

The contribution of libraries in bridging of digital divide and ensuring equal and free access to information.

Maria Doukata, Librarian MSc

Dimitris Politis, Librarian

Abstract

Today we are experiencing the era of informative revolution as a result of the rapid development of new applications of technology and communications, which runs through almost professional and everyday life as well.

This is a revolution which is based on information, mere the expression of human knowledge. Technological advances now provide the opportunity for treatment, storage, retrieval and transmission of information in any form- oral, written or visual- regardless of distance, time and volume.

The Information Society is the society of learning meaning that knowledge, and especially the development of cognitive skills can not be a fragmentary process, but must become a systematic and sustained effort.

The Informative Society holds the potential to improve the lives of citizens, the effectiveness of social, economic organization and the support of cohesion.

Science and technology must increase, not reduce the freedom and choices of everyone but to aim to alleviate the inequality, injustice and discrimination.

The digital gap includes a variety of other gaps, which may have an unequal global distribution of sources. This means lack of access to Communication technology and Information (ICTs), a gap in the acquisition of skills which are needed for use these sources, a gap between the poor and the rich in the ability to have access to the information they need and then a gap in education which is translated as a lack of skills needed to access and absorb information.

The promotion of equal and free access to information for all users is a claim for all libraries and the Technology of Communication and Information is a key factor for this route.

Libraries, because of their mission and organization in the international level, are considered to be the suitable institutions who guarantee the right of universal access to citizens.

Key – words: Information, Access, Library, Information Society, Digital Divide, Social Exclusion, ICT's, Open Access, Information Literacy.

Introduction

Today we experience the era of information revolution as a result of the rapid development of new applications of technology and communications, spanning almost the entire business and everyday life.

In the information society and knowledge the core of gravity shifted from the production of material goods in the production, reproduction and transmission of information.

The information revolution is causing profound changes in thinking about societies and in organizing and structuring.

The main danger lies in creating a two tier society, made up of the haves and not, where only a portion of the population have access to new technology, and uses readily benefit fully from its effects. There is a risk individuals to reject the new age of information and tools provided.

The distance (gap) between those people who have effective access to digital and information technologies and those without access to these called digital divide. and involves various forms of unequal distribution of technological resources, economic surplus, social opportunities, cultural products, infrastructure development, access and use of ICT.

The consequence of this situation is the formation of a global society, divided the haves and the have nots guaranteed access to information and in Information and Communication.

This creation of the digital divide separating the community into information rich and information poor

Libraries, because of their mission and organization at the international level, are considered suitable institutions that guarantee the right of universal access to citizens.

The goal of access to information is an essential duty of every library, located at the top of the aims of the existence and operation of a library.

Libraries have the potential to be the main providers to ensure equal and open access to information of their users through the application of Information and Communication Technologies. In this context shall implement information literacy programs through specific services such as Library 2.0.

Parallel to the direction of free disposal of scientific research libraries leading the development of digital repositories available on the Internet and helping thus crucial to a strong movement to ensure open access to digital material.

1. Revolution of Information

In general, we can define as information any given environment perceived, consciously or not, actively or passively, with the help of various sensory and cognitive processing covered by the individual. The data or information, depending on the content and method of recruitment will then be reclaimed, in the cognitive process. Thus, knowledge and foremost, information consists a prerequisite and the key to solving problems.[1]

As a term information both in Greek and other languages has been used with multiple meanings. The definitions which are given by the three most prestigious Greek dictionaries are the following:

- “item, message which contains and transmits knowledge to someone or something”[2]
- “every element of knowledge or judgment that is transmitted by means of speech, sound or image, as well as with the total of symbols that are understandable to people in order to inform them about any fact or matter”[3]
- “Each item with interest for someone, something that somebody would particularly like to know. Anything unusual, non-banal or expected told. 2. Each item that is transmitted from a source to a receiver, every informative element. 3. The content of the signals transmitted through various media and information”[4]

1.1 Types of information

Through the multiple meanings with which the term information is used in science and everyday practice, interest is focused on the category of information that a man takes from his environment, processes mentally and uses appropriately .

Information can be classified in different ways and on basis of different criteria. Such a basic classification can be based on how information is engaged or, more accurately, on basis the sensor with which information is assumed.[5]

- Vision → visual information
- Hearing → audio information
- Touch → tactile Information
- Smell → olfaction Information

1.2 Necessity of information

The necessity and importance of information becomes more readily apparent in science and technology. Today's life is dominated and dependent on the activities and applications of science and technology. A rapid and accurate information means possible development and supremacy of a social group or society over another.

The importance and necessity of information could be put forward in conclusion and summary with the statement that information is necessary:

- ✓ To address the practical problems

- ✓ For the practical application of scientific and technological breakthroughs
- ✓ For further advancement of science and technology
- ✓ For education at any level or its form [6]

1.3 Century of information

The century of information is a technological standard and is related with technology and not with the social organization and statute. The century of information provides the basis for a certain type of society, the network society. Without the century of information the online community cannot exist, although this new social structure is not produced by the century of information, but from a broad framework of social development. The characteristic of the century of information is not the central role of knowledge and information in the production of wealth, power and ideas. Knowledge and information had a central role in many, if not all, historically known societies. In many cases there were different forms of knowledge, but knowledge, including scientific knowledge, always presents a historical relevance. Over the past two centuries there has been closer interaction between science, technology, wealth, power and communication in comparison to the past. Throughout history, knowledge and information as well as their technological background had close relationship with the political - military dominance, economic prosperity and cultural hegemony. So in a sense, all economies are based on knowledge and all societies are, in fact, societies of information. [7]

1.4 Internet: a unique media of communication

The Internet consists of a set of different technologies and infrastructure. These elements form a non-physical location where people can communicate. It offers individuals, educational institutions, businesses and non-governmental organizations an opportunity to exchange ideas and promote scientific, cultural and economic progress. No other technology can not cross national boundaries and eliminate barriers to free flow of information to the extent that Internet achieves. [8] It comes to connect many different forms of information and provide interaction among users and services that until now did not exist.

The Internet could serve as a strong democratic tool. But is this something which happens in reality? The disparities which were apparent in earlier forms of political expression are likely to be reproduced on the Internet. As the amount of available information and of the material which is presented on the Internet grows, the proportion of attention that is expected to attract each site will decline and thus the value of the means will fall. Citizens' expectations that the Internet will promote the democratic process by increasing in this way the influence of ordinary citizens is more than optimistic. The greatest profit is that whichever failure of democracy will mitigate, to a certain point, due to Internet technology.

The Internet, being tackled as a whole, is:[9]

- ✓ **Global:** provides direct access to information from around the world
- ✓ **Decentralised:** was designed to be decentralized and competitive in many access points

- ✓ **Open:** set low barriers to access and the service is affordable. Expenditure on creation and dissemination of information is extremely low.
- ✓ **No end:** digital form of information and the ability to be transmitted through the telephone network, are characteristics, which are typically combined with the decentralized nature of the Internet suggest that it has unlimited capacity to hold information.
- ✓ **Interactive:** is designed for two-way communication where all users are speakers and listeners, collectively and individually.
- ✓ Controlled by the user: the user moves without commitments by the disposer of the information. User controls the content that reaches the computer or decrypts communications in order to protect them. The material can almost always be published outside the control of governments.
- ✓ **Independent Infrastructure:** is not associated with any other structure except for the telephone system or even with it.

Apart from all these features which present generally the framework within which the Internet is developed and operates, this presents two more elements of internationalism and populism.

It connects people of different nations, strangers to each other but with similar characteristics. The use and exploration of the Internet ignores international boundaries. There are a number of contacts and partnerships controlled by the states in minimum. The popularity of the Internet based on the fact that access to it has no restrictions other than the equipment and know-how, equipment costs fall continuously and expertise becomes more accessible.

The new publishing environment integrates into a united space of information and evidence to the designer and the user. The creator interacts constantly with the informational pool that feeds him and with the readers who are now partners and co-authors.[10]

The services which are offered by the Internet can be divided into two categories, each with two subcategories:

- ✓ Communication between individuals and Teams
- ✓ Information from Personal information centers and sources [11]

1.5 Information and Internet

“Information is not a new issue – it is as old as the hills and mountains. The value of information is growing as it becomes digital, and thus accessible to many and valuable.”[12]

The term information describes any form of data moving through the Internet. This format can be text or other audiovisual material. As information may be considered and data which are addressed in many as well as an email. On the Internet the various forms of information provided by the means in all the world's citizens regardless of their geographic location. There are four laws that describe the entropy of information. Entropy is called the trend information to grow, to spread and become increasingly complex.

