UNIT 10 INFORMATION AS AN ECONOMIC RESOURCE

Structure

10.1 OBJECTIVES

After reading this Unit, you will be able to:

- comprehend the full implications of information and knowledge as key economic resources;
- differentiate Information Economics and Economics of Information;
- become familiar with the nature, scope and ramifications of Information economics:
- get an insight into the difference between information economy and knowledge economy;
- grasp Indian economy in relation to information and knowledge economies:
- appreciate the relevance and value of Information/ knowledge economy to Library and Information studies:

10.1 INTRODUCTION

In this Unit, we will study information and knowledge as the key resources for the economic growth and development of a country.

The characteristics of information/knowledge are distinctly different from characteristics of other products and services. The distinction poses problems in determining their effects on markets, decision making, and other related issues.

It is useful to differentiate Information economics and economics of information which are the two sides of the same coin. Information economics perceives information/knowledge resource as a factor of production, growth and development, both at the micro and macro level economics.

Information Economics at the micro-level deals with problems of information in terms of uncertainty, asymmetry of information between buyers and sellers in different types of markets, such as products, insurance, job markets. In non-market situations dealing with public goods and services, information operates as a vital factor.
These problems are illustrated with examples and analogies.

Generally Information/knowledge Economy of a country deals with issues of economic growth and development at the national and international levels. But in recent years, a distinction is made between Information and Knowledge economies. Information Technology has been the chief instrument that has transformed all processes that were with all activities in industry, business and others. But the impact has resulted only in routinizing traditional processes and has practically no change has been visible in the way major decisions are taken in business or government. Therefore, a new set of paradigms is evolving keeping knowledge as the basic economic resource. This aspect is discussed at some length in this Unit.

Indian economy is said to be moving slowly towards information economy. There are a few indications to support this view. But to rank on par with the western developed countries, there are miles to go. There are serious constraints that slow down the progress of economic growth and development.

Economics of information as distinguished from Information Economics, deals primarily with the financial management of economic resources in institutions and organizations. Some of the implications of these aspects with reference to library and information systems and services are merely cited in this Unit, as they are dealt with in detail in Units on Management

The study of information economics and information/economy is valuable for library and information professionals at least for two reasons: 1) the recognition of information as a key factor for material growth and prosperity of a country, reinforces our faith, efforts, commitments and involvement in all our studies on information and knowledge; and 2) the expansion of job opportunities in other fields for information professionals.

Before we study and analyze these aspects in some detail, let us get a short summary view of what is economics for the benefit of those who do not have a background in the subject of economics.

10.2 SUBSTANCE OF ECONOMICS

Economics deals with human wants and their efforts to get satisfaction from these wants. The core of economics is the study of human behaviour and the allocation of available resources to meet their human wants which invariably involves choice and selection because these wants, needs, desires, demands, etc. are too numerous to have all of them at the same time. They are also varied and constantly changing. Different groups of people perceive their needs, wants, differently. Even in the basic necessities of food, shelter, clothing, health care, education, etc. which are supposed to be common for all, there are variations in getting them fulfilled. The choice or selection of these wants by different groups and individuals depend upon their priorities, ability or affordability to pay for them, social status, and other related aspects. All these wants also change with time. These wants, needs, and such others could satisfy human beings only with the production of goods and services.

A formal definition of Economics according to Webster's International Dictionary is that it is a science dealing with the different aspects of production, distribution and consumption of goods and services for the material welfare of mankind. The material welfare of mankind implies the satisfaction of human necessities and wants by obtaining appropriate goods and services with whatever economic resources available.

The Economic Resources required to produce goods and services are of two kinds viz. human and non-human resources. Human resources constitute knowledge and information, intellectual and intuitive, creative faculties to innovate, know-how skills and other capabilities that transform non-human resources into tangible products and services. Non-human resources generally refer to total surface of the earth, including oceans, rivers, lakes, forests, mountains, mineral wealth, soil fertility, fauna and flora and other similar physical/natural resources. Capital is any resource other than land and human labour that are used in the production and distribution of goods and services. Organizations and institutions that perform various economic functions and activities, providing the necessary mechanisms for production, distribution, etc. are also sometimes included in capital resources.

A number of laws and principles are derived out of studies in human behaviour of consumption, optimum production of goods and services, markets, (demand and supply), competition, cost, price, value, monopolies and oligopolies of production and distribution etc. These laws and principles operate both at the micro and macro level economics in different proportions.

At the macro-level, Economics deals with economic issues at the national and international levels to bring about material well being for the people. The government of a country, being the owner of most of its resources, and also having the responsibility for the economic welfare of its people, mobilizes the resources, developing an economic system. The economic system could be a Free-Market Economy or a Planned Economy.

In a Free Market Economy the market conditions will determine most of the economic activities, like demand and supply, production of goods and services,

and distribution, cost and price, etc. The actors could be business people and others of various potentialities.

In a Planned Economy, the resources are allocated usually by a centralized commissioned body of the government of a country with experts drawn from different specialties. Setting economic goals and objectives, this body draws plans for specific periods and set achievable targets in that specific period for the country.

In a Mixed Economy, the resources are owned partly by private groups and by government. In this system, the resources are allocated partly by means of the price mechanism of markets and partly by the government through the centralized planning body. In actuality the Economic Systems of most countries have both free market and planned elements in different proportions.

