Access to ICT-India and the World

2.1 Introduction

Advancement in new technologies has created many opportunities for improving living conditions. ICTs have enabled countries to leapfrog traditional modes of service delivery and make manifold improvements in process effectiveness and efficiency. Widespread adoption and application of ICTs across the different fields of society and the economy is presently considered to be the key factor behind boosting competitiveness and developing an informed society.

In addition, access to information technologies has become crucial to development. Technologies impact development by increasing the efficiency and competitiveness of the economy, enabling better service delivery to the citizens, and creating new sources of income. Considerable progress has been made in the world in the field of ICTs in recent years: between 1991 and 2006 telephone lines more than doubled and PC owners grew 6 times between 1991 and 2005 (Table 2.1).

Table 2.1: World Access to ICT

(Numbers in million)

	1991	1995	2000	2003	2004	2005	2006	2006 % of World Population
Telephone Lines	546	689	983	1140	1207	1261	1270	19
Cellular Subscribers	16	91	740	1414	1766	2221	2685	40.6
PCs	130	235	500	650	775	808	—	
Internet Users	4.4	40	399	724	870	1006	1131	17

Note: World population = 6,602 million
Source: International Telecommunications Union.[7]

However, as costs become affordable, the most revolutionising progress has been in the newer technologies such as mobile technology and the Internet. Cellular subscribers increased 167 times in the last 15 years globally, while the increase in world Internet users was a whopping 257 times (see Table 2.1). The growth in the use of modern information technologies in developing regions has been particularly fast, especially

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[7] http://www.itu.int/ITU-D/ict/statistics/at_glance/KeyTelecom99.html

in Internet. For example, from 2000 to 2005, Internet growth was the highest in the Middle East (312 per cent) and Africa (258 per cent)[8]. Despite these advances, current technology data does not present a pretty picture of general access to ICT by the average citizen of the world. Table 2.1 shows that only around 19 per cent of the population in the world have a telephone and only 17 per cent are Internet users.

2.2. Internet users worldwide

The world economy has changed its character and functioning drastically in the last three decades. The OECD and a handful of newly industrialised economies have been transformed both qualitatively and quantitatively, by the global flow of foreign direct investment, technology and talent. The new service sector growth led economy is a knowledge based society, whose activities are key to international competitiveness and productivity growth.

2.2.1. Growth of the Internet

Internet has made real what in the 1970's that visionary of communications Marshall McLuhan (1911-1980) called the "Global Village". In a matter of very few years, the Internet has consolidated itself as a very powerful platform that has changed the way we do business, and the way we communicate. The Internet, as no other medium, has given an international or, a "globalised" dimension to the world. Today the Internet continues to grow day by day making McLuhans's Global Village a reality.
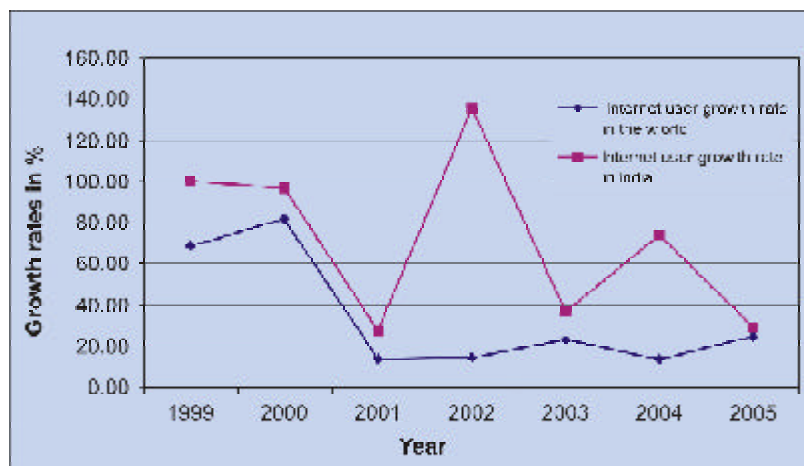
Table 2.2: Growth of Internet users in the world

Date	Number of Users (millions)	% of World Population
December, 1995	16	0.40
December, 1996	36	0.90
December, 1997	70	1.70
December, 1998	147	3.60
December, 1999	248	4.10
December, 2000	451	7.40
August, 2001	513	8.60
September, 2002	587	9.40
December, 2003	719	11.10
December, 2004	817	12.70
December, 2005	1,018	15.70
October, 2006	1,093	16.80

Sources: IDC, C.I. Almanac, Nua Ltd. and Internet World Stats.

