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**REPORT OF
THE WORKING GROUP ON**

CONVERGENCE AND E- GOVERNANCE

**FOR
THE TENTH FIVE YEAR PLAN
(2002-2007)**



**GOVERNMENT OF INDIA
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FOREWORD

There is a growing recognition of the newer and wider possibilities that technology presents before the society in the modern times. Information Technology together with Communication technologies has brought about unprecedented changes in the way people communicate, conduct business, pleasure and social interaction. Governments have started behaving somewhat differently in delivering information and services to the citizens. We are seeing the evolution of new forms of technologies and imaginative forms of applications of the new and older technologies for making the lives of the people better and more comfortable in several ways. There is even greater realization that instead of a single-track technology, lateral integration of technologies can deliver startling results and the world seems to be moving towards such converged systems.

In the sense that Convergence is used for Information and Communication Technology, it involves not only the integration of Carriage and Content but also of Industry. In such convergence, instances of conflicting interests might surface and it may trigger a competition and end up with the survival of the fittest industries and of sustainable applications. It may also be realised that Converged applications have a lot of bearing on E-governance, which, many people perceive as a means to 'good governance'. It is necessary that the scenario is understood in some details and specific roadmap be prepared for stimulating Convergence and E-governance. There is also the question of addressing the problem of 'digital divide' that could create, besides other problems, a mismatch of systems and incompatibility in data exchange unless they are addressed right in time.

In the course of the on-going exercise of formulation of the Tenth Five Year Plan, while the individual concerned Ministries are charting out programmes for development and growth of the respective segments, namely, Information Technology, Broadcasting and Telecommunication, as the world is moving towards convergence of these segments, it is necessary to have an integrated look at the convergence issues and scenario for the coming five years. It has to be determined as to how much public investment should go into bringing about convergence in the sense that it has been occurring in many countries of the world.

It should be understood that convergence cannot become effective unless and until there is organic integration of various evolutionary segments. One cannot jump to weaving together of leaves only without ensuring that the organisms are linked at the routes for bringing about the evolution of newer forms of technologies, devices and applications. There is often a tendency to take up all fancy sounding propositions and practices that are being tried out in other parts of the world and commit public funds in their pursuit. It would be important to lead the path to convergence and E-governance according to our own requirements, technological universe, habits and ethos.

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

This report has tried to address some of these issues and provide suggestion that could ultimately be incorporated in the Tenth Plan after the Steering Committee take a view on the Report. It must be mentioned that the turf of Convergence does not have a template like some of the more established and stablised sectors of economic, social and industrial activities. Things get compounded by the fast obsolescence of technology. Moreover, the march towards E-governance involves several agencies including the Ministry of Information Technology, Department of Administrative Reforms, the States, the Financial and Banking institutions and the procedures for scrutiny of decisions and audit. Without a properly designed re-engineering of administrative procedures in the large number of agencies that touch upon the citizen, our 'patchwork' of E-governance could create more problems than it could solve.

This Report primarily concerns itself with public investments. It has not been able to visualize the extent of private initiative that could be expected to come forth in the Convergence area or in E-Commerce or allied segments for want of adequate inputs. However, there are some examples of good E-governance systems being put up through joint efforts of the public and private investment.

We are grateful to all the members of the Working Group who have contributed their ideas and viewpoints on this very nebulous subject which is still evolving. We are especially thankful to Dr. N.Vijayaditya and Shri M. Moni who have contributed a highly useful paper. Shri V.K. Agnihotri, Additional Secretary, Department of Administrative Reforms was most prompt in sending in his paper on the subject of E-governance and we are grateful to him. Valuable contributions has been made by Shri S.S. Grover, Sr. Director of the Ministry of Information Technology and by Shri K. Jayakumar of the Department of Administrative Reforms and their views have helped in shaping up the schemes. I had the fullest support from Shri S.S. Batra, Adviser(C&I), Shri Nirmal Singh, Director(C&I) and Shri U.K. Sharma, Deputy Adviser (C&I) of the Planning Commission. Last but not the least, I am grateful to Dr A. K. Chakravarty, Adviser (IT), Ministry of Information Technology who, as Convener, put in a lot of effort in arranging the meetings of the Working Group and provided valuable write ups.

In the end I would like to mention that this report had no precedence and many of the ideas and proposals may legitimately have scope for equally strong but different viewpoints. The Steering Committee may take a final view on such issues.

29 November 2001

(R. P Sinha)
Chairman of the Working Group

Executive Summary

Convergence of Information, Broadcasting and Communication Technologies

1. With the emergence of Information Technology on the national agenda and announcement of IT policies by State Governments, “Convergence of core technologies and E-Governance” have gained importance for good governance and sustainable development. The Working Group on “Convergence and E-governance”, constituted by the Planning Commission for the formulation of the Tenth Five Year Plan, looked into the entire gamut of issues involved, including the extent of public funding and policy support for successful convergence of technologies.

2. In simple terms, Convergence can be defined as the convergence of “*carriage and content*” and involves convergence of terminals as well as integration of industries. Conceptually, the convergence of carriage and content, along with imaginative applications opens up tremendous possibilities for delivering a big basket to the consumer empowering him to choose, use and control voice data and images delivered through a common device.

3. In India, Broadcasting has been a State monopoly with the stress shifting in recent years from expansion of network to technology up-gradation. The telecommunications sector, on the other hand, witnessed in the last five years a radical transformation from monopoly of operations to a situation of vigorous competition with fast track liberalization of services and infrastructure. Internet, the latest entrant to the field, acquired tremendous acceptance within a short span with a fast and impressive growth. These three different “product lines”, namely, Broadcasting, Telephony and Internet are now in a position to converge through wired and wireless media.

4. This process involves major changes in the structures of the Computer Industry, Information & Content Industry, and the Communication Industry and has three major aspects:

- *Convergence of carriage:* Maximum convergence is expected in the area of access network (telecommunication including data communication) or local delivery services (broadcasting) as technology now permits the use of the network for carrying broadcasting signals.
- *Convergence of Content:* Content Convergence focuses on fully developing Web content into an integrated on-line experience that enhances the value of the printed and on-line products to both readers and advertisers. Creation of content that is useful, interesting and empowers the user calls for the resolution of contradictory interests.
- *Convergence of Terminal:* Technology and industry are moving towards achieving the ultimate aim of Global coverage to provide anywhere and at any time communication of voice data and images.

5. The success of the convergence would lie in ensuring a seamless transition to the new services and information delivery systems. Both in government funded projects and the private sector, returns in terms of better and cheaper deliveries, scalability and coverage would determine as to which medium would lead the convergence process. The single biggest area of "convergence" could be the integration of the Internet with the broadcast market.

6. The Home Network of the Future will serve a multitude of appliances with a voracious appetite for content. Broadband connections covering the last segment of the data pipeline, i.e. "the last mile" is the crux. The National Task Force on Information Technology & Software Development (1998) recommended the "last mile" linkage either by "fibre optics" or by "radio communication".

7. The main issues facing the convergence of technologies in the Indian context are:

- Availability of a wideband multimedia network with a high bandwidth to support multimedia traffic.
- Seamless interconnection of Internet, cable, radio and other fixed and mobile networks.
- Availability of the digitalised information, appropriately encoded and formatted for transportation over a wideband Multimedia network.

8. The unprecedented growth of innovative services and technologies are also challenging the existing demarcation of business markets, services, providers, users and government regulations in the Information & Communication industry. Many of the existing legal provisions governing telecommunication and broadcasting have become outdated and the need for a unified regulatory mechanism covering all the three sectors has been keenly felt. Keeping this in mind, the Government now proposes to bring forward the **Communication Convergence Bill 2000** (CCB-2000), which envisages a unified regulatory regime to address the convergence of telecommunications, data communications, internet, satellite and terrestrial broadcasting, cable television, audio broadcasting, software and content creation.

E-government and E-governance

9. Electronic Governance is the application of Information Technology to the processes of Government functioning in order to bring about Simple, Moral, Accountable, Responsive and Transparent (SMART) Governance. Electronic governance also involves transformation from being a passive information and service provider to active citizen involvement. However, evolution of E-governance is a highly complex process requiring provision of hardware, networking, software and re-engineering of the procedures for examination of cases and decision-making.

10. Some of the important pre-requisites for successful e-governance are:

- Large-scale computerization
- Capability of Use of local languages in the IT systems
- Changing the mindset of government functionaries
- Creation of Adequate and appropriate Infrastructure
- Standardisation in data encoding, application logic, user interfaces, etc
- Knowledge Networking for better governance
- Creation of Public Key Infrastructure and Certification Authorities

11. The National Task Force on IT and Software Development, constituted by the Prime Minister's office, has identified Citizen-IT Interface as one of the key areas to service the information requirements of citizens through deeper penetration of IT in society and through

the extensive use of latest tools in the networked society. The Task force has also listed a series of services to be delivered at the citizen's doorstep both on 'Transition Fee basis' and 'Commercial basis'.

12. At present, the picture of e-Governance in this country presents a wide variation in the level of computerization and the use of IT enable applications within and outside the Government. In spite of sustained efforts, the entire Government machinery, specially in the States has not yet become fully available for the use of computerization and other IT applications. Some of the State Governments like Andhra Pradesh, Karnataka, Maharashtra, Madhya Pradesh etc. have advanced whereas some others have lagged behind for various reasons.

13. The early starters would have advantage of further growth at a faster rate, the digital divide will increase not only from one region to another but also from one organ of the Government to another. Although, a minimum agenda has been devised for computerization of the Governments, there is no real total picture of the country or any marking of the level up to which IT is being used by Governments.

14. There is an urgent need for a national level coordinating body for guiding the progressive advent of E-governance in the country involving the various Central agencies, States, and other organs of the government. The question of standardisation is very important otherwise there will be a serious problem of mismatch of data and format.

15. The framework of governmental intervention and public funding in the areas of Convergence of Technologies and E-governance should be guided by the following principles:

- Government should act as a facilitator and create conditions for the growth of Convergence applications and good governance through the application of Electronics and Informatics.
- Development of technology should be done at public expense only in areas of gaps or if the cost is disproportionately high in acquiring technology from elsewhere.

