Unit 24
Dimensions of Knowledge Society: Issues of Access and Equity

Contents

Learning Objectives:

This unit will enable you to understand and analyse:

- the emergence of knowledge society in the age of ICT;
- the distinctive features of knowledge society, knowledge economy and knowledge workers;
- skill acquisition and knowledge dissemination in knowledge society;
- dimensions of work participation in knowledge economy; and
- the role of knowledge and ICTs in empowering communities.

24.1 Introduction

Through the units of Block VI we have already seen how the forces of globalisation redefined the economic, social, political, cultural, etc. arena of contemporary human life. Revolutionising developments in Information Technologies (ITs) which occurred during post World War II or more specifically in 1970s and afterwords was an integral part of globalisation process that picked up increased momentum during this period. The rapid interaction and interconnectedness between and among societies created by the current phase of globalisation left Information and Communication Technologies (ICTs) to become dominant in every aspect of social system where technologies of information processing and communication became the core of productivity. Initiation in the processes of information handling, transmission, storage and retrieval become the key to human programmes and development and qualitatively different ways of life. In the emerging society — the information/knowledge society — knowledge and information; and the application of knowledge and information to knowledge generation and information processing/communication became the basic constituents of human progress. It paved the way for the emergence of a global knowledge economy – a networked society with a varied kind of economic and educational requirements and principles of organising the society, its moral values and identity. The World Development Report 1998/99 states that "today's' most technologically advanced economies are truly knowledge based creating millions of knowledge related jobs in an array of disciplines that are emerged overnight" (World Bank, 1999).

The World Employment Report, 2001 predicts that ICTs will have a major impact on the global employment in the future. It is restructuring the global social and economic equation — shifting from income divide to knowledge divide. In the developed countries ICTs have been the drivers of knowledge society.

As evident from the above discussion the information age knowledge becomes the basic form of capital, and the economic growth is driven by the accumulation of knowledge. Here the product with high knowledge component generates higher returns and a higher growth potential. In the knowledge economy, as distinct from peasant and industrial economy where economic wealth was produced by using human manual labour and machines respectively, the process of generation, dissemination and exploitation of knowledge produce economic wealth predominantly. Thus in the emerging knowledge society is one in which productivity is based on acquisition or generation, dissemination and application of knowledge or information. The main objective of this unit is to try and know more about knowledge society or information society. We will also try to trace its emergence and list its characteristics here. How and why the generation, dissemination and application of knowledge become integral part of knowledge society and dimensions of work participation in knowledge society also will be analysed in this unit.

24.2 Technological Transformation and Human Progress

Technological transformation has always played a crucial role in the progression of human societies from one stage to another. This transformation has widely influenced the economic, social, cultural and political institutional arrangements of the society by introducing changes in the nature of work participation in the organisation of production. The transformation of human societies from pre-industrial/agrarian to industrial and then again to post-industrial has widely been shaped by the innovation of new technologies. At the beginning of the 19th century, far-reaching changes in the social and economic lives of mankind were ushered by science, engineering and technology. The changes of that era were marked by the concerted efforts to abolish slavery and large-scale expansion of centralised factory production and the creation of industrial classes — workers and capitalists. This was characterised by production of manufactured goods, and acquisition of new skills required for industrial manufacturing. The latter half of the 20th century witnessed the advent of Information and Communication Technologies (ICTs), which heralds a new phase in the history and the changes brought about by it in the social and economic fabric are effectively unique. During this period there was a phenomenal expansion of computer communication, electronic technology and service economy (Bell 1976).

Table 24.1 Economic Indicators of Some selected Countries

Country	Popu lation Below line	Income share in %		GDP in %					
		Lowest 20 %	Highest 20%	Agricultural		Industries		Service	
				1990	2003	1990	2003	1990	2003
Australia	–	5.9	41.3	3	4	29	26	67	71
Canada	-	7.0	40.4	3	-	33	-	64	-
Netherlands	-	7.3	40.1	4	3	29	26	67	71
U.S.	-	5.4	45.8	2	2	28	23	70	75
U.K.	-	6.1	44.0	2	1	35	26	63	73
China	4.6	4.7	50.0	27	15	42	53	31	32

Sri Lanka	25.0	8.0	42.8	26	20	26	26	48	54
India	28.6	8.9	41.6	31	23	27	26	42	52
Bhutan	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bangladesh	49.8	9.0	41.3	28	22	24	27	48	52
Nepal	42.0	7.6	44.8	52	40	16	21	32	39
Pakistan	32.6	8.8	42.3	26	23	25	23	49	53

Source: World Bank 2005, UNDP 2004

Along the time, change has also been marked in the pattern of work participation. In the wake of industrialisation and rapid urbanisation there has been shift in the pattern of work participation from agricultural to non-agricultural economy not only in the developed but also in the developing parts of the world. However this shift has taken a new turn in the wake of the emergence of the postindustrial society whereby work participation increased in the service economy including those in the telecommunications, transport and marketing. It is significant that till the early decades of the last century a large segment of the workers of the industrialised nations like those of France, United Kingdom, America, Belgium, Japan etc. were in agriculture. Presently though agriculture accommodates substantive proportion of workforce, there has been increasing contribution of service sector to the GDP both in developed and developing countries (see Table 24.1). The blue-collar worker emerged very fast from the last quarter of the 19th century and then growth become very fast till the second half of the 20th century. Indeed the industrial workers grew phenomenally in the first half of this century in factories, mines, and transportation and by 1950s they emerged to be the actual majority of the working population in the industrialised countries. However in last 40 years they have declined equally rapidly first as proportion of the total and since the early 1980s, even in absolute numbers. The emergence of service sector (we will learn more about this in the later part of this unit) as a potential avenue for employment and earning has paved the way for the emergence of knowledge economy both in developing and developed countries. Agricultural wave, industrial wave and information age are the three stages of economic evolution of humanity according to Alvin Toffler. Presently the human society is undergoing the third wave i.e. the information wave, which is markted among others by explosure developments in information technologies and predominance of service employment (Toffler 1980).

Box 24.1: Toffler's First, Second and Third Wave

In his book The Third Wave Toffler describes three types of societies, based on the concept of 'waves' - each wave pushes the older societies and cultures aside.

- First Wave is the society after agrarian revolution and replaced the first hunter-gatherer cultures.
- The main components of the Second Wave society are nuclear family, factory-type education system and the corporation. Toffler writes: "The Second Wave Society is industrial and based on mass production, mass distribution, mass consumption, mass education, mass media, mass recreation, mass entertainment, and weapons of mass destruction. You combine those things with standardisation, centralisation, concentration, and synchronisation, and you wind up with a style of organisation we call bureaucracy."
- Third Wave is the post-industrial society. Toffler would also add that since late 1950s most countries are moving away from a Second Wave Society into what he would call a Third Wave Society. He coined lots of words to describe it and mentions names invented by other people, like the Information Age.

Source: *The Third Wave 1980*

24.3 The Emergence of Information and Knowledge Society

The roots of information society idea are closely associated with the idea of post-industrialism. Although the scientific and industrial predecessors of electronics based information technologies can be found in late 19th and early 20th centuries, it was during the second World War and its aftermath that the major technological break through in electronics took place: the first programmable computer, the transistor, source of microelectronics — the true core of Information Technology Revolution (see Box 24.3) (Castells 1996). Manuel Castells contends that the new information technologies, which include microelectronics, computers, and tele-communications diffused widely in 1970s accelerating their synergistic development and converging into a new paradigm (Ibid).

Box 24.2: Information Technology Revolution

Although the technological inventions such as telephone by Bell in 1876, radio by Marconi in 1898, vacuum tube by De Forest in 1906 were landmark inventions in technological development, major technological brake through leading to a technological revolution in the human history based on electronics based technologies can be said to happened during and after the Second World War. The invention of transistor in 1947 made possible the processing of electronic impulses at a fast pace in binary mode of interruption and amplification, thus enabling the coding of the logic and of communication with and between machines. These processing devices are semiconductors, which are popularly called as chips. A decisive step in microelectronics had taken place with the invention of integrated circuit in 1957. It triggered a technological explosion. The giant leap forward in the diffusion of microelectronics in machine came in 1971 with the invention by an Intel engineer of Silicon valley, Ted Hoff, of microprocessor, that is the computer on a chip. Thus, information processing power could be installed everywhere.

The power of chips is evaluated by a combination of three characteristics: their integration capacity, indicated by the smallest line width in the chip measured in microns (1 micron is equal to 1 millionth of an inch); their memory capacity, measured in bits: thousands (k) and millions (megabits); and the speed of the microprocessor measured in megahertz. The technological advancements of the microprocessors were so fast that while the first microprocessor of 1971 laid in lines of about 6.5 microns the microprocessor of 1999 measured 0.25 microns. Greater miniaturisation, further specialisation and the decreasing price of increasingly powerful chips made it possible to place them in every machine in our everyday life.

The advent of microprocessor in 1971, with the capacity to put a computer on a chip, turned the electronics world and indeed the world itself upside down. The microcomputer or personal computer software also emerged in mid 1980s out of the enthusiasam generated by two Harvard drop-outs, Bill Gates and Paul Allen. Having realised its potential they went onto found Microsoft, today's software giant.

Indeed, to advances in microelectronics and software it has to be added major leaps forward in networking capabilities, which was made possible by major developments booth in tele communications and computer networking technologies during 1970s. during this period tele communications also had been revolutionized by a combination of 'node' technologies (electronic switches and routers) and new linkages (transmission technologies). Major advances in optoelectronics (fibre optics and laser transmission) and digital packet transmission technology dramatically broadened the capacity of transmission lines. Each leap and bound in specific technological field amplifies the effects of related information technologies.

Source: Castells 1996

Manuel Castells (1996) argues that in the new economy emerged around the world as a result of the current phase of globalisation process, productivity and competitiveness is by and large a function of knowledge generation and information processing or informatisation. In the new information age knowledge became the power and the tool for capital accumulation. According to Yoneji Masuda (1981) in the post-industrial, information-based society, knowledge, or the production of information values, will be the driving force of society, rather than industrial technologies (p. 29). Thus in the evolving information age the generation, dissemination and application of knowledge becomes the basis of all aspects of knowledge and hence it is also called as knowledge society.

Reflection and Action 24.1

Do you think the contemporary period is witnessing a technological transformation and a consquent social transformation? Why?

24.4 What is Knowledge/Information Society?

According to Daniel Bell, in information (and knowledge) society science plays an increased role in the productive forces; professional, scientific and technical groups will rise into prominence in addition to the vast expansion of information technology, which include a converging set of technologies in microelectronics, computing (machines and software), telecommunications/broadcasting, and optoelecronics etc. This will be the new axial principle of the economy and society. He forecasts the growth of new social framework based on tele communications which may be decisive for the way knowledge is created and retrieved, and the character of work and occupations people are engaged in. The computer will play a pivotal role. In information society knowledge and information will supplant labour and capital (as in Marxian view) as the central variables of the economy. Here the information will be treated as a commodity and the possession of information will give more power to its owner. There will be more and more penetration of information into more traditional areas of agriculture, manufacturing and services. There will be major social changes resulting from the establishment of new tele-communications infrastructure (Bell 1976). New forms of social interaction based on electronic communications devises are replacing older types of social relations. There is more application of IT to overcome the ecological and environmental problems associated with industrialism as well.

Mannual Castells (1996) prefer to call the emerging society as “informational” society where the process of generation and transformation of information generation has rather become the fundamental sources of productivity and power. To Scott Lash (1999) in the information society the source of power is information. Power in the manufacturing age was attached to property as the mechanical means of production. In the information age it is attached to intellectual property in the form of patent, copyright, and trademark so that they can be valorized to create profit. There is thus commodification of information and no time for reflection. In this society however it is not the commodification that is driving the informationalisation but the informationlisation that is driving commodification. In this age inequality is less defined in terms of the relations of production but more by exclusion.

The society that is emerging is a “knowledge society” one which is characterised by “new structures” of knowledge, methods of dissemination and a technology that permits and sustains “unrestricted” access to knowledge and control over it. Thus in the contemporary phase of human society the proliferation of information technology has led to the emergence of a mass society that produces knowledge and information on a mass scale as the driving force of

economy (Naisbitt 1986:7). Consequently there has been the rise of the category of knowledge workers, who are fast replacing both histories' traditional groups and the groups of industrial society; the group, which is fast becoming the center of gravity of the working population. This group is also becoming the single largest group of the work force in the postindustrial society (Drueker 1994).

The social and economic dynamics of the knowledge society are widely shaped by the new forces of production, influence of the global market and the state. To Antony Giddens (2000) globalisation and knowledge economy are the co-constituents of the global information order and that this economy is populated by an active and reflexive citizenry of wired workers, whose knowledge is the principal source of production and they are non-hierarchical in their work environment.

According to Bob Jessop (2003) knowledge can acquire commodity value after entering the labour market and once it is made artificially scarce and its access depends on payment of rent. Knowledge can be transformed into a fictious commodity by transforming it from a collective resources (intellectual commons) into intellectual property (eg. Patent, copyright etc.) for revenue generation; subsuming of knowledge production under exploitative class relations and by transforming intellectual labour into wage labour for producing knowledge for the market; and bringing intellectual labour under capitalist control through commoditisation and integration into a networked digitized production and a consumption process controlled by the capital. He foresees the possibilities of monopolies in knowledge and information by embedding them in technology, standards or legally entrenching in intellectual property rights.

It is now recoganised that in the wake of present phase of globalisation ICTs have paved the way for the emergence of global knowledge society and economy; a networked society with a varied kind of economic and educational requirements and principles of organising the society, its moral, values and identity. In essence the ICTs have been juxtaposed to the process of restructuring of economic and social institutional arrangements of the knowledge economy of information age locally and globally. ICTs now offer a challenge to the conventional ways of getting information, knowing and disseminating. Thus this cutting edge technology has been linked to the new discourse of development. In this information age knowledge is the basic form of capital and that economic growth is driven by the accumulation of knowledge (cf www.med.gov.nz). There has emerged a symbiotic relationship between knowledge economy and ICTs for releasing the creative potential and knowledge embodied in people and harnessing local-global connectivity, for generation of wealth and to widen the market of this economy (Ibid).

