e-government and e-governance are independent concepts, but are at times used alternatively, thereby the major distinction between e-government and e-governance is missed out. E-government is understood as the use of Information and Communication Technology (ICT) to promote more efficient and cost effective government, facilitate more convenient government services and allow greater public access to information, and make government more accountable to
citizens. E-governance, on the other hand is the use of ICT by the government, civil society and political institutions to engage citizens through dialogue and feedback to promote their greater participation in the process of governance of these institutions. Thus, e-government can be viewed as a subset of e-governance, and its focus is largely on improving administrative efficiency and reducing administrative corruption.

3.2 Scope of e-Governance

Governance is all about flow of information between the Government and Citizens, the Government and Businesses and the Government and Government. E-Governance covers all these relationships as follows.

- Government to Citizen (G2C)
- Citizen to Government (C2G)
- Government to Government (G2G)
- Government to Business (G2B)

3.2.1 Government to Citizen

Government to Citizen relationship is the most basic aspect of E-Governance. The G2C relation includes the services provided by the Government to the Citizens. In modern times, Government deals with many aspects of the life of a citizen which include the public utility services i.e. Telecommunication, Transportation, Post, Medical facilities, Electricity, Education and some of the democratic services relating to the citizenship such as Certification, Registration, Licensing, Taxation, Passports, ID Cards etc. The relation of a citizen with the Government starts with the birth and ends with the death of the citizen. Therefore E-Governance in G2C relationship will involve facilitation of the services flowing from Government towards Citizens with the use of Information and Communications Technology (ICT). Some of the emerging areas in G2C can be listed.

**E-Citizenship**

E-Citizenship will include the implementation of ICT for facilitation of Government Services relating to citizenship of an individual. It may involve online transactions relating to issue and renewal of documents like Ration Cards, Passports, Election Cards, Identity Cards, etc. It is required for the Government to create a virtual identity for every citizen so as to enable them to access the Government
services online. For the same, Government would need to create a Citizen Database which is a huge task.

**E-Registration** - E-Registration will cover the online registration of various contracts. Many of these contracts and transactions require registration for giving it legality and enforceability. Such registration may also be made ICT enabled. E-registration will help to reduce a significant amount of paperwork.

**E-Transportation** - E-Transportation includes ICT enabled services of Government, relating to Transport by Road, Rail, Water or Air. This may involve online –

1. booking and cancellation of tickets,
2. knowing status of vehicles, railways, boats and flights,
3. issue and renewal of driving licences,
4. registration and renewal of vehicles,
5. transfer of vehicles,
6. payment of the fees of licences and-
7. payment of fees and taxes for vehicle registration.

**E-Health** - E-Health services includes ICT enabled health services of the Government. Under this, interconnection of all hospitals may take place. Patient database and local pharmacy database may also be created.

**E-Education** - E-Education would cover the implementation of ICT in education. Distant as well as classroom education needs facilitation through the use of ICT. For instance, use of internet reduces the communication time required in distance education. Internet may also help in conducting online classes.

**E-Help** - E-Help refers to the facilitation of disaster and crisis management using ICT. It includes the use of technologies like internet and SMS for the purpose of reducing the response time of the Government agencies to the disasters. Online information relating to disasters, warnings and calls for help can assist the Government and the NGOs to coordinate their work and speed up the rescue work.
**E-Taxation** - E-Taxation will facilitate the taxing process by implementing ICT in the taxing process. Online tax due alerts and online payment of taxes would help transact faster.

### 3.2.2 Citizen to Government

Citizen to Government relationship will include the communication of citizens with the Government arising in the Democratic process like voting, campaigning, feedback, etc.

**E-Democracy** - The true concept of Democracy includes the participation of citizens in the democratic and governing process. Today due to the increased population the active participation of the citizens in governing process is not possible. The ICT can help to enable the true democratic process including voting, public opinion, feedback and Government accountability.

**E-Feedback** - E-Feedback includes the use of ICT for the purpose of giving feedback to the Government. Lobbying is pursuing the Government to take a certain decision. Use of ICT can enable online feedback to the Government, online debates as to the Government services.

### 3.2.3 Government to Government

G2G relationship includes the relationship between Central and State Government and also the relationship between two or more Government departments.

**E-Administration** - E-Administration would include the implementation of ICT in the functioning of the Government, internally and externally. Implementation of ICT can reduce the communication time between the Government Departments and Governments. It can substantially reduce paper work if properly used. E-administration will also bring speed and transparency to the administration of Government Departments.

**E-Police** - The concept of E-Police is little different from Cyber-Police. Cyber Police require technology experts to curb the electronic/cyber crimes. E-police refers to the use of ICT for the purpose of facilitating the work of the Police department in investigation and administration. The concept of E-police includes databases of Police Officers, their performances, Criminal databases – wanted as well as in custody, the
trends in crimes and much more. ICT can help reduce the response time of the Police department and also reduce cost by reducing paperwork.

**E-Courts** - The concept of E-Court includes the ICT enablement of the judicial process. Technology may help distant hearing, online summons and warrants and online publication of judgment and decrees.

### 3.2.4 Government to Business

**E-Taxation** - Corporate sector pays many taxes, duties and dues to the Government. Payment of these taxes and duties will be made easier by E-Taxation. Online taxing and online payment of taxes can help reduce cost and time required for physical submission of taxes. ICT can also help cross check the frauds and deficiencies in payment, further bringing accuracy and revenue to the Government.

**E-Licensing** - Companies have to acquire various licenses from the Government, similarly the companies have to acquire various registrations. ICT enablement of the licensing and registration can reduce time and cost.

**E-Tendering** - E-Tendering will include the facilities of online tendering and procurement. It alerts to new opportunities of business with the Government and also online submission of tenders and online allotment of work. It will reduce time and cost involved in the physical tendering system.