Below these laws:

- ✓ As information passes from one person to another, it multiplies, creating information products. That is, a growing, non-stop explosion of information is produced.
- ✓ The size of the structure of the diffusion of information is increasing. As the structure grows, the content is multiplied to fill the gaps.
- ✓ The more sophisticated, complex place, means and storage and search of information we have, the more ephemeral it is.
- ✓ Can we really manage such an amount of information? Even as the creation, do we have the requisite mental and emotional capacity to absorb, understand and use it?[13]

An important feature of the information on the Internet is its origin. Can it be derived and presented by a commercial (news agencies), government (ministries ,agencies), corporate (companies informative nodes), science (universities, research organizations) node. And this distinction is not, as the categorization of information, always possible for all kinds of information.

Information with the digitization becomes more flexible, easily retrievable and investigated in more ways. But the definition does not change, the essence remains the same. New features of information and the unprecedented media capabilities make us confront concerns which describe the modern societies of the Internet age.

Internet is a vast storehouse of information. The term "digital information", "Information" is used in the most simplified sense. It does not mean nothing more than providing a text and some images on a screen.

Information given by this technique carries no real meaning and knowledge that makes it misleading. In everyday speech "information" is a scientific regulatory term. This implies that for someone to gain information means that he learned something that did not previously know. But the "digital information" can store disinformation and truth. So in this way a text or a picture can be misleading and lead to false impressions.

Internet, no doubt, is a source of knowledge and a wealth of information. This is true but only if we are able to put what we find under control like other sources.

All the advantages of the Internet undoubtedly make it a very strong tool. With both sides though. Of deception and disinformation, but also of knowledge and learning.

[14]

2. Information Society

Today we experience the era of information revolution as a result of the rapid development of new applications of technology and communications, spanning almost the entire business and everyday life.

This is a revolution which is based on information, itself the expression of human knowledge. Technological advances now give us the opportunity for treatment, storage, retrieval and transmission of information in any form - oral, written or visual - regardless of distance, time and volume.[15]

2.1 Concept and Content Information

The Society of Information is now one of the major priorities of states and governments of the developed world. Europe, while behind the United States in terms of technological developments, however, has made several important steps towards active participation in the new context shaped by increasing productivity, improving economic indicators, the efficiency of capital invested

In Europe [16] has dominated the term "Information Society", while the United States qualifies the term "highways".[17] In both cases is emphasized the great importance of information in our lives, utilizing the revolution which take place in communications and new technologies, eliminating time and distance.

The main feature of the new structures is their ability to produce and manage efficiently the huge volume of accessive information they have. The familiarity of new structures in relation to technological changes gives them a comparative advantage which is the constant search product. Access to relevant users facilitated by dynamic processing of huge amounts of information. One of the major issues that are directly related to the modernization of telecommunications and network infrastructure development.

We could search the information in the book, newspaper, radio or television. But now change form through digital technology, we can now recover either as text, sound, image, or all three together by the computer. Until now, the sources of information were stored in a geographical point of the planet. Which means that a person had to move towards them. This had as a result the high cost of travel and long time procedures. Information now travels through the network for people who are searching for them from a fixed geographical point.

The facilitating of wider populations to approach the information, while reducing recovery time and access costs, the actual annihilation of distance, the beneficial effects on the environment by drastically reducing paper consumption or any kind of movement, is a first recording some of the significant impacts which will occur.

In recent years the information Society is one of the first issues on the political agenda in the European Union.[18] This fact demonstrates clearly the importance and the relevance which is attributed to new applications and services they offer.

2.2 Current reality

The speed of introduction of technologies of Information and Communications (on ICT) through the use of new networks and services varies depending on countries, regions, industries and businesses.

The most important aspect which is introduced by the Information Society is the fact that the production of goods and services is increasingly based on knowledge. The Information Society is the society of learning in the sense that knowledge, especially the development of cognitive skills can not be a piecemeal process of maturing, but must become a systematic and sustained effort.

The widespread availability of new tools and information services provide new opportunities for building a more just and balanced society and enhancing the integration of personality. The Information Society has the potential to improve the lives of citizens, the effectiveness of socioeconomic organization and support of cohesion. The information revolution is causing profound changes in thinking about societies and in organizing and structuring.

The main danger lies in creating a two tier society, made up of the haves and not, where only a portion of the population have access to new technology, uses it readily and it is effected fully from its benefit. There is a risk that individuals reject the new age of information and provided tools.

The possibility of creation and existence of a large number of citizens who will be on the sidelines of the Information Society should be avoided through the creation of lifelong learning, which will impart the necessary knowledge and skills in order to continuously adapt to rapid changes. In the era of network user conducts seeks any kind of information on every topic the human mind can imagine.

If the network is the means, this information is the driving force, and everyone spent time and money to reach it first, gaining a competitive advantage. The dangers and risks must be converted into usable opportunities. To do this the infrastructure that will transform scattered information into knowledge must be created.[19]

In the information society, a global and multicenter society, the state is forced to diversify the way by which it acts and how it performs its duties. The development of information society is continuous and dynamic. The democratic development of the information society requires the participation of civil society. The task of government is to create structures and procedures to protect the rights and ensuring the communication participation and autonomy of individuals.[20]

“Science and technology should increase, not reduce individual freedom and choices . This means that they must try to alleviate the inequality, injustice and discrimination. What more, science and technology should not introduce new inequality, injustice, subjugation, coercion and discrimination”.[21]

3. Digital divide

3.1. Definition of Digital Divide

The term of digital divide is referred to the distance (the gap) between those people who have effective access to digital and information technologies and those without access to them. The digital divide concerns various forms of unequal distribution of technological resources, economic surplus, social opportunities, cultural products, the gap in infrastructure development, access and use of ICT.[22]

At the OECD, the term digital divide refers to "the gap between individuals, families, businesses and geographic areas at different socioeconomic levels in terms of opportunities to have access to information and communication technologies (ICTs) and use of Internet for a wide range of activities. The digital divide reflects the differences between and among countries". [23]

The term digital divide did its first appearance in the 1990's when started the adjustment process and the penetration of the Internet population.

The invention of the Web (World Wide Web - WWW) and the mass membership of large segments of the population in cyberspace highlighted the inequalities in access rights and use of new Information and Communication Technologies), and later many talk about forming a global society, divided the haves and the have nots guaranteed access to information and in Information and Communication.

Such gaps include the rich in information people opposite the poor, those with the right skills over those with few or no skills, those who have Internet access at home compared to those who access from sources outside the home, for example, in the workplace in cybercafes, etc. [24]

The digital divide exists between those cities and those in rural areas. It is presented so among non-educated and among different economic classes, and generally among the more or less industrially developed nations.[25]

The digital revolution progresses, the digital divide is broken down into specific sections, such a gap in Internet use, or in use of non-broadband services (among users), differences in the way of adoption of ICTs observed between urban and rural areas or and in individual countries and continents.

In an attempt to describe the broad term, the digital divide may include both technological issues, the availability of access to digital technologies and the Internet, and social issues such as:[26]

- ✓ The equal access of both sexes
- ✓ Access and use by elderly and disabled
- ✓ Access and use by minorities (ethnic and social)
- ✓ Use based in education
- ✓ The availability of applications and content-based language
- ✓ The use of professional groups like teachers, doctors etc
- ✓ Cultural Affair

The reference to different levels of digital divide indicates the complexity of the problem and the need to show that the penetration of ICTs and in general the new economy is a new model of action at the political, social, economic and business environment.[27]

In summary we can say that there are three broad categories of digital divide:

- ✓ The global gap between developed and developing worlds
- ✓ The intrasocial divide within a country
- ✓ The gap between countries

3.2 Indicators Digital Divide

The Digital Divide is measured by a series of indicators due to the complexity and the spherical relating thereto. For this need, in context, of collecting and processing statistical data to exam whether concerns (the collection and processing) of the world or the intrasocial gap between countries.