Following are some of the distinctive features of knowledge society:

- The basis of knowledge-based development in the knowledge societies is the generation, dissemination and deployment of knowledge.
- In knowledge society scientific knowledge is considered as an asset and the scientific and technical group will rise into prominence.
- The social network in a knowledge society is based on tele and other communication technologies.
- The creation and retrieval of knowledge plays a decisive role in the organisation of work and occupation. The occupations, which make more and more innovative knowledge, will become predominant in this economy.
- The knowledge/information is treated, as commodity and the possession of knowledge gives more power to the owner.

- In knowledge society inequality is defined in terms of exclusion from knowledge.
- In knowledge society knowledge is transformed from collective recourses (intellectual commons) into intellectual property for revenue generation.
- In knowledge society the conflict is between minority knowledge workers and the majority traditional workers.
- Knowledge society will be far more competitive than the earlier societies, as knowledge will be key competitive factor for career and earning opportunities.
- Knowledge in the knowledge society basically exists in specialised application by specialised experts. The central work force will be the highly specialised people and not the generalists. Here the people who acquire the specialised knowledge will have the ever more scope of mobility. "It demands for the first time in history that people with knowledge take responsibility for making themselves understood by the people who do not have the same knowledge base. It requires that people learn to assimilate into their own work specialised knowledge from other areas and disciplines" (Ibid).

Reflection and Action 24.2

Some of the features of knowledge society are given in this text. Can you pointout some more features

24.5 Knowledge Economy and Knowledge Workers in a Knowledge Society

In knowledge economy economic wealth is predominantly produced by using knowledge. Indeed it is an emerging society whose economic base is widely shaped by the processes of generation, dissemination and exploitation of knowledge. The neo-classical economists have emphasised on labour and capital to be key factors of development. To Paul Romer (1990) knowledge is the third factor of production and long-term growth it is the basic form of capital and that economic growth is driven by its accumulation. (www.med.govt.nz.). Here we may sum up the following features of knowledge economy:

- In knowledge economy knowledge is a public good, as this becomes object of wide use.
- As the knowledge economy is dependent on generation of knowledge for its prosperity here knowledge gained by experience is as important as formal education ad training.
- A knowledge economy is to become a learning economy in order to utilise its full capacity and to take its optimum advantage. "Learning means not only using new technologies to access global knowledge, but also to using them to communicate with others about innovation. In the learning economy individuals, firms and countries will be able to create wealth in proportion to their capacity to learn and share innovation (Foray and Lundvall 1996; Lundvall and Johnson 1994). Formal education, too, needs to become less about passing on information and focus more on leading people how to learn (Ibid). Learning thus becomes a life long process in knowledge economy.
- According to OECD, ICTs are the facilitators of knowledge creation. In the knowledge economy ICTs are the tools for releasing the creative potential and knowledge embodied in people. Wealth generation is becoming more closely tied to the capacity to add value using ICT products and services.

Mondal (1997) highlights in a study that each job at Microsoft created 6.7 million new jobs in Washington State, whereas a jobs at Boeing created 3.8 million jobs. (Ibid)

In the information age individuals are put in the centre of the knowledge and skills based society. More than ever before, individuals want to master their own lives and expect to contribute to economy and society. The development of individuals as active citizens of society is increasingly given a central place in statements of learning, education and training objectives.

The individual is becoming the architect and builder responsible for developing his/her own skills, supported by public and enterprise investment in life long learning. ICTs are empowering the individual from a passive teacher-oriented approach to gaining knowledge; there is a shift towards learning for life and work, centered around the individual. The need to learn how to access, analyse and exploit information and transform it to new knowledge is increasing and in particular the Internet based technologies, offer great opportunities. The empowered individuals or the knowledge workers take charge of all spheres of society.

Knowledge workers of the knowledge society are distinctively different from those of the agrarian and industrial society workers. They are defined as "symbolic analyst" who manipulates symbols rather than machines. They include architects and bank workers, fashion designers and pharmaceutical researchers, teachers and policy analysts. They are associated primarily in service sector such as telecommunications, transport and financial services (www.med.gov.nz). Knowledge workers systematically accumulate knowledge, share it and deploy it purposefully. Continuously improving the stock of knowledge will be critical for their success. In the knowledge society the knowledge workers are valued very high. For e.g. In many of the American manufacturing companies the intangible assets are now worth more than tangiable assets. These intangible or intellectual assets are based primarily on the skills and capabilities of their so-called knowledge workers.

The distinctive features of the knowledge workers are noted down here.

- The knowledge workers are the leading class of the knowledge society and necessarily the ruling class. They differ fundamentally from the other, groups in history who occupied the leading dominant position in then values, expectations and social position.
- They get access to work and social position in knowledge society through formal education and training.
- Quantity and quality of knowledge work will differ substantially based on the amount and kind of formal knowledge and training required for a particular job.
- As formal education occupies the center stage of the knowledge society, formal schooling emerges to be the key institution. Here the components of knowledge (knowledge mix), quality of learning and teaching not only become central concern of the knowledge society, but also central political issues. "In fact it may not be fanciful to anticipate that the acquisition and distribution of formal knowledge will come to occupy the place in the politics of the knowledge society which acquisition and distribution of property and income have occupied in the age of capitalism" (Ibid).
- It is significant that not necessarily the conventional system of schooling, but the systematic continuing education offered in the place of employment would get importance. Here an educated person will be someone who has learnt how to learn and throughout her/his lifetime,

continues to learn especially in and out of formal education. Thus acquisition of knowledge is not age specific but life long.

- The knowledge workers work in terms and work as employee in an organisation. They are to learn different kinds of terms for different purposes – their performance capacities, strengths, limitations and trade-offs between various kinds of terms. They are also to learn how to switch from kind of team to another and to integrate one self into a team
- Organisations in general provide the platform to the knowledge workers to convert their specialised knowledge into performance. In the organisation the knowledge workers are at times the employee and at time the bosses.
- The knowledge workers also own the tools of production. Unlike the capitalist society, true investment in the knowledge society is the knowledge of the knowledge workers, without knowledge whole production process is unproductive. It is the knowledge investment that determines whether the employee is productive or not, rather than the tools, machines and capital the organisation furnishes (Ibid).

Reflection and Action 24.3

What do you understand by knowledge workes? People working in tourism and sector are knowledge workers. Do you agree with this statement? Why?

The Three Levels of Knowledge Based Development

As we have seen in the foregoing discussions in the information age knowledge has broader meaning. In the past also clever and creative people always used knowledge to design innovative products and services. But in information age instead of knowledge being vested in one or two creative people it will embedded in systems and data bases and made available to all. Here to achieve maximum effectiveness, knowledge must be systematically accumulated, shared and purposefully deployed.

That means knowledge based society is centered on the three process of knowledge accumulation, knowledge dissemination of the accumulated knowledge and application of that knowledge for the productivity of the society. An analysis of this process of knowledge accumulation, dissemination and deployment in terms of skills, infrastructure and experience in relation to knowledge production will enable to assess the dimensions of knowledge society and economy. It is required to take stock of the literacy and higher education levels to examine the skills for knowledge accumulation. The size and growth of the tele and other communication network will echo the infrastructure required for knowledge dissemination and economic structure will reflect the level of application of the knowledge in knowledge based society. Now in the following sections let us examine each of this separtely.

24.6 Skill Acquisition and Training for Work in Knowledge Society

From the preceding sections of this unit we already gathered that the key characteristic of the knowledge economy lies in the belief that wealth (or productivity) is increasingly dependent on the development and application of new knowledge by specialist knowledge workers. It has been increasingly recognised that in knowledge society people's endowment of skills and capabilities and investment in education and training constitute the key to economic and social development. It is not so much physical capital, or human skills (human capital) that determines economic growth. It is the nation's

capability to apply knowledge to knowledge itself that is essential to economic development. Economies are increasingly being built on a foundation of information, learning and adaptation. Here both the quantity of knowledge increases and the production of knowledge accelerates (Scott 1997).

So an important aspect of the emergence of knowledge society is the readiness to acquire new skills. ICT use represents an augmentation of human skills and capabilities. In examining the skills it is vital to develop measures that indicate the state of readiness to enlarge the use of information to develop knowledge. A principal indicator of such readiness is literacy level. Literacy is the first indicator of the attainment of the skills level needed for the productive use of ICT – an imperative of the information age. Here literacy means more than knowing how to read, write or calculate. It involves understanding and being able to use the information required to function effectively in the knowledge-based societies that will dominate the twenty-first century.

Illiteracy is a fundamental barrier to participation in knowledge societies. Vast majority of the illiterate population will be excluded from the emerging knowledge societies. The skill attainment is hierarchical. The hierarchy begins with the attainment of basic literacy. All the work processes in which ICTs can make a contribution to economic growth require basic literacy.

In knowledge societies it is recognised by governments and organisations that knowledge contributes to individual well being, societal and economic growth. This recognition is translated into action when new models for lifelong learning are encouraged. By investing in their human resources enterprises can improve productivity and compete successfully in increasingly integrated world markets. For e.g. in Denmark enterprises that introduced process and product innovation combined with targeted training were more likely to report output growth. Countries with highest incomes are also those where workers are most educated. Studies indicate in high-income countries primary education is universal, secondary education is almost universal and tertiary education is approaching 50% of the relevant age group. In contrast in poor countries (least developed) primary education is around 71.5% secondary education is around 16.4% and tertiary education enrolments a mere 3.2% of the relevant age group.

Even though higher education has always been formally designed as a structure for the production and organisation of advanced knowledge, the emergence of a knowledge economy and the importance of globalisation and ICT place new demands on higher education. Firms that wish to compete in the global economy will have to possess the organisational abilities/knowledge that enable them to maintain or increase their competitive advantage in a turbulent market environment. It implies that for firms there is a need to have and/or train a flexible and versatile workforce. Firms, therefore, will express a continuous demand for courses in which their employees are retrained. In other words, great emphasis has been given to lifelong learning and the realisation of learning society. For the education of students, one of the implications of the knowledge-driven economy is that students will have to be prepared for a labour market in which they could change jobs many times during their working career. This means that students should acquire appropriate skills for this, and this will have to be reflected in the higher education curriculum – in its content, structure, length and mode of delivery. Thus in knowledge society higher education has itself become a tradable product.

The developed countries have a higher access to ICTs than the developing countries. Fast proliferation of ICTs in developing countries is widely due to sustained investment in education, research and development activities. These countries invest an average 2% of their GDP (e.g. US 2.8%, UK and Australia

1.9% each) in research and development, while countries like India do not spend even 0.1% of the GDP for the same purpose (see Table 24.2). Similarly the developed countries have been consistently spending a higher proportion of their public expenditure in higher education. Advanced countries invest at least 30 times more per student in education and training than in the LDCs. However the developing countries started spending more on education than being spend previously. It becomes evident that human resources development and training contributes to improved productivity in the economy, reduces skills mis-matches in the labour market and promotes a country's international competitiveness.

Another important consequence of the acceleration of scientific and technological progress is the diminished emphasis on remembering countless facts and basic data and the growing importance of methodological knowledge and analytical skills — the skills needed for learning to think and to analyse information autonomously. Today, in a number of scientific disciplines, elements of factual knowledge taught in the first year of study may become obsolete before graduation. The learning process now needs to be increasingly based on the capacity to find and access knowledge and to apply it in problem solving. Learning to learn, learning to transform information into new knowledge, and learning to translate new knowledge into applications become more important than memorising specific information. In this new paradigm, primacy is given to analytical skills; that is, to the ability to seek and find information, crystallize issues, formulate testable hypotheses, marshal and evaluate evidence, and solve problems. The new competencies that employers value in the knowledge economy have to do with oral and written communications, teamwork, peer teaching, creativity, envisioning skills, resourcefulness, and the ability to adjust to change.

Lifelong learning: The second dimension of change in education and training needs is the short "shelf life" of knowledge, skills, and occupations and, as a consequence, the growing importance of continuing education and of regular updating of individual capacities and qualifications (Wagner 1999). In OECD countries a lifelong-education model is progressively replacing the traditional approach of studying for a discrete and finite period of time to acquire a first degree after secondary school or to complete graduate education before moving on to professional life. Graduates will be increasingly expected to return periodically to tertiary education institutions to acquire, learn to use, and relearn the knowledge and skills needed throughout their professional lives. This phenomenon goes beyond the narrow notion of a "second chance" for out-of-school young adults who did not have the opportunity to complete much formal study. It has more to do with the updating and upgrading of learning that will be required in order to refresh and enhance individual qualifications and to keep pace with innovations in products and services. The concept of "lifelong learning for all" adopted in 1996 by the OECD ministers of education stems from a new vision of education and training policies as supporting knowledge-based development. Lifelong-learning requirements may lead to a progressive blurring between initial and continuing studies.

Reflection and Action 24.4

What is the signifacance of life long learning in knowledge societies?

Table 24.2: Levels of Literacy, GDP and Access to ICTs in Some Selected Countries

Country	Adult Literacy (%)	GDP Per Capital US $	Urban Population	Telephone per 1000		Cellular Per 1000		Internet Per 1000		Public Expenditure on education		Public Exp. In Higher Education of Total of all levels	Expenditure on Research and Development as % of GDP
				1990	2002	1990	2002	1990	2002	GDP in %	Govt. Exp. In %		
Australia	100	28260	91.6	456	539	11	640	5.9	481.7	13.8	4.6	22.9	1.5
Canada	100	29480	80.1	656	635	22	377	3.7	512.8	14.2 (1990)	5.2	35.7	1.9
Netherlands	100	29100	65.4	464	618	5	745	3.3	506.3	10.4	5.0	26.5	1.9
U.S.	100	35750	79.8	547	646	21	488	8.0	551.4	15.4	5.6	26.3	2.8
U.K.	100	26150	89.0	441	591	19	841	0.9	423.1	NA	4.6	17.2	1.9
China	91.0	4580	37.7	6	167	0	161	0	46.0	12.8 (1990)	2.3	NA	1.1
Sri Lanka	92.1	3580	21.1	7	47	0	49	0	10.6	8.1 (1990)	1.3	13.4 (1990)	0.2
India	61.3	2670	28.1	6	40	0	12	0	15.9	12.7	4.1	20.3	NA
Bhutan	47.0	1969	8.2	4	28	0	0	0	14.5	12.9	5.3	NA	NA
Bangladesh	41.1	1700	23.9	2	5	0	8	0	1.5	15.8	2.3	11.1	NA
Nepal	44.1	1370	14.6	3	14	0	1	0	3.5	13.9	3.4	12.1	NA
Pakistan	41.5	1970	33.7	8	25	0	8	0.33	10.3	7.8	1.8	NA	NA

Source: UNDP 2005

24.7 ICT Infrastructure and Knowledge Dissemination

In knowledge societies not only the creation of knowledge is important, its dissemination and knowledge sharing with the world around is equally important. In the information age ICTs are the main medium for knowledge dissemination. In this information age the info-technological revolution is restructuring the global social economic equations — shifting from income divide to knowledge divide. We stand at the dawn of the new millennium which ushers with it a world of greater interconnectivity, accelerating flow of data and shrinking time and national boundaries. Accessibility of World Wide Web (WWW) is turning world into global village. The prediction is that around one billion will be

"online" by the end of 2005. The decreased cost of processing and dissemination of information and increased convergence of information, computer and telecommunication technologies became the base of knowledge societies.