Economic issues like setting goals and targets for national economic growth, priorities for investments, nationalization and privatization, means of production and distribution, competition and monopoly, national income, gross domestic products, international trade and balance of payments, etc. constitute concepts that are studied at the macro level. Various policy issues with reference to agriculture, industry, trade, commerce, public finance and taxation, monetary problems, prices and incomes, supply and distribution and a host of other matters of public interest are handled by the government to regulate, and to direct and control the economy to achieve its targeted goals. In all these activities, information and knowledge have a vital role to play. Experts in economics deal with these areas of organized complexities.

Outstanding economists have been giving a great deal of thought and attention to the study of information in economic activities and have a generated a body of literature of considerable value, particularly in the last three decades.

Information, and in recent years, knowledge has occupied the center stage, entirely because of the three converging technologies viz. Electronics, Computers and Telecommunications and software as well as the development of a host of media, materials, products and services.

Let us study these aspects in some detail in the following sections.

Self Check Exercise

1) Give the salient features of Economics as a discipline.

Note:
Write your answers in the space given below;
Check your answer with the answer given at the end of this Unit.

10.3 INFORMATICS ECONOMICS

Until recently economists had an understandable reluctance to consider information and knowledge as distinct factors of production, deserving a special treatment. Information and knowledge were, in fact, considered along with overheads for the purpose of accounting and budgets. But on account of the pervasive and influential role of information and knowledge in micro as well as macro economics, economists have developed Information Economics as a specialty. Lamberton, a specialist in Information Economics says that the specialty has emerged, "as a response to the deficiencies of economics theory built on unrealistic assumptions about the richness and sureness of information available to decision maker, failures of government and business policies and the spectacular advent of intelligent electronics with its greatly enhanced capacities for communication, computation and control. In fact, he claims, "the emergence of a new paradigm that is transforming economics and probably other social sciences."

10.3.1 Characteristics of Information

Information has a number of characteristics uncommon to other resources. Some of these characteristics are that it is

- shareable not exchangeable and can be given away and retained at the same time;
- expandable and increase with use;
- compressible, able to be summarized, integrated, etc.
  possess a definite value, depending upon their use which may be quantified and treated as accountable asset;
- may vary in value over time in an entirely unpredictable way;
- is a source of economic and political power;

Blaise Cronin sums up the characteristics of information as follows:
"It is fashionable to speak of information as a commodity, like crude oil or coffee beans. Information differs from oil or coffee, however, in that it cannot be exhausted. Over time certain types of information lose their currency and become obsolete, but equally, certain types of information can have multiple life cycles. Information is not depleted on use, and the same information can be used by me and be of value to an infinite number of consumers. Furthermore, information has the characteristics of a public good, more for me does not necessarily mean less for you."

10.3.2 The scope and the ramifications of the subject of Economics

Information Economics has been described and reviewed in detail in a publication entitled '*The Economics of Information and Human Capital*', Volume 3 in a Series 'Knowledge: *Its Creation, Distribution and Economic Significance*' by Professor Fritz Machlup, an outstanding economist, who has made significant contributions to this new specialty in Economics. A brief summary of the contours of Information Economics is presented below:

Considering Information and knowledge as human capital, the significance and effect of this capital are analyzed as a factor of economic growth and

development. Information problems relating to markets, trading in commodities, insurance, labour, finance, etc. are
examined in relation to buyers and sellers. Knowledge and information are examined with reference to public decisions and public goods, production and distribution of new knowledge, especially technological innovations, dispersed knowledge, central planning etc. Economic agencies that are involved in their respective activities, have an information and knowledge component which constitute another dimension of study and research. Empirical research, theoretical analysis and applied enquiry get special consideration as methodological aspects of the economics of information and knowledge.

Fritz Machlup has also given a classificatory map for Information Economics. The ramifications of the subject as depicted here consist groups, divided into 115 subgroups. The seventeen main groups are listed below to get a broad view of the contours of the new specialization.

1 Economics of knowledge and Information: General
2 Production and Distribution of knowledge; Knowledge industries, Information Services, Information Machines;
3 Ignorance, Chance, Risk,, and Uncertainty as Factors in the Explanation of individual Choices and Particular economic institutions and Phenomena;
4 Uncertainty, Risk-aversion. Venue spirit, Innovativeness and alertness as factors in the explanation of Entrepreneurship and

Profit;
5 New knowledge (Invention, Discovery) and its application (Innovation, Imitation as factors in Economic growth;
6 Transfer of Technology and Know-How;
7 Economic Forecasting;
8 Cost and Value of information Private and Social, Alternative Information systems;
9 Decision Theory and Game Theory;
10 Decision Making by Consumers and Incomplete and Uncertain Knowledge;
11 Decision making by workers and job with incomplete and incomplete Uncertain knowledge
12 Decision making by Private Firms, in various markets positions, with incomplete and uncertain knowledge.

Self Check Exercise

1) Distinguish between Information Economics and Economics of information.
2) State the characteristics of information.
3) What are the basic contours of Information Economics

Note:
i) Write your answers in the space given below;
ii) Check your answer with the answer given at the end of this Unit.

10.4 MICRO-ECONOMICS OF INFORMATION

We shall, in this section, deal with some of these micro-aspects of information economics. These are some of the narrow aspects of Economics concerned with uncertainty and risks, risk-aversion, information in markets, asymmetry in buyer and seller information, decision making by varied economic agents. All these are considered as aspects of study in micro-economics of information i.e., mainly in the context of individuals, households, firms and institutions.