3.2.1 Indicators Measuring Digital Divide

Here are the indicators which are commonly used in general to measure the gap:

- ✓ **Teledensity**: number of telephone lines per square kilometer or per person. → Can be used for fixed or mobile telephony. Used to measure general technological state as a precondition for the use of ICT
- ✓ **Number of PCs**: obtain the statistics calculated from sales figures. → This number is Used to measure the digital divide in access to ICT
- ✓ **Number of sites** (by country only): number of DNS (Domain Name Service) records. → This number is used to measure the local increase in IT (information technology). Because there is no accurate way to find a host where is in the world, researchers use two main elements to guess: a) The area (domain) of the site in accordance with either the typical extension of any country (specific domain, for example, gr., fr., us) or considering the origin of the general area (generic domains such as. edu., com), b) The address of the owner of the site in international registries, and distribution of large groups of IP (Internet Protocol) address in each country
- ✓ **Number of hosts** (country only): a number of computers connected to internet with static addresses - This numbering loses the computers large organizations behind firewalls and protect individual users connected through ISPs (Internet Service Providers). Used to measure the 'access' to ICTs and the number of actual users of ICTs
- ✓ **Number of Internet users** is calculated through statistical sampling and composition of several smaller studies and country, or to guess the number of users than the number of ISP accounts, hosts of web, computers etc.. → Used to measure how many people are actively using the new technologies
- ✓ **Bandwidth** (bandwidth): the amount of information that can travel from one place to another on the network per second. → Technologies such as modem dialup, ISDN, DSL, cable modems, fiber optics offer increasing levels of bandwidth. Because the structure of Internet more bandwidth often means higher speeds and is used to measure "speed" and "quality access" to ICT
- ✓ **Language of users** is calculated by number of users and the languages used per country
- ✓ **Language of sites** is calculated by sampling sites with direct calculation. → Also is used to measure the "language of the users' content relevancy and usefulness of ICT

- ✓ **Size of the ICT sector:** Determined by percentage of GDP (undefined national product) produced in the ICT sector, the number of jobs, the share of exports in ICT products

3.3 Types of Digital Divide

It is obvious that there are many kinds of digital divides, at local, national or global level, where each has its own background, trends, developments, prospects and their own solutions/initiatives to bridge. In particular, distinguish the following classifications: (Research Institute for Development and Promotion of Digital Access).[28]

- ✓ **Global Digital Divide:** this term is meant the difference of Access to Information and Communication between developed and developing countries or societies, thus creating information "rich and poor areas"
- ✓ **Social Digital Divide:** in the development and "perpetuate" of the digital divide have a key role in the social stratification, hierarchical structures and geographic distribution factors such as class, gender, age and region. Specifically, a new form of social exclusion is emerging and threatens to degrade people, groups and entire societies (with criteria of social segregation).
- ✓ **Democratic Gap:** identify the differences between those who use technology and Internet to participate and be active in public life, and to those who do not use it. It is very difficult to be approached because it concerns the possible influence of the digital world in the distribution of power and influence in the political systems.
- ✓ **Geographical Gap:** illustrates the potential for access to information, which is observed between the capitalist center and the regions (rural towns), and an information gap that is often created within the same city. But above all forms of discrimination are characterized by particular cultural features, those ways in which modern societies incorporate and adopt in their daily lives the benefits of new technologies. The different cultures characterize the technological revolution, explain the distinction between technology development and content value of their society.

3.3.1 Global Digital Divide

The main factors of being the digital divide in developing countries, apart from the low level of economic activity that separates them from developed are the following:

- ✓ The abnormal or absent electrical supply is a common feature and an important obstacle to the use of ICTs, especially outside the major cities of a country
- ✓ The leaks of able people abroad and the low levels of literacy and education among the population have created a serious shortage of human skills and experience at all levels, from policy making to the end user
- ✓ There are many cases where political reasons increase the gap between developed and developing worlds.

- ✓ There are countries where people do not have Internet access because governments want to control the flow of information
- ✓ Another important factor is the low educational level, which severely affects the usage and learning of ICT. Just as there is illiteracy, there is electronic illiteracy as well
- ✓ An additional problem which is associated with the level of education is the language. Internet is only available in some languages, while the largest source of information is in English [29]

3.3.2 Domestic divide

The dissemination of new information and communication technologies creates the need to ensure equal opportunities for all citizens in access to information and access to education and training in new technologies. Lack of this is a risk of creating new discrimination between those who have access and will be users of new technologies and those who do not have. This creates the so-called gap intrasocial (domestic digital divide) ie, the digital divide between social groups and individuals of a country, which breaks down into individual gaps between economically active and non-population, age, income, gender, urbanization, educational attainment, people with special needs groups which must be addressed with appropriate measures and policies.

It has been found that various forms of exclusion are created when the level of skills which are required to manage the tools of knowledge rises. By this way new forms of digital and functional illiteracy are raised which intensify the differences between those who have access and can use and manage information and those who can not.

3.3.3 Democratic divide

There is a class of citizens who consciously refuse to engage in the digital that the “digital divide”... not due to all cases, at economic failure or other external factors, but may be a matter of choice of the individual not everyone is connected to the Internet, or would not want to be.[30]

3.3.4 Geographic Divide

Residents of rural areas have systematically less access to ICT compared to urban residents. This difference can exacerbate existing inequalities in education, income and food security among the citizens or rural and urban areas. But the Information and Communication Technology can be powerful tools to give voice to marginalized groups in rural areas, when are used properly.[31]

Governments, regional and international organizations, NGOs and other stakeholders should pay attention to:

- ✓ Rural Education plays a key role in developing countryside
- ✓ Rural primary education in developing countries should acquire universal significance (general education to pursue the necessary skill for all citizens)
- ✓ Institutions for rural-agricultural education should be more supported
- ✓ ICTs offer many opportunities for rural development

When used properly, ICT are powerful tools to give voice to marginalized groups in rural areas, including women, girls, youth, ethnic minorities, to increase access to formal, non formal, informal education, while improving the quality education and finally can help in rural development by transferring knowledge of rural and agricultural technology.

3.4 What benefits the Digital Divide

The challenge of bridging the gap of information and knowledge can not be underestimated. It is a matter of priority for many developing countries. However it is known that there are many other serious problems that continue to adversely affect a large part of the so-called developing world and which could equally be the focus of international attention, for example, fair working conditions, mortality, poverty, illiteracy and many other nations and between peoples. The fact that the gap between ICT access in developed and developing countries are now on the agenda at international conferences and summit talks around the world do not necessarily reflect the importance of the gap itself in world affairs.

What it shows is a great convergence of interests and their ability to collectively set the policy agenda so that the digital divide be considered today as a serious and important social problem.[32]

According to conducted studies that support the promotion of the digital divide as a policy issue benefits four major groups: the digital section (information capital), the governments of developing countries combined with some groups of citizens, the 'industry' development (development “industry”), and global civil society (civil society).

4. Libraries and ICT

Information and communication technology has facilitated networking, creation and accessing of remote electronic data base, putting at the disposal of libraries and library users a wide range of information services and product. Use of information technology and access to electronic information networks is slowly transforming libraries from book-centered to information-centered institutions.

Library is dependent on life and change. Without the human and organizational changes that occur, the library would neither function properly nor meet its purposes. Dr. S.R. Ranganathan, the father of library and information science, formulated the five famous laws of library and information science. The fifth law- "Library is a growing organism" is now being challenged by the tremendous progress of ICT and its speedy application in all fields, especially in the field of library and information science.

4.1 Concept and meaning

ICT incorporates a range of technologies used to support communication and information. ICT includes both networks and applications. Networks include fixed, wireless and satellite telecommunications, broadcasting networks. Well-known applications are the Internet, database management systems and multimedia tools. By implication, a holistic understanding of ICT necessarily includes consideration of telecommunications policies, information policies and human resource development policies.

Information and Communication Technology (ICT) is a diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information.[33]

The ICT sector is a heterogeneous collection of industry and service activities including information technology equipment and service, telecommunication equipments and services, media and broadcast, Internet service provision, libraries, commercial information providers, network based information services and related professional specialized services.[34]

ICTs are those technologies that enable the handling of information and facilitate different forms of communication. These include capturing technologies (e.g. camcorders), storage technologies (e.g. CD-ROMs), processing technologies (e.g. application software), communication technologies (e.g. Local Area Network) and display technologies (e.g. computer monitors).

So, we can define ICT as 'the use and application of computers, telecommunications and microelectronics in the acquisition, storage, retrieval, transfer and dissemination of information.

ICT is not a panacea for all the problems of developing countries. However, digital divide has important implications for these countries as the uneven distribution of ICTs access may mean that segments or groups who have no or limited accessibility to these technologies may be denied of socioeconomic opportunities such as:

- ✓ **Social equality.** ICTs have the potential to dispel disadvantages that may be associated with cultural barriers. For example, ICTs may be used to improve gender equality in education. Through ICTs, girls may undertake their education through e-learning at home in a society where cultural barriers isolate girls. In addition, they may be empowered to utilize high-end

technology in their economic participation in later years. (Daly, 2003, K. Chen, 2004).