### 3.3 Objectives of e-Governance

Following are the objectives/aims of E-Governance:

**To build an informed society** – An informed society is an empowered society. Only informed people can make a responsible Government. Access to every piece of information of the Government and of public importance is one of the basic objectives of E-Governance.

**To increase Government and Citizen Interaction** - E-Governance aims at build a feedback framework, to get feedback from the people and to make the government aware of people's problems and to find solutions with their active involvement.

**To encourage citizen participation** - E-governance aims to restore democracy to its true meaning by improving citizen participation in the Governing process, by
improving the feedback, access to information and overall participation of the citizens in the decision making.

**To bring transparency in the governing process** - E-governance carries an objective to make the Governing process transparent by making all the Government data and information accessible to people. It is to make people know the decisions, and policies of the Government.

**To make the Government accountable** - Government is responsible and answerable for every decision taken by it. E-Governance aims to help the Government to be more accountable than now by bringing transparency and making the citizens more informed.

**To reduce the cost of Governance** - E-Governance also aims to reduce cost of governance by cutting down expenditure on physical delivery of information and services particularly by cutting down on stationary, which amounts to the most of the government expenditure.

**To reduce the reaction time of the Government** – Normally due to red-tapism and other reasons, the Government takes long to reply to people's queries and problems. E-Governance aims to reduce the reaction time of the Government to the people's queries and problems.

### 3.4 Advantages of e-Governance

Following are the important advantages of E-Governance:

**Speed** – Technology makes communication speedier. Internet, Phones and Cell Phones have reduced the time taken in normal communication.

**Cost Reduction** – Paper-based communication needs lots of stationary, printers, computers, etc. which calls for continuous heavy expenditure. Internet and Phones make communication cheaper saving valuable money for the Government.

**Transparency** – Use of ICT makes governing process transparent. This is possible when every piece of information of the Government is uploaded on the internet and is available for the public to peruse. Current governing process leaves many ways to conceal the information from the people. ICT helps the information available online, eliminating all possibilities of concealing information.
Accountability – Once the governing process is made transparent the Government is automatically made accountable. Accountability is answerability of the Government to the people. It is the answerability for the deeds of the Government and accountability makes a responsible Government.

3.5 E-Government Initiatives in India: An Overview

A major initiative of the Government for ushering e-Governance on national scale, called National e-Governance Plan (NeGP) was initiated on 16th May 2006. NeGP consists of 27 Mission Mode Projects (MMPs) encompassing 9 central MMPs, 11 State MMPs and 7 integrated MMPs that span multiple backend Ministries/Departments. It also includes 8 program support components aimed at creating the right governance and institutional mechanisms, core infrastructure, policies & standards and the necessary legal framework for adoption of e-Governance in the country. It is implemented at the Central, State and Local Government levels.

From the early nineties, information technologies were supplemented by ICT technologies to extend its use for sector-wide applications with policy emphasis on reaching out to rural areas and taking in greater inputs from NGOs and private sector. There has been an increasing involvement of international donor agencies under the framework of e-governance for development to catalyze the development of e-governance laws and technologies in developing countries.

While the emphasis has been primarily on automation and computerization, state governments have also endeavored to use ICT tools into connectivity, networking, setting up systems for processing information and delivering services. At a micro level, this has ranged from IT automation in individual departments, electronic file handling and workflow systems, access to entitlements, public grievance systems, service delivery for high volume routine transactions such as payment of bills, tax dues to meeting poverty alleviation goals through the promotion of entrepreneurial models and provision of market information. The thrust has varied across initiatives, with some focusing on enabling the citizen-state interface for various government services, and others focusing on bettering livelihoods. Every state government has taken the initiative to form an IT task force to outline IT policy document for the state, and the citizen charters have started appearing on government websites.
3.5.1 Emerging Areas for e-Governance

**Agriculture Allied Services**

Implementation of e-governance will provide real-time information to the farmers on crop prices to enable farmers to sell their crop at the best possible rates and eliminating the role of middleman. The disbursement of cash and monitoring of agricultural credit can be made more effective, quick and transparent. Information can be provided to farmers helping them to increase agricultural produce by adopting new technique for selection of land, buying of seeds, and use of fertilizers to post harvest processing. Farmers can use a network of tele-centers to co-ordinate their planning so that there is steady supply to the market and regulated and regular prices.

**Education**

Literacy is the key challenge which affects major problems of the society and only e-governance is one of the probable ways, which can solve the problem. As rural India suffers from inadequate education services, e-governance can play an important role in the delivery of education to rural areas. Using technology, students in these villages can be taught by teachers in urban areas. With this in mind, Government of India has taken significant effort by launching of ‘EDUSAT’ the first Indian satellite built exclusively for serving the educational sector. This is a collaborative project of the Ministry of Human Resource Development, Indira Gandhi National Open University, and the Department of Space / Indian Space Research Organization. It is mainly intended to meet the demand for an interactive satellite based distance education system for the country. It strongly reflects India’s commitment to use space technology for national development.

**Health and Sanitation**

E-governance can be used as a tool for comprehensive management of hospitals and health centers in the villages to ensure proper delivery of health related services in rural India. ICT are being used in developing countries to facilitate remote consultation diagnosis and treatment. The immunization process can also be covered by e-governance so that the percentage child vaccination can be improved to a great extent. An infant child can be registered, and as a result of that his/her vaccination detail can be uploaded to a centralized database of portal. An SMS service can be
implemented to remind the parents about the scheduled vaccination day for their child. It will also help not only in the process of immunization but also in monitoring the vaccination programmes in various states.

**ICT in energy conservation**

Information and Communication Technologies can play a crucial role in achieving an energy-efficient and low-carbon economy. The European Commission has put ICT at the forefront of an energy revolution. Using ICT in a smart way could help to reduce energy consumption in buildings by 17%, transport and logistics by 27%, and save 15% in total carbon emissions by 2020. ICT can improve energy efficiency in several ways.