10.4.1 Uncertainty and Information

Uncertainty is inexorably interwoven into human life, Nobody can with any degree of certainty predict accurately future events and activities of individuals, or groups or nations. As events are concerned with human volition, their behaviour cannot be predicted with accuracy, except in very rare circumstances. Predictions are largely in the nature statistical probability of an occurence or an event, the aggregate analysis of which may result in the formation of theoretical constructs or models. The phenomenon is very much present in Economics, as all investments are risk prone and need an insurance coverage for sustaining losses. Information economists say that this type of uncertainty is reduced to a certain measure by the availability of timely information. "Theoretical economics is changed by the increased emphasis economists place on knowledge, information, ignorance, uncertainty and so forth, and by computerized methods of simulation and hence, of ascertaining the effects of different assumptions, underlying the theoretical models; and empirical economics is changed by the amount of data available and by the speed, and indeed the practical possibility of processing such masses of data." (Machlup, 1983, p.39)

Uncertainty is common both to buyers and sellers; both at the stage of production and at the point of exchange. All markets have informational characteristics. Usually buyers know less about products and services than sellers. This is a common experience of many of us when we go out shopping for house hold appliances, textiles, or even food items. Here there exists an information asymmetry between buyers and sellers, as the former is not equally informed as the latter. Recent literature in Information Economics reports that such information asymmetries cause market failures of various kinds. The emerging area of consumer protection is said to rely on the informational structure of markets, since the need for consumer protection usually arises because consumers are not fully informed.

Currently the principal studies in Information Economics are directed towards finding ways to incorporate information flows and information gaps into models of markets in order to assess rigorously the impact of information or its absence on market performance.

10.4.2 Information and Markets

We shall examine the effects of asymmetry with reference to four different markets with which we very familiar (a) Consumer products, (b) Insurance, (c) Jobs and (d) Financial markets.

Consumer Products Markets

In this market, in particular, in retail markets, buyers (household) are typically less informed than the sellers about aspects of product quality such as invisible defects, risks or malfunction, leakage and decomposition. To build up consumer confidence in the firm that sells the product, sellers resort to the provision of guarantee and liability. Consumer protection is also effected through the imposition of regulatory controls by government. However, one disadvantage of guaranteeing minimum standards of quality is that the variety of products available in the markets may be reduced.

Buyers do have the option for ensuring reliable quality of the product through various kinds of product literature. Two somewhat related activities of market parties are screening and signaling, the former designed to obtain information and the latter to transmit information. Sellers wanting to send messages about themselves and about the quality of their goods and services to potential buyers, engage in signaling. Buyers intent upon learning more about the sellers and the goods and services offered, engage in screening. Trademarks, trade names, brands, besides guarantees and most importantly, the seller's good will earned through a long period of reliable service, give greater credibility to their product. Consumer protection activities ensure a certain standard of assured product quality, prices commensurate with quality and transactions, procedures, etc.

Insurance Markets

In Insurance Markets, it appears there are several kinds of informational problems such as (i) Adverse selection in which low-risk people leave the pool of those insured; (ii) Moral hazard where those who area insured, because they are insured, take actions that increase the risk of the occurrence of the unwanted events; (iii) Adverse incentives when the insured tend to over purchase a service such as medical attention as a result of the factor that the insurance pays a percentage of the cost. As we can see, in insurance, it is typically the seller who has lesser information, since the buyer is well informed about the risk class to which he belongs. The seller takes a greater risk in his business and the asymmetrical characteristics in these markets are clearly the opposite of those that are prevalent in a consumer product market. Of course, insurance companies take several remedial measures to overcome the risk potentials by resorting to differential premia for personal life insurance by the methods of inspection and monitoring of plant, equipment, by observation of safety rules, with surcharges levied for deficiencies.

Job Markets

In job markets, there are problems of information that have a special importance. Searching, signaling and screening are activities affecting the supply and demand for workers, the dispersion of wage rates, and the rate of employment, working age, and such others. The employees and job seekers resort to different methods of informing themselves of the opportunities and markets to meet their particular requirements.

Finance Markets

This financial markets, information, imperfect knowledge, risk and uncertainty play different roles, particularly in different credit and capital markets. The information sought, produced, offered, disseminated and acquired by the parties involved (lenders, borrowers, buyers and brokers in stock and share markets) is usually about quite different matters, so that its not easy to formulate general propositions fitting all financial markets. Some of the kinds of information generally available to financial investors, particularly with reference to the stock market are the financial statements of companies at periodical intervals, the annual statements audited by certified public accountants, balance sheets of companies, annual reports of the managements of companies, prospectus for new issues of equity or debt brokerage firms, write-ups of financial analysts, current news and analysis appearing in newspapers and news magazines, etc.

In all these markets, the Internet with its global spanning technology offers today, remarkable E-Commerce (E-Business) facilities for exchange of information, goods, and payments with speed and efficiency irrespective of location. Benefits to consumers offered by E-biz include:

- Benefits of easy shopping (since most intermediaries are eliminated);
- Buyers can reach out to sellers across the country or even the world;
- Bargaining power shifting from sellers to buyers;
- Product features of different suppliers can be accessed almost Instantaneously;
- Getting comforts of shopping (including online payments) while at Home.

Non-Markets

There are many contexts and situations in which the market pressures discussed above do not operate. Yet the information problems are very much present. In providing public amenities, government at different levels has to take many vital decisions at different times. These may be social and welfare activities for the communities and hence regarded as public good and services. With public goods, if one person has more, there is no reduction in the quantity available to others. Provision of streetlights, defence activities for the security of a country, construction of a park are good examples of public goods. In these types of activities, the peculiar characteristics of information is the presence of externalities. Externality or external economics are defined as favourable effects on one or more persons that come from the action of a different person or firm. Negative externalities occur in the same fashion in that they refer to harm done to others from external source. In the construction of a park, the person living in the surrounding areas gets obviously a definite benefit. But investments by government in higher education may not always result in social benefits to the community. The often discussed example is the problem of brain drain in countries like India which takes the human capital from the country after a good deal of effort and investment in building up this capital. In all these economic activities information plays a role in obtaining data and analyzing them to provide appropriate indications for taking appropriate decisions at different levels of government and institutions.