- Government should promote setting up of robust backbone with ample bandwidth which shall be available to the content providers/distributors and network service providers.
- Government may fund ‘test-bed’ projects to test the applications specially in the field of delivery of government services and information electronically.
- Since Convergence has a bearing on E-government, the projects funded from public resources should be such that they help in tackling the ‘digital divide’ and taking the benefits of IT to the common man
- The projects should aim at creating a knowledge society and generate intellectual and cultural enrichment.
- Standardisation should be started without any delay otherwise confusion will ensue that would negate the advantages of use of IT
- For deriving appropriate benefits from such systems or applications, often more than one Ministry or Department (Ministry of Information Technology, Ministry of HRD, Ministry of Health Ministry of Rural Development etc.) would be involved. It is of utmost importance that projects are taken up with full involvement of the concerned Departments and agencies. It is also necessary to involve the States in the implementation of the projects.

16. National Informatics Centre (NIC) of the Ministry of Information Technology (MIT) has been instrumental in steering Information and Communication Technology (ICT) applications in government departments at Central, State and Districts, facilitating improvement in government services. In view of its expertise in government informatics, it is suggested that the existing NICNET infrastructure should be strengthened as well as extended to sub-district levels (i.e. to 6500 development Blocks) for promoting “E-governance” at various levels of government.

17. Intensive and extensive attention is required to be given to re-engineering government rules and procedures.

18. Private investment in the area of convergence application has not been estimated.

19. Government should give priority to the creation of Public Key Infrastructure without which E-commerce and E-governance cannot take off effectively.

20. It is not necessary to take up the imitation of every process and practice that is going on in other countries and experiment with them at public expense. Our basic research should be fully relevant to the needs of the country.

21. The total Plan proposal comes to Rs. 2680 Crore out of which Rs. 1830 Crore is for Convergence and Rs. 850 Core for E-governance.

PART I

CONVERGENCE

Emergence of Information Technology on the national agenda and the announcement of IT policies by various State Governments have recognised the “Convergence of core technologies and E-Governance” as the tool for good governance, sustainable development and globalisation of economy. In view of its potential and the powerful impact that the convergence of technologies can have on social and economic development of the Country, the Planning Commission has constituted a Working Group on “Convergence and E-governance” to assess the emerging scenario and have a look at the issues involved, specially to visualize the extent of public funding and policy support in the wake of the formulation of the Tenth Five Year Plan (2002-07). The terms of reference required the working group to go into :

- ◆ Measures for promotion of e-governance at various levels of Government
- ◆ Measures for ensuring seamless transition to convergence of IT, Telecommunication and Broadcasting Sector
- ◆ Measures to address the issue of digital divide and taking the benefits of IT to the Masses
- ◆ Infrastructure requirements for faster growth and penetration of internet and convergence of services
- ◆ Integrated view of the development of Telecommunications, IT and Information & Broadcasting sectors

2. The notification constituting the Working Group is at **Annexure II**

Approach Paper on the Tenth Plan

3. The Tenth Plan Approach Paper calls for an economic growth target of 8% during the Plan Period, with emphasis on second-generation reforms, reduction in subsidies and hard economic decisions to raise resources for increased investment and prune non-plan expenditure. The Approach Paper reiterates that faster growth is necessary in order to maintain India's position in the World Economy and build upon it further, in the context of the changing global circumstances and growing aspirations of the People.

4. The concept of Convergence as well E-governance activities fall in the realm of new areas which are emerging fast but for which there are no experiences available. There are no standard models nor any set of schemes to work on for future growth and investment. The issues, therefore, have to be approached in the light of the 'possibilities' and the happenings in the global scenario. The overall objective of providing better life to people through application of new technologies and to bridge the digital divide has been the basis for the approach followed in the report.

Digital Information Technology as driver of modern economies

5. As we enter the 21st century, the realm of electronic communication, which encompasses telecommunication, broadcasting, information technology, enabled services and industries, is undergoing profound changes leading to a Global Information Infrastructure (GII), which will be capable of carrying any type of information, be it text, data, voice or video. Information is now broadly defined to embrace voice in telephony, text in fax and newspapers, images in video and TV broadcasting, and data in computers. All information can be digitised, transported, stored, retrieved, modified, and then distributed. All of these are getting transportable over a common infrastructure – high-speed, broadcast, digital electronic highways. Emerging digital techniques, new network alternatives (Intelligent Networks), high bandwidth communication technology, and state-of-

the-art software for network functions and services, are the new technology trends evident in the development of electronic communication systems.

6. Technological changes, convergence, and deregulation are taking place throughout the World. They have brought about rapid growth in several industry sectors, together with many challenging issues to address. Changes in markets have led to the convergence of ownership and services across national boundaries and have created gaps and contradictions in national policy. Driven largely by technological developments, which can be a boon or bane, for developing countries, the converging communication environment has profound policy implications. Visions developed for the future foresee the eventual emergence of an Information Society in India based on the Convergence of Telecommunication, Broadcasting, and Computers.

7. Information Technology and Bio-technology have now become the “drivers” of globalisation of the economy, with their complementarities of liberalisation, privatisation and tighter intellectual property rights. Developments in Information Technology (IT) are bringing about a second industrial revolution, where the drivers are information, data, computers, and connectivity, and not iron_& coal, as it was the case in the earlier revolution. The global economic transformation is now intensifying and leading to rapid economic growth. Unlike most developing countries, India is expected to gain from the emerging “digital economy”, as it has several advantages, the main being:

- i. the *capacity* to build, operate, manage, and service the technologies involved
- ii. *affordable access* to core information resources, cutting edge technology and to sophisticated telecommunication systems and infrastructure

- iii. *policies* that promote equitable public participation in the information society as both producers and consumers of information and knowledge; and
- iv. *work force* trained to develop, maintain and provide the value-added products and services required by the information economy.

8. The diffusion of Information and Communication Technologies throughout all industries is far more important than the production of ICT industries per se. Convergence of Computing and Telecommunications was perceived as one of the most important trends in ICT. Since the early nineties, Computer Networks were widely used, and increasingly contributed to the globalisation of economic activities. Computer Networks in convergence with Telecommunications, commonly referred to as Information Infrastructures, are now viewed as fundamental and critical bases for future economic and social development.

9. Initiatives of the Governments and the private sector to adopt standards, develop interconnection and accounting systems and to deploy infrastructures, due to liberalisation policies, have seen the growth of satellite systems and regional WANs (Wide Area Networks) in India. National Task Force on Information Technology and Software Development (1998) of the Central Government has suggested a plan of action to **make India an IT super power** in the World. Emergence of IT on the National Agendaⁱ and announcement of IT Policies by several State Governments (e.g. Andhra Pradesh, Delhi, Goa, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Punjab, Rajasthan, Sikkim, Tamilnadu, Uttar Pradesh, West Bengal, etc.) have strengthened India's position in the software-driven IT sector in the World.

10. Public and private investment in Information Technology in developing countries, like India, was negligible up to the early 1990s. Although serious attention has been given in the nineties, the productivity gains vis-à-vis IT

investments have been lagging behind. The primary reason for this lag is that the learning needed to use the new technology did not develop with the same tempo. However, the scenario is now fast changing, broadly due to the following factors:

- Introduction of computer education in schools,
- Growth of computer educational institutions in higher centres of learning,
- Use of computers and networks in governments, public sector, private sector, & cooperative sector, and
 - Favourable government policies.

11. The Vittal Committee (1997) constituted by the Department of Administrative Reforms recommended 2-3% of the budget outlay for Information Technology applications in Government Departments. The National Conference on Informatics for Sustainable Agricultural Development (ISDA) (1995) had recommended 3-6% for IT Applications in the Agricultural sector. In the present “crucial decade” of this millenium, a high rate of investment in Information Technology capital and a supportive environment are expected to achieve “digital economy”.

Convergence of Information Technology, Telecommunication, Broadcasting and Entertainment

12. Convergence as a basic concept is nothing new. More than one technologies have often been used to produce devices and services in the past with amazing results. However, in the present context, the term which has gained currency in the last few years denotes simultaneous use of basic Information and Communication Technologies in a merged format leading to newer forms of deliverables. A number of existing and emerging technologies are involved in bringing about such deliverables and it also involves emergence of new industries.

A number of issues, technological, infra-structural and economic, are involved in the possibilities that are in the experimental stage in several parts of the world at varying stages and with varying degree of success.

13. In simple terms, Convergence in the ICT sector can, be defined as the convergence of “*carriage and content*” and involves convergence of terminals as well as integration of industries. Conceptually, the convergence of carriage and content, along with imaginative applications, opens up tremendous possibilities for delivering a big basket to the consumer empowering him to chose, use and control voice data and images delivered through a common device. Imaginative value addition to services adds to the attractiveness of such deliveries. The success of internet lies in the empowerment of the user and his capacity to access information with least cost and effort. However, it is not so easy or simple to bring the dream of convergence applications to the user with the existing organization of industry and other structures. Convergence involves vertical as well as horizontal integration of various entities. Applications based on the concept of convergence are still evolving in different parts of the world driven by the level of IT and communication infrastructure, the interest that the industry and the Governments show and the overall context of their cultures and economies. Convergence applications go much beyond the three segments of information and entertainment and have a capacity to change the system of governance and delivery of services in the total electronically networked environment.

14. Traditionally, communication and media have been quite distinct. Broadcasting, voice telephony and on-line computer services operated on different networks and used different “platforms”. TV sets, telephones and computers, each have been regulated by different laws and by different “regulators”. In India, Broadcasting has been a State monopoly. In the last two or three decades, the stress has been on expansion of network. Most of the radio broadcast has been in Amplitude Modulated (AM) mode. Television broadcasting which started as an adjunct to radio broadcasting in 1958 also followed the same route and both the wings functioned as public broadcasters. Content was created primarily with this objective in view although there was a gradual but discernible orientation towards commercial broadcasting. Technology upgradation is now being recognized as an important need and plans and programmes are being conceived to bring at least half of the television broadcasting to the digital system in the next five or six years.

15. In the telecommunications area, the Department of Telecommunications provided all the services till the opening up started in 1991. In the last about 5 years, the telecommunications sector has experienced a radical transformation from monopoly of operations to a sector facing full and vigorous competition with fast track liberalization of services and infrastructure. The regulatory restrictions of the telecommunications sector in the past were in sharp contrast with the free-market environment of computer industry and their coming together meant that some rationalization of these different regulatory mechanisms would be needed if the new services were to flourish. The greater harmonization and market opening in telecommunications should now provide a highly fertile environment for growth. This is already bringing benefits to many businesses and consumers with lowering of prices, improved customer service and innovative service offerings. Even so, the overall level and structure of prices continues to have a major impact on the take-up of new services.