**3.6 ICT Growth in India**

In the past two decades we have seen a tremendous growth of ICT and ITES (IT enabled services) industry worldwide and India has an impressive mark in the world trade of ICT and ITES. Indian ICT industry is a fast growing industry in terms of its annual growth in production, domestic market share, exports, offshore outsourcing and investment. Indian electronics hardware and computer software/service industry is now a very fast growing industry both in terms of production and exports.

The share of ICT industry in India’s GDP (Gross Domestic Product) is continuously increasing since 1999-2000. To mention, ICT registered 8.2 percent of India’s GDP in the year 2003-04 and Indian ICT sector constitutes an estimated value of 16 percent in the overall export basket of India. India’s export of electronic hardware products maintains the average annual growth rate of 21.6 per cent during 1991-92 to 2004-05 whereas India’s export of computer software and services maintains the average annual growth rate of 48.6 percent during 1991-92 to 2004-05.
Table 3.1
*Trend of Production of Electronic Hardware and Computer Software in India*

<table>
<thead>
<tr>
<th>Year</th>
<th>Electronic Hardware (Rs/Cr)</th>
<th>Computer Software/Services (Rs/Cr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-97</td>
<td>20340</td>
<td>6713</td>
</tr>
<tr>
<td>1997-98</td>
<td>22100</td>
<td>10270</td>
</tr>
<tr>
<td>1998-99</td>
<td>25500</td>
<td>18300</td>
</tr>
<tr>
<td>1999-00</td>
<td>28100</td>
<td>24500</td>
</tr>
<tr>
<td>2000-01</td>
<td>31100</td>
<td>36900</td>
</tr>
<tr>
<td>2001-02</td>
<td>32750</td>
<td>47374</td>
</tr>
<tr>
<td>2002-03</td>
<td>37500</td>
<td>59900</td>
</tr>
<tr>
<td>2003-04</td>
<td>43800</td>
<td>73350</td>
</tr>
<tr>
<td>2004-05</td>
<td>49750</td>
<td>96930</td>
</tr>
<tr>
<td>2006</td>
<td>64400</td>
<td>167175</td>
</tr>
<tr>
<td>2007</td>
<td>79800</td>
<td>203060</td>
</tr>
<tr>
<td>2008</td>
<td>92130</td>
<td>258000</td>
</tr>
</tbody>
</table>

Source: Annual Reports of Ministry of Information Technology (Govt of India) and Economic Survey of India

From the table 3.1 it is clearly seen that the production of IT related products like electronic hardware and computer is continuously increasing over the years.

Table 3.2
*Direct Employment (‘000s) in the Services and Software Product Segment*

<table>
<thead>
<tr>
<th>Sectors</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic market</td>
<td>378</td>
<td>427</td>
<td>500</td>
<td>525</td>
</tr>
<tr>
<td>BPO Exports</td>
<td>553</td>
<td>704</td>
<td>738</td>
<td>768</td>
</tr>
<tr>
<td>IT Exports</td>
<td>690</td>
<td>865</td>
<td>958</td>
<td>993</td>
</tr>
</tbody>
</table>

Source: Strategic Review 2008, 2010; NASSCOM * Forecast

Above table clearly explains that there is significantly high employment opportunity in the IT sector in India.
As tables 3.1, 3.2 and the figure 3.1 given above indicates, ICT sector is a major income generator and employment provider in the Indian economy as well as a major contributor to the rapid growth of industry turnover exports. Exports from this sector contributed 20 per cent of gross revenues in 1990-91, rose sharply to account for as much as 49 per cent of revenues by 1999-2000. Even in dollar terms software exports have risen at a remarkable rate, from an estimated $150 million at the beginning of the decade to close to $4 billion in 1999-00. According to NASSCOM, software exports in dollar terms increased by 57 per cent in 1999-00. With this faster expansion of export revenues the domestic IT spending was also increased rapidly during these years. While the export segment grew at a higher rate of 39.9 per cent per annum, the domestic segment also grew at a rate of 26.6 per cent in nominal terms.

India has developed ICT manpower over the years through huge investments in the engineering and technical institutions over the years and across the states. With
the growth in ICT there is huge penetration of technological gadgets among the households in India over the years. Communication is fast through email, mobile, internet etc. Common people have started to adopt these gifts of ICT very fast. Following table represents the growth in personal computer and internet adoption among the households in India.

Table 3.3

*Growth in Personal Computer and internet Adoption among the Households (hhs)/Individuals (‘000)*

<table>
<thead>
<tr>
<th>Year</th>
<th>PC owners (hhs) (units ‘000)</th>
<th>Internet subscribers (hhs) (units ‘000)</th>
<th>% of PC Owners with Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>288</td>
<td>25</td>
<td>8.7</td>
</tr>
<tr>
<td>1999</td>
<td>461</td>
<td>126</td>
<td>27.3</td>
</tr>
<tr>
<td>2000</td>
<td>732</td>
<td>318</td>
<td>43.4</td>
</tr>
<tr>
<td>2001</td>
<td>1073</td>
<td>624</td>
<td>58.2</td>
</tr>
<tr>
<td>2002</td>
<td>1550</td>
<td>837</td>
<td>54</td>
</tr>
<tr>
<td>2003</td>
<td>1886</td>
<td>1025</td>
<td>54.3</td>
</tr>
<tr>
<td>2004</td>
<td>2550</td>
<td>1304</td>
<td>51.1</td>
</tr>
<tr>
<td>2005</td>
<td>3683</td>
<td>1891</td>
<td>51.3</td>
</tr>
<tr>
<td>2006</td>
<td>3861</td>
<td>2927</td>
<td>75.8</td>
</tr>
<tr>
<td>2007</td>
<td>5723</td>
<td>3878</td>
<td>67.8</td>
</tr>
<tr>
<td>2008</td>
<td>7805</td>
<td>4846</td>
<td>62.1</td>
</tr>
</tbody>
</table>

Source: Strategic Review 2009, NASSCOM

At present ICT sector is contributing a lot into Indian national economy in various ways. Almost all the states in India are targeting this sector as a vehicle for economic development. Moreover, the ICT development has made the rural people better informed about the market and the many Indian farmers benefitted with the reach of ICT in the form of mobile phone or internet in the remote villages.
Thus ICT revolution has both a direct and indirect growth-inducing role. Directly, falling costs of computing power and communications and new activities and innovations resulting from technological advances provide new incentives to invest. Such investments by increasing productivity and through innovation stimulate cumulative growth in all sectors of the economy.