10.4.3 Information Measurement

A continuing source of weakness in the study of information economics is the absence of reliable measures for such fundamental elements as cost, price and value. These elements are very much interconnected. Cost determines the price at which an information product could be offered. But price cannot be determined only on the basis of cost, as the quality of the product or service is a very crucial factor in fixing the price. Apart from the difficulties of determining the cost of a product or a service in which a number of inputs are involved, other costs such as opportunity costs are to be taken into account as an economist would conceive. Opportunity costs represent the cost of foregone alternatives, the need to satisfy one's want at the sacrifice of another. For example, forgoing the chance of a holiday in order to purchase a car.

Price is usually denoted in monetary terms, as the amount of money that has to be paid for a good or service. But price may have to be according to the different segments of customers to whom the goods or services are offered. This has to be so if a product is to have economic viability.

Determining the value is a complex matter, which lies at the heart of information economics. Value of information is highly subjective as it is to be judged and measured by the person who is seeking the information. But the problem of measurement of information is elusive and evasive, as it is difficult to determine a unit of information. Again attempts at measuring value by means of cost-benefit analysis may also present the problem of assigning a monetary value for the benefits.

Self Check Exercise

5 Elucidate the effects of uncertainty in different markets.

6 Examine the role of information in non-markets.

Write

Write your answers in the space given below:

Check your answer with answers given at the end of this Unit.

10.5 INFORMATION ECONOMY

Economy refers to the judicious allotment of resources to the different sectors of a country, like agriculture, industry, transport, communication, power etc. with a view to productivity. This implies that the basic problem of an economy is the prudent management of resources for the optimum production of goods and services, maximum employment, their steady growth over a period with provisions for further development. In the last half a century, information and knowledge have evolved as the key resource for economic development. We shall briefly sketch how this evolution has come about.

Information, knowledge, ideas, skills, etc., have always been at the heart of the growth, progress, and developmental processes of a society. Historically all societies, ancient or medieval, have achieved growth and prosperity on the basis of information and knowledge in their various stages of development. In the past, the creation of new knowledge, innovations and inventions has been the efforts of

a small band of individuals with a passion and deep involvement and dedication to such creative activities. Consequently growth of knowledge has been slow. The economic value of information and knowledge has never been regarded as important factors of production of goods and services, as they could not be separately accounted for.

With the advent of industrial revolution in the 18th century, consequent advances in science and technology (S&T) and the resulting economic growth, prosperity and standards of living of people in western countries, S&T have come to be recognized as important contributing factors for economic growth and prosperity. Institutions exclusively for Research and Development in science were set up to expand the frontiers of knowledge. While science helped to advance the wave front of knowledge, science-based technologies advanced the frontiers of economic wealth.

The burgeoning volume and variety of information and knowledge resulted in the explosion of recorded S&T information. Consequently new and well organized S & T information systems and services began to take shape, providing access and facilitating their use for furthering knowledge.

The arrival of computers with inventions in microelectronics provided new opportunities to develop information systems and services on a massive scale that provided universal access to new information to advance knowledge further.

The Internet and the World Wide Web furnished not only unrestricted low-cost access to information but also facilitated communication among peer groups. Now acquiring and adapting global knowledge and creating new knowledge; investing in human capital to increase the ability to absorb and use knowledge; and investing in technologies to facilitate not only the acquisition and the absorption of knowledge, but also represent the best possible strategy for the overall development of any region, or people. All these have been possible entirely because knowledge generation and information processing are at the root of new productivity.

With all these unprecedented advances in technology providing instant access to a variety of information, information and knowledge have taken the central position and have become key factors for economic growth, productivity and development. Although information and knowledge have been critical for economic accumulation and political power throughout history, it is only under the current technological, social, cultural parameters that they have become directly productive forces and are imparting the societal growth and development in a manner not known earlier.

Self Check Exercise

7) What are the salient features of Information Economy?
8) What are the factors that have led to the new growth theory of Economics?

Note:

i) Write your answer in the space given below:
ii) Check your answer with the answer given at the end of this unit.

10.6 KNOWLEDGE ECONOMY

We will begin this section with a definition of 'knowledge' for putting our discussion in the right perspective. A definition of knowledge as given by a knowledge management expert is that "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms." (Davenport)

While information is now accessible globally and available without any restriction, irrespective of their location, Peter Drucker asserts that "a new Information Evolution (knowledge) is well under way. It has started in business enterprise, and with business information. But it will surely engulf ALL institutions of society. It will radically change the MEANING of information for both enterprises and individuals. It is a revolution in CONCEPTS. …So far, for fifty years, Information Technology has centered on DATA---their collection, storage, transmission, and presentation. It has focused on the "T" in "IT". The new information revolution focus is on the "I". (Drucker) What is being referred to here is Knowledge as the basis of productivity.

To differentiate information from knowledge for the purpose of our discussion here, although information is said to be the raw material for knowledge, Information is an unreliable and inefficient method for transferring knowledge from person to person because the receivers – not the senders – give the information its meaning. Information is entropic (chaotic), while knowledge is not entropic.