- ✓ **Social mobility** which refers to the upward movement in status of individuals or groups based on wealth, occupation, education, or some other social variable in a society where one status is not dictated or decreed by birth of origin. Advancements in ICTs are capable of bestowing advantages in education, job-training, health-care as well as social networking and quality of life that they could make a difference between upward social mobility and a declining standard of living. In other words, ICTs could improve life for those who are within reach of these technologies.
- ✓ **Economic equality.** Bridging the digital divide has implications in terms of fostering economic equality, educational potential, and earning potential.
- ✓ **e-democracy.** ICTs can be a powerful tool for increasing transparency and facilitating information and communication processes among stakeholders. ICTs may lead to increased democratization by enabling citizens or constituents to participate in the decision making process of policymakers and government through the electronic channel. However, e-democracy has yet to reach its ideal level of actualization in the political participation process.
- ✓ **Economic Growth and Innovation.** Long-term economic growth has often been associated with technological progress.[35]

4.2 Components of ICT in Libraries

ICT came about as a result of the digital convergence of computer technologies, telecommunication technologies and other media communication technologies.[36]

The components of Information Technology (IT), which frequently used in library and information center are as follows:

- ✓ Computer Technology
- ✓ Communication Technology
- ✓ Reprographic, micrographic and printing technology[37]

A brief account of these Information and Communication Technologies is discussed below:

- ✓ **Computer technologies:** The dramatic development in the information transmission process in every field of human endeavor has been made by the widespread use of computer technology that can further be divided into following categories:
 - **Workstations:** These are expensive and powerful computers used mainly by engineers and scientists for sophisticated purposes. These include following:
 - ✓ Mainframe computers
 - ✓ Super computers

- ✓ Mini computers
- ✓ Personal Computers (PCs)
- ✓ Microchip technology
- ✓ Artificial Intelligence

➤ **Software technology:** Software consists of the step-by-step instructions that tell the computer what to do. Many software packages for various applications in the field of library and information services and management are commercially available. Some of the important library packages available are:

- ✓ Cds/isis(computerized documentation system/integrated set of information system)
- ✓ In magic
- ✓ Book
- ✓ Minisis
- ✓ Libsys
- ✓ CD-ROM technology

✓ **Communication technologies:** Communication or telecommunication technologies are used to transmit information in the form of signals between remote locations, using electrical or electromagnetic media as carriers of signals. Communication technologies comprise the following:

➤ **Audio technology:** The outmoded AM (Amplitude Modulated) radio receivers are being replaced by the modern FM (Frequency Modulated) receivers. The recent development is the production of Compact Discs (CDs). Audio technology can be used in libraries and information centres for a wide variety of purposes such as story telling to children, imparting education, knowledge, recreation, etc.

➤ **Audio-visual technology:** AV technologies are those by which things can be understood by listening as well as seeing. AV technologies include the following:

- ✓ **Motion picture**
- ✓ **TV**
- ✓ **CATV**
- ✓ **Videodisc**
- ✓ **Videotext**
- ✓ **Teletext**
- ✓ **Telephone**
- ✓ **Cell phone or mobile phone**

- ✓ **Fax (facsimile transmission)**
- ✓ **E-mail**
- ✓ **Voice Mail**
- ✓ **Teleconference**
- ✓ **Satellite technology**
- ✓ **Internet**

➤ **Network technology:** The important function of network is to interconnect computers and other communication devices so that data can be transferred from one location to another instantly. Generally computer network is of following two types:

- ✓ **WAN (Wide Area Network)**
- ✓ **LAN (Local Area Network)**

4.3 Why is ICT needed in libraries?

Various factors have contributed to bring about change from traditional to ICT based library operations. Basically ICT is needed in libraries for the following two main reasons:

- **In terms of various problems faced by the traditional library systems:** The manual performances of library functions were getting difficult because of the following main reasons:
 - ✓ The size of recorded information is ever growing whereas space available at the disposal of each library is limited. No library can think of getting additional space every year, although the collection will grow continuously
 - ✓ Due to knowledge explosion, the society is faced with multifaceted and multidimensional information to such an extent that not only its storage has created challenge, but the organization of this bulk of information has also become unwieldy
 - ✓ Library operations, due to potential growth of information, could take many hours to perform manually
 - ✓ Due to information explosion, all sorts of house keeping jobs and information works can be performed by manually with less effective and less accuracy
- **In terms of various facilities provided by computers and related technologies:** The advantages of using computers and other telecommunication media/devices in managing libraries are manifold. Some of the advantages are as follows:
 - ✓ **Speed:** A computer can carry out an instruction in less than a millionth of a second. Searching of information, compilation of bibliographies, preparation of current awareness bulletins,

- indexing and sorting can be processed by a computer in a few hours
- ✓ **Storage:** Human brain can store pieces of information to some limitation whereas computers can store voluminous data
 - ✓ **Accuracy:** Computers can perform functions very accurately
 - ✓ **Reliability:** Computers and all related technologies have long life if maintained properly. The data gathered in it are reliable
 - ✓ **Repetitiveness:** A computer can be used repetitively to process information
 - ✓ **Compactness:** The present day computers are laptop/waptop/palmtop, which do not occupy more space

4.4 Functions and benefits of ICT based library system

Traditionally, computers in libraries have been used and in most cases are still being used to automate the following functions:[38]

- ✓ Acquisition and budget
- ✓ Cataloguing and short loans
- ✓ Circulation
- ✓ Serial control (Periodicals)
- ✓ Provision of access to online catalogue.

Since the 1950s, use of ICT in libraries has basically gone through four stages, corresponding to the major reasons for automating:[39]

- ✓ Improving the efficiency of internal operations
- ✓ Improving access to local library resources
- ✓ Providing access to resources outside the library
- ✓ Interoperability of information systems.

ICT is used in various fields of library activities. Some of the areas where new technologies can perfectly be used are as follows:

- ✓ **Acquisition:** Acquisition/Accession list, Order file/report
- ✓ **Serials management:** Serials check-in/out and claiming, Union/holding list

- ✓ **Cataloguing/classification:** Catalogue card/label production, Retrospective conversion, On-line catalogue
- ✓ **Circulation:** Issuing, Inter library loan, Reservations, Over dues
- ✓ **Audio-visual management:** AV acquisition/cataloging
- ✓ **Management:** Accounting/budgeting, Word processing/ mailing, Scheduling/planning, Statistics/report
- ✓ **Information storage/retrieval:** Database construction, Online database searching, Down loading/uploading, Indexing and abstracting
- ✓ **Reference/Information services:** Bibliographic listings, Library instructions, Public access/computer literacy.

4.5 ICT – Based user services

Use of ICT in libraries enhances users' satisfaction. It provides numerous benefits to library users. Some of the benefits are:

- ✓ provide speedy and easy access to information
- ✓ provides remote access to users
- ✓ provides round the clock access to users
- ✓ provides access to unlimited information from different sources
- ✓ provides information flexibility to be used by any individual according to his/her requirements
- ✓ provides increased flexibility
- ✓ facilitates the reformatting and combining of data from different sources.

Libraries are also providing various ICT-based services to their users, including the following:[40]

- **Web access to OPACs:** Libraries are providing access to Web-based Online Public Access Catalogue (OPAC) interfaces. This is making it easier for OPAC users to learn and use these resources since they only have to learn how to use one universal access client, the Web browser.
- **Electronic document delivery:** Libraries are implementing ICT-based interlibrary lending system using electronic networks to deliver copies of journal articles and other documents in digital format [mainly in Portable Document Format (PDF)] to library users' desktops.

- **Networked information resources:** Libraries are providing their users with access to networked information resources, i.e. databases, electronic scholarly journals, encyclopedias, public government information, etc, provided by various publishers or suppliers.
- **Information delivery to users:** Library and information users are now getting access to electronic information resources from the computer desktops in the computer laboratories, Internet cafes, offices and even at home. This is resulting in librarians and other information specialists investigating and implementing systems that can deliver customized information to users' desktop computer environment, irrespective of their geographical location.
- **Online instructions:** Libraries are also implementing online based bibliographic or library use programmes. These include online tutorials on searching online resources and virtual tours of library collections.
- **Online readers advisory services:** Libraries are implementing Web-based versions of readers' advisory services and reference services. These include services such as informing users via the Web about new acquisitions, providing reviews and recommendations, providing facilities for readers to interact with the reference staff (Virtual Reference Desks), etc.

4.6 Impact of ICT on Libraries and Librarians

Computer has brought in a new impact to the library and information usage. In libraries, information technology has assisted library professionals to provide value added quality information service and give more remote access to the inter-nationally available information resources. Today's highly sophisticated information technology to facilitate the storage of huge amounts of data or information in a very compact space. Information technologies promise fast retrieval of stored information and revolutionize our concept of the functions of a traditional library and a modern information center. Recently technological developments have dramatically changed the mode of library operations and services.

Modern ICT is impacting on various aspects of libraries and the information profession. Advancements in ICT and the wide spread use of ICT is resulting in digital information sources and digital media replacing and becoming the dominant form of information storage and retrieval.