From Table 2.2 it is clear that the usage of Internet has increased quite rapidly. In the last ten-year period, the per centage of users has increased by more than 18 times. How India fares in comparison with the world is brought out in Figure 2.1.

Figure 2.1: Comparison of Internet user growth rates of the World and India

Source: Internet World Stat.

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[8] http://www.Internetworldstats.com/stats.htm.

From Figure 2.1, one can say that the growth rate of internet users in India was throughout higher than that of the world as a whole but it has much to do with the base effect (India started with a smaller base. World growth rate showed a distinct trend of a very high growth rate to start with, followed with a spectacular dip implying saturation was reached within a short span. After 2004, there is a slight upward trend in the growth rate of the global Internet users. But, in case of India there were too many spikes in the growth rate so that only observation that can be made is that of a slowing down of the acceleration in the growth rate.

2.2.2 Accessibility of the Internet

The digital divide has been the subject of increasing policy discourses, academic research and civil society debates in recent years. Concerns have been raised by heads of states to the private sector, and citizen groups concerning the dangers of a widening disparity between the e-Haves and the e-Have-nots. While countries around the world have scrambled to invest in information technology infrastructure, the focus has remained on issues of connectivity.

The access to, and distribution of, tools for information and wealth creation are highly skewed between regions and countries of the world. Even though between 1980 and 2005 the number of fixed and mobile telephones increased over 30 times in developing countries, a telephone is still only available to one in 3 persons compared to the developed world where there are 1.3 telephones for each person[9]. Access opportunities are uneven between countries of the same region, as well. In East Asia, in the Republic of Korea every 2nd person is an Internet user and has a telephone compared to Cambodia where 300 persons share a telephone and only 1 in 1250 persons ever goes online. In Western Asia, every 6th person is online in Israel but in the neighboring Syrian Arab Republic Internet is available on only one in 286 persons[10]. Masked by these aggregates is the stark reality that many people in developing countries, especially in the rural areas, have negligible access to ICTs. Table 2.3 gives the top 20 country Internet users.

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[9] http://www.cidcm.umd.edu/library/papers/ewilson/apxc.pdf
[10] http://www.unpan.org/egovernment4.asp

Table 2.3: Distribution of Internet users in the World

Country or region	% of world users
1 United States	19.40
2 China	11.40
3 Japan	8.00
4 Germany	4.70
5 India	3.70
6 United Kingdom	3.50
7 Korea (South)	3.10
8 Italy	2.90
9 France	2.70
10 Brazil	2.40
11 Russia	2.20
12 Canada	2.00
13 Mexico	1.90
14 Spain	1.80
15 Indonesia	1.70
16 Turkey	1.50
17 Australia	1.40
18 Taiwan	1.30
19 Poland	1.10
20 Netherlands	1.00
Per centage of world users in top 20 Countries	77.70
Per centage of world users in rest of the World	22.30
Total World - Users	100.00

Sources: Nielsen//NR Oct/06, Aug/06, June/04; CNNIC June/06, eTForecasts Dec/05; IWS Nov/06, ITU Sept/06; eTForecast Dec/05; AMIPCI Oct/06; C.I.Almanac Mar/05; Survey Oct./06.

Important points that emerge from Table 2.3 are:

- World top twenty Internet user countries cover more than seventy-seven per cent of world Internet users, implying a high concentration of Internet users in these countries.

- More than 50 per cent of world internet users are concentrated in the top six countries.

- India is at the fifth position in the ranking of top twenty countries with 3.7 per cent of the world Internet users.