Another critical observation on Information revolution is that "so far IT has only transformed processes that were here all along. In fact, the real impact has not been in the form of "information" at all. Almost none of the efforts of information envisaged forty years ago have actually happened. For instance, there has been practically no change in the way major decisions are made in business or government. But the Information Revolution has routinized traditional processes in an untold number of areas."

"Some examples of the way computers have routinized processes:
The software for tuning a piano converts a process that traditionally took three hours into one that takes twenty minutes. There is software for payrolls, for inventory control, for delivery schedules**,** and for all the other routine processes of a business. Drawing the layout of the heating, water supply, sewerages systems in a big building such as an office complex, hotel or a hospital formerly took, several highly skilled draftsmen, several days; now there is a program that enables one draftsman to do the job in a couple of days, at a tiny fraction of the cost. There is software to help people do their tax returns and software that teaches hospital residents how to take out a gall bladder. The people who now speculate in the stock market online do exactly what their predecessors in the

1920s did while spending hours each day in a brokerage office. The processes have not been changed at all. They have been routinized, step-by-step, with a tremendous saving in time and often, in cost." (Haravu)

While Internet, WEB and other ICT facilities have provided instant access and availability of any required information, it has created also an overwhelming problem of information overload. The excess of information is a critical factor in the productivity of the newly emerging knowledge workers. Users are now to contend with the relationship between information and knowledge. This is particularly affecting business which has to be (i) constantly alert to changes in the business environment; (ii) ever ready for competition; (iii) ability to handle the overload of information and get the best of information accessibility, getting the right information at the right time in right proportion. This had lead business organizations to seek knowledge rather than information.

It is now increasingly realized in business that the key to being innovative is knowledge that is held with the company or country and outside it. "The key is also in ensuring that knowledge is continuously created, accessed, assessed, communicated, sustained, and exploited--in short managed, as a resource as much as other resources like capital and labour." (Haravu) Peter Drucker argues that in this economy, knowledge is not just another resource alongside the traditional factors of production, viz. land, labour and capital, but the only resource rather than just a resource. To quote the World Bank Development Report 1999, "For countries in the vanguard of world economy, the balance between knowledge and resources has shifted so far towards the former that knowledge has perhaps become the most important factor determining the standard of living – more than land, than tools, than labour. Today's technologically advanced economics are truly knowledge-based. "(World Bank)

10.6.1 New Growth Theory of Knowledge

A new growth theory of Knowledge is slowly evolving. Paul Romer, Stanford University, Maurice Scott of Oxford, Jacob T Schwartz of New York University are some experts working on the new growth theory of knowledge. The thinking goes as follows:

Knowledge is the basic form of capital. Economic growth is driven by the accumulation of knowledge.

Technological breakthroughs can create technical platforms for further innovations and this platform effect is a key effect of economic growth.

Traditional economics predicts diminishing returns on investment in technology. But the new growth economists argue that the non-rivalry and technical platform effects of new technologies can lead to increasing returns.

Investment can make technology more valuable and vice-versa. According to this new growth theory, the virtuous circle that results can raise a country's growth rate permanently.

Human capital generates the ideas and knowledge that in turn decide how efficiently and effectively traditional inputs of capital (such as plant and equipment) and labour are translated into output.

10.6.2 Some characteristics of Knowledge Economy

- Knowledge-based economics is characterized by a set of qualitative and quantitative changes in the last 15 years or so that have transformed the structure, functioning and rules of the economy.

- Knowledge has a high rate of obsolescence of goods, services and ideas. This calls for a higher rate of generation of new ideas and their conversion into applications, products and services.

- Knowledge sensitive organizations proactively encourage and enable their workers to take initiatives and to sustain their core competencies to enable the firm to remain competitive in a fast changing world.

- The increased importance of knowledge means that the net stock of intangible capital (e.g. education and research and development) has grown faster than tangible capital e.g. Buildings, Transportation, Roads, Machinery).

- While the old economy was fundamentally organized around standardized mass production, the New Economy is organized around flexible production of goods and services. The New Economy is a high-tech, services and office economy.

- In the New Economy, where competitive advantage increasingly stems from customization, design quality and customer service, more of the value-added is produced in office.

- Knowledge-based jobs require post secondary, vocational or higher education.

- A class of knowledge workers is being created although this new class is not the largest now, but likely to increase.

All that have been said above are in the context of advanced countries of the West, which have a very strong high-tech industry and currently dominating global economy.

To sum up the main features of an Information and Knowledge economy are:

- The Centrality of theoretical knowledge and knowledge acquired through accumulated experience, value added, with intuitional enrichment and capacity for wise application,as the key resource in innovation and policy formulation;
- Distinct change from commodity producing to a service economy;
- The pre-eminence of a managerial, professional and

technocratic class and emerging knowledge workers.

Let us study now the Indian Economy to assess as to what extent these attributes of information or knowledge economy are present.

Self Check Exercise

9) What is the New Growth Theory of Economy?
10) What are the characteristics features of Knowledge Economy

Note :
i) Write your answer in the space given below
ii) Check your answer with the answer given at the end of this unit.

10.7 INDIAN ECONOMY

The expert economists' view is that it Indian economy is currently being structurally transformed and developing new strengths to become a strong regional economic power in the new millennium. This transformation has begun from 1991 from a highly regulated and inward-oriented to an outward looking economy in which the State dominance in many spheres of economic activity is giving way to private enterprise. This is a far-reaching economic policy shift.