The term library no longer refers only to physical buildings located in a specific geographic location but also to electronic or digital or virtual libraries that can be accessed from anywhere. Library collections consist not only of physical information resources such as books, periodicals, videos, films and many more, stored in physical library buildings, but also include digital resources. Access to digital information resources is not restricted to specified hours and days of the week at one physical library building. The proliferation of digital information available over the Internet, intranets and extranets is resulting into libraries and information centers losing their former place as the focus of the information environment in many organizations. Libraries are becoming one of the many information systems available to information end-users.[41]

ICT also survives and makes true the rules of Library Science-“Every reader his/her books/information”, “Save the time of the readers” and “Library is a growing organism”. ICT with its tremendous information sources, rapid transmission speed and easy access ensures the satisfaction of the user with complex demand, break down the distance barrier and shortened the time required and ensure the right information to the right reader at the right time. It also increases and solves the library's demand of collection development. It is really an excellent tool for the library and information centres.

4.7 New skills and knowledge required for Information Professionals

Information sources and services being provided by libraries to their users need to adapt to the electronic information environment being experienced by most information end-users. In addition to the traditional library and information management skills, librarians now need to possess additional skills and expertise, more so in the use of modern information and communication technologies, automated information service, electronic publishing, digital information management and knowledge management.[42] New informational professional should acquire technological systems thinking, commitment to continuous improvement of skills, techniques and strategies and sensitivity to network environment.

In modern ICT based library services, the information professionals handle various types of activities in relation to the use of computers and other new information technologies. Some of these are: handling and developing information storage and retrieval systems of specialized/local data and materials, managing different types of housekeeping operations, carrying out on-line searches for information users using modern equipment, exchanging local databases and sharing of resources through networking.[43]

For the modern information services, technically qualified personnel will be required to provide access to databases and databanks and to work in the exploitation of the resources of libraries. In a studyless system, the information personnel, who are familiar with the resources available in machine-readable form and with vocabularies, query languages, indexing and search strategies will be needed to exploit these resources most effectively and efficiently.

4.8 ICT in Libraries: various challenges

The use of ICT in libraries has raised a number of challenges. These include:

- ✓ **Changing role of libraries and librarians:** More and more library users are using digital technologies and have access to global information resources via the Web. Unfortunately, the huge amount of information available on the Web is generally overwhelming information users. Further, a large number of Web users are still not able to use the Web efficiently.
- ✓ **Funding for libraries:** Due to severe budget cuts and high prices for books and journal subscriptions, libraries are faced with no options but to reduce expenditures on books and journal subscriptions. The introduction and use of ICTs in libraries has not made the situation any better. Money is required to maintain and upgrade the equipment and software, pay software license fees,

pay for access to electronic journals and online databases, pay for Internet connections, etc

- ✓ **Copyright management:** Digitization and provision of access to digital collections accessed via electronic networks, especially the Internet, is presenting bigger challenges to librarians. Unlike print-based documents, digital-based information resources can be accessed from anywhere via electronic networks, copied several times, manipulated (i.e. edited, modified, repackaged, etc) or deleted. The ease at which digital information resources can be copied and manipulated may result in governments, under pressure from information producers, to put in place rigid copyright laws in which the rights of the right-holder are increased at the expense of users and this may affect the provision of access to digital information sources in libraries.
- ✓ **Information access:** Whereas libraries generally contain and provide access to selected information resources, this is not the case with information accessed on the Web. Distribution of pornographic materials and information produced for deliberate disinformation is very easy to do on the Web and this presents problems to many librarians on how to exclude access to such types of information, especially on Internet workstations located in libraries.
- ✓ **Preservation of digital information resources:** The print-based library and archives environment, as opposed to the digital information environment, has evolved over centuries. Preservation methods and formats for print-based documents have also been developed and tested. There are print-based documents that are over 2000 years old in the world today and can still be read. The digital information era is in its infancy and already some of the information is stored in formats or media that cannot be accessed or read.
- ✓ **Legal deposit:** In the print-based environment, producers of publications are required by law to deposit copies of their documents with the national library or national archives, or any agency designated to receive and preserve such publications. In the digital information environment, the situation in many countries is still not clear as to who is responsible for the long-term preservation of digital information resources.[44]

5. Libraries and Digital Divide

Libraries, because of the mission and organization at an international level, are considered suitable institutions that guarantee the right of universal access to citizens. The goal of access to information is an essential duty of every library, located at the top of the aims of the existence and operation of a library.

Libraries, regardless of category, are a group of organizations which are involved actively in shaping the Information Society due to the organization and especially of their mission. Libraries have been pioneers in the use of computers, information exchange, the use of telematics, creating an appropriate infrastructure to meet the challenges of the new era. Depending on their type contribute to the integration of citizens-users, the IS. This contribution has two axes a) Infrastructure issues, free use of computers, media, automated information systems b) access to information.[45]

Libraries have the potential to be the main providers to ensure equal and open access to information of their users through the application of Information and Communication Technologies. In this context shall implement information literacy programs through specific services such as Library 2.0 and Open Access which is included in a new design for the broadest and full access to knowledge and information.

5.1 Free and equal access to information

"Everyone has the right to freedom of opinion and expression, which means the right not to suffer adverse consequences for the opinions and the right to seek, receive and impart information and ideas through any media and around the world "[46]

This is the nineteenth of the thirty articles of the Universal Declaration of Human Rights adopted by the General Assembly on December 10, 1948.

“Chapter II: **Freedom** (right to liberty and security, respect for private and family life, protection of personal data, right to marry and right to found a family, freedom of thought, conscience and religion, **freedom of expression and information**, freedom of assembly and association, freedom of the arts and sciences, right to education, professional freedom and right to work, freedom to establish business, property rights, asylum, protection in case of removal, deportation and refoulement)”[47]

Freedom of expression is "a fundamental element of the principles of genuine democracy, the rule of law and respect for human rights.“Freedom of expression and information, according to the Declaration, "necessary for social, economic, cultural and political development of every person and is a condition for the harmonious progress of social and cultural groups, nations and the international community.”

From the above it appears clear the importance of the freedom of expression and information in the proper development of society and human effort and the establishment and protection of these principles by all European countries.

There are several different levels at which the free flow of ideas can be impeded. At the societal level, legislative bodies of all kinds are expected to consider the legal and

regulatory frameworks they put in place to support the free flow of information and ideas about the interests and concerns of citizens. At the institutional level, library and information services are expected to encourage the free flow of information and ideas within the scope of their roles and responsibilities. At the individual level, citizens are expected to make informed decisions in exercising their rights and responsibilities.

The Australian Library and Information Association believes that library and information services have particular responsibilities in supporting and sustaining the free flow of information and ideas including:

- ✓ Assertion of the equal and equitable rights of citizens to information regardless of age, race, gender, religion, disability, cultural identity, language, socioeconomic status, lifestyle choice, political allegiance or social viewpoint
- ✓ Adoption of an inclusive approach in developing and implementing policies regarding access to information and ideas that are relevant to the library and information service concerned, irrespective of the controversial nature of the information or ideas
- ✓ Ensurance of that their clients have access to information from a variety of sources and agencies to meet their needs and that a citizen's information needs are met independently of location and an ability to pay
- ✓ catering for interest in contemporary issues without promoting or suppressing particular beliefs and ideas
- ✓ protection of the confidential relationships that exist between the library and information service and its clients;
- ✓ resisting attempts by individuals or groups within their communities to restrict access to information and ideas while at the same time recognising that powers of censorship are legally vested in state and federal governments;
- ✓ observation of laws and regulations governing access to information and ideas but working towards the amendment of those laws and regulations which inhibit library and information services in meeting the obligations and responsibilities outlined in this Statement.

5.2 Information Literacy

Information literacy first appears and introduced as a term in 1989 as "the ability to recognize one's need for information, to identify, evaluate and use effectively the needed information.[48]

In 2000 the Association of College and Research Libraries (ACRL) adopts the definition of the American Library Association and publishes the Information Literacy Competency Standards for Higher Education to promote and use in education. Under such an information literate person is able to:

- ✓ Identify the extent of necessary information
- ✓ Have access to needed information effectively and efficiently
- ✓ Evaluate information and its sources critically
- ✓ Incorporate selected information to the student's knowledge base
- ✓ Use information effectively to accomplish a specific purpose
- ✓ Understand the economic, legal and social issues surrounding the use of information
- ✓ Have access and use information ethically and legally

According to the Institute of Professionals of Information and Libraries (CILIP) is necessary to know when and why we need the information, where to find it and how to evaluate, to use it and to share in a proper and ethical manner.

For this to happen it is necessary to understand the following:

- ✓ Needs for information
- ✓ Available Resources
- ✓ How to Find Information
- ✓ Need for evaluation of results
- ✓ The process of evaluation results
- ✓ The ethics and responsibility to use
- ✓ The notification and dissemination of results
- ✓ The way of findings[49]

Information literacy as a core of lifelong learning and as a fundamental human right in the digital world contributes decisively to the inclusion of all individuals and communities.