Knowledge sharing is the interactive process of making the right information available to people at the right time in a comprehensible manner to enable them to act judiciously- enriching the knowledge base in the entire mechanism. Knowledge sharing can occur at all levels— between countries, within a country, between communities and among individuals. It can occur from local to global, from poor to rich and vice versa. Knowledge dissemination and sharing became indispensable in day today life, for good governance, participation of people in their development etc. Unrestricted and continuous sharing of global and local knowledge between policy makers, public and private sectors and civil society heralds the way forward to an empowered knowledge society, which can efficiently manage the development change process. It ensures inclusion of poor and marginalised communities in the change process.

Rapid technological advance since Second World War occurred due to the convergence of telecommunications and computing technology, known as Information and communication technologies (ICT). ICT have been the drivers of the knowledge society. They are providing new and faster ways of delivering and accessing information, innovative ways for real time communication and new ways to do business and create livelihood opportunities. Since ages, knowledge has been passed on from one generation to the other through written text, folklore, word of mouth religions and customs. The knowledge however remained preserved geographically and hierarchically. On the other hand ICT breaks all the natural, social, cultural and hierarchical barriers to knowledge sharing. It has the potenital to help the people to leapfrog some of the traditional barriers to development by making use of knowledge in various ways such as by improving access to information, expanding their market base, enhancing employment opportunities, making government services work better etc.

In the contemporary gloabl context the use of information and communication technologies (ICTs) is expanding rapidly. ICTs comprise a diverse set of technological tools and resources to create, diseeminate, store and manage data and information. Traditional ICT tools such as television, radio and the telephone have proven their effectiveness in promoting development. The emergence of computers, the Internet and wireless communications technology, along with powerful software for processing and intergrating text, sound and video into electronic media, comprise modern ICT. For the past two decades the spread of teh global electronic netwrok of computers, popularly referred to as the Internet, and wireless telephony has generated an unprecedented global flow of information, products, people, capital and idea. Internet based electronic mails, newsgroups, discussion groups and interactive web sites hold boundless potential to reach everyone who is connected to the Internet to target specific information.

The greatest advantage of ICTs is the reach and low cost of technology and data transmission. Technically, every individual can have a private or public access to a data terminal, which connects him to each and every individual in the world. Knowledge dissemination and knowledge sharing in knowledge societies depend on ICT infrastructure, which mainly include tele-communications, computer-mediated communication — the Internet and mass media of communication.

Tele-communication Network

Tele communication network is a key facilitator to knowledge society. Tele communications system is one of the most complex systems ever built by the humankind. It has penetrated to every aspect of human life. In the 19th

century, the invention of the telegraph and the telephone forever changed how messages moved around the world.

Telephony made possible virtually instantaneous two-way communication between any two places in the planet connected by appropriate wiring and switching devices. In the beginning most of the telephony networks were developed as public monopolies, though US was an exception. Extensive international organisational arrangements were established to ensure interconnectivity through common networks standards. The International Telecommunications Union (ITU) and related Treaty arrangements represent some of the first attempts to develop effective forms of international governance (Wiesman 1998). Since 1980s governments in all countries have come under increasing pressure to commercialise, privatise and deregulate their tele communications industries and by late 1990s virtually all national telephone networks have been at least partly privatised and opened up to national and international competition. This resulted in drastic decreases in the price of international communications services and thereby promoting a faster and cheaper knowledge dissemination.

Tele communications is now but one form of the processing information; transmission and linkage technologies are increasingly diversified and integrated into computer-operated networks.

The latest development in the tele communication technology, the cellular or mobile phones shows a convergence of different communication technologies. Although the cell phones, or at least the technology behind them, have been around since the 1960s, tremendous technological improvements in cell phones started happening for the last one-decade and half. Sending images, text messages and, of course, sound. Every month, it seems, a new cell phone comes out that's "smarter" than the last in its ability to gather and transmit a growing amount of data: voice, images, news and more. Of late technologies of photography, broadcasting, audio system and Internet all converged into one gadget of cellular phone.

Computer Mediated Communication Network — the Internet

The Internet network began in 1960s (see Box 24.5) in United States and soon became common. Internet network became the backbone of the computer-mediated communication in 1990s, since it gradually links up most networks. In the mid-1990s it connected 44000 computer networks and about 3.2 million host computers worldwide with an estimated 25 million users and it is expanding rapidly (Castells 1998). In the year 2005 Internet network crossed 6 million computer networks (see Table 24.5).

Box 24.3: The Beginning of Internet

The Internet originated in a daring scheme imagined in the 1960s by the technological worriers of US Defence Department Advanced Research Project Agency (DARPA) to prevent a Soviet takeover or destruction of American communication in case of nuclear war. To some extent it was the electronic equivalent of the Maoist tactics of dispersal of guerrilla forces around a vast territory to counter an enemy's might with versality and knowledge of terrain. The outcome was a network architecture that, as its inventors wanted, cannot be controlled from any centre, and is made up of thousands of autonomous computer networks that hane innumerable ways to link up going around electronic barriers. Ultimately ARAPANET, the network set up by the US Defence Department, became the foundation of the global, horizontal communication networks.

Source: Castells 1998

The rapid evolution of microprocessor technology since its discovery as well as the swift advances in fibre optic network technologies resulted in rapid growth of computing power and the communication power of people around the world. This advances in the technology enabled the development of new types of services to be used in digital format. Technological advances have also slashed the costs of information and communication. Services such as electronic mail (E-mail) has become free of cost. Internet telephony offers much cheaper long-distance communication than the traditional telephone. The cost of transmitting digital information anywhere in the world has also fallen dramatically. Until the early 1980s, communication was generally restricted to analog signaling, which means each telecommunication network was designed to carry different types of information separately. Voice traffic was carried over the telephone system, text used a separate telex network and high-frequency broadcast networks were dedicated to sending video and audio signals. With digital communication, these separate networks are becoming less differentiated. The Internet currently carries a combination of pictures, drawings, moving images, sound and text. The technologies of telephone and television, the radio and camera, the fax and word processor, the data base and the spread sheet all are integrated into one system, the Internet, which makes Internet unique in its capacity to support two-way interactions. Since early 1990s the World Wide Web (WWW) has become the mainstream environment for creating and disseminating digital information.

Previously access to Internet was almost exclusively form personal computers. This has been changing for the past couple of years. As mentioned earlier now Internet is available through mobile phones (data enabled wireless telephones). This development did enabled users in remote areas to access the Internet and its related services without a basic ICT infrastructure.

Table 24.3: World Internet Usage and Population Statistics in 2005

World Regions	Population (2005 Est.)	Population % of World	Internet Usage, Latest Data	Usage Growth 2000-2005	% Population (Penet-ration)	World Users %
Africa	896,721,874	14.0 %	**23,867,500**	428.7 %	2.7 %	2.5 %
Asia	3,622,994,130	56.4 %	**327,066,713**	186.1 %	9.0 %	34.2 %
Europe	731,018,523	11.4 %	**273,262,955**	165.1 %	37.4 %	28.5 %
Middle East	260,814,179	4.1 %	**21,422,500**	305.4 %	8.2 %	2.2 %
North America	328,387,059	5.1 %	**223,779,183**	107.0 %	68.1 %	23.4 %
Lain/America Caribbean	546,723,509	8.5 %	**70,699,084**	291.31 %	12.9 %	7.4%
Oceania / Australia	33,443,448	0.5 %	**17,655,737**	131.7 %	52.8 %	1.8 %
WORLD TOTAL	**6,420,102,722**	**100.0 %**	**957,753,672**	**165.3 %**	**14.9 %**	100%

Source: http://www.internetworldstats.com/stats.htm

Box 24.4: Increase in PC and Net users in India

Sale of personal computers increased by 20% in 2004-05 to 3.63 million units due to strong demand from the financial, IT and telecom sectors. It is expected to grow 17% to 4.25 million PCs during the current fiscal. Internet subscribers also went up by 23% in 2004-05 to 2.92 million over the previous year.

The rise in PC sales can be attributed to the home segment, which posted a growth of 48% Significant consumption by the telecom, banking, manufacturing as well as BPO and IT services segments also contributed to the rise in PC sales.

Smaller cities and towns fuelled the IT consumption with C class cities accounting for over 50% of total PC sales. The Manufacturers' Association for Information Technology (MAIT) made these projections based on a study conducted in 22 Indian cities. The survey showed small regional brands and unbranded systems accounted for 41% of sales in 2004-05, down from 53% in the previous year. Indian brands accounted for 24% of total sales, up from 21% in 2003-04 and MNC brands grew to 35% in 2004-05 from 26% a year ago.

The PC industry and been witnessing lower growth rates in the last four years due to a larger base. "the association is giving a very conservative estimate of 17% at this point of time, ad the growth could be about 25% over the next four years," said Vinnie Mehta, executive director, MAIT. Increased usage of broadband and higher penetration in small towns could drive up the growth rate of 25%.

Hindustan Times, July 6, 2005

Mass Media of Communication

Wireless broadcasting was one of the great contributors to the development of oral communications culture in the 20th century. It became one of the important mediums for knowledge dissemination in information age. Unless like telecommunication where communication happens form person to person, here knowledge is transferred from one person to many. The mass media are media of communication—newspapers, magazines, television, radio, movies, videos, CDs, and other forms—that reach mass audiences. Out of this visual media of which visual media became predominant communication medium especially in the information age. Led by television there had been a communication explosion in the last three decades. Marshall McLuhan argues that media influence society more in terms of how they communicate than in terms of what they communicate.

Reflection and Action 24.5

Do you think India is transforming towards a knowledge-based economy? Why?

24.8 Dimensions of Work Participation in Knowledge Economy

We have already learnt that in the postindustrial information society knowledge and information are the major sources of productivity and growth. The Asia-Pacific Economic Co-operation (APEC) Economic Committee extended this idea to state that in a knowledge based economy "the production, distribution and use of knowledge is the main driver of growth, wealth creation and employment across all industries" (APEC 2000). There is a growing belief in the past few decades that knowledge can do more than increasing economic growth; it can also lead to structural change in an economy and therefore society. Such change differs from the incremental changes to which all economies are constantly subjected. Neef (1998) states that the new products and services resulting from technology growth may bring about profound changes in the way we live and work. He argues that this economic transition is characterised by the changing nature of work from low skill to high skill. This is reflected in the rapid growth in the services sector since the 1960's and in more recent changes in the goods-producing sector towards employing higher-skilled employees.

It is important to note here that the classical theory of post industrialism combines three statements which show the trend in the shifting employment pattern (Bell 1976):

a) The source of productivity and growth lies in the generation of knowledge, extended to all realms of economic activity through information processing.

b) Economic activity would shift from goods production to services delivery. The demise of agricultural employment would be followed by the irreversible decline of manufacturing jobs, to the benefit of service jobs, which would ultimately form the overwhelming proportion of the employment. The more advanced an economy, the more its employment and its production would be focused on services.

c) The new economy would increase the importance of occupations with high information and knowledge content in their activity. Managerial, professional and technical occupations would grow faster than any other occupational position and would constitute the core of new social structure.

According to Toffler, the "second wave" formed an entirely new concept the "massification" in which we find mass production, mass markets, mass consumption, mass religion, mass political parties, weapons of mass destruction etc. He argues that the third wave will show a reverse trend where minority interests will come to the fore. The economy will be based on the productivity of knowledge work and knowledge worker. Whereas the organisations in second wave were built around the availability of land, labour and money, the third wave company will be firmly based on development of knowledge and imaginative use of technology. Hence it is obvious that in the information age there will be a change in the economic structure where there will be tilt towards the more openings in knowledge based economic sector, i.e. service sector. The contribution of high value added manufacturing and services to the national economy is measured as one of the key indicators of a knowledge economy. This is because they are more knowledge intensive and less labour intensive.

We have already seen that the revolutionising developments in information, computer and telecommunication technologies and its low cost and high accessibility created a marked change in the employment structure of both developed and developing economies. In knowledge societies knowledge-based service industries form a significant proportion of GDP and there is a reliance on knowledge technologies to foster business competitiveness, economic and employment growth. And this is evident if we examine the economic structure of different countries. Data shows that the agricultural workers who form the majority of the work force till the early 20th century and the industrial workers who grew very fast in the second half of the century in the developed countries now declined to be minority in the workforce. Now the workers of the service sector are replacing these categories of workers very fast all over the world though varying degrees (see Table 24.1). For example in Australia agricultural workers formed 5.0%, industrial workers 21% and the service workers formed 74% of the total work force and in India they formed 52.43%, 10.87% and 36.7% of the work force in 2001. There has been increase of the share of the service sector to the total GDP of these countries and corresponding decline of the share of the agriculture and industries.