Although India's economic strength is derived from agriculture with food self-sufficiency, Industry is no longer shielded from external participation. Beginning from the last decade, industry has been attempting to restructure itself in ways that could help India to compete with the rest of the world. What is of growing significance is the steady rise in the service sector, accounting for 52 per cent of the Gross Domestic Product (GDP), with agriculture 26 per cent and industry with 22 per cent respectively of GDP. Information Technology (IT) in India has developed a universally acclaimed software industry. This is the fastest growing sector of the economy at 50 billion US dollars, as compared to the current level of merchandise exports at 45 billion US dollars. Future growth of the Indian economy is likely to be driven equally by IT related services as well as by other sectors such as trade, transport, tourism, financial and community services. The services taking a major share of Indian economy is characteristic of Information economy wherein the distinct change is from a commodity producing to a service economy.

10.7.1 Workforce in India

In the changing context of sectoral composition of GDP and workforce, although agriculture workforce accounts for 65 per cent, the services sector has assumed a key role and its expansion inluences production, employment and exports. The share of agriculture of GDP has declined from 52 per cent in 1950s to 26 per cent at present. This is a clear indication that agrarian economy is shifting towards the services sector where information is at the center. IT workforce in India is steadily increasing. But one of the problems India is facing is that this force of

economic strength is getting depleted because of the brain drain i.e that the workforce is going out of the country causing serious loss to the country.

Other indicators that India is moving slowly but steadily towards Information economy, are seen in many jobs and activities in government, business houses and other agencies and institutions which are more and more computer-based. Distinct changes have taken place that are visible are in railway reservations, post office services, banking and in such other services. Libraries are also switching over to computer-based services.

There are also indications that Indian business to compete with world markets, are trying to invest in knowledge management. Infosys, TVS, Dr. Reddy's Pharmaceutical Labs., Samtel (manufacturing TV picture tubes)are a few industrial enterprises that are looking towards knowledge management for innovations and creating new knowledge to compete in global markets.

A trend is seen in government policy encouraging software development and hardware manufacturing in the country by creating appropriate environment. Government has recommended that each ministry must allocate 3 per cent of its budget on IT promotion, as a move towards integrating it with government functioning and E-governance.

There are a number of programs of Central and state governments which have launched projects on e-governance. To what extent
are they operational and what results have been achieved are not very clear. Some of these projects are listed in the Reading list in Sec.10.13

10.7.2 Constraints towards progress

While there is a visibility that India is moving towards Information and knowledge economy, its progress is slowed down by a number of massive challenges. Poverty (one-third of the world's poor are in India), full employment, universal literacy, health care, drinking water, quality education, raising the standard of living of people optimally without any discrimination of caste, creed, gender, heavy import of information and knowledge, corruption at all levels, are formidable tasks to cope up with and achieve any tangible success. Quality education and training in vocations, research and development appropriate to the country's economic needs and other efforts to create new knowledge and innovations that would give strength to compete with world economies are serious constraints in India that need considerable efforts to overcome.

Critical observers have made well-meaning comments on the vision of India to drift into knowledge economy. Some of these are:

- India's industrial base has to be strengthened before moving towards knowledge-based economy. The developed countries of the West, in fact, had built a strong industrial base before moving towards a knowledge economy. We cannot leap frog to knowledge economy without a strong industrial base.

- Employment in Industrial sector and in infra structural

facilities like transportation, communication, power grids, etc. will be far more than in the IT sector, despite India becoming a Software power in 2008.

- Literacy as we define now having the ability to read and write simple words in any language is irrelevant in the context of a knowledge economy. High Quality education and training in different disciplines at all levels are at the root of building a knowledge-creative manpower force.

- Entering global markets also has its plus and minus points.
  There is a tendency to protect their business interests by developed countries to the detriment of developing countries.

- IT can be very profitably employed in agriculture and
  industry to increase productivity qualitatively and quantitatively.

Self Check Exercise

11) What is the state of current Indian economy?
12) State the constraints of Indian economy.

Note :

i)Write your answers in the space given below:
ii)Check your answer with the answers given at the end of this Unit.

Constructive Efforts

It is worthwhile here referring to a an interesting project launched by Dr. Swaminathan, the renowned agricultural scientist towards 'sustaining development' in some parts of rural areas in India is worth mentioning here "The M.S. Swaminathan Foundation has established an experimental network in India that will soon connect more than 20 isolated rural villages to a wireless internet service. About half of the population in most of these villages has a total family income of less than $25 per month. The project is designed to provide knowledge on demand to meet local needs using the World Wide Web, and it does so through a bottom-up process. The process starts with volunteer teams that help poll the villages to find out what knowledge they want. Particularly popular thus far are women's health–information, advice on growing local crops and protecting them from diseases, the daily market prices for these crops, local weather forecasts, and clear information about the bewildering array of programs that are provided by the Indian government to aid poor families. To participate, each village must provide a public room for the computer system, as well as the salaries for a set of trained operators. In return, the village receives the needed hardware and maintenance for the communication system, specially designed Web sites in the language they convey the requested information, and training programs for those villages who have been selected to run their local knowledge system. The network will allow them to easily access the scientific and technical knowledge that they need to solve local problems and enhance the quality of their lives, as

well as to communicate their own insights and needs back to scientists." (Swaminathan)

10.8 ECONOMICS OF INFORMATION SYSTEM AND SERVICES

The foregoing account of Indian economy preceded by a general presentation of Information and Knowledge economy gives an idea of the context Indian library and information systems and services should develop to meet the information needs of users. IT has, as pointed out earlier, provided the necessary tools to develop a system and appropriate services with innovative ideas. Library automation, the development of specialized databases, the opening of online database search services, the development of consortia and library networks, electronic publishing, the development of Information Retrieval Thesauri, and software for one or more of the above mentioned products or services are some of the initiatives taken to provide easy and wide access to information. The arrival of CD-ROM in the 1980s paved the way for the mastering of large databases and their distribution worldwide on stand-alone computers. The Internet and the Web technologies and all other supporting technologies have strengthened the accessibility to worldwide information.