16. Internet, though the last to emerge on the scene, has acquired tremendous acceptance in India and the growth of internet users has been very impressive. According to NASSCOM there would be about 10 million internet users by March, 2002. It would be interesting to go into the profile of the internet using community presented in a report of the CII's National Sub Committee on IT Enabled Services. According to this report more than 80 per cent of the PCs sold in 1999-2000 were for internet access and more than 4 lakh Indian household had internet connections. The dominant use of internet was for "Search". (77%) followed by usage for e-mail (73%) and for software download (23%). The average use of internet has been about 6 hours a week.

17. The three different "product lines", namely, Broadcasting, Telephony and Internet are now in a position to converge through wired and wireless media, and "topple down" old business models and value chains. It can occur either through competitive substitution or through the complementary merging of products or services or both at once" **Information, Communications and Entertainment ("ICE")** represents the converging industries of communications, media, software and the Internet, electronics and travel, leisure and tourism. Convergent technologies, which blend multiple streams of information into a single presentation on a single device, are central to the future growth of IT industry.

18. IT convergence began with the digitization of switching and transmission and the utilisation of Intelligent Network (IN) platforms. Digital networks redefine what kinds of infrastructure are possible under the sweeping trend of convergence and highlight the need for privatisation and regulatory changes commensurate with such developments. The hypothesis "diversity of applications and services increases whenever core technologies converge" holds good. Thus, convergence is entering homes and business with the extensive use of the Internet. This technology convergence can release customers from the barriers imposed by proprietary solutions, allowing organisations to develop integrated voice and data applications.

19. Convergence describes a process change in structures of Computer Industry, Information & Content Industry, and the Communication Industry that combines markets through technological and economic dimensions to meet merging consumer needs. This process change is taking place in the following segments:

Computer Industry

- Computers
- Software
- Interfaces

Information/Content Industry

- Databases
- Information Services
- Audio-Visuals products
- Films
- Music
- Photos

Communication Industry

- PSTN
- Cable Networks
- Broadcasting
- Mobile networks

20. It is also important to examine individual cases of convergence of emerging services and technologies (i.e. Internet Telephony – Voice over Internet Protocol, PC-to-PC, phone-to-PC or PC-to-phone, phone-to-phone) to understand the possible future structures of the communications industry. The following aspects, which are inter-dependent but separate, are relevant:

- *Technological innovations which enable the convergence of different appliances and their functions*
- *Cooperation among companies from different sectors or expansion of companies into hitherto unrelated industries*
- *Changes in consumer behaviour, specially, the adoption of interactive television usage patterns which are similar to internet-surfing.*

21. In the context of India, it is yet to be seen as to which segment of industry leads the convergence phenomenon. In the global scenario, each of the three industrial segments, namely Internet, TV and Mobile phones are striving to be the prime focus and leader of the process of convergence of deliveries. Experience in some countries has shown that there is a large populace of TV users who would embrace the Internet, video-on-demand, and greater interaction with content, but are diffident about buying and using a Personal Computer (PC).

Convergence of carriage

22. Maximum convergence is occurring in the area of access network (telecommunication including data communication) or local delivery services (broadcasting). This is because technological developments now permit the network used for carrying broadcasting signals to the customer premises, namely, to be used for purposes of carrying telecommunication and data (including Internet) signals also. Likewise, the network connecting subscriber to the telephone exchange, can be used for carrying broadcasting signals. In a similar manner, the webcasting function utilised for Internet data transfer though a telecommunication service uses the broadcast mode.

Convergence of Content

23. Content Convergence focuses its business on fully developing Web content into an integrated on-line experience - an experience that ultimately enhances the value of the printed and on-line products to both readers and advertisers.

24. Expansion of the market for services and the means of their distribution can provide impetus to content production, though often regulated. The telecommunication and Data transmission having moved from a separate technology and merged with computing and information technology, we have to look at the next step, the convergence of a third piece, the entertainment industry. As hardware and bandwidth become commodities, profit is moving towards the content industry and the new technology behind it. Another factor forcing the

convergence of the content is the need for real time answers. As transactions occur at speed of light, consumers want the same from their entertainment providers.

25. Technological skill is increasing exponentially. Now a lot of consumers possesses the skills necessary to utilize the technological innovation provided by entertainment content providers. Focus should be on enrichment of the content that can be delivered on the existing delivery platforms and then slowly romping it up for more advance platforms once they become popular. Streaming media has taken large strides, in recent years to offer audio and video over the internet.

26. Content on the web has to be somewhat different from the TV. Interactivity is the enrichment of the web. Hence the content which is amenable to interactivity (where interactivity enhances the consumer experience) is what is likely to work better on the web. Hence the challenge is not only to visualize how the content is to be prepared for the web, but also for the content provisioning and management to understand the computer software that allows enhancement of the content value i.e. interactivity

27. Creation of Web content that is useful, interesting and empowers the user, specially if it delivers entertainment products like films and video, requires the resolution of contradictory interests. In the case of Web-broadcasting, the high cost entertainment content suffers because it can be sustained only on high revenues, but empowering the viewer, as in the case of video on demand or interactive TV, the advertisement will suffer. This is an issue that has yet to resolve itself to provide a sustainable commercial segment. In India, we are still far from the reality of viewer empowerment.

Convergence of Terminal

28. The direction of technology and industry growth leads to the ultimate aim of Global Coverage to provide anywhere and at any time communication of voice data and images. A number of satellite network operator have already begin working towards this goal and development is underway of terminals that will

integrate both GSM and satellite network. Such phones will operate as ordinary GSM mobile at their usual tariffs when the user is within a GSM coverage area. When they move out of coverage their calls will travel by satellite.

29. These developments are pushing mobile phones into third generation wireless communication domain. Mobile terminals under the 3G system will allow subscribers to enjoy a host of value added services including mobile video conferencing and sharing of data and images among users who are connected with a voice or a video connection. Although the 3G systems have not spread widely enough and the initial response has not been highly encouraging, the development and adoption of technologies will proceed to invent products that the users demand. It does not indicate the weakness of technology or its capacity to deliver goods but indicates that certain aspects of human psychology had been overlooked. All technological spread has an element of sociology and psychology and those who are able to perceive it better reap commercial benefits. In the situation when 3G has not caught on well, initiatives on 4G system are already on the anvil. India should also move in this direction.

Seamless transition and growth

Internet as the driving force for Convergence

30. The success of converged environment would lie in the approach that would ensure a seamless transition to the new services and information delivery systems. In creating such systems, the investment decisions would be driven by sustainability considerations and the reach of the system at minimum cost. Both in the domain of government funded projects and the private sector interest, visible returns in terms of better and cheaper deliveries, scalability and coverage would determine as to which medium would lead the convergence processes, specially in the domain of entertainment industry.

31. In spite of the possibilities associated with the TV and the Mobile, Internet is and will be the most promising medium and the convergence of services and

terminals will be centered on the Internet, at least in the immediate future. The rapid growth of Internet happened not only because of the sheer brilliance of the core technologies behind it, but also due to other factors, namely, innovation, open standards and de-regulation

32. The single biggest area of "convergence and embedding for the Internet" could be the integration with the broadcast market. Since both the Internet and most future Broadcasting are digital, broadcasting is the bridging technology that could converge them into a single, seamless digital medium. The convergence of broadcasting and telecommunications in Japan and some other countries has created several exciting phenomena, like:

- * The Era of IP anywhere
- * The Economy of speed
- * The Media becoming the Market
- * Portal Wars

33. In future, IPv6 (128-bit address) is likely to facilitate convergence of technologies in an era of 'IP anywhere'. Software radio is emerging as the pragmatic solution for future mobile systems, holding the key to total convergence. Data broadcast applications (Intranets, Extranets, Focussed Affinity Networks (FANs) – CUGs, and Branded Business Channels) will have impact on productivity and economic growth. Emerging applications over a single corporate network, often run on Internet Protocol. (killer applications) will be :

- Unified messaging
- Collaborative data sharing (e-commerce and datawarehousing)
- Video streaming and conferencing
- Unified Internet multimedia service
- Internet service using satellites
- Ultra High speed internet service
- Expertise content service

Growth of Internet in India

34. The last decade has seen the birth and growth of Internet in India as a phenomenon that has transformed the way of life of the people in several respects. Its presence has been universal. The following table shows the yearly picture of the number of Internet connections as well as Internet users estimated.

Table I
Growth of Internet in India

(Figures in Millions)

Month/Year	Internet Connections	Internet users	Direct Exchange Lines (DELs)
March 1996	0.05	0.25	11.98
March 1997	0.09	0.45	14.54
March 1998	0.14	0.70	17.80
March 1999	0.28	1.40	21.61
March 2000	0.90	2.80	26.65
March 2001	2.30	7.00	32.71
March 2002	4.50	13.50	40.53
March 2003	10.0	30.00	48.40

Broadband Internet Connectivity : Projections

35. Widespread use of “Convergence”, however, revolves around next generation applications taking advantage of increases in bandwidth. While a large number of technologies are getting developed for broadband access such as DSL/ADSL, Cable Modems, VSATs, Wireless technologies, the mix of deployment would depend upon the market forces and promotional efforts made by Government.

36. International Data Corporation (IDC) has recently carried-out a market survey giving the future projections covering interalia, worldwide broadband penetration, outlook as well as possible technology choice in India. These are given in the following tables:

Table 2
Broadband Penetration Worldwide

	2000	2004 *	CAGR
Internet HH	108	192	15%
Broadband HH	10	104	79%
Broadband HH as % of Internet HH	9.5%	55%	-

Table 3
Broadband Penetration by Region

	2000 Subscriber: 14 Million	2004 Subscriber: 132 Million
US	45%	36%
Asia Pacific	31%	27%
W.Europe	12%	31%
RoW	12%	6%

Table 4
Global Scenario and India

	2000				2004			
	Global		India		Global		India	
Cable	56%		65%		33%		52%	
DSL	43%		35%		60%		48%	
Subscriber	14 million		13,000		132 million		450,200	
	Commer.	ousehold	Commer.	Household	Commer	Household	Commer.	Househ old
	50%	50%	30%	70%	70%	30%	10%	90%

HH - Households

DSL - Digital Subscriber Line

CAGR - Compound Annual Growth Rate

RoW - Rest of the World

“The Last Mile”

37. The Home Network of the Future will ultimately serve a multitude of appliances with a voracious appetite for content, for which the obvious answer is broadband connections covering the last segment of the data pipeline, known as “the last mile”. Bridging "the last mile" involves technology, planning, economics and geography. The available technologies for transmission are Wireless Technology and Dial-Up Connection. One of the major problems with the Wireless Technology is how to deal with the high rate of packet loss. Millions of dial-up users are tired of sluggish connections and hence the market is there for broadband – in one form or another. The emphasis on full Internet Protocol (IP) interoperability has been important, as the backlash has already begun against the lighter-weight Wireless Applications Protocol (WAP).