3.7 Measuring the Impact of ICT

In India, much work on measuring the impact of the IT industry on economic growth and employment has been carried out. The Government of India has been making sustained efforts to improve the availability of ICT data for policy making and research. A significant amount of data exists on the ICT service industry, collected by National Association of Software and Services Companies (NASSCOM), and on ICT manufacturing by the Communication and Manufacturing Association of India (CMAI). The measurement of the impact is done with reference to the basic core indicators (a) infrastructure b) access and c) use of ICT by households & individuals. These core indicators are measured through a) Fixed telephones per 100 inhabitants b) mobile telephones per 100 inhabitants and Internet users per 100 inhabitants

Fixed telephones per 100 inhabitants

Telephone lines are fixed telephone lines that connect a subscriber's terminal equipment to the public switched telephone network and that have a port on a telephone exchange. Integrated services digital network channels and fixed wireless subscribers are included.

Table: 3.4

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>47</td>
<td>46</td>
<td>45</td>
<td>44</td>
</tr>
<tr>
<td>Brazil</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Canada</td>
<td>54</td>
<td>53</td>
<td>51</td>
<td>50</td>
</tr>
<tr>
<td>China</td>
<td>22</td>
<td>21</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>India</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Source – World Bank Report 2014
Fig: 3.2 No. of telephones per 100 inhabitants

**Mobile Cellular Subscription per 100 people**

Mobile cellular telephone subscriptions are subscriptions to a public mobile telephone service using cellular technology, which provide access to the public switched telephone network. Post-paid and prepaid subscriptions are included.

Table: 3.5

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>100</td>
<td>105</td>
<td>106</td>
<td>107</td>
</tr>
<tr>
<td>Canada</td>
<td>76</td>
<td>79</td>
<td>80</td>
<td>78</td>
</tr>
<tr>
<td>China</td>
<td>63</td>
<td>72</td>
<td>80</td>
<td>89</td>
</tr>
<tr>
<td>Brazil</td>
<td>101</td>
<td>119</td>
<td>125</td>
<td>136</td>
</tr>
<tr>
<td>India</td>
<td>62</td>
<td>73</td>
<td>70</td>
<td>71</td>
</tr>
</tbody>
</table>

*Source – World Bank Report 2014*
Source – World Bank Report 2014

Fig: 3.3 No. of mobile phone subscribers per 100 inhabitants

Internet users (per 100)

Table: 3.6

Internet users (per 100)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>76.0</td>
<td>79.5</td>
<td>79.0</td>
<td>83.0</td>
</tr>
<tr>
<td>Canada</td>
<td>80.3</td>
<td>83.0</td>
<td>83.0</td>
<td>85.8</td>
</tr>
<tr>
<td>China</td>
<td>34.3</td>
<td>38.3</td>
<td>42.3</td>
<td>45.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.7</td>
<td>45.7</td>
<td>48.6</td>
<td>51.6</td>
</tr>
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<td>India</td>
<td>7.5</td>
<td>10.1</td>
<td>12.6</td>
<td>15.1</td>
</tr>
</tbody>
</table>

Source – World Bank Report 2014

Fig 3.4: Internet users per 100 inhabitants
3.8 ICT Development Ranking of Select Countries

India has been ranked 121st among 157 countries in terms of progress in the realm of information and communication technology (ICT) by International Telecommunication Union (ITU), which makes an annual assessment based on a wide range of parameters and data. The report includes India among a group of 39 least connected countries (LCCs) with low IDI 2012 values.

Table 3.7
ICT development Index

<table>
<thead>
<tr>
<th>Country</th>
<th>ICT development ranking</th>
<th>ICT development index</th>
<th>Access sub-index ranking</th>
<th>Use sub-index ranking</th>
<th>Skills sub-index ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>121</td>
<td>2.21</td>
<td>122</td>
<td>121</td>
<td>117</td>
</tr>
<tr>
<td>China</td>
<td>78</td>
<td>4.18</td>
<td>80</td>
<td>66</td>
<td>93</td>
</tr>
<tr>
<td>Pakistan</td>
<td>129</td>
<td>1.83</td>
<td>119</td>
<td>132</td>
<td>143</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>135</td>
<td>1.73</td>
<td>133</td>
<td>139</td>
<td>127</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>107</td>
<td>3.06</td>
<td>104</td>
<td>115</td>
<td>90</td>
</tr>
<tr>
<td>US</td>
<td>17</td>
<td>7.53</td>
<td>29</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Brazil</td>
<td>62</td>
<td>5</td>
<td>67</td>
<td>57</td>
<td>72</td>
</tr>
<tr>
<td>Korea*</td>
<td>1</td>
<td>8.57</td>
<td>11</td>
<td>2</td>
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<td>Sweden</td>
<td>2</td>
<td>8.45</td>
<td>7</td>
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<td>Iceland</td>
<td>3</td>
<td>8.36</td>
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<td>Niger**</td>
<td>157</td>
<td>0.99</td>
<td>148</td>
<td>152</td>
<td>157</td>
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</table>

**Ranked last. Source: Measuring the Information Society 2013

India's rankings in three sub-indexes which relate to access, skills and use, on which the IDI is based, are in a similar range. In the skills sub-index, which evaluates ICT capability or skills in terms of indicators that include adult literacy as well as gross secondary and tertiary enrollment, India was ranked 117 in 2012, the same position it had occupied in 2011. (The Hindu, October 8, 2013)

In terms of the use sub-index, which broadly measures the uptake of ICTs and the intensity of usage based on parameters such as Internet users per 100 inhabitants, fixed (wired)-broadband subscriptions per 100 inhabitants, and wireless-broadband subscriptions per 100 inhabitants, India has been ranked 121st, up from 124 in 2011.