Libraries and information systems and services do not exist in isolation. They are in most cases components of other institutional frameworks. While information and knowledge are fast changing the work environments out of necessity everywhere, libraries and information systems cannot remain unaffected. Here also, innovative thinking to institute new types of services is absolutely essential to meet various requirements. New skills will have to be acquired by constant updating of professional knowledge through continuous learning and training, which are, indeed, lifetime processes. These are challenges, but at the same time opportunities.

10.9 RELEVANCE OF INFORMATION AND KNOWLEDGE ECONOMICS TO LIBRARY AND INFORMATION STUDIES

The specific advantage of the relevance of the study of Information and knowledge economies can be summed up as follows:

- The value and importance of information and knowledge are deemed to be the key resources for national growth and development. Library and Information professionals having always been associated with information and knowledge services, get further opportunities to commit themselves to develop new and innovative services to stay in the competitive job market ;

- The scope and dimension of Information Economics open up new areas of study and research for us to pursue;

- A new type of job market is emerging which expands the scope for professional opportunities for employment.

Self Check Exercise

12)State the new changing situations which demand a new approach to manage libraries and information institution

13) What is the relevance of Information and Knowledge economies to the library and information professionals

Note

i)Write your answer in the space given below:

ii)Check your answer with the answers given at the end of this Unit.

10.10 SUMMARY

This Unit begins with a brief introduction to the substance of economics. Differentiating Economics of Information and Information Economics, it deals with the ramification of this specialization, giving some examples of the role of information in typical markets such as products, insurance, jobs, and financial markets. Discussing Information Economy of a country brings out the effects and changes on the different sectors of economies of a country, the chief instrument of change being ICT. Distinguishing Information Economics from Knowledge Economy as a new growth theory of Economics, explains the shifting emphasis from Information to Knowledge. While these changes are very much seen in the economies of developed countries, the Indian economy has its special problems, before India can claim to reach the level of growth and development as the developed countries. The Indian situation is examined with reference to the constraints India has been facing, although there are attempts to create the necessary conditions for the progress and advancement of its economy. How far this changing context affects professionals in library and Information science is briefly stated. The new skills to be acquired by Indian library and information professionals are indicated.

10.11 ANSWERS TO SELF CHECK EXERCISES

1 Economics deals with human wants, needs, demands and desires and the means of obtaining them for fulfilling human satisfaction. Goods and services are the means of achieving this satisfaction. But these are to be produced utilizing various resources, both human and non-human. This involves a market wherein the activities of buying and selling are in their place. Markets are conditioned by value, cost and prices, which influence both buyers and sellers. The means of production and distribution are controlled and regulated by governments, which have the responsibility of the welfare of the people. This brings in the concept of planned or mixed systems of economy and many related economic issues.

2 Information Economics perceives information as a resource of importance in its own right and examine it role in all economic activities, as a factor of

production, growth and development. All economic issues are studied with reference to the role of information in markets, decision-making, its cost, price and value, monopoly, competition, etc. At the macro-level, the national economy is viewed as an Information Economy with a particular reference to the contribution of information to the Gross National Product, with information products and services and Information Technology.

Economics of information is the prudent planning and management of households, institutions and governments in the deployment of resources so as to avoid unnecessary waste or expenditure.

3 Some of the characteristics of Information are:

- Shareable not exchangeable and can be given away and retained at the same time;
- expandable and increases with use;
- compressible, able to be summarized, integrated, etc.
  possess a definite value, depending upon their use which may be quantified and treated as an accountable asset;
- may vary in value over a period of time in an entirely unpredictable way;
- is a source of economic and political power;

4 The basic contours of of Information Economics are
macro-economics of information dealing with the economics problems of individuals, households, firms, etc. Some of these economic issues are indicated below:

Information Economics

Uncertainties and Information
Ignorance, Chance, Risks as factors in the explanation of individual choices and institutions
Cost, Price and Value
Decision Making
Information Markets
Human Capital

5 Uncertainties are common both to buyers and sellers, both at the stage of production and at the point of exchange.

In Consumer Product Markets, particularly in retail markets, buyers (household) are typically less informed than the sellers are about aspects of product quality such as invisible defects, risks of malfunction, breakage and decomposition. To build up consumer confidence, sellers resort to the provision of guarantees and liability. Such guarantees are a form of insurance against product failures and serve as signal of reliability. Consumer protection is also effected through imposition of regulatory controls by government. This sort of information flow would reduce the uncertainty of the buyers. .

In Insurance markets, it is typically the seller who has lesser information, since the buyer is well informed about the risk class to which he belongs. The seller takes a greater risk in his business and the asymmetrical characteristics in those markets are exactly the opposite of those that are prevalent in consumer product markets.

In job markets, the employers and job market seekers resort to different methods for informing themselves of their opportunities and markets to meet their particular requirements.

Internet has now provides much better facilities through its
E-commerce to meet the demands of various market situations.