38. The National Task Force on Information Technology & Software Development (1998) recommended the “last mile” linkage either by “fibre optics” or by “radio communication” for IT Applications Services Providers (ASPs), Internet Services Providers (ISPs), and IT Promotional Organisations, with the aim to “boost efficiency and enhance market integration”, through Internet/Intranet, for sustainable regional development. The logical way to network ever increasing number of households is to use the already existing telephone lines, television cables, the electric power lines and the globally available 2.4 Ghz wireless ISM Band. Using existing telephone wires, Digital Subscriber Lines (DSL) offer speeds upto 8MBPS or more, depending upon the protocol and the distance. Symmetric DSL and Asymmetric DSL are the leading contenders. The Cable TV line provides asymmetric bandwidth 2MBPS uplink and 50MBPS downlink on a single TV channel of 6MHz. The U.S. based Media Fusion’s Power Line Technology – Advanced Sub Carrier ModulationTM- expects to deliver the signal – at speeds of upto 2.5 gigabits per second (GBPS). With the implementation of IPv6 (**IP anywhere**), the **Bluetooth Technology** (2.4GHz ISM Band) may be the most widely used technology of the current decade for the SOHO (Small Office Home Office) segment.

Regulatory Measures

The Communication Convergence Bill 2000

39. The unprecedented growth of innovative services and technologies are challenging the existing demarcation of business markets, services, providers, users and government regulations in the Information & Communication industry. Evolution of industries is generally facilitated by a proper regulatory environment where every stakeholder feels assured and is encouraged to invest. Multiplicity in regulation, which is basically a matter of legacy, tends to discourage new investment and growth especially in a free environment. Every dimension has importance otherwise, the possibilities that may be seen theoretically would not translate into reality.

40. Whereas, the issues regarding the carriage of the information are mainly of technology and infrastructure, content providers will only be willing to make contents available if their Intellectual Property Rights are adequately protected. Insufficient protection is already a serious problem for off-line electronic content, and this could be projected into the on-line world. The perceived road -blocks are as follows:

- a) Cable networks, Internet providers, Phone and Cellular companies are not allowed to connect to each other which is essential for convergence to occur.
- b) Broadband networks, high speed systems for transmitting video, cable, telephone calls, music or any form of communication that can be digitised – do not exist
- c) If cable companies and ISPs are allowed to start all kinds of new digital services, what happens to the Rs.7000 Crores of licence fees paid by private telephone companies. ?
- d) A host of convergence plans, like Direct-To-Home (DTH) television and Internet delivery to remote areas, presently need the so-called KU satellite band which eliminates the need to lay wires.

41. The respective laws governing telecommunication and broadcasting were, until 1997, the Indian Telegraph ACT, 1885 and the Wireless Telegraph Act 1933, which gave exclusive privilege to the State to establish telegraph and broadcasting services. Many of the existing legal provisions contained in the Indian Telegraph Act, 1885, the Indian Wireless Telegraphy Act, 1933, Telegraph Wire Unlawful Possession Act, 1950, the Cable Television Networks (Regulation) Act, 1995, the Telecom Regulatory Authority of India Act, 1997, have become outdated and there is a strong case for giving a fresh face to the regulatory mechanism.

42. The National Task Force on Information Technology and Software Development (1998) recommended telecom networks be allowed to connect to each other, as network interconnectivity is the key to the digital revolution. Although broadcasting's special role cannot be ignored in a democratic society, government should not create boundaries between industries when digital technology is bringing about convergence. Since it is difficult to predict the effect of digital innovation on broadcasting, the policy should be to allow the market be the prime arbiter of the development of digital innovation.

43. The Telecom Regulation Authority of India (TRAI) has found the VSAT (Very Small Aperture Terminal or Via Satellite Terminal) to be an important infrastructure tool. Its major recommendations include:

- Free competition
- Decrease in license fee
- Removing the 64 KBPS barrier, and
- Interconnection (CUG) to share the resources.

44. The question of setting up unified regulation mechanism has engaged the attention of the government and at the time of writing this report (Nov 2001) the Government of India is all set to bring about revolutionary changes in the regulatory and legislative environment in the Information, Communication and Entertainment (ICE) sectors, in order to facilitate a smooth convergence of these sectors.

45. It would be appropriate to recount the main recommendations of the Final Draft Report of the Sub-Group on Convergence (Fali S Nariman, Convener) which have been the basis for drafting the proposed legislation, as follows:

- *All antiquated acts including Indian Telegraph Act 1885 must go*
- *A single regulatory framework for information content and carriage*
- *Single, independent, autonomous commission for licensing and regulation (Communication Commission of India)*
- *Facilitate the development of national infrastructure for information-based society; and*
- *Closer cooperation between the regulator and the industry and to remove any restrictions on using any technology for providing quality services to consumer.*

Salient features of the CCB-2000 are at **Annexure III**.

46. The **Communication Convergence Bill 2000** (CCB-2000) envisages establishing a unified regulatory regime to address the growing technological convergence of telecommunications, data communications, internet, satellite and terrestrial broadcasting, cable television, audio broadcasting, and software and content creation. The CCB-2000 defines that “convergence” commonly refers to the provision of different kind of services over the existing infrastructure and the enhancement of existing technologies so as to provide a wide variety of new services.

47. The CCB-2000 envisages four different service providers namely:

- A. Network Infrastructure Facility Provider (NIFP)
- B. Network Service Provider (NSP)
- C. Application Service Provider (ASP)
- D. Content ASP

48. The CCB-2000 proposes that in the era of convergence, an ASP/Content ASP can utilize the services of any NSP for carrying their application/content.

49. The CCB-2000 proposes the setting up of a single unified regulator, **Communications Commission of India** (CCI), a super regulator governing the Information, Communication and Entertainment sectors. The CCI will subsume the Telecom Regulatory Authority of India (TRAI), the Telecom Disputes Settlement and Appellate Tribunal and the earlier proposed Broadcasting Authority of India. *The super regulator will carry out the functions of granting licenses, assigning and managing spectrum, regulating content and right of way, resolve disputes, as well as determine the conditions for fair, equitable, and non-discriminatory access to network facilities.* Overall, it will be vested with the powers for the handling of these sectors in a holistic manner. The companies in this sector therefore can look forward to a world-class regulatory regime.

Convergence Issues in India:

50. Although large possibilities are seen for convergence to provide better life for all, the extent to which it would actually take place would depend on how the infrastructure is laid and how technological possibilities are converted into acceptable and sustainable activities where commercial and other interests often present situations of conflict. A technology and an application would survive if it is “fit” and it would edge out older technologies only if it has satisfaction value specific to various cultures. In India various levels and stages of technologies have existed together in several fields. For ICT the same will hold good.

51. The main issues which needs to be addressed for the convergence to encompass various aspects of activities are:

- ◆ Availability of a wideband multimedia network having a very high bandwidth capable of supporting multimedia traffic. This wideband network should have high

speed switching and routing at all nodal points of the networks making it capable of handling information, audio, video and data. Convergence is dependent upon the robust backbone network with the guaranteed uptime, service level and evolving Bandwidth requirements. Also there needs to be the scalability to absorb the further development and enhancements in the front end networks.

- ◆ This network should have seamless interconnection with cable, radio and other fixed and mobile networks.
- ◆ Availability of the digitalised information appropriately encoded and formatted to be able to be transported over a wideband Multimedia network.

Entertainment segment-Digitisation

52. The convergence of technologies for carriage and delivery systems is in a nebulous state in India. Whereas, several possibilities have been seen, nothing much is happening in real terms. The convergence of broadcasting and Internet has not even been initiated. One reason is the near absence of digital environment in broadcasting. During the Tenth Plan, the Ministry of Information and Broadcasting is proposing large scale digitization of programme production and distribution activities, both for the radio and the television. Digitalisation of TV broadcasting is in existence for some private channels but the full chain of digital processes and products is yet to be in place.

53. Cable TV distribution, which has been totally in private sector and initially totally unregulated, has not been fully geared for taking up Internet. A few cable network operators are providing internet connectivity through a separate set of cable LAN network for local areas. This is quite a different and indigenous approach to providing converged access through set-top-boxes for interactive TV.

E-governance and E-commerce

54. The other form of convergence, that is content related, has made its presence felt in limited areas of tele-education and delivery of services in certain parts of the country depending upon local initiatives. In the field of E-commerce, besides networking, it is the absence of Public Key Infrastructure and Private Key Infrastructure that holds its fast spread. Until this aspect is addressed properly, the full benefits of the technological convergence would not be felt in any significant way. Converged applications can go a long way in empowering the citizen through introduction of E-government and E-governance. This aspect has been dealt with in details in the Part II of this report.

Industry Response-Public and Private investments

55. Despite the convergence of the regulatory mechanism, the real challenge of convergence is in knowing how the information technology industry should organize itself to best meet the needs of a market expected to grow strongly in coming years, and offer the end-user an attractive package of products and services that are simple to use and probably reach him in a wide variety of ways. Even in a reasonably enabling environment, hesitancy on the part of the Industry can delay or deny the benefits of convergence applications for newly evolving services. The transition from State monopoly to an open environment where hurdles still exist, is not easy to achieve in those areas of investment which are not properly field tested. To an extent, convergence between traditional telecom technologies and IP, that is, the convergence of voice and data communications – is already under way.

56. For bringing about convergence at the user level, convergence of mind is the ultimate determinant. A key factor in mind convergence will be the penetration of PCs in the home, and particularly multimedia and Internet capable PCs/TVs. Penetration of multimedia PCs is considerably lower than the TV but

Internet usage in the home is growing steadily although from a low base. The PCs are becoming multimedia capable fairly quickly, and increasing familiarity with these technologies at work and in schools will help to boost the PC penetration in home segment also.