- There is a very sharp disparity between these top twenty countries with regard to Internet usage. Except for the United States, China and Japan, the other seventeen top Internet users consist of less than five per cent of the world Internet users. This actually demonstrates huge levels of imbalance in the growth of Internet Usage.

Figure 2.2: Frequency distribution of world Internet users among the world top twenty Internet users countries
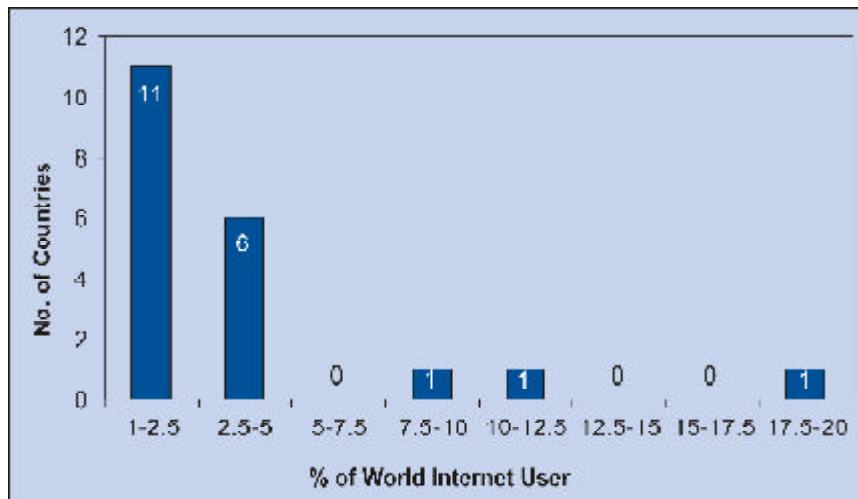

Figure 2.2 actually shows the disparities in the use of Internet facilities in the world. It is clear from the table below that fifty five per cent of the world top Internet user countries fall into the lowest category, i.e. though they are among the world top twenty Internet user countries, most of them have less than 2.5 per cent of world Internet users individually. The world Internet users are not equally distributed in the world top twenty Internet user countries. Only one country that is United States belongs to the highest category with more than nineteen per cent of the world Internet users.

Table 2.4: Disparity in Internet Usage

	% of world Population	% of world Internet Users	Internet users as % of Regional Population
Africa	14	1.7	1.8
Asia	56.4	34.5	8.9
Europe	11.4	28.7	36.8
Middle East	4.1	2.3	8.3
North America	5.1	23.8	68.0
Latin American/Caribbean	8.5	7.3	12.5
Oceania	0.5	1.8	49.2

Source: Internet World Stats.[11]

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[11] http://www.internetworldstats.com/stats.htm)

The inequality in access to technology is significant in the case of developing countries, where an inadequate telecommunication infrastructure and low Internet penetration has given rise to a huge telecommunication access divide. Taken together, low-income countries accounting for 40 per cent of the world's population and 11 per cent of the world's gross national income comprise only 2 per cent of the world's Internet users. Table 2.4 indicates that two world regions particularly lag behind: South Asia and Africa. Whereas Asia encompasses more than half of humanity, only 8.9 per cent of its population use the Internet. Of the entire population of Africa, only about 2 per cent use the Internet compared to 68 per cent in North America, 37 per cent in Europe and around half in Oceania. In fact, there are as many Internet users in Finland alone, with a population of five million, as there are in Sub-Saharan Africa, with a population of 643 million[12].

2.3. e-Readiness of Different Countries

The increasing rate of Internet penetration coupled with dramatic advances in the use of information technology throughout the world is creating an extensive literature of various aspects of 'e-Business' and 'e-Commerce' as well as a special interest in e-Readiness both here and overseas. 'e-Readiness' measures the capacity of nations to participate in the digital economy or networked world. In other words, a country's e-Readiness is essentially a measure of its e-Business environment, a collection of factors that indicate how amenable a market is to Internet-based opportunities.

e-Readiness is not simply a matter of the number of computer servers, websites and mobile phones in the country (although these naturally form one of the core components). It also comprises such things as its citizen's ability to utilise technology skillfully, the transparency of its business and legal systems, the extent to which governments encourage the use of digital technologies etc. It also includes broadband access and Internet connectivity. These are proving to be the key enabling qualities for effective e-Business, such as the penetration of public access wireless "hotspots".