Manuel Castells (1998) roughly classify service economy into different categories. This includes producer services (banking, insurance, real estate, engineering, accounting, miscellaneous business services and legal services), social services (medical, health services, hospital, education, welfare and religious services, non-profit organisations, postal service and miscellaneous social services), distributive services (transportation, communication, and whole scale and retail services) and personal services (domestic services, hotel, eating and drinking places, repair services, laundry, beauty and barber shops, entertainment, and miscellaneous personal services). He argues that there is a significant increase of job participation in these services in G7 countries in the past few decades. According to him the evolution of employment during post-industrial period (information age) shows at the same time, a general pattern of shifting away from manufacturing jobs, and

two different paths regarding manufacturing activity: the first amounts to a rapid phasing away of manufacturing, coupled with a strong expansion of in producer services (in rate) and in social services (in size), while other services activities are still kept as source of employment. A second, different path more closely links manufacturing and producer services, more cautiously increases social services employment and maintains distributive services (p 215)

24.9 Women in Knowledge Societies

The emerging knowledge societies, which are based on global competition, progress in information technologies and a move towards knowledge-based economy, pose several opportunities and challenges to women.

The New Job Opportunities for Women: The new ICTs enabled the work to be brought to homes and allows for better accommodation of work and family schedules and this created new types of jobs that favoured women. Women have also been able to capture a large proportion of jobs in ICTs-enabled services. The most promising potential for women is in the creation of new jobs at call centres and in work involving data processing. The ILO reports "telecentres and fax booths have created a quarter of a million jobs in India in the last four years alone, a huge proportion of which have gone to women".

By the end of the 1990s, almost 5000 women in the Carribean countries were employed in data-processing activities. The ILO Report adds, "in terms of numbers employed, the role of women in the digital economy has become more marked in on-line, export-oriented information-processing work rather than in telecommuting".

Internationally outsourced jobs, such as medical transcription work or software services, do make a considerable difference to the lives and career paths of women in developing countries. In software, women enjoy preferences on a scale that they never experienced in any other field of engineering and science. Women in India occupy 27 per cent of professional jobs in the software industry, which is worth 4 billion US dollars annually. Women's share in the employment total in that industry mounted to 30 per cent in 2001.

The ICTs have enabled women to tap global markets for their products and raised incomes. New technologies and networking are new means by which women are empowered to improve their economic and social status. Let us see some examples.

Sapphire Women, created by a woman in Kampala, Uganda, is an organization that supports women who have lost family members to AIDS, as well as supporting orphans created by the AIDS epidemic. The members of Sapphire weave traditional Ugandan baskets which are then sold on the Internet with the help of Peoplink, an American-based NGO with extensive experience in on-line sales of handicrafts.

The Grameen Bank Village Phone project, which provides mobile cell phones to its mostly female members in Bangladesh, demonstrates not only the employment-generating impact of the women who collect fees for the usage of their mobile phones, but other positive spill-over effects as well. Mobile phones and access to the Internet have given rural Bangladeshi women access to learning, created new opportunities for autonomy and improved their position in community and public life.

These examples illustrate how technology can improve the lives of poor women by opening up opportunities they were previously excluded from. Electronic networking between women has led to new social and economic phenomena, such as e-campaigns, e-commerce and e-consultation. The empowerment of women via technology in this way enables them to challenge discrimination and overcome gender barriers (ILO).

However, all these new avernes have been created around the contemporary development pattern of globalisation. This while creating some new opportunities for women also leaves negative imprint. While more competition sets in, the attention given to labour welfare decreases markedly. Moreover, most of the newly created job opportunities are in the informal sector, which provide no job security. All these compells women to work in an exploitative work atmosphere.

Reflection and Action 24.6

Examine the opportunities and challenges women have in the present economic scenerio shaped by large scale technological development.

24.10 Conclusion

During the second half of the 19th century there began a great revolution in storage and communication of information. After industrialisation society moved towards a post-industrial information age where production dissemination, and deployment of knowledge became the basis of productivity and social advancement. The evolving information/knowledge societies marked by rapid advances in science and technology, convergence of the information, computer and communication technologies and the reduced cost of processing and disseminating information; and the increasing connectedness of nations. These revolutionary changes said to transform societies into smart communities largely through the impact of the converging new information, computer and telecommunication technologies (ICTT).

This unit examines the background of the information revolution and the characteristic features of the emerging society. It also analyses why and how knowledge becomes the basic constituent of this society.

24.11 Further Reading

Castells, M. 1998. The *Information Age: Economy, Society and Culture.* Vol. I *The Rise of Network Society*. Blactwell Publishers: London

Bell, Daniel 1976. *The Coming of Post industrial Society. A Venture in Social Science Forecasting.* Basic Books: New York

Jessop, B. 2000. "The State and the Contradictions of the knowledge Driven Economy". In Bryson, J.R. etal (eds) *Knowledge, Space, Economy*. Routledge: London

Unit 25
Critique of Knowledge Society

Contents

Learning Objectives

This unit enables you to critically analyse:

- the conceptual dilemma in defining knowledge society;
- theoretical discourses that examine technology and human progress;
- the empirical impediments in accepting knowledge society as a universal phenomenon;
- the extend of knowledge/digital divide in the contemporary information age.

25.1 Introduction

The idea and concept of knowledge society got wide popularity towards the end of twentieth century. This concept has been widely contested too and has been questioned by various scholars from diverse corners. Social scientists have criticised it content, form and direction. Let us see some of the these criticisms in more detail here in this unit. The theoretical discourses that examines technology and human progress and the dimensions of knowledge and digital divide in knowledge societies are also discussed here.

25.2 Criticisms of Knowledge Society

- All societies are knowledge societies and hence the argument that the present society is an emerging knowledge society is questioned.
- There still exist an ambiguity in defining knowledge society, which is evident from the interchanged use of knowledge and information society as well as knowledge economy.
- Ambiguity exists not only in defining knowledge society but also defining in the very concept of knowledge with relation to knowledge society.
- The very ambiguity in defining knowledge and knowledge society makes it difficult ot measure knowledge society empirically.
- The difficulty in measuring the knowledge society makes it difficult to measure the extend of penetration of knowledge society into all spheres of society.

- Knowledge society is often referred to as like long learning society. But projects and plans by individuals and groups and institutions to develop lifelong learning are more credibly regarded as a response to the requirement of the state in knowledge society rather than to an independent requirement of the knowledge society itself.
- Growth in higher education is taken into account in assessing the growth in knowledge society. The question is that whether the higher education ensures a the emergencie of an egalitarian society. Or does the knowledge society ensure equal to higher education to all seations of the population can knowledge society ensure an equal standard for higher education.
- Studies on knowledge society indicate a growing "digital divide" (we will learn more about this in the later part of the unit) within and across the communities. It looks as if the pre-existing inequalities in the society are only reinforced in knowledge societies.
- It in often chained that knowledge societies would bring progressive transformations in the society. However, innumerous examples of system crash, deskilling, ever insufficient upskilling, redundant mountains of hardware, incessant innovation, enforced creativity, workplace and lifestyle stress etc., also represent a substantial matter of "knowledge failure" or "systemic waste". One should not take sight away from such realitics of knowledge society.
- The different theoretical strands related to Internet based knowledge transmission have their own critical approach about knowledge society (we will learn more about this in the succeeding section).
- Some of the knowledge society imperatives such as international economy, fully modenised state, the future of work and well being all seems to be thrust upon the people leaving no scope for the people to make their own choice for accepting or rejecting the system.
- It is also argued that the social fatalism has reached such a height that the latest technological determinism strips the collective and individual intelligence or knowledge of people of its most precious characteristics, namely the ability to critically question and to device alternatives to what must inevitably be.

Now in the following section let us critically evaluate the theoretical discourses on knowledge transmission in knowledge societies.

Reflection and Action 25.1

You must have been experiencing the proliferation of various elements of the knowledge society both in your individual and collective social existence. Based on your regular experience write a critique of knowledge society.

25.3 A Critical Appraisal of Discourses on Web-based Knowledge Dispersal

There are different discourses that relate knowledge and power in a knowledge-based society. Foucault (1977), who demonstrated how knowledge and power are related, argues whenever someone transmits knowledge it involves power. Whenever power is exerted, knowledge is involved. The four discourses related to Internet based knowledge transmission, which forms significant basis of knowledge-based society are techno-utopianism, techno-cynicism, techno-zealotry and technostructuralism (http://cade.icaap.org). In this section let us look briefly the counters of these theoretical discourses. The concentration or dispersal of knowledge power through the medium of Internet and World Wide Web is the main question in all these four discourses.

Techno-Utopianism

Techno-utopians are optimists who believe the Web leads to greater access to education and there by greater dispersal of knowledge. This facilitates the universal accessibility of knowledge and this may lead to empowerment of larger section of the population because in knowledge-based society the acquisition of knowledge empowers the individuals. In this discourse, they argue, the Web i) lowers barriers that impede access to education in face-to-face settings, ii) will eventually result in equity, iii) reaches the hard-to-reach iv) straddles cultural boundaries v) constitutes a "paradigm shift" in learning and education vi) fosters high degrees of interaction vii) leads to a reinstallation of fading local democracies viii) invites learner participation ix) encourages a desirable level of collaborative (rather than individual) learning, teamwork and cooperation.

Techno-utopians are often have a global vision about the ICT infrastructure and ICT penetration without taking into account local particularities. They predict a universal dispersal of knowledge through Internet and World Wide Web without taking into consideration of the fact that a vast majority of the world population are in the developing countries where the first priority of the people even in this 21st century is the basic amenities of life not ICT infrastructure. For example in developing Asia, despite techno-utopian talk of "paradigm shifts" there are only roughly 9.8 million people on line - a mere 0.3 percent of the population (Erickson, 1998). Techno-utopians version of "information highway" - a utopian narrative which argue that progress and salvation through technology and transportation - makes little sense in most part of the world even today. If the techno-utopians fail to view technological advancements in the societal contexts of inequality, illiteracy, poverty, ill health and other forms of social backwardness that persist in many parts of the globe, the paradigm shift that they claim that they claim the technological will bring about may instead lead to a "paradigm lost" (SinghaRoy 2002).

Techno-Cynicism

Techno-cynics have a critical view about the role of Internet and Web in the dispersal of knowledge. They do not believe that the Web is a wired utopia for learning and education. Instead, they argue, it will lead to a concentration of power. Techno-cynics are realists, distrust corporatism and the commodification of education and regard globalisation as a code for Americanisation. They argue the Web i) will not significantly enhance access to education, ii) will not yield equity iii) will aggravate the gap between the 'have's' and 'have-nots', iv) will converge around the orthodoxy of Americana (Boshier, Wilson and Qayyum 1999), v) will help foist free-trade on the world and thus lower occupational, health and environmental regulations, vi) enable global enterprises to monitor markets and make instantaneous adjustments with the click of a mouse and thus reinstall exploitative colonialism.

Techno-cynics were largely critical of techno-utopian ideas. They argue that technology itself is not bad. The problem is in the way it constructs relationships. They believe being too connected (online) may deprive people of humanity. Interactions through Net give people a chance to ignore the human side of such relationships. A disturbing part of the techno-cynic position is enunciated by Mander (1996) who argues that economic globalisation involves the most "fundamental re-design" of socio-political and economic arrangements since the industrial revolution. Advocates and beneficiaries of the new order (free trade, deregulation, restructuring) use computers, not to empower communities, as techno-utopians would claim, but as a tool of financial exploitation. "Computer technology may actually be the most centralising technology ever invented, at least in terms of economic and political power. This much is certain. The global corporation of today could not exist without computers. The technology makes globalisation possible by conferring a degree of control beyond anything ever seen before" (p. 12). In the old days this kind of globalisation was called colonisation.

Techno cynics disagree with the techno utopians on many grounds. They agrue that the virtual universities – a major mode for the dispersal of knowledge in knowledge societies according to the utopians – in effect will function as a digital diploma mills. Noble (1997) is a leading North American exponent of techno cynicism claims online courses will lead to comercialisation of higher education, the loss of faculty independence, a secondrate "shadow cyber-education" and virtual universities with perhaps no faculty whatsoever.

Another argument is on the basis of racial divide. In the United States access to the Web appears to depend on race. According to a study done by Hoffman and Novak (1998) in late 1966 and early 1997, 44.3 per cent of white and only 29 percent of black Americans own a home computer. In households with incomes $40,000 or less, white people were six times more likely than black people to have used the Web in the week prior to the survey.

Another manifestation of techno-cynicism arises from the Web's inclination to promote a conservative view of education. They argue that there is much more to education than filling empty vessels or producing "stuffed docks." The problem with Web learning, according to them, is with the fact the Web and too many other distance technologies deliver information without raising appropriate questions or to make a critical evaluation of the information transferred. The Web causes people to think of education as an information transfer process. "We are building an educational system on the assumption that our minds are a lot of hard drives that can simply be filled up with data" (Ott 1998).

Techno-Zealotry

For Techno-zealots power relations of technology and knowledge are irrelevant because technology has inherent value irrespective of how it used. In significant ways, technology is neutral. Techno-zealots are typically consultants or academics with few theoretical pretensions and a vested interest in cultivating corporate interests or others who control research and development grants. Techno-zealots typically use a PowerPoint presentation (which greatly minimises the likelihood of critique) to enthuse about "convergences," "paradigm shifts" and the galaxy of wonders lying at the intersection of telecommunications and computers (http://cade.icaap.org).

In the techno-zealotry discourse i) deploying the Web is a "rational-technical" process that knows no bounds. It's just a "technical" problem, ii) statements about the benefits of the Web are couched as grand generalisations which have little regard to discrepancies between rich and poor, developed and developing countries or the learning proclivities of different people iii) technology and the Web are worth pursuing for their own sake - irrespective of the context or what they might mean for the human condition, iv) the Web is a technology bristling with potential for profit.

The views of techno-zealots are significantly detached from material realities including rural landscapes, where information technology is nowhere to be seen. They argue that information technology can overpower "cultural barriers, economic inequalities (and) compensate for intellectual disparities. High technology can put unequal human beings on an equal footing and that makes it the most potent democratising tool ever devised" (Pitroda 1993). But the critiques view that in a situation where the number of people without phones is growing faster than the number of people with them, the prospect of bandwidth intensive Web applications seems downright criminal (Leonard 1998).