57. One major change in the home has been the transition from collective, family viewing of two or three generalist TV channels to individual family members viewing alone, selecting from the much broader range of channels on offer in today's multi-channel environment. The multi-channel broadcast environment itself competes with packaged media, played on video recorders and video-game consoles. All of this will increasingly compete with the TV/PC, particularly with its use on line.

58. Aware of the changing patterns of consumption, the television and computing industries in many countries are vying for viewers' attention. Broadcasters and TV manufacturers are enhancing the interactive capabilities of their services and equipment. Today's digital television set-top boxes already combine television and telecommunication functionality. TV sets can already function as monitors when connected to low cost Internet appliances. Many in the consumer electronics industry predict that TV sets with built-in PC capability, including Internet access, will become an important feature of the consumer market in the near term provided its advantages are such that provide sustained satisfaction rather than a novelty only.

Tenth Plan perspective on convergence and proposals

59. Convergence can take many forms and there are limitless applications for putting it into use for the delivery of improved products. However, the Tenth Plan is being formulated at a time when there is a visible slowdown in the IT sector which has been further aggravated by the events of 11 September, 2001 at New York WTC. The effect on the Indian economy has not been significant but the trend needs to be watched for some time to project with the shape of things to come. However it is generally believed that the slowdown is a temporary phenomenon and that nothing can stop the growth of the IT sector and the spread of IT enabled services including those emerging out of the converging technologies.

60. In so far as Convergence and E-governance is concerned in the context of the Tenth Plan, the framework of governmental intervention and public funding should be guided by the following principles:

- *Government should act as a facilitator and create conditions for the growth of Convergence applications and good governance through the application of Electronics and Informatics.*
- *Development of technology should be done at public expense only in areas of gaps or if the cost is disproportionately high in acquiring technology from elsewhere.*
- *Government should promote setting up of robust backbone with ample bandwidth which shall be available to the content providers/distributors and network service providers.*
- *Government may fund 'test-bed' projects to test the applications specially in the field of delivery of government services and information electronically.*

- *Since Convergence has a bearing on E-government, the projects funded from public resources should be such that they help in tackling the 'digital divide' and taking the benefits of IT to the common man.*
- *The projects taken should aim at creating a knowledge society and generate intellectual and cultural enrichment.*

61. For deriving appropriate benefits from such systems or applications, often more than one Ministry or Department (Ministry of Information Technology, Ministry of HRD, Ministry of Health Ministry of Rural Development etc.) would be involved. It is of utmost importance that projects are taken up with full involvement of the concerned Departments and agencies. It is also necessary to involve the States in the implementation of the projects.

62. Convergence of Technologies and Services may lead to “divergence” of products and services and hence higher private investment, as the Government has been engaged in disinvestment of various Public Sector Undertakings, of late. The Public Investment on establishing Government Informatics Network (NICNET) by the Central Government to facilitate “e-Government” for decision support in various government departments at national, state and district level (550 districts administrations) in 1980s has induced public investments by various State Governments and also private investments for ICT industries on a large scale, in India in 1990s. But “Convergence and E-Governance Sector” is becoming a niche market wherein both public investment and private investments are expected in ICT industries, both hardware and software.

63. In order to take advantage of the convergence of technologies and applications for promotion of “E-governance” (digital governance) and also “corporate governance”, it is essential to have a national organization to play as an effective “catalyst” and “facilitator” who will make available the emerging killer applications .

Role of National Informatics Centre

64. National Informatics Centre (NIC) of the Ministry of Information Technology (MIT) has been instrumental in steering Information and Communication Technology (ICT) applications in government departments at Central, State and Districts, facilitating improvement in government services and moving towards creating transparency in government functions. It has helped in decentralised planning and management.

65. NIC is, perhaps, the only S&T organisation which has the infrastructures to perform the functions of four different service providers envisaged in the Convergence Communication Bill 2000 , namely:

- Network Infrastructure Facility Provider (NIFP)
- Network Service Provider (NSP)
- Application Service Provider
- Content ASP

66. In addition to this, NIC has other capabilities and infrastructure to implement the emerging killer applications. NIC implements the "minimum agenda" of E-Governance of the Central Government. In view of its expertise in government informatics, NIC has suggested that it should continue to function as the nodal agency for "e-governance" at various levels of Governments with active and joint involvement of other concerned Ministries and Departments. During the tenth plan period, it is suggested that NICNET should have a Metaframe System Server based on the emerging IP-any-where (thereby solving the "last mile" problem) and Open GIS architecture. This requires strengthening the existing NICNET infrastructure as well as extending it to sub-district levels (i.e., to 6500 development Blocks) for promoting "E-governance" at various levels of government. Public Investment is required to strengthen NICNET to undertake this innovative infrastructure during the Tenth Plan Period, which will

“crowd-in” private investment in the ICT industries and services in the converged form.

67. Some of the important recommendations made in the paper sent by the NIC are summarised as follows:-

- (a) Establishing a National Information Infrastructure (NII) as a “network of networks” including such nationwide networks as NICNET, ERNET, HVNet & I-Net, in addition to an extensive Fibre Optic Telecommunication Backbone being set up by Department of Telecommunication (DOT), Railways, and the Private Sector, as the "**National Information Infrastructure**" has the characteristics of a “public good” and is viewed as fundamental and critical bases for future economic and social development.
- (b) Implementation of minimum agenda on E-governance at various levels of government by 2005.
- (c) Implementation of the action plans formulated by the sub-group on “E-governance” of the main Working Group on “**IT for the Masses**” (2000) constituted by the Ministry of Information Technology.
- (d) Allocation of 2-3% of the Non-Plan Expenditure of the Central Government and out of this amount, allocation of 1% as an R&D budget component for S&T projects in ICT applications to facilitate strengthening “E-governance”.
- (e) Identification of National Informatics Centre as the Nodal Agency to implement “e-governance”, in view of its expertise in ‘E-government’ at various levels of government, since 1975.
- (f) Strengthening NIC as central Certification Agency (CA) for Government organisations to Issue Digital Certificates for ensuring security, integrity, authenticity and non-repudiation of Information Transactions and prevent impersonification and other frauds.

- (g) Strengthening of NICNET, which has its nodes in all 550 district administration, 35 state secretariats and about 55 central government departments, with Metaframe System Server based on the emerging IP-anywhere (thereby solving the “last mile” problem) and Open GIS architecture, so as to make the Government Informatics Network (NICNET) delivering services using the state-of-the-art ICT network.
- (h) Expansion of NICNET infrastructure to sub-district levels (~6500 development blocks) for promoting “E-governance” at various levels of government.
- (i) Creating a “National Free Trade Zone on Internet” to take advantage of convergence of technologies and services, and E-commerce
- (j) Securing a high rate of investment in ICT industries & applications leading to E-commerce and E-governance, as the impact of IT would be predominant in the social sectors like health, education, judiciary and rural development, and the primary sector - agriculture.
- (k) Launching pilot projects to overcome the “last mile” problems – i.e. to network ever increasing number of households by using the already existing telephones, television cables and electric power connections.

68. There will be some overlap in the scheme relating to convergence and E-governance, A complete list of schemes proposes for the Tenth Plan is at Annexure I. A total outlay of Rs.2700 Crore has been suggested. Details of some major schemes is discussed below.

69. A lot of basic research work will be involved for developing Information Security and Encryption Systems as well as for Public Key Infrastructure. Putting these into specific applications would also require public investment. A

lump-sum provision of Rs.300 Crore is proposed for all these schemes taken together.

Specific Projects and Schemes

70. In the process of taking the benefits of IT and convergence to the common man some specific applications like interactive **Tele-medicine** and **Tele-education** should be encouraged. Collaborative programmes between the IT Ministry and the Health Ministry should be taken up to develop processes of generation of test reports, hard-ware, transmission systems and software with specific India requirements. Mere copying Western models may not yield effective results as the medical care culture in India is vastly different than in the developed countries. Self sustainability should be one of the important guiding factors in formulating such projects as these cannot be funded indefinitely from the budget. These projects can be taken up as centrally sponsored schemes with active participation of State governments, Universities and NGOs on a time bound basis with zero based budgeting approach at each stage. The government can earmark a amount of **Rs 300 Crore** for these projects during the tenth five year plan.

71. In order to provide accessibility to masses in all parts of the country and to derive the benefits from converged applications like tele-education, telemedicine and world wide web access, government should set up **Multifunctional Converged Applications Community Centres (MCACs)** at Panchayat level. (Appropriate Indian or local name can be given to the project which should convey the essence of the services that are likely to be delivered rather than the drab name of MCACs). The MCACs should provide the following facilities:

- 1) Telecommunication services such as Local/STD/ISD PCO, Fax.
- 2) E-mail and Internet access.
- 3) Telemedicine, Tele-education and E-governance.
- 4) Exchange of Social & Cultural heritage across the country

- 5) Information about local data base, governments programmes
- 6) As many on line services as possible to be brought through the network

72. In the tenth five year plan a sum of Rs **700 Crore** should be earmarked for approximately 1000 such community centres across the country. Panchayats can be provided grants/loans from this amount earmarked for community centres. During the Ninth Plan, Ministry of Information Technology has already initiated Community Information Centres (CICs) in North-East States.

73. Ministry of Information Technology has formulated a programme for IT for Masses for implementation during 10th Plan based on the recommendations made by a Working Group constituted for the purpose. MCACs, besides above objectives, would also need to address to the requirements of (i) adult literacy, (ii) Rural empowerment and creating awareness on social, education etc (iii) Vocational training and employment generation for rural people, (iv) Health Care advice for remote specialist and (v) IT enabled education. A series of pilot projects are required to be launched in these areas with a view to replicate these in the country. These could be clubbed under a generic scheme “Technical Support to Support to State Governments for accelerating E-governance practices. A budgetary provision of Rs **50 Crore** for such a promotional effort may be required.

74. The government should concentrate on making information about government working available to the citizens. The objective of the government should be to bring total transparency in its functioning. Towards this effect the government shall concentrate on making E-governance as one of its goal during this planning period. To start with the government can provide the information about its various plans for poverty alleviation, employment generation, etc. the citizens who have been benefited by it etc. All the forms shall also be made available to the citizens as part of the E-governance. It can also start with the information for registration charges for the land in various parts of the city. These are some of the components of the E-governance on which government should concentrate.