2.3.1. Catching Up Process in Ranking

According to 'The 2006 e-Readiness ranking' of the

Economic Intelligence Unit, virtually all countries included in the e-Readiness rankings have improved their scores in 2006. The improvement, however, both in relative and absolute terms, is greater in the lower tiers of the rankings than at the top and consequently the distance separating the best from the rest has declined.

The average e-Readiness scores in 2005 and 2006 of the top 60 countries in the rankings are grouped into a top tier of 20, middle 20 and a lower 20. While the average score of the top tier improved by 2.5 per cent, that of the middle tier increased by 6 per cent, and the lowest tier boosted its average scores by 9 per cent. Therefore, convergence of e-Readiness scores of different countries has taken place in the international scenario[13].

There are signs that countries lagging in the rankings are finding different ways to accelerate their digital development. The adoption of open source software provides an example. It has expanded business and public sector access to IT in Latin America, where the cost of basic packaged software is prohibitive for many small enterprises and government agencies. In this field Indian companies are receptive to open source for its ability to generate savings and serve as a cost-effective gateway into the next generation. Broadband wireless technologies like WiFi and WiMAX are also coming into the picture for markets looking to improve online access. Mobile Internet makes sense for emerging markets, not only because the networks are quicker to roll out than fixed infrastructure, but also because developing countries are comfortable with wireless solutions. Voice over IP (VoIP) is another tool used to enhance connectivity - in developed and developing markets alike - by reducing the cost of international calling to help consumer and enterprises.

According to Pyramid Research, a telecom consultancy, the global IPTV subscriber base will grow from about 5million in 2006 to around 40million by 2010. The most interesting fact is that more than half of these subscribers will reside in Asia. The higher growth rates of developing regions compared to the developed regions in ICT ensure convergence of e-Readiness in the world. Figure 2.3 shows how the increase in the e-Readiness scores of developing regions like Middle East and Africa, Latin America etc. are higher than those of developed regions like North America, Western Europe etc.

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[12]Mathew Clarke. E-development? Development and the New Economy. UNU World Institute for Development Economics Research (UNU-WIDER) policy paper.

[13] The 2006 e-Readiness rankings –A white paper from the Economic Intelligence Unit

Figure 2.3: World Region Scores
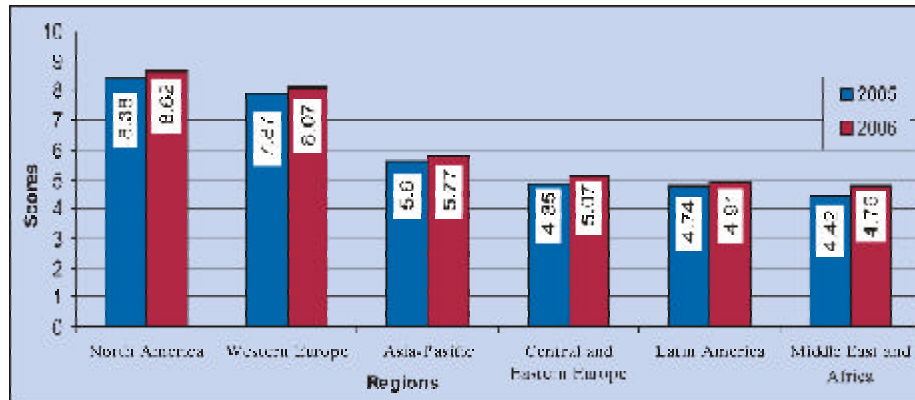
Note: Each Region's score is based on the e-Readiness scores for each of that region's countries.
Source: Economic Intelligence Unit, 2006.