And the access sub-index rankings place India in the 122nd position, down from 114 a year ago. This sub-index has to do with ICT readiness in terms of fixed-
telephone subscriptions, mobile cellular telephone subscriptions, international Internet bandwidth per Internet user, percentage of households with a computer, and percentage of households with Internet access.

In terms of overall global rankings, the Republic of Korea, with a value of 8.57, leads the world, a track record it has set in recent years. Sweden, Iceland, Denmark, Finland, Norway, Netherlands, United Kingdom, Luxembourg and Hong Kong (China) follow Korea to find a place among the top ten.

3.9 Digital Natives

A new dimension that the report adds to the discourse on ICT is the increasing importance of 'digital natives' in the scheme of things: youths between 15 and 24, with at least five years' experience using the Internet. Though India and some other countries like China, US and Brazil are predominant in terms of having large populations of digital natives, other countries like Iceland, New Zealand and Republic of Korea are in the fore when it comes to penetration in terms of the percentage of youth using the Internet. The trend is for high-population countries have high absolute numbers of digital natives, and for high-income countries to have digital natives making up a relatively high percentage of their population.

3.10 Constraints and Challenges

In spite of the massive opportunities and advantages, there are many bottlenecks in ICT implementation process. Creation of infrastructure and the diffusion of technologies in moving towards e-governance have been rather slow. This may primarily be attributed to the following reasons:

**Lack of IT Literacy and awareness regarding benefits of e-governance**

There is general lack of awareness regarding benefits of e-governance as well as the process involved in implementing successful G-C, G-G and G-B projects. Lack of IT literacy is also major drawback. The administrative structure is not geared for maintaining, and retrieving the governance information electronically. The general tendency is to obtain the data from the files as and when required rather than using Document Management System (DMS) and workflow technologies. DMS and workflow technologies are usually used in those departments where there is a lack of workforce.
Underutilization of existing ICT infrastructure

To a larger extent, the computers in many departments are used for the purpose of word processing only, resulting in the underutilization of the computers in terms of their use in data mining for supporting management decisions. The time gap between the procurement of the hardware and development of the custom applications is so large that by the time application is ready for use, the hardware becomes obsolete.

Attitude of Government Departments

The psychology of government servants is quite different from that of private sectors. Traditionally the government servants have derived their sustenance from the fact that they are important repositories of government data. Thus any effort to implement DMS and workflow technologies or bringing out the change in the system is met with resistance from the government servants.

Lack of coordination between Govt. Department and Solution developers

Designing of any application requires a very close interaction between the government departments and solution developers. At present the users in government departments do not contribute enough to design the solution architecture. Consequently the solution developed and implemented does not address the requirements of an e-governance project and hence does not get implemented

Resistance to re-engineering of departmental processes

Successful implementation of e-governance projects requires lots of restructuring in administrative processes, redefining of administrative procedures and formats which finds the resistance in almost all the departments at all the levels. Additionally there is lack of expertise of departmental MIS (Management Information System) executives in exploiting data mining techniques, and collection and updating of real time content onto website etc. In such a scenario, it is difficult for any e-governance solution to achieve its intended results.

Lack of national level Infrastructure for sustaining e-governance

Infrastructure to support e-governance initiatives does not exist within government departments. Whatever efforts have been made by various govt.
organizations may be defined as islands of computerization. The infrastructure creation is not guided by a uniform national policy. Required networking and communication equipment is either nonexistent in government departments, or it does not serve any tangible purpose of e-governance. The use of connectivity options provided by government agencies are used in a very limited manner for data transmission purpose between various locations and is mainly utilized for e-mail and internet purposes only.

3.11 e-Governance - The Kerala Experience

Kerala always does things in its own, inimitable way. So you have one of the most socially developed States that is on a par with many developed nations on many counts. And the spread of societal development is uniform throughout the state and not restricted to select cities. The benefits of social progression have been disseminated to the maximum number of people. Regional disparities are, more or less, non-existent. At the same time, Kerala has a discouraging industrial scene with high unemployment rates. It has a vast pool of educated youngsters, but they are not effectively utilized. Such paradoxes are aplenty.

But today Kerala is changing and has a lot to offer. Referred to as God's Own Country, the state is turning out to be one of the hot spots of tourism in the country. Once in God’s Own Country, the salubrious climate and endless greenery are more than likely to keep any tourist spell bound. This distinctive resort town ambience coupled with the highest physical quality of life, are seen by companies as reason enough to move in. But that is not all. In the changed scenario it is offering more. An investor friendly Government, easy availability of qualified personnel and an extremely facilitating and scalable infrastructure beckon various industries. And the best part is that these are available at the most economical rates.

In information technology (IT) too, Kerala has its notes of contradiction. It's considered a minnow among other South Indian States in terms of software exports. But when it comes to application of IT in Government, Kerala has come a long way. Many would still recall those days when the computers were perceived as mean machines that would take away jobs from people, already struggling to make both ends meet. But in the 21st century, Kerala is leading in e-governance initiatives. Keralites are fast realizing that logging on to a computer is better than queuing up
before a government counter and dealing with a fussy employee. The Government of Kerala has implemented many citizen-friendly E-governance projects. E-governance does not stop at data collection in digital format. It has to convert raw data into useful information required for planning. E-governance affects everyone, helps to build trust, collaborative effort, and to engage people.

The broad objectives of E-governance in Kerala are the following.