75. Government should actively take up the development of interactive TV(I-TV). This will lead to a sea change in the use of most commonly available terminal available with the public. The TV will no longer be an entertainment only medium. The government should take up development of this I-TV service as centrally sponsored joint project of Ministry of Information and Broadcasting (MIB), Ministry of Communications (MoC) and Ministry of Information Technology (MIT). The success of this pilot project will provide valuable inputs for further development of service in the country. The initiative and main allocation of funds should come from the Plan of the Information and Broadcasting Ministry which is aiming at digitalization of broadcasting and entertainment software in the coming years.

76. To develop open standards in line with the international standards for convergence. Government has to take into account the developments in International standards and it will be necessary to frame Indian standards for using these in the country. It is urgent and imperative that the Government should set up a national standardization body with the following objectives

i. Development of high quality technical standards covering all aspects of convergence concurrent with the technical advances. The body shall have study group for different aspects of convergence with members drawn from related agencies in Government, private and public service providers, experts from the field and technical Institutions(Engineering, Medical, Management and other institutions).

ii. For looking into the interoperability issues. The CCI envisages four different sectors for licensing and if the network, the terminals, the contents etc have to work as a single harmonious unit then the different components have to interoperate seamlessly. To ensure this there is need for an independent body which will go into the interoperability issues and decide the course of action. The standardizing body should be made responsible for ensuring seamless interoperation of different components.

iii. To suggest the technology to be used for various applications.

iv. To undertake some of the pilot projects as technology demonstrators.

77. The body should have its HQ in National Capital Region (NCR). An amount of Rs **100 Crore** with appropriate phasing of the expenditure should be provided for setting up the standardization body which may be called “National Standardisation Institution for Convergence Standards” during the initial years of the Tenth Plan.

78. It may be mentioned that at this stage it is not possible to fill in detailed expenditure pattern of the various schemes that are considered necessary for being taken up during the Tenth Plan period. The titles of the schemes mentioned in the list under “Schemes Envisaged in the Tenth Five Year Plan for facilitating Convergence and E-governance” give the titles of the Schemes. The details, as much as possible should be brought out when the Plan is being formulated.

Tomorrow’s Postal Service

79. Convergence and Internet Economy is having significant impact on Postal Services in the world. In today’s & tomorrow’s working environment, the post office has changed from mail to e-mail (e-post) and e-commerce logistics, special packages for delivery, payment collections and settlement and Certification Services are now considered as legitimate postal activities. These are bringing about sea change at Product Level, Delivery Level and Functional Level. Post Office will need to play an increasing, pro-active role in the services of the future. As Post Office has been the biggest provider of services for the society, all encouragement and support be given during the 10th Plan to enable Post Offices to respond to changing needs of time and take to IT aided delivery of services.

80. The Working Group did not have inputs on the detailed plans and schemes of the Department of Post for conversion to IT enabled services. However, the effort of the Government should be to make the postal services self-paying as much as possible and not resort to subsidies while making the switch over. The Steering Committee may like to go into the proposals of the Postal sector in this regard and suitably integrate it into the Tenth Plan funding structure.

Part II:

E-GOVERNANCE

81. With the arrival of IT in a significant way in India, the manner in which products and services are now being delivered is undergoing a change. As with all the other institutions in the country, the processes in the Government too have to realign themselves in accordance with this shifting pattern where IT is becoming the enabling tool for reaching out to citizens of the country with speed and economy. The approach to public governance has been witnessing a fundamental shift in the concept, manner and method by which the State delivers its services. In its final stage, public governance may come to assume the form of Electronic Governance.

82. The Mid-term appraisal of the Ninth Plan and the Approach Paper of the Tenth Plan have commented on the deterioration in the governance processes. It has been mentioned that Development is an outcome of efficient institutions rather than the other way round. *Good Governance* has entered the development lexicon even though how to achieve good governance remains debatable. Systems in the government are not only administration oriented but are at times totally oblivious of the perception of the citizen. Too much discretion at every level, lack of transparency and cumbersome record management have made the system totally user- unfriendly. Use of IT can have immense impact on the quality of services that the government delivers to its citizens and can also demystify the government procedures making them citizen friendly.

E-government and E-governance

83. Electronic Governance is the application of Information Technology to the processes of Government functioning in order to bring about Simple, Moral, Accountable, Responsive and Transparent (SMART) Governance.

84. The terms 'E-governance' and 'E-government' are often used in overlapping manner although the two are not exactly the same thing. Much of this is due to the lack of a standard definition of E-governance and we in India have been using this term in a general sense. In the case of E-government the services and information are delivered to the citizens or clients through electronic medium while in the case of E-governance, the interaction between the citizen and the government takes place through electronic medium and decisions are processed electronically. It is necessarily more interactive and goes beyond E-government.

85. Electronic governance involves transformation from being a passive information and service provider to active citizen involvement. Its dimensions could include the following:

- Single source of information for citizen
- Equality and ease of access
- Optimising resources of multiple organisations
- Intergovernmental participation
- Public networks
- Involving various stake-holders
- Stimulating debates
- Exchanging views and information
- Increasing participation by citizens in decision making
- Public information feedback

86. Information & Communication Technologies (ICT) can serve a variety of different objectives and the resulting benefits that emerge would be: increased transparency, greater accountability, impact on corruption, greater convenience for workers as well as citizens, revenue growth and cost reduction.

PRE-REQUISITES FOR E-GOVERNANCE

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

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

Large-scale computerization: The introduction of computers in every department/ministry of the central and State governments and their subordinate organizations is the starting point of E-government. This would involve huge investments for the acquisition of hardware and software. One possible way of reducing and distributing costs is that the Governments enter into arrangements for leasing of computers and gradually acquire them over a period of time.

Capability of Use of local languages in the IT systems: The access of information would have to be made available in the language most comfortable to the public user, generally the local language. There are existing technologies available in the country such as GIST and language software by which transliteration from English into other languages can be made. Other tools for local language can also be developed as progress is made of their use in the systems of government.

Awareness: Perhaps the most important aspect of e-governance, computerization and spreading of IT, is the bringing of a change in the mindset of the government functionaries who have been accustomed to work only in the manual mode. It will be necessary to train all employees in basic computer usage.

Infrastructure: Adequate and appropriate Infrastructure for Information Technology has to exist across the country with sufficient bandwidth.

Standardization: E-governance demands standards in all areas. Some of the key areas are: data encoding (ISCII or UNICODE), application logic for common horizontal applications, user interfaces, data dictionaries, etc. These standards will need to be put in place before E-governance can effectively be implemented.

Certification Authorities: Public Key Infrastructure and Certification Authorities to provide digital certificates that help create an on-line identification and security system for the Internet allowing individuals, corporations and government organizations to conduct transactions and communications is an important requirement for E-governance and E-business

Knowledge Networking for better governance: Good Governance rests on the pillars of knowledge and recognition of this knowledge by the decision-makers. Digitisation of the entire set of knowledge within a network which links every individual including the decision-makers and gives democratic freedom to everyone to access and make use of this knowledge paves the way for Digital Governance.

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

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

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

E-Governance Experience in some countries

92. Services to citizens and their participative role in governance has to proceed according to a well conceived framework of what the Government wants to do for its citizens and at what levels of convenience for the citizens. This has to be driven by a promise or declaration by the Governments.

93. The United Kingdom was one of the earliest to launch the Citizen' Charter in 1991 as part of the reforms process which gave a much larger role to private sector and consumer focus to public services. The United Kingdom Citizens' Charter was re-launched in 1998 with the objective of setting "standards of service" and also involve the citizen in the decision making process. It sought to empower the citizen to encourage access and promotion of choice by providing him full information. The methodology involves working with other providers of information and service.

94. In Canada, which started service standard initiative in 1995, largely modeling on the United Kingdom with enlarged scope, aimed at creating knowledge and awareness of the range of Government services and aimed at improving quality of service delivery. Costs of these services and service delivery targets such as waiting time and the manner of delivery of service including the rights of citizens and client in the case of default of services were also included.

95. Australia sought to improve the quality of service by creating consumer focused procedures and one cost delivery of Government services. The basic approach was to remove the complexities of procedures of the Government which the citizen encountered in dealing with the Government and to initiate overall performance improvement.

96. In Singapore, the National Computer Board was set up in 1981 and the computerization programme in the Government Departments was intensified in latter part of 1980. Singapore is a perfect example of a compact well managed system which has come to be known as an intelligent island with all pervasive use of IT. In Indonesia, an award has been instituted for best client charter.

97. With the capabilities of IT applications evolving fast and the area of applications widening everyday the scenario the world over is changing in favour of the client. These procedures necessarily involve decentralization and

devolution of powers, reviewing of administrative procedures, strengthening of public grievance redressal machinery and making information available to citizens and clients.

E-governance Initiatives in India

98. The National Task Force on IT and Software Development, constituted by the Prime Minister's office, has envisioned India emerging as an IT Superpower in the world by 2008. The Task Force has already submitted its report in 3 parts. Task Force has set a target of US\$ 50 billion for software export from India by 2008. Domestic software industry is targeted to reach the level of US\$ 30 billion by this time. A number of initiatives recommended in this report have already been implemented by the concerned ministries/departments. The Task Force has also identified Citizen-IT Interface as one of the key areas to service the information requirements of citizens through deeper penetration of IT in society and through the extensive use of latest tools in the networked society. Information Technology applications can be used in everyday administration to make the quality of life of the citizen better, by removing hassles.

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

Government-wide Information Infrastructure

1). Government-wide electronic information infrastructure should be created to simplify service delivery, reduce duplication, and improve the level and speed of service to the public. This would provide the public (business and individuals) with the opportunity to send and receive, over electronic terminals, the information that currently passes between them and the government on paper.

2). **Nation-wide National Info Infrastructure is essential for carrying the services/information from government to citizens. Government and the private sector have to invest to develop this infrastructure.**

3). **The government should encourage the establishment of Internet Service Providers (ISPs) which will provide access to the Network based services from even the most remote locations in the country.**

4). **The government and the private sector would need to collaborate to put in place Electronic Fund Transfer (EFT) system, since this is critical to the successful implementation of Electronic Commerce, as well as direct service delivery to citizens.**

5). **It is necessary that computers should be cheaper to increase their penetration. The possibility of procuring cheaper second-hand computers available elsewhere should also be explored. These can be channelised through ET&T, and NICS I by proper coordination with groups of NRIs abroad.**

Re-engineering of Government Processes

6). **Re-engineering of the existing government processes and procedures is essential to bring about transparency in working, reducing bureaucratic controls, increasing efficiency and productivity, reducing cost of service delivery etc. Integration of projects across various departments to provide a single point of contact for citizens for delivery of services electronically is essential.**

7). There should be complete transparency in governance. Citizen Charter of each and every government department should be available to citizens over the Net.