It is the key to the realization and expansion of the knowledge society so that everyone, without exception, citizens to develop a satisfactory way of the learning ability in their lifetime.

In the environment of information technology and communication as learning how to learn, adapt to change and understanding the wealth of information are skills to be acquired by all. Particularly important is emerged the role of libraries through the development and implementation of information literacy programs for users who are to serve effectively and efficiently exploit the abundance of information available.

5.2.1 Information Literacy: The role of the librarian

Information literacy is a basic skill which should be developed by all citizens. Librarians should be involved in the development of information literacy by helping users in proper use and application of information contributing thereby to reduce the gap between information poor and information rich.

Librarians need to learn to items such as learning theories, teaching techniques and methods of transferring knowledge to be gained through various forms of education not available today and that will give the opportunity for enhancement of the contribution of librarians in the educational process.[50]

It is necessary to know informative needs of people who will train, which can be very different and very specific.

Librarians to be able to teach their users must:

- ✓ To find out what is information literacy and critical thinking skills that
- ✓ To understand the theories of learning and motivation
- ✓ To know and use various teaching techniques [51]

Libraries serving as access points to important information is the best source of lifelong learning as they provide the knowledge necessary for effective use of

resources available and the best defence against the control mechanisms of information.

The right of information to the right person at the right time is key to success for any organization. Libraries need to employ suitably qualified personnel with the necessary knowledge to identify, retrieve and utilize information in order to:

- ✓ Allow easy access to all forms of information
- ✓ Identify and offer the most interesting of these
- ✓ Organize information in an accessible and friendly to the user
- ✓ Lead to increased literacy levels in the organization

5.3 Web 2.0 Model

5.3.1 Definition of Web 2.0

The Web 2.0 is the advanced version of the original Web (Web 1.0), the new generation of Web, characterized by increased interaction between users and in which blogs have a leading role, RSS Feeds, the tags, the wikis and social bookmarking services (social bookmarking services), etc. The latter (bookmarking services) allow users to participate actively in the organization and the enrichment of new electronic services and have full control over their personal data. [52]

5.3.2 History of Web 2.0

The phrase Web 2.0 was said for the first time in 2004 during a conference between the companies O'Reilly Media and Media Live International where ideas for upgrading the web. The Dale Dougherty and O'Reilly VP, noted that the Internet was becoming very popular and important part of life growing percentage of people. We are constantly coming out new applications and sites that were recognized by the general public shortly. Furthermore, more companies began to focus their business activities online and to try to bring their customers to this channel. [53]

Having all this data as looked at Web 2.0 as a second generation Internet-based services. They used this phrase as the title for a series of conferences titled Web 2.0 Summit. These conferences continued until today to clarify the term and to promote the idea to all interested parties.

5.3.3 Characteristics of Web 2.0

The Web 2.0 goes beyond the limited boundaries of a computer platform. The user can operate the Web so far as he was acting on his computer. Most experts talk about a new way of web design which is based on user interaction. It allows the user to change both the environment page and interfere with the content. The most principal features of Web 2.0 are:

- ✓ social networking
- ✓ Co-operation – collegiate

- ✓ The interaction
- ✓ (Participation)
- ✓ (Sharing)
- ✓ Usability)
- ✓ Consists of modules (Modularity)
- ✓ User control
- ✓ Communication and facilitate community building (communication-communities)
- ✓ Low cost
- ✓ Free access
- ✓ Decentralization

Typical applications of Web 2.0 is social media, the wiki and blog (blogs). Many of the commands of interaction that characterize the operation of Web 2.0 is already known from various websites and social media networks like facebook or youtube for example. Such expressions are searching, the tag, the quote links or authoring such works on many wiki where users can create articles and to renew or delete existing ones.

“The Web 1.0 has led people to information, the Web 2.0 information leads to people”[Miller 2005]

How does the Web 2.0 is changing the way people live, work and participate in the applications? How are experiencing the information in this post? What is the impact of the information needs of citizens and practical information search from within applications Web 2.0? How does the way in which libraries provide support and information literacy programs?[54]

5.3.4 The Web 2.0 challenge to Information Literacy

In the Society of Information the question of how the Web 2.0 applications can affect us, is raised to change the content of information literacy and the understanding we have of it. The rapid growth of technology has made information literacy more or less important? Response to the above questions highlight the important role of educational background, the importance of information literacy in the environment of new Web 2.0 combined with the growing use of applications by the younger generations.[55]

Therefore required an update on the training of scientists to new information technology applications, and how teaching users to use the new tools of Web 2.0.

5.4 What is Library 2.0?

Library 2.0 is “a model for library service that encourages constant and purposeful change, inviting users to participate in the creation of physical and virtual services they want, supported by on going evaluation of services. Also, trying to reach new users and better serve existing and enhanced through user-directed offerings. Each piece in itself is another step towards improved services. But only through the combination of the above we can reach Library 2.0.” [Casey and Savastinuk 2006]

In the early stages of adapting to the Library 2.0 model the planning of the changes is made and the process is mapped out on a theoretical level. If goals are properly defined there is a bigger chance of reaching them. It is also an important part of justifying the manpower and resources needed for an adaption to the Library 2.0 model. The digital divide is one factor that decision makers may consider.

When the process of changing has begun there is a chance that patrons and staff take to it in different ways. The Library 2.0 model affects the values, resources and services libraries. The goal is to satisfy patrons by recreating the library in their image. It might however confuse or upset those opposed to change, whether positive and justified or not. As the library becomes more modern, some might ask for traditional service. As it becomes online some will be intimidated by the suddenly needed computers. As it reaches out to the needs of the local community some will feel left out of the new decisions. To keep the question of access in mind is important, both physical access, difference in degree in access between groups and the general degree of motivation to gain access to the library. Support in questions of ICT and an interest in how changes are seen are also important if the library should be accessible to both sides of the digital divide.

It has in any case become clear that libraries are important for creating a common and open environment for exploring the potential of electronic resources. This makes it possible to create a bridge over the digital divide or quietly point out the possibility to learn more about what is going on at the different sides of it. For libraries to do this for their local communities would be very exciting and important as knowledge of electronic resources is becoming increasingly important to be a part of society.

5.4.1 Library 2.0, the application of web 2.0 technologies in libraries

Library as an entity lacks spatiotemporal constraints but it is everywhere. Not providing the frontier participatory action potential users through the use of all new technologies and systems.[56]

In this context preceded the access towards making the acquisition to provide information literacy as a prerequisite to allowing access to information. Thus the library becomes an area where action human web dominant role played by the provision of information literacy. That way users do not get “only” the information they need. But learn, especially how to develop self-sufficiency with their information skills in preparation for the Information Society.[57]

5.4.2 Features of Library 2.0

The Library 2.0 is the space where the growing technological applications of Web 2.0 and is governed by the following characteristics:

- ✓ **The user is at the center (user - centered):** This means that the user not only makes use of library services, but actively participate in creating content and services that are accessible through the Internet.
- ✓ **Provides multimedia (multi - media experience):** The collections and services of the library containing 2.0 using audiovisual media.
- ✓ **Interactivity:** The library's website incorporates user presentations. There are synchronous and asynchronous modes for users to communicate with each other and with librarians
- ✓ **Innovation:** This is probably the most important aspect of the characteristics that make up the concept of Library 2.0. In the modern social process with far-reaching social changes that libraries do not stay aloof but accepted them, but going one step further and gives users the ability to change.[58]

5.4.3 The librarian in the age of Web 2.0

The changes in the landscape of librarianship shape and define the new role of the librarian. The model of Web 2.0, digital reality, new technologies, developing new trends, competition, the modern mode of production of knowledge, information and services-and other-recombine and redefine the skills and abilities to be the scientist has the information.[59]

The librarian in the 21st century, the era of information and Web 2.0 must:

- ✓ Learn and use the tools offered by Web 2.0
- ✓ Utilize and implement appropriate applications of Web 2.0 model at the library
- ✓ Combine well with skill to manage printed and electronic material
- ✓ Provide electronic and digital services
- ✓ Educate users in understanding and use of new technological innovations
- ✓ Accept the usefulness of non-print but audiovisual information (images, video)
- ✓ Online to encourage communication with users to resolve queries
- ✓ Use the latest communication tools like MSN, gtalk and Skype
- ✓ Develop social networks
- ✓ Allow user intervention in content creation (wikis)
- ✓ Understand the power and the potential of the blogsphere and wikisphere.

5.5 Open Access

In recent years it a new global trend has been developed in favor of free distribution of scientific research especially when financed by public funds. This potential power, finds many supporters and has been initiated by depositing any research output in digital repositories accessible via the Internet.