- To make Kerala a leader among states in India in using ICTs to achieve economic and social development, environmental and cultural promotion, and benefits to its people
- To deliver high-quality citizen-focused services
- To improve overall performance as measured through better policy outcomes with focus on streamlining and re-engineering government processes and routines so as to obtain measurable benefits
- To improve efficiency in revenue mobilization and public expenditure

A large number of E-governance programme affecting all walks of life are being implemented in Kerala. The most important among them are summarized in the table 3.8

Table 3.8

<table>
<thead>
<tr>
<th>Major e-governance programmes in Kerala</th>
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<tr>
<td>FRIENDS</td>
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<td>AKSHAYA</td>
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<td>SWAN (Secretariat)</td>
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<td>SWAN (State)</td>
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<td>SPARK</td>
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<td>Program</td>
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<td>KISSAN</td>
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<td>KPCS.org</td>
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<td>E-nabling</td>
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<td>E-Filing of com. tax returns</td>
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<td>ATI</td>
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<td>e-Law</td>
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<td>VDCCs</td>
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<td>Sutharyakeralam</td>
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<td>IDEAS</td>
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<td>MESSAGE</td>
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<td>AASTHI</td>
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<td>SPARSH</td>
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<td>E-Krishi</td>
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<td>YES @ Kerala</td>
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Source: Various Publications Kerala State IT Mission

Note: Full names are given in the subsequent descriptions of programs.

**FRIENDS:**

One of the very first and the most successful initiatives Government of Kerala put in place was the Fast Reliable Instant Effective Network for Distribution of
Services (FRIENDS). The aim of the FRIENDS project is to create a single window, enabling the citizens to pay taxes and other utility payments. The project was first launched in Thiruvananthapuram Corporation in 2000. The participating departments were given the freedom to maintain payment counters in their office premises as well. The project was then rolled out to other districts. The FRIENDS counter today handles bill payments of several departments – revenue, motor vehicles, civil supplies, local bodies, universities, electricity, water, telephones etc. Close to around a million people have used the FRIENDS service so far and it is growing at about 150% every year.

**Akshaya:**

Launched in November 2002, Akshaya (perpetuating prosperity) is an effort on the part of the IT department to ‘bridge the digital divide’. It has imparted basic IT literacy to at least one member in each of the 6.5 million families in Kerala; generated and distributed locally relevant content; improved public delivery of services; and created employment opportunities. The Akshaya project is being implemented through Panchayati Raj Institutions, and involves private enterprise in the development of training institutes and content generation. The project has helped in taking IT to the remotest part of Kerala.

**Secretariat Wide Area Network (SWAN)**

Secretariat is the Administrative Headquarters of Kerala Government and its buildings house the offices of all Ministers, Secretaries to Government and 37 Departments. These Departments are housed in 6 blocks. Government has implemented a Secretariat Wide Area Network (SWAN) connecting Secretariat, Secretariat annexe, Vikas Bhavan and Public Offices. This infrastructure is the platform to deliver various E-governance services.

The success of the e-governance project is the computerized environment in which the employees are working. As part of this exercise, Government of Kerala initiated the refurbished whole Secretariat. The current network of around 1000 computers is connected using cables hubs and switches. It is connected to the Internet using BSNL line of high capacity. Network server, Mail server etc are also in place for proper functioning of the system. The system mainly connects the offices of all the
Ministers, Secretaries and other senior officials in the Secretariat. Effective communication system using this network is in place. Internet Based Messaging System (IBMS) is introduced in Secretariat as an alternative to the existing Tele-printer equipment. The IBMS is only a replacement of the earlier manual TP system with the advantage that instead of typing the messages, they are scanned and send to the offices and all these offices are connected using ISDN lines for data transfer. The system maintains an effective and error free mechanism for sending and receiving messages.

**Service and Payroll Administrative Repository for Kerala (SPARK)**

SPARK is G2E (Government to Employee) web based Personnel Administration and accounts software for Government of Kerala covering 5.25 lakhs employees. Permanent Employee Number for all employees is allotted through the system. The system addresses all requirements regarding Service, salary, income Tax and accounts matters. Centralized database helps in quick decision-making and applying rules and regulations uniformly for all employees. All reports are generated in PDF format. Provision is available to send alert messages to employees, when payments are credited.

**KISSAN**

Karshaka Information Systems Services And Networking (KISSAN) is an integrated, multi-modal delivery of agricultural information system, which provides several dynamic and useful information and advisory services for the farming community across Kerala. It is one of the leading citizen centric E-governance projects of the Department of Agriculture, of Government of Kerala. The project was conceptualized, designed, developed, implemented and managed by the Indian Institute of Information Technology and Management- Kerala (IIITM-K) for the Department of Agriculture, Govt. of Kerala.

**KPSC.org**

KPSC.org is considered as a transparent window to the recruitment of government officials in Kerala state. The logistic challenge of handling of a vast human resource prompted the Kerala government to automate the task of KPSC. With
help from the Centre for Development of Imaging Technology (C-DIT), KPSC launched its web window in September 2003.

**E-nabling paddy procurement: The Supply Co way**

The intervention of the Kerala State Civil Supplies Corporation, across the entire supply chain of the paddy ecosystem – procurement, processing, marketing and distribution – has been one of the more dramatic illustrations in the state, of what information technology, appropriately applied, can do. In a fairly short time period, it has helped to transform a sluggish, system into one that is efficient, swift and a transformational tool for whom it is a livelihood. Today in the districts of Kottayam, Pathanamthitta, Thrissur, Ernakulam and Malappuram, rice farming is once more a viable and attractive proposition for the farmer – thanks to the virtual elimination of the ‘middle man’ in the business.

**E-Filing of Commercial Tax Returns**

In January 2009, Kerala implemented the electronic filing of Value Added Tax (VAT) across the state – making it the first state in India to shift commercial tax collection to a paperless system promising transparency, error free and efficiency for all the stakeholders.