2.4. Public-Private Partnership Developing ICT

A Public Private Partnership (PPP) is a partnership between the public and private sector for the purpose of delivering a project or service, which was traditionally provided by the public sector. The PPP process recognises that both the public and private sectors have certain advantages, in the performance of specific tasks. Private sector's innovation, technological, financial and management expertise are but some of the attributes, which the private sector can contribute. Through a partnership arrangement, the public and private sector can combine to provide quality public services and infrastructure in the most economically efficient manner.

In many cases it has been seen that PPPs are the best way to progress. According to McConnell International, over 500 initiatives across all attributes and countries are making a real difference in e-Readiness scores, sustainable programs, reforms, and policies that increase connectivity, strengthen e-Leadership, improve information security, develop human capital and enhance the e-Business climate. According to Microsoft Corp., ongoing public-private partnerships are narrowing the gap of economic opportunity and helping, build knowledge-based economies in underserved countries and regions[14]. PPPs in different regions are achieving impacts.

2.4.1 Some Successful PPP Initiatives

• Sri Lanka's University of Colombo has created an "External Degree Program" resulting in a Bachelor of Information Technology degree. While university faculty members conduct the examinations, the program is linked with research facilities and private sector training institutions to jointly design the curriculum and provide the actual instruction. The program produced almost 3000 graduates within three years, 100 times the capacity that the university alone could have produced.

• Chile adopted an approach (in 1995) to reduce the cost of providing pay phones in rural areas with the government's fund for telecommunications development. Over five years, the government set up multiple rounds of reverse auctions for entrance in the rural market to provide telecommunication service. Pre-qualified private operators bid for the chance to enter new rural markets with government subsidy. Administrators of the fund estimated the maximum subsidy needed to allow an operator to serve a designated area or group of communities and made that amount potentially available to the winner in competitive bidding. Those bids requiring the least subsidy won, and winners, upon fulfilling the mandate to provide coin-operated payphones, could also provide additional revenue-generating telecommunication services to the same communities. The technique reduced the share of Chile's population without access to basic telecommunications from 15 per cent in 1994 to 1 per cent in 2002. The least-subsidy auctions resulted in huge savings from what the government would otherwise have had to pay, with total subsidies costing just 0.3 per cent of overall telecom revenues. In addition to its careful design, the process encouraged efficiency by transferring market risk to the operators themselves—those best able to bear it[15].

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[14] www.microsoft.com/press/2005/dec05
[15] Asian Forum on ICT Policies and e-Strategies; PPP and Financing ICT Development by Paul Ulrich

- CITI (Commonwealth Information Technology Initiatives) is a public/private partnership to promote IT education, through strategic investments, that prepares graduates to participate, lead and innovate in the knowledge-based economy of Massachusetts. Launched in 2000, CITI brings together K-12[16], community colleges, public universities and industry to promote IT education across the curriculum and respond to technology workforce needs.

- PPP has also been very successful in Finland. The development of the Computer Driving License began in the early 1990's as a joint venture between public, private and third bodies such as the Ministry of Labour, Ministry of Education, educational institutions and teachers, labour unions, employers' organisations, and ICT experts. The work was coordinated by TIEKE Finnish Information Society Development Centre as a neutral intermediary, relying on a strong private-public partnership and highly networked ways of working.

- British Colombia, Centre of Telecom Development in Canada, has a long history of successful companies in the field. Many small and medium size enterprises (SME) in the telecom industry in British Colombia (BC) started to face difficulty in overcoming the various barriers to international markets, which threatened to slow down their growth. The establishment of a flexible market network, the Canada West Telecom Group, was a public private partnership to assist companies in overcoming some of the barriers they face and to enhance their chance of success. Today BC has a thriving advanced technology industry and ICT is a key component of this dynamic sector. According to BC Stats Report of 2001, BC companies absorbed 42,000 knowledge workers with an employment growth rate of 124 per cent between 1990 and 2000. Of these, 29,000 are in the ICT sector, which includes about 3,000 firms[17]. To be successful BC companies not only need to be successful in technology development, but they also have to be successful marketers in the global market. This is mainly because of the small market in Canada and global nature of telecom industry.