Techno-Structuralism

Techno-structuralists are not interested in whether technology is good, bad or neutral. They are mostly interested in institutional forces or the social context wherein the Web is used. In the techno-structuralism discourse there are questions about: i) who is using the Web, who is doing what to whom and for

what reason? ii) the extent to which the Web is "World Wide" or largely carrying an American message iii) the extent the Web will invigorate or enfeeble democratic structures and processes iv) will it reinforce or challenge the interests of corporate, political and military elites? v) will it lead to a celebration of "information highway" (an utopian concept) vi) the nature of power relations nested in Web learning and education? vii) how the Web suits the modus operandi or learning proclivities of different groups (such as indigenous people, women, rural folk).

The centrepiece of this discourse is the way technology is used. As Galtung (1979) noted "A naive view of technology sees it merely as a question of tools – hardware - skills and knowledge and software. These components are certainly important, but they are the surface of technology, like the visible tip of the iceberg. Technology also includes an associated structure, even a deep structure, a mental framework, a social cosmology, serving as the fertile soil in which the seeds of a certain type of knowledge may be planted and grow and generate new knowledge … Tools do not operate in a vacuum; they are man-made and man-used and require certain social arrangements".

According to the techno structuralists although the Web can facilitate vertical and horizontal communication, more information does not, by itself, lead to desired action. It's a question of who is doing what to whom and why? Other questions informed by a techno-structuralist discourse concern who uses the Web.

After having a look at the theoretical critiquing of knowledge societies, let us turn to the one of the often discussed aspect of empirical critiquing of knowledge society the digital/knowledge divide.

Reflection and Action 25.2

What are the differences that you can find between techno-utopians and techno-structuralists?

25.4 The Digital Divide in Knowledge Society

In the previous unit we have already seen that the free flow of information and ideas has sparked an explosive growth of knowledge and its myriad new applications in the information age. We also noticed that information, its access, dissemination and control, is at the core of this revolutionary phase of human development and as a result, economic and social structures and relations are being transformed in the contemporary phase of human development. Yet the vast majority of people in the world remain untouched by these revolutionary developments in information and communication technologies and explosive growth of knowledge. Although this transformation to information age and knowledge society offers many potential benefits to developing and transition countries, increasing reliance on digital information and advanced communication technologies carries, at the same time, the real danger of a growing digital divide/gap among and within nations.

Digital or knowledge divide refer to the gap between the technology-empowered and the technology-excluded communities in the world around; as well as to the lack of information transfers in and between these communities. The developing world and transition economies comprise the largest portion of the digital and knowledge divides. While global teledensity shows signs of improving the gap between those with and without access to the Internet continues to increase throughout the world. The 'digital divide' has created a knowledge gap between information rich and information poor peoples, which has the potential to give rise to a new form of 'illiteracy.' The 'digital divide' promotes information and knowledge poverty and limits the opportunities for economic growth and wealth distribution. ICTs spur the

creation of economic and social 'networks' of individuals and communities. The power of these networks is their ability to connect diverse groups by allowing them to access and exchange information and knowledge that is crucial for their socio-economic development. Traders and entrepreneurs benefit from ICTs through the opportunities created by promoting their businesses nationally, regionally and globally. As well, ICT offers the possibility of delivering basic health and education services more efficiently because people can have access to them from their own communities. Unfortunately the accessibility to ICT to the larger population is very limited and hence their chances for taking advantage of these technological developments is very limited creating a division among people.

Our increased ability to communicate and share information and knowledge increases the possibility for a more peaceful and prosperous world for all of its inhabitants. However, the majority of the world's people will not be able to benefit from this information revolution unless they are enabled to participate fully in the emerging knowledge-based society. In an universal knowledge society knowledge and information should be easily accessible to all, including those living in rural areas and the disabled. Special attention must be paid to the marginalised, unemployed, underprivileged, disenfranchised peoples, children, the elderly, the disabled, indigenous peoples and those with special needs. The universal human values of equality, and justice, democracy, solidarity, mutual tolerance, human dignity, economic progress, protection of the environment, and respect for diversity are the foundations for a truly inclusive global information society. Now let us examine in the succeeding sections the digital or knowledge divide in relation to skill and infrastructure for knowledge generation and dissemination and employment structure in knowledge societies.

25.5 The Digital Divide Among and Between the Global Countries

The 'digital divide' threatens to widen the already existing development gap between the rich and the poor among and within countries. The majority of the world's people will not be able to benefit from this revolution unless they are enabled to participate fully in the emerging knowledge-based information society. Internal divide is between digitally empowered rich and the disempowered poor; linguistic cultural divide between domination of Anglo-Saxon and the other world culture; divide in access of technology between the rich and the poor nation; and the divide between the values of ICTs driven affluent elite and conventional authority and hierarchies (Keniston 2003). Disparities in per capita income and standards of living could translate into the marginalisation of entire societies or segments of society. Also within countries, technological change often means that groups, which were already disadvantaged or excluded — low-income families, rural populations, women, minorities, and the elderly — fall farther behind. In the United Kingdom, for example, only 4 percent of households in the poorest income quintile are connected to the Internet, compared with 43 percent in the top quintile, and the gap is increasing every year. In the United States the proportion of Afro-American families that are connected is half that for white families (OECD 2001: 149). The 2001 ILO report reveals a "digital gender gap" in many parts of the world, including OECD countries. Although some economies have near parity in Internet use (examples are Taiwan, China, with 45 percent female users, and Korea, with 43 percent), the situation is more often far from balanced.

On a global scale, it divides industrial and developing countries according to their ability to use, adapt, produce, and diffuse knowledge. In Korea the number of households connected to the Internet in 2000 doubled, raising the total to 3 million homes, whereas in Japan only 450,000 homes are connected. The technological gap between high-income and low-income countries is

reflected in the number of personal computers per 1,000 inhabitants — less than 1 in Burkina Faso, compared with 27 in South Africa, 38 in Chile, 172 in Singapore, and 348 in Switzerland. Sub-Saharan African countries together have 1 Internet user per 5,000 population; in Europe and North America the proportion is 1 user for every 6 inhabitants (International Communications Union data). Among developing countries, the digital divide sets apart the technologically more advanced countries from the less advanced ones. Whereas a few African countries with small populations still lack even one Internet host, in Singapore 98 percent of households use the Internet. Within a given region, some countries have a stronger information and communication infrastructure than others. In Sub-Saharan Africa the number of Internet hosts per 1,000 population ranges from 0.01 in Burkina Faso to 3.82 in South Africa (International Telecommunications Union data). Most reports on disparities in ICT access within countries look at the problem according to socio-economic criteria such as race, income, geographical location, education, age, gender, and disability.

Notwithstanding this divide many experts are of the opinion that the countries that do not adopt and adapt to the current technological changes will be marginalized widening further digital divide within and between the countries.

Reflection and Action 25.3

What do you understand by digital divide? Examine the dimensions of digital divide that exist in our country.

25.6 The Question of Literacy in Knowledge Society

In the information societies knowledge is the power. But this knowledge power will become reality only if one has accessibility to knowledge.

The appearance and the rapid evolution of ICT have created at least two major challenges for education: to achieve the appropriate integration of ICT into overall education systems and institutions, and to ensure that the new technologies become agents of expanded access and equity and increase educational opportunities for all, not just for the wealthy or the technologically privileged. Indeed, early policy research in the United States, one of the first widespread adopters of new ICT, found strong evidence that uneven access to the technologies was worsening existing equity gaps in education. Explicit attention needs to be given to equity considerations so that the new technologies, which "shatter geographical barriers (may do so without) erecting new ones and worsening the digital divide" (Gladieux and Swail 1999: 17).

There is another potential threat for education in knowledge societies. It is now established that the knowledge economy needs an educational arrangement to promote extensive use of ICTs, educational programmes that can be traded across the border as commodity and life long learning for the workforce. Several noted experts on distance education however, have viewed ICTs as a vehicle for commercialisation education globally. To David F. Noble (1997) against the backdrop of phenomenal expansion of ICTs educational campuses are now being identified as a significant site of capital accumulation by converting intellectual activity into intellectual capital. To him this processes has penetrated with the process of commoditisation of the research function and of the educational function of the university, transformation courses into courseware, learning instruction itself into commercially viable products that can be owned, bought and sold in the market. Against the backdrop of the exponential emergence of knowledge economy he highlights that the corporate and political leaders of the major industrialised countries in order to retain their economic supremacy now turn towards the "knowledge-based" industries.

To him, as impacts of commoditisation of university function, teachers as labour are made subject to all the pressures of undergoing rapid technological transformation from above. They have also reduced their autonomy, independence, and control over their work. Now universities are transformed into market for the commodities being produced, whereby faculty who conducted research in the role as educators and scholars, has became instead producers of commodities for their employer. 'Much to suffice the commercial end there has emerged close partnership between universities and industries to convert the instructional process into marketable products, such as a CD ROMs, Websites, or courseware which they themselves may or may not "deliver" (Noble 1997).

Latchem, C.and Hanna, D.E. (2002) find that in general the 'higher education is experiencing a shift from supply driven to a demand driven pressures due to impact of globalisation and information and communication technology (ICT), competition from new providers, and the need to be self sustaining. Universities are increasingly seeking solutions to these challenges in the open and the flexible and ICT based online or virtual learning, and the ODL system also getting transformed from quality driven and marginal to commercially-oriented and mainstream.

25.7 Accessibility of ICT Infrastructure in Knowledge Society — the Internet

In the previous unit on Knowledge Society we have seen how the ICT infrastructure of tele and Internet based information dissemination technologies act as the backbone of knowledge societies. In this information age Internet is the largest self-governing organisation, all pervasive. Even those opposed to globalisation depend on it to exchange ideas and mobilise support. While the Internet facilitates exchange of ideas, access to knowledge, communication between diverse people etc., it also alters the structure of knowledge and proves advantageous to those who have better access to it. The info-technological revolution is restructuring the global social economic equations – shifting from income divide to knowledge divide. But how can Internet and corollary technologies contribute to the building of knowledge societies without universal access to education and information? How can people benefit from the Internet if they lack access or if they are in constant fear of persecution?

In the so-called knowledge societies more than 850 million people in the developing countries are excluded from the wide range of information and knowledge. The poor in the developing countries remain much isolated economically, socially and culturally from the burgeoning information and progress in arts, science and technology. Little is known about the barriers to evolution and growth of knowledge societies in developing countries in spite of advancements in the use of information and communication technologies.

Real disparities exist in access to and use of information and communications technology (ICT) between countries (the "international digital divide") and between groups within countries (the "domestic digital divide"). There is a wealth of real and anecdotal evidence to support this statement. The volume of statistics is impressive and persuasive: "In the entire continent of Africa, there are a mere 14 million phone lines – fewer than in either Manhattan or Tokyo. Wealthy nations comprise some 16 per cent of the world's population, but command 90 per cent of Internet host computers. Of all the Internet users worldwide, 60 per cent reside in North America, where a mere five per cent of the world's population reside"(Nkrumah). "One in two Americans is online, compared with only one in 250 Africans. In Bangladesh a computer costs the equivalent of eight years average pay" (The Economist). Underlying trends are often lost in the heated debate over how to define the problem, but a pattern emerges from within the statistics.

There is an overall trend of growing ICT disparities between and within countries:

- All countries, even the poorest, are increasing their access to and use of ICT. But the "information have" countries are increasing their access and use at such an exponential rate that, in effect, the divide between countries is actually growing.
- Within countries, all groups, even the poorest, are also increasing their access to and use of ICT. But within countries the "information haves" are increasing access and use at such an exponential rate that, in effect, the division within countries is also actually growing.

This basic pattern of disparities is repeated again and again with other technologies such as telephones. There is a wide disparity in access to phones. In 1998 there were 146 telephones per thousand people in the world, but only 19 per 1000 in South Asia, and only 3 per 1000 in countries such as Uganda (World Bank 2001. Mobile Phones show a similar disparity, for every 1000 people in the world, 55 had mobile phones in 1998, but only 1 person in 1000 had a mobile phone in either South Asia or Uganda.

Two basic disparities exist in the affordability of ICTs – in the basic cost of the technology, and in the cost of the technology relative to per capita income. Access costs are almost four times as expensive in the Czech Republic and Hungary as in the United States (during off hours; peak prices are even higher) (OECD 2001). Outside a few select countries, only wealthy individuals and sections of the middle class can currently afford access. The majority of people in developing countries cannot afford the technology, even when it is available, so usage remains low: "Poverty remains the greatest barrier to Internet growth in Africa. The monthly connection cost for the Internet in Africa exceeds the monthly income of a significant portion of the population (Ibid).

Now if we turn to domestic scene we can see that ICTs however, function in societal context. Most reports on disparities in ICT access within countries look at the problem according to socio-economic criteria such as race, income, geographical location, education age, gender etc. if we take the case of India, we can see that globalisation and information age have led to a diverse social formation in India within and between societies. A large section has remained outsiders from within, being subordinated and excluded from the dominant processes of globalisation and knowledge economy. Indian societal context is ridden with unequal distribution of resources, and divides based on caste, class, ethnicity and gender. Illiteracy, low income and spatial isolation widely contribute to sustain the pre-existing social exclusion. Along the time, there are also the dimensions of digital divides of various sorts. These divides are between rich and poor, between urban and rural, between English speaking upwardly mobile literati and non-English speaking rest of people. This digital divides are again accentuated with the varied extent of access of electricity, telephone and computer in different states in India (See table 7). In the globalised world while these has emerged areas of inclusion; there also exists a vast section as excluded from within. While most of the urban areas have been connected with the forces of globalisation and ICT networks and a distinctive category of elites have emerged therein as the ICT driven 'digiterati' within the same urban set a large segment of the work force working mostly in the unorganised sector and surviving in a sub-human existence has remained excluded from the ICTs access. The rural areas on the other hand while the rudimentary forms of connectivity have only touched the upwardly mobile gentry; the agricultural labourers, tenants, poor peasants and the artisans who represent the vast section of the marginalised people of India has also remained excluded. Their educational and economic status often bar them from getting integrated with the information age.