8). The Freedom of Information Act to be enacted which shall ensure right of citizen to have access to information.

9). State Institutes of Public Administration shall be reengineered to help bring about IT-Responsible State Governments. (Recommendation No.98) Study of BPR will be an essential element in these institutes. Alignment of IT and business requirements of Government Departments, and focus of citizen as a customer to deliver one-stop integrated services will be essential. The institutes will need to be reengineered to orient their thinking on the Citizen-IT Interface.

10). A National Institute of Smart Government should be set up to focus on all issues concerning IT-supported governance (Recommendation No.97) Electronic Governance Institutes throughout the world are concerned with public policy, cyber law, economic development, delivery of services to citizens, constituency relationships and replacing industrial age institutions with the electronic art of governance, i.e. through digital age technologies and networks.

Service Delivery to Citizens

11). Delivery of services should be on “Transaction fee” basis. Private sector should partner with government in electronic delivery of services. In view of the enormous capabilities of the private enterprises, they should be involved in public funded projects as far as possible.

12). A Business Model for joint partnership of government and private sector to electronically deliver services on a sustained basis, so as to ensure that the government does not incur any expenditure, while the private sector invests initially, and recovers money on transaction fee basis, has been proposed. This

may be taken as a model and tailored by government departments, state governments for their individual needs.

13). Service Delivery Points (SDPs) should to be set up at convenient locations for citizens to access services. Information Kiosks may be set up in public places such as shopping centers, post offices, railway stations, libraries etc. All the STD/ISD booths should be converted into IT booths through whatever necessary steps required to do the same. They will operate as PTICs (Public Tele Info Centres.).

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

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

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

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

Service Delivery on Commercial Basis

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

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

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

19). Government Tendering/Procurement should be taken up as mission mode project. Electronic procurement and settlement system to eliminate the need for duplicate departmental systems. Government-wide single system will take advantage of data once entered in buyer's system, as it is re-usable several times in the supply and settlement chain. The processes and data of buyers and sellers have to be integrated to implement a fully electronic procurement system which will enable informed, and transparent decision to be made with uniform terms and conditions. The following will be integrated:

- Supply Database
- Procurement Database
- Financial Systems integrated with Payment systems
- Electronic Catalogues
- Price, performance, delivery details, payment mechanism

- Transaction set standardized
- Electronic Bulletin Boards and E-mail lists to support E-procurement

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

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

Citizen Identification Cards

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

HRD Requirements

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

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

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

100. At the central level, the government has extensively promoted the use of information technology in managing its internal process through the agency of the National Informatics Centre (NIC) which was set up in 1975. A High Powered Committee constituted under the chairmanship of the Cabinet Secretary took a decision in February 2000 to direct all ministries/departments of the central government to designate a senior officer as IT Manager to act as the focal point for promotion of IT. Subsequently, a 12-point 'Minimum Agenda of E-governance' was drawn up, comprising provision of basic infrastructure and training and use of IT for certain G2G operations as well as G2C transactions (Annex). A five-year 'IT Vision' and annual 'Action Plans' are also required to be prepared by every ministry/department. A recent review shows that three items of the Minimum Agenda have been implemented by 60% or more of the ministries/departments and another six items have been covered by 20-25% of them. A programme for training/capacity building of IT Managers is also being formulated.

101. Certain other IT initiatives at various stages of development/implementation in central government include: India Portal (a user-

friendly portal of all government websites for providing information and delivery of services), National Institute of e-Governance, Central Repository of Data, Citizen Service Centres for one-stop non-stop delivery of public services, dissemination of information relating to best practices/innovations in e-Governance (including a documentary series entitled 'IT in the Service of People'), and awards for best websites and innovative use of IT in the delivery of public services.

E-Governance Initiatives at State Level

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

Entrance Examinations has been automated to bring about transparency in allocation of colleges to successful students. In Maharashtra, the Connectivity Project has networked 3000 offices.

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

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

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

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

106. As a major step in bringing in E-governance, NIC has been implementing the following "**minimum agenda**" of E-governance, as announced by the Central Government:

- Internet/Intranet Infrastructure (PCs, Office Productivity Tools, Portals/Vortals on Business of Allocation and Office Procedures) up-to Section Officers level

- IT Empowerment of Officers /officials (Training)
- IT enabled Services
- G2G - Government -to-Government Portal
- G2B - Government-to-Business Portal
- G2C - Government-to-Citizen Portal : Community Information Centre, AGMARKNET Nodes, Passports, Courts, Central Excise & Customs, Land Records, Property Registration, etc.
- IT Plans for Sectoral Development
- Business Process Re-engineering
- Video-Conferencing
- Replication of ICT Application : G2C operational in Fatehgarh (Punjab), STAR/CARD/PRISM/PEARL, Ruralsoft, in other States
- "India-Image" Portal : A G2C Portal to be a state-of-the-art-portal of the Country
- G2G Portal, G2B Portal and G2C Portal in Central Government Departments and its Apex Organisations in the following areas of activities to begin with:
 - Central Excise and Customs
 - Registrar of Companies
 - Courts - Supreme Courts, High Courts and District Courts
 - Passports
 - Road Transport
 - Banks and Financial Institution
 - Agriculture
 - Water Resources

 - Women and Child Development
 - Health and Family Welfare
 - Rural Development
 - Higher Educational Institutions
 - Energy
 - Industry and Commerce

□ Parliament

- Development of an "Informatics Model" based "business process re-engineering methodology" and the features of the Information Technology Act 2000, to get maximum ROI (Return On Investment) as well as increase in productivity and delivery of services in government (i.e. Design and development of an "IT Governance" Model in Government) in the Central Government, State Government and District Administrations.
- Expansion of NICNET to cover all developmental blocks (~6500 in Nos.) to facilitate G2C access through CIC, in the country.

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

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

108. In view of its expertise in government informatics, and also to avoid coordination by a web of agencies in the Government, it has been suggested that NIC should continue to function as the nodal agency for "E-governance" in the Central Government. Government of India's strategies on "development of information systems and utilisation of information resources" initiated since 1975, have proved the existence of the complementarity relationship between communication system and information system : the "Communication System and Information System reinforce commitments to productivity" holds good. Starting as a small programme under an external stimulus by an UNDP project in 1975, NIC has grown incrementally and later exponentially as one of India's

major programmes, which has helped to usher in the required transformation to cope with the trends in the new millennium.

Road map and Proposals for the Tenth Plan

Country Outlook

109. At the national level, the picture of E-government or E-governance presents a wide variation of the level of computerization and the use of IT enable applications within the Government and for delivery of services and information. Also, in the Central Government itself, various ministries are at different levels of computerization and delivery of services. In spite of sustained efforts, the entire Government machinery, specially in the States has not yet become fully available for the use of computerization and other IT applications. Some of the State Governments like Andhra Pradesh, Karnataka, Maharashtra, Madhya Pradesh etc. have advanced whereas some others have lagged behind for various reasons. Since the early starters would have advantage of further growth at a faster rate, the digital divide will increase not only from one region to another but also from one organ of the Government to another. Although, a minimum agenda has been devised for computerization of the Governments, there is no real total picture of the country or any marking of the level up to which IT is being used by Governments.

110. The Ninth Plan period has seen considerable achievement in the IT sector with some excellent experiments under what is generally known as 'E-governance'. But if the whole country is to benefit at a reasonably uniform pace of growth and G2C interface, a more detailed look will have to be given at the shape of things as they are desired. There is a great danger in allowing things to proceed in a segmented manner and not define a vision where the role, costs, pitfalls and gains pertaining to all segments of society including the industry, employer, employee, government functionaries and all other stake holders are clearly visible.

111. Although 'E-governance' began with NIC's efforts to connect all the district headquarters through computers in the nineteen eighties, the approach over the years has grown out of the same philosophy. The philosophy has been dominated by connectivity, net-working, technology upgradation, selective delivery systems for information and services and an array of software solutions. A serious look is now necessary at the 'reengineering of procedures and rules'. Very little has been done on this front which is the crux of bringing about E-governance and its benefits to the common man in a sustained manner. Admittedly, this is the most difficult part of the exercise and would involve comprehension and examination of various internal and external procedural requirements in the government.

112. The Master-plan of E-governance should be guided by the following:

- A clearly focused vision of what is the objective of introducing E-governance.
- The range and standards of delivery of information and services to the people must be defined with time frames within which they are to be attained
- Any plan or scheme for E-governance should have sustainability; it should not be a mere novelty at government expense only for the sake of doing something that is in fashion
- Standardisation should be started without any delay otherwise confusion will ensue that would negate the advantages of use of IT
- Areas of public funding should be clearly spelt out
- The situation in various States should be gone into in details and appropriate plans and schemes suggested suited to different States
- Interactivity must be built into all schemes of E-governance otherwise it will only remain as a labor saving device for the government functionaries

- In the matter of E-governance, G2G, G2C, G2B functionalities have necessarily to be developed. E-Governance is to be understood in the sense also of governance even of public and private corporate bodies, Municipal Corporations and even local bodies. If e-Governance is to be ushered in an effective manner, it is necessary to create set of ‘flash pictures’ of the state of E-governance in the country.

National Council of E-Governance

113. So far, the process of computerization in the governments has proceeded in an adhoc, patchwork manner. There has been no clear-cut frame of resources and responsibilities to create follow up actions on the various recommendations made on this regard. : Actions and programmes have been driven primarily by individual initiatives rather than by institutional thrusts. It is, therefore, necessary to establish a central body for taking stock of the total IT picture of the country in one frame. The central body could be a **“Council for E-governance”** or a temporary **“Commission on re-engineering administrative procedures for E- governance”**. Another alternative is to set up a **National Institute of Smart Governance**. However, such Institute is not likely to have the necessary orientation towards administrative procedures across the country and complex plethora of rules, whose re-engineering is the crux of any governance reforms. In recent past, there has been mushrooming of e-Government/e-Governance initiatives at Central and State Government levels. There is need to put these in perspective and developed a framework for their consolidation and dissemination.