6 In providing amenities, governments have to take many vital decisions at different levels and at different times. These may be social and welfare activities for the communities and hence may be regarded as public goods and services. Provision of streetlights, defence activities for the security of a country, construction of a public park are good examples of public goods. In these types of activities, the peculiar characteristics of information, is the presence of externalities. In the construction of a park, the persons living in the surrounding areas get obviously a definite benefit. But investments by government in higher education may not always result in social benefits to the community. In all these economic activities, information plays a role in obtaining data and analyzing them to provide appropriate indicators for taking decisions of different levels of governments and institutions.

7 Information as a key economic resource has evolved over a period of time**.** Industrial revolution, which led to mass production and distribution, started the productivity growth without any precedent. Information revolution with its vital component of IT placed information as the key resource for economic changes. All these present a set of new features of information economy which are:

Higher productivity as information is being made accessible and available irrespective of its location at low cost;
The pre-eminence of a managerial, professional and technocratic Class;
Reducing uncertainty and risk factors for buyers and sellers through the facility of E-commerce;
The centrality of theoretical knowledge as the source of innovative and policy formulation;
distinct change from a commodity producing to a service economy;

8 A new theory of economic growth due to the following factors:

While the Internet has made it possible to access information globally with speed, it has also created the problem of overload of information;
Information has routinized processes but not effected any radical change in the fundamental concept of growth through innovative ideas and knowledge;
The information revolution focused only the technological part of IT rather than the need for innovative creation of new knowledge.

9 The new growth theory of economics propounds**:**

Knowledge is the basic form of capital. Economic growth is driven by the accumulation of knowledge.

Technological breakthroughs can create technical platform for further innovations and this platform effect is a key effect of economic growth.

Traditional economics predicts diminishing returns on investment in technology. But the new growth economists argue that the non-rivalry and technical platform effects of new advances can lead to increasing returns.

Investment can make technology more valuable and vice-versa. According to this new growth theory, the virtuous circle that results can raise a country's growth rate permanently.

Human capital generates the ideas and knowledge that in turn decide how efficiently and effectively traditional inputs of capital (such as plant and equipment) and labour are translated into output.

10 Knowledge-based economy is characterized by a set of qualitative and quantitative changes in the last 15 years or so that have transformed the structure, functioning and rules of the economy.

Knowledge has a high rate of obsolescence of goods, services and ideas. This calls for a higher rate of generation of new ideas and their conversion into applications, products and services.

Knowledge sensitive organizations proactively encourage and enable their workers to take initiatives and to sustain their core competencies to enable the firm to remain competitive in a fast changing world.

The increased importance of knowledge means that the net stock of intangible capital (e.g. education and research and development) has grown faster than tangible capital e.g. Buildings, Transportation, Roads, and Machinery).

While the old economy was fundamentally organized around standardized mass production, the New Economy is organized around flexible production of goods and services. The New Economy is a high-tech, services and office economy.

In the New Economy, where competitive advantage increasingly stems from customization, design quality and customer service, more of the value-added is produced in office.

Knowledge-based jobs require post secondary, vocational or higher education.

A class of knowledge workers is being created. Although this new class is not the largest now, in course it is likely to likely to increase.

11 The current state of Indian economy is as follows:

The Indian economy is structurally transformed, developing new strengths to become a strong regional power in the early years of the new millennium.
Structural changes are that Indian economy has moved from a highly-regulated and inward-oriented to an outward –looking economy in which the state dominance in most spheres of economic activity is giving way to private enterprise.
Sectoral share of GDP are Agriculture at 26 per cent, Industry at 22 per cent and services sector at 52 percent.
Fast growing IT industry, the fastest growing sector of the economy being the highest export.

12 The constraints of Indian economy, which contain or delay its growth are:

Poverty, full employment, universal literacy, health care, quality of education, training in vocations, research and development, raising quality of life in all sections of people, heavy impact of information and knowledge, corruption at all levels.

The new situation in India depicts an account of sea changes that have taken place in its economy due to technological advances. All institutions have to adopt themselves to these changing conditions with new approaches and skills. A combination of professional competence and subject knowledge coupled with an ability to adapt to changes, good inter-personal skills and innovation are the prerequisites for succeeding in workplace, working in a more expanded sphere of activities.

13 The specific advantage of the relevance of the study of Information and knowledge economies can be summed as follows:

- The value and importance of information and knowledge are deemed to be the key resources for national growth and development. Library and Information professionals having always been associated with information and knowledge services, get further opportunities to commit themselves to develop new and innovative services to stay in the competitive job market ;
- The scope and dimension of Information Economics open up new areas of study and research for us to pursue;
- A new type of job market is emerging which expands the scope for professional opportunities and employment.

10.12 KEYWORDS

Asymmetry **:** Imbalance of information between a buyer and a seller.

Externality : Favourable effects on one or more persons that come from the action of a different person or firm.

Information Industry **:** Industries involved in the production and distribution of information.

Information Infrastructure : Components of Information economy.

Information Markets : Markets trading in Information**.**

Information Workforce : Occupational force involved in information work.

Obsolete Information : Outdated information**.**

Public good : Any consumable item meant for public use**.**

Searching : Buyers search for reliable quality through various kinds of product literature.

Screening : Process to obtain information. Buyers are generally engaged in screening sources to get right information**.**

Shareable Information : Information can always be shared without any loss in sharing**.**

Signalling : Sellers are usually engaged in signalling wanting to send messages about themselves and about the quality of their goods and services to potential buyers.

Uncertainty : Inadequate information causing uncertainty in decision making.

Value of Information : Value of Information not always in terms of money but in relation to its use.

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