Table 25.1: Digital Divide in India

Country	Access to Electricity % of household	Telephone Connection per 100 people (2004)	Internet Connections per 1000 people
Maharashtra	59.7	5.34	8.21
Pubjab	83.5	10.86	1.24
Kerala	61.1	9.79	0.87
Karnataka	63.0	5.58	2.73
West Bengal	18.8	1.96	2.51
Orissa	20.1	2.45	0.12
Uttar pradesh	-	4.66	0.12
Andhra Pradesh	-	4.76	-

Source: Balakirishnan 2001 and Observer Statistical Handbook 2005

The linguistic diversity and cultural identity

Here we may analyse the impact of certain incidents of the information society on social and cultural development. Culture is at the heart of contemporary debates about identity, social cohesion, and the development of a knowledge-based economy. The promotion of linguistic diversity on global information networks, the production of local and indigenous content on the Internet and universal access to cyberspace are central issues. Language is one of the major barriers to the formation of perfect knowledge societies in developing countries. Each day over two million pages are added on the Internet but there is a very small content representation on the net in the vernacular languages of the southern countries. Statistics point out that over 85% of the content on the net is in English; yet fewer than one in ten people worldwide speak that language. Further, with high rates of illiteracy in the developing countries, people who are unable to read the content even in local languages would be excluded from the knowledge-sharing network. Thus, the literally well connected have an overpowering advantage over the illiterate poor, whose voices and concern would be left out of the global conversation.

Reflection and Action 25.4

Do you think the existence of multiple languages in India will hamper the growth of knowledge based society in India? Suggest some ways to over come the situation.

25.8 Divide in Employment Accessibility

In the contemporary phase of rapid globalisation and revolutionary changes in the technological developments there is a widening gap in terms of country's participation in global economy and the benefits that these countries, enterprises and individuals reap from this participation. Also within many countries the gap in terms of access to decent work and incomes and participation in economic and social life is widening between various income groups. The poorly educated and trained are generally the losers in the process of economic change where society as a whole seems to march towards higher order of development. This is what happens in knowledge societies. Those who have access to knowledge and related technologies can take advantage of emerging economy and thus the economic advantage. This true in the case of both the individuals and nations.

Globalisation, declining communication and transportation costs, and the opening of political borders combine to facilitate increased movements of skilled people (knowledge workers). This dynamic is de facto leading to a

global market for advanced human capital in which individuals with higher education are the most likely to participate (Carrington and Detragiache 1999). This may lead to mobilisation of qualified people from lesser developed to the developed countries, thereby depriving the developing countries the service of their better minds.

In this 21st century marketplace, the richer countries strive to attract and retain the world's best-trained minds in many ways. Among the more powerful "pull" factors are effective policies that stimulate R&D activities and increase direct investment, offer attractive post- graduate training and research opportunities, and recruit younger graduates and professionals (Glanz 2001). OECD countries are increasing their investments in R&D not only in the science and technology sector but also in other knowledge-based sectors, thus creating job opportunities for well-trained people. For example, in early 2001 the Australian government announced a 100 percent increase in the funding of the Australian Research Council and a tax write-off equivalent to 175 percent of the value of R&D spending by firms.

Roughly 25 percent of the science and engineering students in U.S. graduate schools come from other countries. This amounts to some where between 50,000 and 100,000 students from abroad who are intro-duced into the U.S. market for advanced human capital. Most of these students received their basic education and first degrees in their home countries — meaning that the cost of their initial training was probably assumed by the countries of origin rather than by the country of employment (NSF 2000: app. table 4-22). Advanced countries are opening recruitment offices in countries where, because of lack of opportunity and political instability, graduates are available. Australia, Canada, EU members, and others all compete for their share of well-trained people in the global marketplace. France and Germany have freed up the issuance of visas to attract foreign professionals in technology-related areas, and in October 2000 the United States introduced an amendment to its immigration laws that made available 600,000 new visas for scientists and engineers.

The global labor market for advanced human capital is an expanding reality that brings the circulation of skills and the related problem of "brain drain" to the forefront of national concern, particularly in developing countries. Whether it results from push or pull factors, brain drain can have a debilitating effect on national governing structures, management capacities, productive sectors, and tertiary institutions. It is estimated, for example, that at least 40 percent of the graduates of the highly regarded Indian Institutes of Technology seek employment abroad. The countries of Sub-Saharan Africa have an aver- age tertiary enrollment rate of only 4 percent, compared with 81 percent in the United States, yet it is estimated that about 30,000 Africans holding Ph.D.s live outside Africa and that 130,000 Africans are currently studying overseas. Although the phenomenon of brain drain – international mobility of skilled human resources – existed in the past too, this received an increased acceleration in the contemporary phase of technological development when knowledge and knowledge workers become commodities of high value. The rising process of brain drain can have positive as well as negative effects on countries at all levels of development. Developing countries, however, tend to suffer largely adverse consequences, as they may lose the very technical and professional specialists who would be capable of contributing to poverty-alleviating improvements in the living conditions of the local population.

25.9 Conclusion

This unit makes an attempt to make a sociological critiquing of the phenomenon of knowledge society at all the three levels of conceptual, empirical and theoretical. In conceptual critiquing the very concept of knowledge-based society is questioned since all the human societies are knowledge societies. Also the ambiguity in defining the concept of knowledge is widely criticised.

On theoretical grounds there are different ideological strands that relate technology and human progress. While techno utopians consider technology all pervasive and it leads to universal human progress, techno cynics consider technology as fecilitating the existing societal divisions and inequalities. Whereas, techno structuralists are not concerned with the merits of technology but the way technology is used. They believe that if technology is used with a deliberate determination of reducing the existing disparities in development, it will be beneficial to the humanity as a whole. In empirical critiquing the unit is more focused on digital/knowledge divide. The wide gap in the mass participation in the process of knowledge production, dissemination and deployment in a knowledge-based society has been highlighted in this unit. We have seen wide disparities in ICT accessibility exist between the countries on the basis of GDP rates and within the countries based on socio-economic criteria such as geographical location, race, income, education etc.

From the fore-going discussions we understand that the challenge before the knowledge-based society is whether such a society, the basis of which is the universal phenomena of knowledge and its production, dissemination and application actually will be able to achieve the universal concepts of equity and equality to all.

25.10 Further Reading

Castells, Manuel 1996-8 *The Information Age: Economy, Society and Culture*. Vol. 1: *The Rise of the Network Society*; Vol.2: *The Power of Identity*; Vol. 3. *End Of Millennium*. Blackwell: Oxford

Giddens, Anthony 2000. *The Third Way and its Critics*. Polity Press: Cambridge

Jessop, Bob 2003. "The State and the Contradictions of the Knowledge-Driven Economy". In Bryson, J.R. et.al. (eds.) *Knowledge, Space, Economy* Routledge: London

Unit 26
Changing Roles of Media and ICTs on Employment

Contents

Learning Objectives

This unit will help you to understand:

- the process of evolution of mass media of communication;
- the shift in the approaches and the functioning of mass media in the globalisation era and its impact on the socio-cultural aspects of society;
- the interface between Internet and mass media and the convergence of mass media of communications with other information technologies in the contemporary period;
- the impact of convergence of information and communication technologies on employment; and
- the challenges for ICTs for better economic growth and new form of employment generation.

26.1 Introduction

The term 'mass media' refers to any medium of communication such as newspaper, radio, motion pictures, television, designed to reach the masses and that tends to set standards, ideals and aims of the masses. The distinctive features of any mass media undertaking is the dissemination of information and ideas to the public, or a portion thereof. The mass media may be said to include the print media of newspapers, magazines and books, the broadcast media of radio, television and movies and the comparatively newer form of media, the Internet. However latest forms of media such as Internet have not as yet made their way to a large enough area beyond major towns and cities to have significant mass impact, especially in developing countries. The traditional media has a comparatively larger reach and audience. These mediums have a good reach and can be used for entertainment or education. Mass media present the opportunity to communicate to large numbers of people and to target particular groups of people. Mass media communication is significantly different from other forms of communication in that it has the capacity to reach 'simultaneously' many thousands of people who are not related to the sender.

Media today has evolved into a multi-faceted entity that has become an integral part of our life. Using available technology, such as the Internet, we can now communicate with one another anywhere on Earth instantly. The technological developments of the past few decades which resulted in the convergence of information and communication technologies has affected all spheres of human life especially in the economic front. The present unit will deal with evolution of mass media, its changed dimensions in the globalisation era and its collaboration with latest developments of communication technology of Internet. The unit also deals with the impact of convergence of information and communication technologies in the economy and employment front.

26.2 The Evolution of Mass Media

If we look into the history of human communication the development of speech can be viewed as one of the defining characteristics in the transition to human civilisation. The use of pictures and writing allowed communication to move beyond the face-to-face requirements of direct speech and facilitated the development of trade and monetary exchange across large distances. The invention of printing in fifteenth century and the rapid spread of the art of printing marked the period of profound, even revolutionary change in the medium of communication around the world. Printing technology was designed for reproducing alphabetic systems. The first printed pages appeared more than 500 years ago... since then, the media has been delivering information, entertainment educative materials etc.

For centuries civilizations have used print media to spread news and information to he masses. During this period printing was the dominant information transfer medium, and for much of that time was unchallenged and so also further development of the technology was slow. Mechanical power was applied to the printing press in the 19th century and the mechanical systems entirely displaced typesetting by hand. In 20th century dramatic developments have taken place in mass media. The mechanical system was replaced by the electronic type setting and in the contemporary period the most advanced the digital type setting.

By the middle of the 19th century, newspapers became the primary means of disseminating and receiving information. The invention of the telegraph in 1844 transformed print media. The new technology enabled the transformation of information within a matter of minutes, allowing more timely, relevant reporting. During this period newspapers were appearing in societies around the world.

Broadcast radio exploded onto the media scene in the 1920s. The introduction of technologies of "mechanical reproduction" such as phonograph, photography and cinema created new opportunities for disseminating images to wider audiences with increased power and immediacy the inventions of telephony, radio and television have been even more significant in compressing time and space in communicating information to larger masses. The invention of recording and the development of telegraphy and wireless gave a vast great significance to oral communications. The invention of telephone was a great advance on telegraph, which allowed direct spoken communication. Wireless broadcasting was a great contributor to the further development of oral communications from one person to another. Different from telephone, which can be used for communication from one person to another, this could be used for communication from one person to many people provided that all of the would-be recipients of the signal had appropriate equipment on which to receive it. Wireless broadcasting of both speech and music was established in many part of the world by the first half of the 20th century and it was rapidly becoming an integral part of daily life. This gave a challenge to print in many fronts. The broadcasters could at the same time beat the printed newspapers in the immediacy of their coverage and occupy the leisure time that might

otherwise have been devoted to reading books. The term mass media was coined around 1920s with the advent of nationwide radio networks and of mass-circulation newspapers and magazines. The mass-media audience has been viewed as forming a mass society with special characteristics, notably atomization or lack of social connections, which render it especially susceptible to the influence of modern mass-media techniques such as advertising and propaganda.

The other great popular medium of mass communication during this period was cinema. Film was one of the most potent mechanisms for propaganda in the 1930s and around World War II around the globe (Feather 1998). The new medias of both broadcasting (it became "radio" in popular speech by 1960s) and cinema began to undermine the primacy of print by 1930s.

Although influential, sound broadcasting and the cinema had their limitations. The former made its impact being instananeous, the later did so by its use of powerful visual images, emotive music, and evocation of life style far beyond the reach of vast majority of its audience. Television greatest of mass media did both (Ibid).

From very tentative beginnings in 1936, television became, within little more than 30 years, the most universal and most powerful medium of communication and information ever invented. It was at once domestic, universal, instantaneous and ubiquitous. Like radio and cinema, television broadcasting also needed a complex and costly infrastructure, although in real terms the cost began to fall in 1980s as new miniaturised and digital technologies became widely available. Due to the rapidity and pervasiveness of television as communication medium very soon after its appearance in historical scene it became synonymous to mass media.

The technological revolution of today is creating new challenges and opportunities for traditional media. Never before has so much information been so accessible to so many. The amount and immediacy of information in the latest mass mediums are unparalleled. But it has not signaled the end of the traditional mediums. Newspapers in print remain a popular and powerful medium for the reporting and analysis of events that shape our lives. Taken together, the mass media of 20th century have enriched and enhanced the lives of hundreds of millions of people throughout the world. Despite the apprehensions of the moralists and the governments and the complaints of partially displaced cultural elites, mass media like radio, cinema and above all television have given more access to more information to more people than at any time in the history.

The current process of globalisation which gained an accelerated pace in 1970s and afterwords with the rapid changes in the technological and other developments had its impact on the mass media of communication also. The emergence of Internet as a networked communication and other technological advancements provided a new paradigm to mass media.

Let us learn globalisation impact on mass media.

Reflection and Action 26.1

Do you think the traditional mass media of communication such as print and radio became less significant in the current phase of technological development? Justify your answer.

26.3 Mass Media and Globalisation

During 1980s new technologies transformed the world of media. Newspapers were written, edited and printed at distance, allowing for the simultaneous editions of the same newspaper to be published form different parts of the world. Radio became increasingly specialized with thematic and sub-thematic

stations. VCRs exploded all over the world and became in many developing countries a major alternative to the official TV broadcasting. Also it provided great deal of flexibility to the use of visual media. There has been a decisive change in the nature of mass media with the multiplication of television channels. This process has been facilitated by a worldwide trend toward deregulation and privatisation of the mass media, which was till then largely under the control of the State. Development of cable TV technologies, fostered in the 1990s by fiber optics and digitisation, and of direct satellite broadcasting dramatically expanded the spectrum of transmission and put pressure on the authorities to deregulate communications in general and television in particular (Castells 1998).

The development of cross border TV stations accelerated powerfully at the end of 1980s due to the globalisation trends that was manifested all over the world. The boom in satellites, the proliferation of installed bases of dish antennae over vast regions of the world, progress in the miniaturisation of TV control rooms, cameras and small scale transmission stations that drastically reduced the distance and time in transferring communication widely lead to the success of the cross border TV transmissions. Cross border TV networks reach millions of homes around the world via cable network or collective or individual reception of satellite signals. CNN is a channel which best embodies the instant, global worldwide status of television. The channel today can reach every region around the world via a network of satellites covering the whole planet.