114. The National Task Force on Information Technology and Software Development had made a recommendation for setting up of the National Institute of Smart Government. In the course of the meeting taken by the Secretary to the Prime Minister, at the initiative of the Chief Minister of Andhra Pradesh, it was decided that the NISG might be set up in collaboration with the private sector and as part of the existing facility. At the time of writing this report, a dialogue has

been opened up with NASSCOM, which has developed a Concept Paper on the subject. The objectives of the Institute *inter alia* comprise documentation and dissemination of best practices; standardization; provision of consultancy; training, education and capacity building; awareness generation; and think tank operations. The Institute is proposed to be set up in collaboration with NASSCOM, Central and State Governments, academic institutes like IIT, IIM etc. It is proposed to be registered as a Section 25 Company under the Companies Act. The NASSCOM Report suggests an investment of about Rs.55 Crore over a period of 8 years with a capital expenditure of Rs.21.5 Crore and revenue expenditure of Rs.33.5 Crore. The resources for this are expected to be raised as follows:

- Industry:	Rs.21.50 Crore
- Government:	Rs.19.50 Crore
- Resource generation through consultancy etc.:	Rs.14.00 Crore

115. At the time of writing of the report the question of setting up Institute of Smart Government is under active consideration. The assessment made indicates that the Government contribution may well be only Rs 15 Crore. Hence a provision of Rs.**15 Crore** may be made in the Tenth Plan for the purpose.

116. Setting up of the National Council for E-governance or a one time Commission on re-engineering administrative procedures may not require any significant amount of fund but at the time of formulation of the schemes for inclusion in the Tenth Plan mention may be made about the need for such a Council which can provide continued interaction between the States and the Centre.

India Portal

117. India Portal would serve as a one-stop non-stop destination for public access to information on various aspects of government functioning. It would also serve as a single window for delivery of government services. An Expert Group to

conceptualize the India Portal was set up and its draft report has been received. *Inter alia* it envisages setting up of a National Information Services Board and implementing the Portal with the support of various stakeholders including industry associations, academic institutions etc. It would require development of information management plans, standards, data architecture, reference data, initial data collection and conversion to digital form, forms, deliverables, migration plan, sustainable strategy and maintenance. The critical success factors would be commitment of key contributors, change in work culture, re-engineering of organization processes and e-inventing government.

118. In terms of costing this programme, broadly speaking the hardware, software for data warehousing and developing models of payment gateways for various Central Government organizations and States, and consultancy arrangements for upkeep and maintenance of the Portal will be the minimum requirements. Although, working out of detailed proposals will take some time, on a rough estimate a sum of approximately Rs.100 Crore may need to be allocated during the Tenth Plan for the purpose.

Annexure I

Schemes Proposed in the Tenth Five Year Plan for facilitating Convergence and E-governance

(Some schemes may overlap the areas of Convergence and E-governance since E-Governance is one of the prime areas of application of convergence)

Convergence

<u>No</u>	<u>Scheme</u>	<u>Amount</u> (Rs. in Crore)
1.	Research Centre for Information Security	300
	a) Technology for E-Commerce	
	b) Information Security, Encryption, Digital Signatures	
	c) Public Key Infrastructure	
	d) Smart Cards	
	e) Bio-metrics	
	f) Digital Rights Management	
2.	Centre of Excellence for Wireless Technologies	360
3.	Test-bed Projects in Emerging Technologies	100
4.	Development and Application of appropriate Tele-medicine Technologies suited to Indian conditions	150
5.	Development and Application of Tele-education Technologies	150
6.	IT for Masses (Support for Multi-functional Application Community Centres)	700
7.	Setting up of National Standardization Institution for Convergence Standards	100
8.	National Institute of SMART Governance	15
9.	National Council for E-Governance	5
	Total	1830

E-Governance

1.	Computerisation of Secretariat	3% of Plan outlay
2.	Creating India Portal (single window)	100
3.	Development of Local language Tools and Content	50
4.	Evolving IT Architecture (Guidelines, Best Practices, Standards and support for Pilot/Test-bed projects etc)	50
5.	Technical Support to State Governments for accelerating E-governance practices	50
6.	Creating Citizens data bases through ID/Smart Cards	600
	Total (excluding 3% Plan of each Ministry)	850

G. TOTAL **2680 (Crore)**
Say 2700 (Crore)

PRIVATE SECTOR INVESTMENT

It is not possible to estimate the likely investment in the Convergence and E-Governance segments that would come from the private sector. Various facilitating lead actions are proposed to be taken by the Government and it is expected that private sector would take advantage of the situations and favourable policy arrangements. The Working group would not like to hazard a guess in the absence of detailed interaction with the private sector which was not possible within the limited time frame available to the group.

STATE SECTOR

- The size of the State Five Year Plans is yet to be determined.
- E-Government (Computerisation and delivery of services and Information through IT medium) is at varying stages in the different States. Individual State Plans should take care of the investment needs of the States.
- The guiding principle should be that 3% of the total Plan funds should be spent on computerization and setting up of delivery of services to the citizens
- Need for IT training and education should be borne in mind while formulating the State Plans of individual States.
- The States must ensure participation of the Industry and Private sector business in the ventures of E-government/E-governance projects
- Sustainability and commercial viability should be the most important factors in devising schemes for Government-Citizen Interface.

Salient Features of The Communication Convergence Bill, 2001

A

BILL

to promote, facilitate and develop in an orderly manner the carriage and content of communications (including broadcasting, telecommunications and multimedia), for the establishment of an autonomous Commission to regulate carriage of all forms of communications, and for establishment of an Appellate Tribunal and to provide for matters connected therewith or incidental thereto.

STATEMENT OF OBJECTS AND REASONS*

Convergence connoting the provision of different kinds of services over the existing infrastructure, and the enhancement of existing technologies so as to provide a wide variety of services is a relatively new phenomena; in addition, the rapid technological developments are leading to an inability to predict the emergence of new services. The existing legislations are proving inadequate in dealing with the emerging scenario of convergence. Furthermore, the existing licensing and registration powers, and the regulatory mechanisms for the telecom, information technology and broadcasting sectors are currently spread over different authorities. Therefore, a flexible type of legislation to accommodate and encourage permutation and combination of technologies and services is required. The Communication Convergence Bill proposes to establish a structured mechanism to promote, facilitate and develop in an orderly manner the carriage and content of communications (including broadcasting, telecommunications and multimedia) in the scenario of increasing convergence of technologies.

2. The Bill aims at facilitating development of national infrastructure for an information based society, and to enable access thereto; provide a choice of services to the people with a view to promoting plurality of news, views and information; establish a regulatory framework for carriage and content of communications in the scenario of convergence of telecommunications, broadcasting, data communication, multimedia and other related technologies and services; and establish the powers, procedures and functions of a single regulatory and licensing authority and of the Appellate Tribunal.

3. These objectives are proposed to be achieved by setting up an autonomous body to be known as the Communications Commission of India with wide ranging powers, duties and functions. The Head Office of the proposed Commission shall be located at Delhi and its regional offices will be located at Kolkata, Chennai and Mumbai. The Commission shall consist of a Chairperson, not more than ten Members and the Spectrum Manager as an ex-officio Member, shall be appointed by the Central Government from amongst persons of eminence recommended by a Search Committee from fields such as literature, performing arts, media, culture, telecommunications, law, broadcasting technology, information technology, finance etc.

4. The Bill proposes to combine and bring under the purview of the Commission the licensing and registration powers and the regulatory mechanisms for the telecom, information technology and broadcasting sectors. It is also proposed to replace large number of categories of license with the following five broad categories to enable service providers to offer a range of services within each category, namely:-

- (a) to provide or own network infrastructure facilities.
- (b) to provide networking services
- (c) to provide network application services
- (d) to provide content application services
- (e) to provide value added network application services

*Relevant Extract from the Bill introduced in the House on 29th August 2001

5. This flexible licensing regime is expected to optimize the use of resources, and encourage the development of infrastructure. The information technology enabled services such as call centres, electronic-commerce, telebanking, tele-education, tele-trading, tele-medicine, videotex, video conferencing shall not be licensed under this legislation and all the facilities and services exempted from licensing or registration immediately before the commencement of this legislation shall continue to be so exempt, until otherwise notified.

6. The Commission is envisaged to be involved in the assignment of spectrum; it will carry out frequency management, planning and monitoring for non-strategic or commercial usage of spectrum; determine appropriate tariffs and rates for services; facilitate and regulate all matters relating to the carriage and content of communications; promote competition; take measures to protect consumer interest and promote and enforce universal service obligations; formulate and lay down codes and technical standards and norms to ensure in a technology neutral manner the quality and interoperability of services and network infrastructure facilities; report and make recommendations either suo motu or on such matters as may be referred to it by the Central Government, etc.

7. The Commission is also proposed to be empowered with dispute resolution functions, and will have the power to appoint Adjudicating Officers. It is also proposed to set up an Appellate Tribunal, to be known as the Communications Appellate Tribunal to hear appeals against decisions or orders of the Commission, or against orders of Adjudicating Officers imposing civil liabilities. The jurisdiction of the Appellate Tribunal may be exercised by its Benches, which shall ordinarily sit at Delhi and at such other places as may be notified. The Appellate Tribunal shall consist of a Chairperson and not more than six Members. The Chairperson of the Appellate Tribunal shall be a person who is, or has been, a Judge of the Supreme Court, and shall be appointed in consultation with the Chief Justice of India. The Members of the Appellate Tribunal shall be appointed from amongst persons recommended by the Search Committee and they should be, or should have been, Judges of High Court or should have held the post of Secretary to the Government of India or any equivalent post in the Central

Government or a State Government for a period of not less than two years, or should be persons who are proficient in any of the fields specified for appointment as Members of the Commission.

8. The Bill proposes to repeal the following legislations, namely:-

- (a) The Indian Telegraph Act 1885.
- (b) The Indian Wireless Telegraphy Act 1933
- (c) The Telegraph Wires (Unlawful Possession) Act 1950
- (d) The Telecom Regulatory Authority of India Act 1997
- (e) The Cable Television Networks (Regulation) Act 1995

9. The Bill also provides that with effect from the dates of establishment of the Commission and of the Appellate Tribunal, the Telecom Regulatory Authority of India and the Telecom Disputes Settlement and Appellate Tribunal respectively, established under the Telecom Regulatory Authority of India Act 1997, shall stand dissolved and proceedings pending before them shall stand transferred and deemed to be pending respectively before the Commission and the Appellate Tribunal.

10. The Bill seeks to achieve the above objectives.