**E-governance in Higher Education**

Universities in Kerala have embraced information technology to make the entire teaching and administrative ecosystem more efficient, even while providing a friendly interface for all stakeholders: teachers, parents and students. Kerala University has developed E-governance projects like Any Time Information System (ATI), SWEET (System for Web-enabled Exam Transactions), and Web-enabled Management information system. All other universities are also in the final stages of computerization.

**E-governance and Law**

In 2008, the Law Department became the first department of the Kerala Government to be fully computerized. The modernization of the Law Department was a Plan scheme approved by the Planning Commission. The Digital file flow system has been introduced in Law Department as part of this Scheme, with central funding. The Project introduces ICT in Law Department to speed up legal advice by building
up a data base which can be accessed by other departments. All functions of the Law Department have been automated including its critical knowledge-based functions.

**Sameeksha- Village Documentation and Community Computing Center**

Village Documentation and Community Computing Centers (VDCCs) is a local unit run by community members trained in all aspects of computing services and media production. VDCCs will impart e-literacy to local communities and provide essential computing services to the communities and empowers them to combat rights violations, isolation, exclusion from mainstream media and their lack of control over decisions affecting their lives. VDCCs can produce a range of media content focused on critical social issues using technologies such as radio, video, web and news media.

**Sutharyakeralam**

It is the innovative initiative of the Government of Kerala helping to bring the complaints and grievances of citizens directly to the notice of the Chief Minister, thereby ensuring transparency and efficiency in the functions of the Government. This is achieved through the automation of Chief Minister's Grievance Redressal Cell and convergence of all the available ICT means to redress the grievances of the citizens.

**Information and Data Exchange Advanced System (IDEAS)**

The Information Technology Department has implemented ‘IDEAS’, an advanced file information system, to track files of the offices of the State government, in a manageable realm of electronic governance, utilizing the core strengths of Information Technology. This system makes the government more transparent and approachable for the citizens, bringing benefits in its overall governance.

**Modern Electronic Systems & Services Agility & Governance in Enterprises (MESSAGE)**

It is an Intranet based centralized application for the internal use of offices and internet based application for the citizen services. MESSAGE can be instantiated for multiple offices from the same intranet database. The files, letters, petitions are captured at source and their movements across the office can be easily tracked.
AASTHI

AASTHI is an automated e-Inventory management of computers and related equipment, based on open source software. Implemented in Kerala State IT Mission, the AASTHI Version (I) is currently under implementation.

SPARSH- Information Kiosk

To provide information quickly to the not-so-computer savvy and untrained citizens visiting the Secretariat for various needs, Govt. has installed touch Screen Information Kiosks at the Secretariat. Available for free access to citizens coming to the State secretariat, visitors are now able to make enquiries and find the replies displayed on the monitor before them. Some enquiries that can be accessed through the kiosk are fair-value of land, PSC notifications, SPARK salary slip etc. Currently information pertaining to more than 35 Departments has been made available through this Kiosk.

E-krishi

E-krishi is a market driven agricultural initiative through IT enabled Agri Business Centres (ABC) to address the existing gap in agriculture information flow and transaction management. The project envisages facilitating and enabling farmers and other stakeholders through ABC to interact with agricultural service providers in the private, Government and Non Government sectors. E-krishi envisions a connected farmers community throughout Kerala with access to information on market demand, prices, good agricultural practices and quality agricultural inputs supported by a technology enabled robust transaction platform that facilitates all their offline activities.

YES @ Kerala

The ‘Youth Employability and skills-YES@KERALA’ was launched in the State in June 2008, to provide soft skills and technical skills training to students from various colleges in the State. The purpose of this project is to hone the skills of the students and make them ready for employment in the industry; especially considering that Kerala is making sustained efforts at attracting investments in the IT sector all over the State. In its pilot phase, the programme targets 3750 students from 15 colleges and polytechnics in the State.
Other E-governance programs of the Government

Citizen's Call Centre:

By making a local call from anywhere in the State, one can get information on government departments. This includes details of government schemes, programmes, entitlements and welfare benefits. The Citizen Call Center attached to the ‘FRIENDS’ Center at Thiruvananthapuram provides, over telephone, information relating to common citizens transaction, through a full-fledged database with over 2,000 government processes. For speedy access to relevant information, a search facility is integrated. It operates from 9 am – 7 pm on all working days and can be accessed from anywhere in the state by calling the # 155300

Information Kerala Mission:

In 1997, the State-level Informatics System for Strengthening the Decentralized Plan Implementation (SLIDE) was conceived to focus on creating efficient and responsive mechanisms for governance at the local level. The project, which has evolved into what is now known as the Information Kerala Mission (IKM), computerized and established a wide area network (WAN) to connect the 1,215 local governing bodies throughout the state. One of the unique features of the IKM project had been the extensive effort taken in systems documentation and the overall emphasis on business process re-engineering and development of an integrated services backend database. The project management team has succeeded in networking

- 991 Grama panchayats
- 152 Block panchayats
- 14 district panchayats
- 53 municipalities
- 5 corporations
- 14 district planning offices
- Deputy director of panchayats and 3 Regional directors with
  - Panchayat Directorate
Various Government departments also rolled out their own version of e-governance projects that improved the citizen-government interaction considerably.

**Rural Development Department**

‘Rural Soft’ is a web enabled e-governance application developed on LAMP (Linux/Apache/My Sql /PHP) model for the Rural Development Department of Kerala for effective monitoring of the SGRY scheme of the Government of India. This is being extended to the SGSY scheme also. Data capturing is done from the level of Grama Panchayats and Block Panchayats, which are the implementing agencies of this scheme, which aims at providing additional wage employment in rural areas. This IT tool helps the officials at the District, State and Centre in monitoring the achievements of the scheme more efficiently and with more transparency. It also helps the officials to monitor the scheme implementation status from the grass root level.