The growth of global mass media firms has been fueled by a parallel move toward deregulation and privatisation of mass media organisations. This is most clearly evident in the broadcasting sector, which in many countries of the world had been maintained as nonprofit, public service, state supported entities. As the forces of capitalism and entrepeneurship have emerged as the dominant model of economic organization, the state has receded as a regulator of the market place. This development has allowed the global media giants to enter into partnerships with dozens of national mass media firms around the world to produce, provide and/or disseminate news and entertainment to domestic markets. Advances in satellite broadcasting has secured the presence of the giant mass media firms in the cultural and information market place of every region of the world.

Perhaps the most significant development of the last two decades in international communication is the increasing concentration of mass media ownership within and across national borders. Concentration of mass media ownership has had two significant implications for the ways news (and other cultural products) is assembled and disseminated world-wide: First, concentration of ownership and privatisation of mass media has been accompanied by commercialisation of news and other cultural products, a trend that is characterised by aesthetic, technical, and professional standardization at the global level. And second, alliances between the international "media moguls" such as Rupert Murdoch and forces of political conservatism has led to increasingly "soft" media content. These phenomena are part of the process of globalisation.

Currently there are five major corporate players in international mass communication. These giants are News Corp., Disney/Cap Cities, Time Warner, Viacom, and TCI. In addition, two other "mini-giants," General Electric and Westinghouse have global ambitions. Of these seven firms, all but Viacom and TCI have major news components. News Corp. is the owner of or significant partner in newspapers, television stations, and satellite broadcasting systems (including STAR TV and Sky TV) around the world. Disney/Cap Cities owns ABC. Time Warner's recent acquisition of Turner Broadcasting, which created and owns CNN, gives it a major international presence in newsgathering and

dissemination. General Electric owns NBC and Westinghouse own CBS. All of these mega-corporations but one are based in the United States; News Corp. is based in Australia (http://www.idsnet.org).

With the proliferation of a variety of channels and programmes in television networks experts opines that there is an evolution from mass society to segmented society because the new communication technologies focus more on diversified, specialised information and hence audience become increasingly segmented by ideologies, tastes and lifestyles (Toffler 1980, Ito 1991).

The impact of mass media on the socio-cultural life of people: Television and other medium of mass communication is an integration of technology, culture, commerce and politics. As a cultural product using audio-visual codes it projects the cultural values of their producers and the social realty in which they are produced. It is argued viewing television is not merely an act of consumption but is "rather complex process of decoding cultural meanings" (Wang et al. 2000:4). This increased internationalisation of media has had an impact on the economic, socio-cultural and political spheres of society, which created "imagined societies" (Anderson 1983). By the 1990s several scholars of globalisation had begun to address consumption and the formation of transnational consumption communities, as key issues and foci for media study (Griffin 2002). Post-1990s witnessed onslaught of Transnational television also referred to as "international satellite broadcasting", "television without border", "cross border television", "transborder television", "global television" or "satellite television". That lead to unique process of communication where though most audiences were located within confines of one country the media became transnational creating transnational audiences. Varied concepts like cultural dependency, cultural imperialism; media imperialism (Schiller 1976, Boyd-Barrett 1998, Lee 1980) communication imperialism, electronic colonialism etc. came into being. All these concepts dealt mainly with the flow of transnational television programs from West to the other parts of the world.

Mc Luhan (1964) visualisation of "global village" also was inspired by the penetration of alien culture into local/regional culture mediated by this process of internationalisation of mass media. His vision of a global village was the first substantial attempt to analyze the profound impact of internationalisation of cultural techniques on various dispersed societies, which are exposed to the same signals and messages. His view inspired the vision of an unknown transformation of cultures and societies into a "global village," a new cultural space of 'sameness' and 'uniformity'. In recent decades, technological developments have triggered a new complexity and diversity of globalisation, not only of a 'global culture', which is still today the central topic of the sociological globalisation debate (Tomlinson 1999), but also of political communication.

Notions of a global 'public' sphere - a new dimension of the globalisation process have gained a new awareness since September, 11, 2002 (Volkmer 2003). In the public spheres there also arose private and individual spheres. The Internet, following Manuel Castells' (1996) argument, has increased the dynamics and complexity of the political globalisation process and has created a new global "network society" or what he calls "Networked Individualism" (Castells 2001). To him although media have become indeed globally interconnected, and programmes and messages circulate in the global network, we are not living in a global village, but in customised cottages globally produced and locally distributed (Ibid). Appadurai also argued that the central problem of globalisation is the "dialectic tension" between cultural homogeneity and heterogeneity a dilemma perpetuated mainly by media. And today's 'dialectic tension' invariably affects life-worlds.

There is also a growing belief that the spread of culture through mass media is unbalanced and thus has led to the term cultural imperialism being applied in society. Tomlinson (quoted by Poux 2004) defines cultural imperialism as the use of political and economic power to exalt and spread the values and habits of a foreign culture at the expense of a native culture. Cultural imperialism theory suggests that one culture (usually the developed countries) exports cultural products (electronic/mass media productions) to another society (usually developing countries) with the goal of a) eliminating native cultural representations and b) replacing them with "alien" representations which in turn are supposed to c) transform the culture so that it loses its autonomy and becomes 'assimilated' into the global capitalist world-system. In many ways, it arises out of the critique of media and ideology from people like Herbert Marcuse. For Marcuse and others, the media are used as an instrument to promote the ideology of the ruling classes, and to perpetuate the "false consciousness" of the masses. While they argue electronic media are a threat to indigenous peoples by way of making them to give up their traditional customs, rituals, and practices in favor of the new technology, undermining the strong "oral" character of indigenous societies. Some scholars (Mander 1991) argue that television, radio, and other electronic media are allowing indigenous people to reassert themselves on the global stage and have their voices heard.

Reflection and Action 26.2

Discuss the role of mass media in accelarting the pace of globalisation process.

26.4 Internet as a Mass Media

For much of the last one hundred and fifty years the most striking features of the development of the communication technologies have been the capacity to convey information to an ever-expanding range of audiences with a speed that now makes communication instantaneous. The speed of both broadcasting and interactive communication technologies has helped to compress dramatically all kinds of relationships across both time and space. The media in all its forms became a central influence in the creation of individual, communal and national identities in the postindustrial societies. The emanicipatory potential of new information and communication technologies has been further strengthened by the emergence of the Internet as a decentralised, interactive, comparatively more democratic network that created virtual communities and multiple realities.

From modest beginnings as a showcase for the technology and its commercial possibilities for image advertising, the Internet has had a role in expanding the media environment. The Internet fundamentally depends on telecommunications capacity. It is widely predicted to produce "digital convergence, in which computing, telecommunications, and broadcasting all merge into a single stream of discrete bits carried on the same ubiquitous network. In this transformation of mediated communication into a more vernacular, more interactive, more nearly "natural" channel, the Internet stands out for expanding participation in whatever it touches.

Some scholars have argued that the Internet has become a mass medium used mostly by relatively passive consumers, and as such major content providers will dominate it (Margolis R). There is another view, which argue that Internet is not a mass media. According to them since Internet is giant network that interconnects innumerable smaller groups of linked computer networks and considering the three functions of Internet namely i) electronic mail or e-mail (transmission of messages to addressee or multiple addressee), ii) bulletin board (like ordinary bulletin board) and iii) World Wide Web (documents stored in Internet carrying varied information), it is evident that it is available only to the owner of a computer which is connected to network of computers and

hence it cannot be considered as a mass media. They view Internet for transmitting messages to the owner of the computer and it does not transmit message or information to the general public as mass media does.

There had been attempts to compare Internet and other mass media in terms of audience. Baran and Davis charecterise mass communication as a process involving i) an organised sender ii) engaged in the distribution of messages iii) directed towards a large audience. They argue broadcasting fits into this model. Internet, which is considered as an interactive pipeline that excludes the possibility of broadcasting, it may not have audience in the traditional notion. Unlike traditional broadcasting Internet communities does indeed include the possibility of interactivity and niche communities. In that sense the so-called audience of Internet is limited and specified.

Morris and Ogan define the Internet as a mass medium because it addresses a mass audience mediated through technology (Morris and Ogan 1996). They divide producers and audiences on the Internet into four groups:

- One-to-one asynchronous communication (e-mail);
- Many-to-many asynchronous communication (Usenet and news groups);
- One-to-one, one-to-few, and one-to-many synchronous communication (topic groups, construction of an object, role-playing games, chat rooms);
- Asynchronous communication (searches, many-to-one, one-to-one, one to-many, source-receiver relations) (Morris and Ogan 1996)

Thus, according to them some Internet communication qualifies, as mass communication while some does not it is too slippery to define the audience of this medium.

As the World Wide Web (WWW) makes pre-packaged content the norm, the Internet increasingly resembles a traditional mass medium (Rosco). Timothy Roscoe argues that the main focus of the World Wide Web is not the production of content (and, hence, the fulfillment of the Internet's democratic potential), but rather the presentation of already produced material: "the dominant activity in relation to the Web is not producing one's own content but surfing for content" (Ibid). He concludes that if the emphasis is on viewing material, the Internet will become a medium similar to television.

Some scholars, when discussing new media of communication, longer even refer to audiences. They speak of users or consumers (Pavlik and Dennis 1998). The logic of the marketing model lies in the changing revenue base for media industries. Advertising-supported media revenues have been dropping since the early 1990s while user-supported media such as cable, satellite, online services, and pay-per-view have been steadily growing (Ibid). In the Internet-based media landscape, the audience is a revenue stream and a source of consumer information and in that sense Internet is a mass medium.

The Internet is the first medium that allows access to unedited material or information about events to be delivered to an audience with neither the time constraints of broadcast media nor the space limitations of the traditional press. This is often cited as one of the characteristics that set the Internet apart from other media. This feeds the idea of the Internet audience as a participatory, democratic public. For example, it is often claimed that the Internet can foster democratic participation by providing voters with uninterrupted information about candidates and issues (Selnow).

26.5 ICTs — The Convergence of Information and Communication Technologies

Convergence in communication technologies means that different kinds of communication technologies are coming closer to each other. During the past few decades of rapid technological advancements the boarders between

telecommunications, the Internet and mass media are receding. The convergence of communication technologies means one terminal device, for example a mobile telephone or a digital television can be used for various different services.

In order to survive in the digital era most of the mass media sources find ways to get involved with the new technology, Internet. Due to the high demand for the new media called Internet, other sources of media such as newspapers and other TV channels started taking advantage of this source and began to make their homepages on Internet sites. The difference between the Internet and other media sources is that Internet provides Information technology, such as digital recording system, voices, images and broadcasting media etc. all in one medium.

The peculiarity of the emerging information society also is that both information and communication technologies such as telephone, computer, cable television and other media technologies are all merging together to form one entity working for the effective communication of information compressing time and space to almost nil. Digitization, convergence of technologies, and networking (all the specialities of post modern technologies) lead to a transformation in the nature and expectations of mass media (Cunningham and Turner 2002). These technological advancements made mass media more interactive. For example SMS voting became popular in the present times and increased audience interactivity in the case of both print (such as newspaper) and broadcasting media (such as television and radio). The convergence of media technologies and the digital forms of access and delivery offer even more ways for the audiences to engage with the media. The convergence of wireless form of communication allows the audience to a higher interactive platform. For example an IGNOU student sitting at the study center can engage in a discussion with the subject expert at the University center also by viewing him on the TV screen. Another example is how some official web sites invite audience to vote and decide what is being broadcasted or a viewer can a ask a question to the anchor of a programme while it is being broadcasted either in TV or radio.

It is important to state that the convergence seems to be a condition of all contemporary media and the media technologies; all contemporary media can be associated with other media forms and the boundary between them are getting less clear as new technology developments enters the market. New technologies that allow convergence between televisions and computers have been developed. Experts even predict a total convergence of television and Internet where Internet is available through TV sets (Deery 2003).

26.6 ICTs Boosted Service Economy

One of the striking aspect of the convergence of communication and information technologies and the resulting technological revolution is the emergence of the use of this technologies for application in different areas of economic activities with significant implications. The claimed benefits of these new information and communication technologies are i) it improves the quality of life by eliminating the repetitive and dangerous work, ii) it increased efficiency and productivity, through better decision-making and cost effective procedures (Abrol and Jain 1990). There has been a considerable growth in service economy compared to other economic activities such as agriculture and industry in the past few decades of rapid technological development. This was mainly because the activities related to service economy become less expensive and more convenient to the consumers with the help of new information and communication technologies. Although service sector was the most important sector to feel the impact of the new information and communication technologies, surveys of international experience clearly shows that the impact of ICTs differs from country to country and sector to sector and the impact

is determined to large extent by the way the country uses it. It is also evident that the introduction of ICTs demands a fundamental change in the work content. Work that previously required combing perceptions and the use of senses with cognitive processing is now largely dependent on cognitive processing with automation taking over the other elements of the work process (Ibid).

Now let us examine why the emergence of the ICTs aided the growth of service economy. We have already seen in unit 22 what service economy is and its different categories. Here too we will see briefly the features of service economy.

According to Distributive Trade Statistics in India, Service Sector covers a wide range of economic activities. It includes services related to wholesale and retail sale such as such as hotels and restaurants, real estate, machinery renting and leasing, data processing, advertising, motion pictures, broadcasting, photography repairs and some personal services. Besides the sectors of trade, hotel and restaurant, transport, storage, communication, real estate & ownership of dwellings, banking and public administration, it also covers the sectors of business services and 'other services'. Business services include business accounting, software development and data processing, business and management consultancy, advertisement and other business services. The sector 'other services' comprises education, research & scientific services, medical and health services including veterinary services, sanitary services, religious and other community services, recreation and entertainment services and personal services like domestic, laundry, dyeing and dry cleaning and barbers and beauty shops. If we take it on the basis of performance of the service economy we can see that the rapid employment growth in services sector of several OECD countries over the past decade results from the strong performance of certain market services, notably telecommunications, transport, wholesale and retail trade, finance, insurance and business services. Over the past decade these services accounted for around 60% of all employment created in the OECD area. Moreover they are charecterised by growing use of productivity-enhancing technologies such as ICTs (OECD 2005). Among the services, while the share of telecommunications and business services is 60% the remaining 40% are from community, social and personal services including health and education (Ibid). In Inida as per the data released by Central Statistical Organisation, in the first half of year 2005-2006 there is a spurt in the service sector. Among services, the highest growth was seen in trade, hotels, transport and communication 12%, whereas francing, insurence, real estate and business services grew by 9.9% (HT, 1st Dec. 2005).