- Egypt's Prime Minister and Microsoft's Chairman launched Egypt's e-Government Gateway, a new citizen-oriented gateway that aims at enhancing the level of services offered to citizens and create a favorable environment for investors and members of the business sector. Currently, more than 15 complete services are available online; services now range from requesting a birth certificate, to checking traffic fines to taxation and customs services. Additionally, information related to more than 700 services provided by various ministries is available on Egypt's government services' portal www.egypt.gov.eg.

- Under the Framework Programs for Research and Development of European Union, two types of PPP exist: European Technology Platforms (ETPs) and Joint Technology Initiatives (JTIs). Generally ETPs help academic and industrial research communities in specific technology fields to coordinate their research and tailor it to a common "strategic research agenda" (SRA), which sets out R&D goals, time frames and action plans for technological advances that are relevant to industry and society. Strategic research agendas typically seek to overcome barriers to the development, deployment and use of new technologies. There are cases in research where the sheer scale of resources involved justifies setting up long-term public-private partnerships such as JTIs.

2.5. Conclusion

"International fragmentation of production processes has played an important role in shaping global trade patterns in IT products. Changes in technology have facilitated vertical specialisation in IT that has increasingly concentrated labour-intensive assembly operations in East Asia and have increased the trade in components both within the region and with the USA and Europe."[18] The emergence of East Asia as a global production base for ICT development has important implications for the nature and extent of regional interdependence.

PPPs are fundamental to the development process and to the diffusion of the benefits of ICT. The collaborative efforts by Microsoft, local governments and other organisations have produced new training and educational programs. These efforts are further enabling digital literacy and access to technology, as well as expanding government involvement in technology-related security.

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[16] K12 is a technology-based online education company serving students in kindergarten through 12th grade.
[17] Source: Profile of the BC High Technology Sector, 2001 Edition, BC Stats
[18] Applied Economics, 2007, 39, 215–228
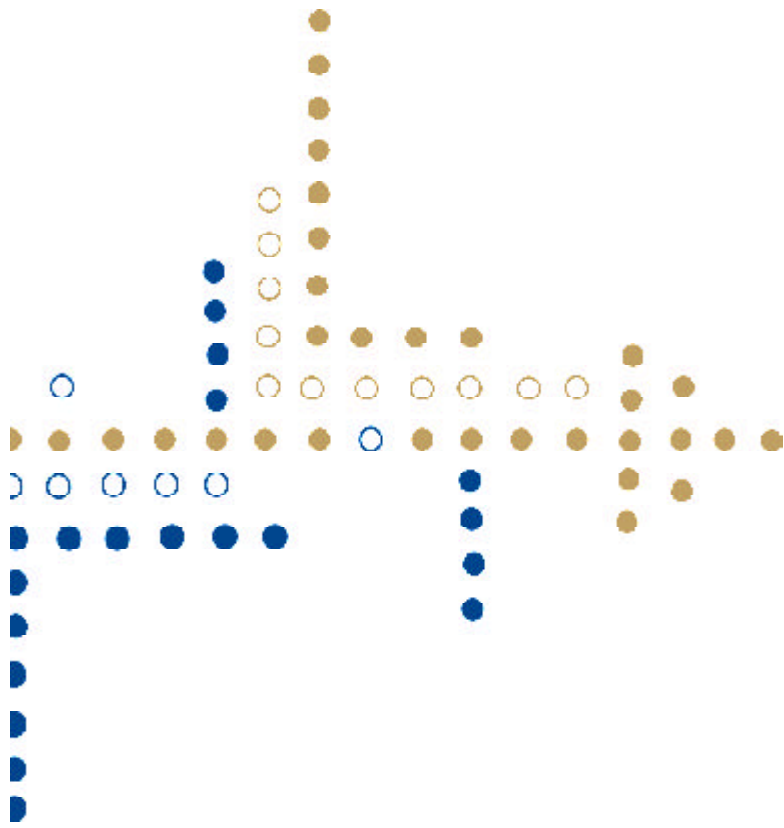
Impact Analysis through SAM Multipliers and Computer Penetration