Open access is free, immediate, durable and free from most fees and copyright restrictions, online access to digital scientific and scholarly content. [60]

Readers can use the available material for research, educational and other purposes. The primary purpose is to facilitate the exchange of scientific information.

An example of the philosophy of open access is the MIT OpenCourseWare (<http://ocw.mit.edu/> MIT OpenCourseWare (OCW), where the MIT view to promoting free access to knowledge, provides a full educational course materials at the University free.

The MIT OCW supports the goals of the university, namely the development of education, dissemination of knowledge and serve the global community. The MIT OCW is a large-scale electronic publishing program, which amounts to 1800 courses. The potential user has free access to a set of educational materials and even polymorphic.

Technology has made such progress while it has become quite affordable, so there is now an urgent need for highly qualified to be created and maintained an online publication.

The need for rapid dissemination of information is a serious business, open access can help improve the lives and work of potential community as a whole. [61]

5.5.1 Users and benefits

The academic, research community (professors, researchers, students, teachers) may be:

- ✓ Have direct and free access to full texts of scientific content
- ✓ Enhance the readability and impact of their work world acquiring more references (citations) from other members of scientific community
- ✓ Monitor (tracking) the course of their work through statistical tools that provide open access infrastructure
- ✓ To bring together in one central point of their work
- ✓ To manage and control their work online without any geographical limitation with the help of user-friendly web applications
- ✓ Be certain to maintain their scientific material to be consistent with international standards
- ✓ To have reduced costs through the free and free access to Journals
- ✓ To have more direct contact with members of the scientific community[62]

In academic and research institutions and libraries, Open Access offers:

- ✓ Reduced costs of diffusion of the scientific content
- ✓ Scope for cooperation and concerted action
- ✓ The provision of more modern and high quality services
- ✓ Projection of the validity and value
- ✓ Opportunities for securing funding
- ✓ Potential exploitation of innovative ideas
- ✓ Control and maintenance of scientific content through one centralized system.

In business and profit organizations are presented opportunities to:

- ✓ Develop innovative products and services
- ✓ Connecting science with production
- ✓ Strengthening competitiveness at national and international level
- ✓ Cooperation and dialogue with the scientific community

In society Open Access:

- ✓ Makes scientific results public good
- ✓ Promotes creativity and making the research results
- ✓ Supports a network of transnational collaborations and contacts
- ✓ Offers to modern developing countries and at no cost creating opportunities and access to scientific content
- ✓ Offers direct and free access to patents (patents), making innovative products for the benefit of society as the Office U.S. Patent (United States Patent and Trademark Office, PTO) grants patents which provides free access and search all patents issued in IPA.

5.6 Repositories

Repositories are digital databases on the Internet that provide free and unrestricted access to scientific and research material (full text and metadata). There are two types of repositories:[63]

- ✓ Thematic repositories (eg arXiv covering the discipline of physics)
- ✓ Institutional repositories, which are usually implemented and supported by an academic institution or research institution (eg repository eSholarship Repository of the University of California).

Electronic Repositories of Open Access have their roots in some initiatives which are related to the free disposal of files and content as the Open Archives Initiative and the “self-archiving initiative.”

The repositories do not work as a means of publication of articles or material for which the author expects to be paid, nor is it a means of personal publishing (self publishing).

The services of the repositories are:

- ✓ Collection and storage of research material and scholarly
- ✓ Organization
- ✓ Long-term maintenance
- ✓ Distribution and Access

5.7 Open Source software

In the phrase “open source”, the term refers to the source code, computer readable code, which is also the source of each program. The term refers to open access regulations that accompany such a code. Thus, the “open source” software is software whose source code is freely available.

According to the definition provided by the official website of the open source, Open source software promotes the reliability and quality of software, supporting the independent review and rapid evolution of source code. To certify a product as open source, you must license the program to guarantee rights of free reading, re-distribution, modification and use.[64]

The term open source software has several levels of interpretation. First, this software is created and maintained by developers across corporate and national boundaries, working using communication tools and development tools on the internet.

Secondly, the products produced in this way is a kind of free products. In most cases, each application is accompanied by a license that makes it clear that software is free to use, modify and re-distribution. Any redistribution must also be provided on the same terms set by the permission of the original system.

The fact that the code of these products may be freely distributed, leading to the creation of successful applications faster, with greater responsiveness to user needs, who can easily use and evaluate these applications. As for users, no distinction is made between persons or groups. The open source products are available to everyone.

5.7.1 Features of open source software

To qualify a product as open source system, there are 5 criteria - freedoms that must be met:

- ✓ The program should be freely available for use
- ✓ It should enable anyone to study how the system and adapt it to your needs.
- ✓ Should be given the freedom to redistribute copies of any system to assist anyone who wishes.
- ✓ There must be freedom to improve the program and release improvements to the public so as to benefit all the (scientific) community.
- ✓ Finally, the system must be accompanied by a free software license in order to promote the redistribution.

5.7.2 Digital libraries and open source

The ease in finding ideas, code and software on the internet led the developers of programs to the conclusion that the creation of commercial software is actually not so efficient work. One important reason is probably that many of the stakeholders will want to enter the sales process, market and support software. Another reason is that the more people involved in the development of a system, the faster its upgrade.

But how can the open source software be useful in the development and operation of a digital library? The answer is that the characteristics and potential of the open source does not exist in commercial systems, while fully satisfying the needs and functions of a digital library . The main reasons why open source digital libraries are preferred by most private plans are as follows:

- ✓ **The open source systems have little or no financial cost:** These programs are usually inexpensive, whether for use by one or thousands of users. It also significantly reduces the cost of construction, as the developers of the systems have access to software libraries that are needed at no cost.
- ✓ **Supporting an open source system can be done from within:** Support for open source products do not belong exclusively to a single organization. Anyone knowledgeable individuals can work to develop such a system. Having this flexibility, any library staff able to understand the source code can be found that is able to use their own people in order to adapt the system to its environment, as members know far better than any other organization and needs.
- ✓ **An open source digital library can serve the needs of different user groups:** Open source systems, the responsibility for meeting user needs can be shared throughout the community libraries. A commercial system, for example, can both support and non-X Window X Window user interface. The developers an open source program, but can cooperate with other development teams in order to create alternative interfaces. These environments are then free online in order to integrate other systems and open software. In this way, programs developed much faster and more efficiently than ever.

Nowadays software products are distributed freely on the Internet. This allows global cooperation between members of the scientific community, resulting in faster development of increasingly efficient systems. Based on the above, one realizes that open source software can perform a key role in developing a digital library system, as well as systems based on open software and digital libraries are aiming to better serve their users.

The libraries are to perform a social mission: to provide adequate training to users which will allow them to be citizens of a strong, capable, independent, cooperative and free society. We encourage the use of free software in the same way that we encourage research and learning. The aim is to create responsible, critically thinking active citizens.

Regardless of age, gender, economic status, education level, ethnicity and physical ability to use free software is an experiential civic education course because it gives us a concrete example of teamwork and cooperation.

Conclusion

This paper presents the important role that libraries play in addressing the digital divide which is caused by lack of access to digital and information technologies.

Libraries are organizations that utilize information and communication technologies, promote the interest in knowledge and new skills, provide effective access and use of new technologies. By this way technologies can meet the needs of citizens, ensuring them an easier life and contributing decisively to the creation of an open society with more opportunities for citizens.

Today we are experience the era of information revolution, libraries in the frame of new design which materialize for wider and full access to knowledge develop information programs and services (information literacy, library 2.0, repositories) aiming at to bridge the digital divide reclaiming the advantages of new technology for the benefit of their users.

In this direction free, immediate, continuous and free of charges and from the most restrictive copyright online access to digital, academic and scientific content which is obtained from the open access and use of open source software bridges effectively to digital inclusion.