The technological innovations, particularly in the area of ICTs, that have underpinned the birth of the information society were sparked in OECD countries. An analysis of economic development of the OECD countries shows among other factors ICTs plays an important role in the transformation of service sector. It is seen that ICTs can help services firms to introduce new business models, develop new applications, improve and re-invent business processes, enhance customer services and raise efficiency throughout the value chain. It also shows much of the ICTs use is in service sector. With ICTs revolution people can have their bank account balance sent to them by text message, get pensions and benefits paid straight into their bank accounts, and can pay their taxes online. Such ICTs innovations have been embraced widely by organisations in all service sectors as a way of transforming the way they work. There are four main reasons why ICTs can add value to such organisations. It a) changes transactions b) changes interactions c) enables sharing of information across boundaries d) overcomes spatial constraints. All these four factors if applied give value added advancements to all economic sectors especially to the service sector. ICTs is also seen as critical to improving the efficiency of transactional services, the back office and the 'productive time' of staff. It is seen as vital to offering 'choice' of delivery channel – face-

to-face, phone or online – and as enabling transformation of long-established working practices, for example by giving social service workers remote access to electronic information, thus enabling them to stay 'out and about' and see more people for longer. ICTs add value by allowing users to operate within faster, larger and more interactive networks. These lower transaction costs and speed up innovation because people and markets are better connected, whether in sharing knowledge or trading goods. Firms use ICTs to improve efficiency and reduce costs.

Reflection and Action 26.3

Examine the reasons why there is a higher growth in service sector in ICT age?

In a case study conducted by Australian Government's Department of Communication, Information Technology and Arts found that it is advantageous to adopt information and communication technologies by Non-profit organizations and communities in enhancing operational efficiency and capability, delivering services and support; and building communities, networks and connections.

- ICTs helped enhancing operational efficiency and capability in terms of
- Improvement in work processes in administrative and financial operations. This results in reduced processing time, less waste and reduced costs or reallocation of resources.
- Improved business information management, resulting in increased capacity, continual improvement of service delivery and decision making.
- Improvement in the organisational culture surrounding the use of ICTs and there is better use of information. This helps empower staff to be innovative.
- A planned or architected approach to ICTs implementation and management, such as centralisation of ICTs operations or using open or interoperable systems, facilitates:
- greater alignment of ICTs with overall strategic and organisational objectives;more robust, portable and flexible ICTs applications; and improved connections and engagement with external agencies.
- Collaboration, directly or through an intermediary, enables greater sharing of ICTs resources, training and knowledge and cost sharing.

In delivering services and support ICTs helped in terms of

- Creating new opportunities such as improved relationships with members or clients. It also enhances an organisation's capacity for online engagement and access to a wider audience and interagency coordination, collaboration and networking.
- Providing wider community benefits, for example volunteers skills transfer, and enhances the role of nonprofit organisations as trusted intermediaries in the community.
- Overcoming social and geographic isolation and exclusion so there is greater access to and availability of information, services and support for clients and members.
- Better access to ICTs facilities, training and support can empower clients.
- Improved outcomes for members such as the ability to keep in touch and share knowledge or skills with other members through online community networking.

- Voluntary member-driven organisations can provide ICTs training that is appropriate and relevant to their client group.
- With support, community organisations that previously felt overwhelmed by ICTs issues are developing confidence that they can move forward without losing control.
- Ability of small organisations to collaborate and take advantage of economies of scale by, for example, jointly develop new services or applications, such as online donations.
- The capacity for ICTs can not only provide direct benefits to organisations but also enable a multiplier effect, extending benefits to wider networks and communities.

In building communities, networks and connections (such as bonding bridging and linking social capital) ICTs helped in terms of

- ICTs can be effectively built into equity strategies targeted at the needs and interests of particular groups.
- Mixed models which combine face-to-face and online interaction can act as a transition strategy in communities with low levels of ICT skills and use.
- ICTs can be used as a tool to connect individuals to a range of community types, both wired and virtual, primarily designed to increase bonding social capital providing a sense of belonging, inclusion and community.
- ICTs can be used to create bridging social capital between geographically or socially diverse individuals forming a basis for collaborative work and understanding

At the same time they also encountered certain common barriers and challenges. The most common barriers and challenges encountered are:

- costs and lack of resources;
- level of ICTs skills, knowledge and awareness by staff, management and board members;
- ensuring sustainability;
- lack of experience with ICTs (or ICTs readiness) within particular sectors and smaller organisations; and
- the need for specific skills such as negotiating a contract, system implementation and change management present a significant challenge for many organisations. (http://www.dcita.gov.au/ie/community)

Although these findings are related to the social sector services it is applicable to other service sectors too.

26.7 ICTs and Employment Opportunities

ICTs can contribute to employment and income generation and poverty reduction. It enables people and enterprises to capture economic opportunities by increasing process efficiency, promoting participation in expanded economic networks, and creating opportunities for employment.

ICTs enhance the economic productivity across region and geographic location. For instance ICTs can enhance rural productivity. ICTs enables solution sharing between local people and communities, providing access to practical

information on small business accounting, weather trends and farming best practices, for example. Timely access to market information via communications networks also helps farmers make appropriate decisions about what crops to plant and where to sell their produce and buy inputs. In Chile, for example, an Internet network among farmer organisations has dramatically increased farmers' incomes by providing information about crop status, weather, global market prices and training. ICTs also provide unprecedented access to rural finance service. The financial and information service network provided by Pride Africa offers micro-finance opportunities for local people and small enterprises that previously had no access to flexible financing due to rigid banking regulations and the information monopolies of government and large businesses (http://www.opt-init.org).

ICTs enable improved business process efficiency and productivity. Businesses can reduce operational costs by decreasing material, procurement and transaction costs, resulting in lower prices for intermediate and finished goods, and they can also use more and better information to improve the value of their output. ICTs, for example, provides an e-trading platform to utilities companies, which may help both sellers and buyers by simplifying their procurement processes and thereby reduce costs. In another example, a number of companies in developing countries are using the Global Technology Network, provided by the US Agency for International Development (USAID), to find comparable small and medium-sized US companies to share business solutions that satisfy their existing technological needs (Ibid).

ICTs facilitate global connectivity, resulting in new ways of creating and delivering products and services on a global scale. New business models and market configurations enabled by ICTs, including business process outsourcing, value chain integration and disintermediation, provide developing countries with access to new markets and new sources of competitive advantage from which to drive income growth. Through PEOPLink's global artisans trading exchange, for example, local craftspeople in developing countries are increasing their incomes not only through access to new markets, but also because the wholesaling intermediaries for their produce have effectively been removed. Local craftspeople can now receive up to 95 percent of the selling price for their produce where previously they received only 10 percent (Ibid).

ICTs have lead to massive job generation in some of the OECD countries. For instance in Japan, more than 2 million jobs were created by IT between 1990 and 1999 (Bamber et al 2004). ICT can contribute to better employment opportunities in developing countries also both through improved labor market facilitation and direct employment. Using electronic job marketplaces, employers and employees can match labor skills and availability to satisfy their demands. For example, TARAhaat, a portal designed to serve villages in rural India, provides job opportunity information on local web sites in local languages. In addition, the establishment of local telecenters in countries such as Bangladesh, India and Senegal has created direct employment for thousands of local women and men.

Reflection and Action 26.4

What are the new employment opportunities created by the proliferation of ICTs?

ICT favoured job opportunities for Women: Information and communication technologies have created new types of work that favour women because the technology enables work to be brought to homes and allows for better accommodation of work and family schedules. Women have also been able to capture a large proportion of jobs in ICTs-enabled services because of the worldwide shortage of skills necessary for work in this sector.

Thus far, the most promising potential for women is in the creation of new jobs at call centres and in work involving data processing (Swasti Mitter 2001). The ILO reports that "telecentres and fax booths have created a quarter of a million jobs in India in the last four years alone, a huge proportion of which have gone to women" (www.ilo.org).

Internationally outsourced jobs, such as medical transcription work or software services, do make a considerable difference to the lives and career paths of women in developing countries. In software, women enjoy preferences on a scale that they never experienced in any other field of engineering and science. Women in India occupy 27 per cent of professional jobs in the software industry, which is worth 4 billion US dollars annually. Women's share in the employment total in that industry is expected to rise to 30 per cent in 2001.

Although impressive, the prospects for women, as recent research and projections indicate, lie more in Information Technology Enabled Services (ITES) than in software services. The worldwide demand for ITES is expected to grow at a dramatic rate in the coming decade, to USD 671 billion by the year 2005 (http://www.usaid.gov/wid/pubs). With revenues of USD 870 million from ITES (also called Remote Services) in 2000-2001 and an annual growth rate of 66%, India currently has the potential to target a large part of the market. In 1999, NASSCOM projected that by 2005 employment figures in ITES in India could reach 1.1million. Although there are no gender-disaggregated statistics according to the Confederation of Indian Industries (CII), at least 40% of these newly created jobs are taken by women (http://www.indiainfaline.com).

The ILO Report cites several examples where ICTs have enabled women to tap global markets for their products and raised incomes. New technologies and networking are new means by which women are empowered to improve their economic and social status. Examples of this include:

The Grameen Bank Village Phone project, which provides mobile cell phones to its mostly female members in Bangladesh, demonstrates not only the employment-generating impact of the women who collect fees for the usage of their mobile phones, but other positive spill-over effects as well. Mobile phones and access to the Internet have given rural Bangladeshi women access to learning, created new opportunities for autonomy and improved their position in community and public life.

SEWA, India's self-employed women's organization, which has been organizing women in the informal sector since 1972, and has a membership of over 215,000, was one of the first organizations in India to realize the potential of harnessing ICTs for the productive growth of the informal sector. By organizing computer awareness programmes and imparting basic computer skills to its team leaders and association members, SEWA has enabled many of its members to launch their own Web-sites and to sell their products in the global virtual market place.

These examples illustrate how technology can improve the lives of poor women by opening up opportunities they were previously excluded from. Electronic networking between women has led to new social and economic phenomena, such as e-inclusion, e-campaigns, e-commerce and e-consultation. The empowerment of women via technology in this way enables them to challenge discrimination and overcome gender barriers (Source: http://www.opt-init.org).

However, even in ICT age with a higher job opportunity for women, studies show that there exist gender disparity to a great extend in employment in terms of status sector and wage/earnings (ILO 2005). ILO studies show that wome are also likely to earn less than men for the same type of work. Most of the new job opportunities are found in the informal sector of the economy where there is little social security and high degree of volatiility.

26.8 Challenges for ICTs for Better Application in Service Economy

It is very clear that the ongoing development of ICTs in all its forms and applications is driving radical change in our lives, with the constant creation of new products and services, new ways of conducting business, new markets and investment opportunities, new social and cultural expressions and new channels for citizens and government to interact. To maximise the potential benefits of ICT to the economic development, especially the service economy certain things need to be taken into account.

Let us see what are the essentials needed for the success of the service economy. OECD case studies of some international services firs show that a number of factors are common to their success. These factors are i) open markets ii) innovation and ICTs (innovation either in terms of processes or products and introducing ICTs and developing applications) and ii) work organization and human resources (organisation of work, motivation and skills of workers, and the company culture). ICTs are particularly important for service sector innovation, as this enables the firms in a variety of services industries to engage in process innovations throughout the value chain, develop new applications, and raise productivity. While service sector has been widely transformed by ICTs, there are certain challenges that have to be tackled with successfully.

The development of efficient, low-cost and broadly diffused networks remain a high priority for the wide spread ICTs application in service sector. This will require continued efforts to improve competitive conditions for tele-communications services. Broadband networks are particularly important, as they will offer new opportunities for many services, including health, education and government. It had been seen that privacy and security concerns remain among the key barriers to ICTs use. Hence it is required to develop regulatory frameworks and technological solutions that can enable electronic business and digital delivery of services like health, financial services, tourism, distribution or logistics etc. that foster the culture of security.

ICTs are only a tool for development and these tools can be used for acceletating development. It is clear that for maximum gains to emerge, the development of essential ICTs skills, including software development is necessary. Without such skills, the technologies can neither be maintained nor adapted to local usages, from which greater economic advantages are obtained. Literacy and education are vital for reaping greatest advantages for the emerging digital/ ICT era. The promotion of education and literacy in general, and digital literacy in particular, is a challenge facing all countries. Educational differences underlie the different rates of ICTs penetration in different societies.

The adoption of ICTs in enterprises is creating two types of skill needs. The first relates to a variety of foundation skills, such as the ability to learn, to communicate, and to analyse and solve problems, all of which are essential to work environments that rely on rapid innovation, and the interpersonal exchange and creation of knowledge. Also required are the technical skills that related to ICTs itself, the need for which extends well beyond the ICTs sector to the economy as a whole.

26.9 Conclusion

The present unit begins with a brief introduction to the evolution of mass media. Print was the main medium of mass communication till the middle of 20th century. With the invention of broadcasting and wireless transmission other medium of mass communication posed challenge to this. With the invention of new technologies and introduction of television, things started changing dramatically in the field of mass communication. With globalisation getting accelerated pace and more and more privatisation and liberalisation of

mass media of communication, the transformation was tremendous. The convergence of information and mass media communication technologies and the networked communication technology of Internet drastically compressed the twin concept of time and space in terms of communication of information across societies. This convergence of ICTs reflected in the economic, social, cultural etc. spheres of human life. All these aspects have been elaborated in this unit. The unit also briefs on the ways in which ICTs boosts service economy and also challenges in applying the advanced technologies for the further expansion of service economy.

26.10 Further Reading

Feather, John 1998. *The Information Society*: *A Study of Continuity and change*. Library Association Publishing: London

Georgios, I. et al 2004. *Social and Economic Transformation in Digital Era*. Idea Group: U.K.

Crede, Andreas and Robin, Monsell 1998. *Knowledge Societies in a Nutshell: Information Technology for Sustainable Development.* IDRC: Canada