**General Education Department**

A full-fledged computer centre with four servers and one backup server was set up at the Pareeksha Bhavan by the Government of Kerala. Each server was connected to 20 nodes in client-server architecture. An intranet connects all these servers; the final result processing will be done in a single server. The technical result processing is done in a single server. The software developed for processing Secondary School Leaving Certificate examination & Higher Secondary Certificate examinations and the subsequent dissemination of results are addressed by the ‘Examination Management System’ software.

**Motor Vehicles Department:**

This department has implemented software called ‘Smart-Move’ in three districts. Through this, any one who wishes to get a driving license can choose a test date, take the test on any working day and get the learner’s license immediately upon passing the test. It also provides a range of conveniences such as randomly generated
registration certificates, support system for booking and tracking of fancy number applications, faster retrieval of data and integration of modules such as vehicle registration, permits and taxes. This also avoids any scope for manipulation and calculates taxes and fees. This project will be extended to other districts as well in the future.

**Treasury Information System**

The State Finance Department has computerized all treasuries in the State through a project called ‘Treasury Information System.’ The 187 treasuries in Kerala handle over 70 lakhs chalans, 50 lakhs bills and stamps worth Rs 350 crores a year. They also deal with four lakhs direct pensions and 1.5 lakhs money order pensions a month. Such large-scale activities of the treasuries have been streamlined using the automated system. The result is that now pensions can be given across the counter as compared with three to four hours’ waiting period in the manual system. Also, there is no waiting period to give the dearness allowance (DA).

**Agriculture Department**

The agricultural resources available in the State which are monitored by the Directorate of Agriculture, Kerala State, has been streamlined by using the automated application software called “AIMS” [Agriculture Information Management System], using the state-of-the-art technology ‘OOPS’. Agriculture department comprising of around 1500 offices spread across the State are under this network. The monitoring starts from the ‘Krishi Bhavan’ at the village level, with the direct interaction of the Agriculture Officers (in-charge of Krishi Bhavan) with the farmers. The data gets consolidated at Block, District & the Directorate level for effective monitoring. With the available mode of networking up to the Krishi Bhavan level from the top, a total offline module is provided at all the 1054 Krishi Bhavans of the State, thereby creating an IT revolution in the field of agriculture.

**E-Procurement**

E-Procurement system is an e-infrastructure for G2B purchase and sale of work, goods and services using the ICT tools. It is a win-win approach towards buying and selling inducing and enhancing transparency, efficiency and confidentially in procurement process through the application of PKI enabled tools. As a Global
standard, a 5-10 percent of cost saving is achieved through the adoption of e-Procurement system. e-Procurement is a Mission Mode Project (MMP) under National e-Governance Plan (NeGP) of Government of India (GoI). With a vision & clear objective to embrace emerging technologies/ solution for socio-economic development of the State, Government of Kerala implemented the e-Procurement system to enhance transparency and efficiency in Public procurement activities and monitor the same on a real-time basis

**Webinars**

Webinars are used to conduct live meetings, trainings, or presentations via the Internet. In a webinar, each participant sits at his or her own computer and is connected to other participants via the internet. Webinar offers a real time communication tool that supports interactions over a network between participants across various geographic locations. It also has additional features like data, voice & video sharing and meeting tools such as common Whiteboard, Reference file sharing, Application sharing, text chatting etc. All this managed in a highly secured environment allows only authenticated users.

Webinar is a cost-effective solution to conduct Meetings / Seminars / Trainings etc. People can avoid travel by participating in the webinar from the comfort of their own location. This attributes to time and cost save from travelling. KSITM proposes to subscribe to a Webinar Solution which shall be useful in conducting meetings and trainings for Government departments and other Govt. organizations.

Some of the applications/benefits of webinar solution are:

* Conducts remote trainings to various Government Departments
* Conducts multiple meetings/trainings simultaneously
* Can digitally record sessions and can be revisited as many times needed
* Conducts meetings even when participants are out of station
* Conducts meetings with people at different location on short notice
* Eliminates travel cost
* Can conduct remote identity verification
* Can provide distance education courses effectively

* Facilitates faster and efficient services from IT Support team

**E Payment**

The e-Payment Gateway will provide an operational component of the e-Governance infrastructure and a full e-Commerce facility that will allow secure online payments (e-Payments). The e-Payment Gateway will operate as a critical shared service within the e-Governance architecture along with the State Government eServices Portal.

The goal of the e-payment gateway project is to provide a mechanism to handle the online payment for services offered by the government of Kerala, which subsequently, will be made available to commercial entities in Kerala. The e-payment gateway is a key enabler to the successful delivery of public sector services online and once operational will increase the adoption of e-services due to its efficiency and ease-of-use. The e-Payment Gateway shall support Internet and other electronic channels including the mobile phone, IVR, Call Center, etc in future.

**INSIGHT**

An initiative of KSITM in association with SPACE (Society for Promotion of Alternative Computing and Employment), INSIGHT uses the possibilities offered by Information and Communication Technologies to make the differently abled people of Kerala active participants in the development process. Established in May 2007, the project embodies the Kerala Government's IT Policy 2007 that the benefits of ICT should reach all sections of the society. A first-of-its-kind initiative in Kerala, INSIGHT aims at enabling the differently abled through the deployment of free software.

The major objectives behind the setting up of INSIGHT are:

- To use technology as an interface to increase the quality of life of the differently abled
- To make technology accessible and available for hassle-free use by the target group

To enhance the employability of the differently abled
State Service Delivery Gateway (SSDG)

The State Service Delivery Gateway project has been formulated under the National e-Governance Plan (NeGP) to fulfill the vision of providing easy and convenient services to the citizens through remote access primarily through Common Service Centres (CSCs) and enabling the State Portal (by implementing the key components State Portal viz. SSDG, electronic Form (“eForms”), Application and Computing Infrastructure).

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