References

- [1] Bokos G. (2001), Introduction to Information Science, Papasotiriou
- [2] Institute of Modern Greek Studies (1998), Dictionary of Modern Greek, Aristotle University of Thessaloniki
- [3] Kriara E. (1995), New Dictionary of Modern Greek Primary Language, Written and Oral, Athens Publishing
- [4] Babiniotis G. D. (1998), Dictionary of Modern Greek, with comments on the Proper Use of Words, Centre of Lexicology
- [5] Bokos G. (2001), Introduction to Information Science, Papasotiriou
- [6] Bokos G. (2001), Introduction to Information Science, Papasotiriou
- [7] Castells M. (2005), The century of information and network society online at www.open-source.gr/content/modules/downloads/CASTELLS.pdf accessed 25.4.2012
- [8] Part of the Declarations of the Global Internet Liberty Campaign, a coalition of organizations from around the world which was created for the protection of human rights to freedom of expression on the Internet online at <http://www.gilc.org/> accessed 6.3.2012
- [9] Stamoulia - Polyzou A. and Tsoli T. (2006), Freedom of speech, Internet Filtering, censorship and libraries
- [10] Gordon G. (2001), Internet: a sociological approach, Periplus
- [11] Sartzetakis N. (1998), Ethics in Internet, Internet rights online at <http://www.sartz.gr/pdf/thesis.pdf> accessed 10.3.2012
- [12] Severson R. W. (1997), The Principles of Information Ethics, Sharpe Press
- [13] Pearce C. (1997), The Interactive book, Macmillan Technical Publishing
- [14] Gordon G. (2001), Internet: a sociological approach, Periplus
- [15] Doukata M, Theophilatou A, Bella I and Chatzaskou. C (2006), User information services today: features and trends, Work in Masters program in Information Science
- [16] Bangemann M. (1994), The Europe and the global Information Society. Recommendations to the Eu online at http://www.epractice.eu/files/media/media_694.pdf accessed 2.3.2012
- [17] Kubicek H. and Dutton H.W. (1997), The Social shaping of information superhighways: European and American roads to the Information Society, St. Martins Pr (Short)

[18] European Commission, Europe's way to the information society: An action plan Communication from the Commission to the council And the European Parliament and to the Economic and Social Committee and the Committee of Regions Correndum, COM(94) 347/2 final

[19] Doukata M, Theophilatou A, Bella I and Chatzaskou C (2006), User information services today: features and trends , pp. 1-50. Work Masters program in Information Science

[20] Mitrou L(2006), Law in the information society, Sakkoulas

[21] Citizens Rights and New Technologies – A European Challenge, Report of the European Group on Ethics in Science and New Technologies on the Charter on Fundamental Rights related to technological innovation online at http://europa.eu.int/comm/secretariat_general/sgc/ethics/en/index.htm/ accessed 25.2.2012_

[22] Mossberger K, Tolbert C.J. and Stansbury M (2003), Virtual Inequality: Beyond the Digital Divide, Georgetown University Press

[23] Gurstein M. (2003), Effective use: A community informatics strategy beyond the digital divide, First Monday,8, online at http://firstmonday.org/issues/issue8_12/gurstein/index.html/ accessed 2.5.2012

[24] “The digital divides”, Caslon Analytics net metrics and statistics guide on line at <http://www.caslon.com.au/index.htm/> accessed 2.5.2012.

[25] Gurstein M. (2003), Effective use: A community informatics strategy beyond the digital divide, First Monday, 8 online at http://firstmonday.org/issues/issue8_12/gurstein/index.html/ accessed 2.5.2012

[26] Electronic Integration and Measurement, online at www.observatory.gr/files/meletes/INCL_A0907XX-TX_Ηλ.Ενσωμάτωση_και_μέτρηση.pdf/ accessed 5.5 2012

[27] Kamaras D.(2004), Digital Strategies for the state, politics and economy, online at http://www.economics.gr/AllMedia/_gr/ accessed 04.05. 2012

[28] www.digitaldivide.gr/ accessed 5.5.2012

[29] Jenser M. (2008), (Independent IT, Internet and Telecom Consultant) online at <http://www.suvabay.com/> accessed 07.05. 2012

[30] Mylonakis G. (2003), Digital divide, but because of choice, online at http://www.enet.gr/online/online_text/c=112,dt=25.09.2003,id=27378468/ accessed 08.05.2012

[31] UNESCO (2004), Transforming the Digital Divide into Digital Opportunities for Rural Populations online at http://portal.unesco.org/ci/en/ev.php-URL_ID=17415&URL_DO=DO_TOPIC&URL_SECTION=201.html accessed 7.5.2012

[32] Luyt B. (2004), Who benefits from the digital divide? First Monday, 9, online at http://firstmonday.org/issues/issue9_8/luyt/index.html/ accessed 8.5 2012

[33] Blurton C. (1999), New directions of ICT-use in education, UNESCO's World Communication and Information Report 1999, online at <http://www.unesco.org/education/educprog/lwf/d1/edict.pdf/> accessed 25.01.2012

[34] Shariful I. and Nazmul I. (2006), Information and Communication Technology (ICT) in Libraries: A New Dimension In Librarianship, Asian Journal of Information Technology, 5, 809-817

[35] Fong M. W. L. (2009) Digital Divide: The Case of Developing Countries, Victoria University

[36] Chisenga, J. (2004). ICT in Libraries: An overview and general introduction to ICT in libraries in Africa, online at <http://www.inasp.info/lsp/ict-workshop-2004/session1-chisenga.ppt/> accessed 22.4.2012

[37] Patil D.B., S.S Kumbarand and H. Krishnananda, (1994), Information Technology: Current Trends, Library and Information Science, 3-32

[38] Chisenga J. (2004). ICT in Libraries: An overview and general introduction to ICT in libraries in Africa, online at <http://www.inasp.info/lsp/ict-workshop-2004/session1-chisenga.ppt/> accessed 22.04.2012

[39] Shariful I. and Nazmul I. (2006), Information and Communication Technology (ICT) in Libraries: A New Dimension In Librarianship, Asian Journal of Information Technology, 5, 809-817

[40] Shariful I. and Nazmul I. (2006), Information and Communication Technology (ICT) in Libraries: A New Dimension In Librarianship, Asian Journal of Information Technology, 5, 809-817

- [41] Chisenga J. (2004). ICT in Libraries: An overview and general introduction to ICT in libraries in Africa, online at <http://www.inasp.info/lsp/ict-workshop-2004/session1-chisenga.ppt/> accessed 22.04.2012
- [42] Chisenga J. (2004). ICT in Libraries: An overview and general introduction to ICT in libraries in Africa, online at <http://www.inasp.info/lsp/ict-workshop-2004/session1-chisenga.ppt/> accessed 22.04.2012
- [43] Shariful I. and Nazmul I. (2006), Information and Communication Technology (ICT) in Libraries: A New Dimension In Librarianship, Asian Journal of Information Technology, 5, 809-817
- [44] Shariful I. and Nazmul I. (2006), Information and Communication Technology (ICT) in Libraries: A New Dimension In Librarianship, Asian Journal of Information Technology, 5, 809-817
- [45] Fragedakis A. (2003) Services of Academic and Public libraries against digital exclusion online at <http://eprints.rclis.org/bitstream/10760/9685/1/12psab047.pdf/> accessed 08.04.2012
- [46] Universal Declaration of Human Rights, Article 19. Decisions adopted by the General Assembly on December 10, 1948, online at <http://usgovinfo.about.com/bldechumanrights.htm/> accessed 20.3.2012
- [47] Charter of Fundamental Rights, Nice, December 7, 2000, online at http://www.europarl.europa.eu/charter/default_en.htm/ accessed 20.3.2012
- [48] www.ala.org/ accessed 15.03.2012
- [49] www.cilip.org.uk/ accessed 15.03.2012
- [50] Korompili S., Malliari A. and Christodoulou G., Contribution of Librarians in Information Literacy online at http://195.251.240.254:8080/bitstream/handle/10184/1270/koro_papei.pdf?sequence=3/ accessed 03.04.2012
- [51] Killcullen M. (1998). Teaching librarians to teach: Recommendations on what we need to know, Reference Services Review, 7-18
- [52] Andreou J, Gaitanou P., Garoufallou E., Koutsomicha D. and Kriezi V.(2008), Research on the familiarity of Greek Cypriots and Information Scientists with Web 2.0 services, online at <http://eprints.rclis.org/bitstream/10760/12417/1/b13.1.Andreoy.pdf/> accessed 13.2.2012
- [53] www.wikipedia.com/ accessed 13.03.2012

- [54] <http://conferences.alia.org.au/access2010/call.html/> accessed 12.02.2012
- [55] Godwin P. (2007), The Web 2.0 challenge to Information Literacy, online at <http://www.inforum.cz/pdf/2007/godwin.peter.pdf/> accessed 24.04.2012
- [56] Papazoglou A. (2010) Information, Digitization, Dealing with plagiarism, Organisation, Developing reading habits: some keywords from the multiple role of the librarian today. How the librarian of the 21st century can deal with them? Workshop “Role of Librarian in the 21st century”?
- [57] Tsimpoglou P. (2004), Libraries in the digital environment. Possible roles and necessary skills online at www2.ucy.ac.cy/~ftsimpoglou_ionio_2004.ppt/ accessed 20.02.2012
- [58] Maness J. M. (2006), Library 2.0 Theory: Web 2.0 and Its Implications for Libraries, Webology, 3, online at <http://webology.ir/2006/v3n2/a25.html/> accessed 10.05.2012
- [59] <http://greeklis.org/?p=149/> accessed 23.04.2012
- [60] Open Access online at http://www.openaccess.gr/openaccess/ekt_openaccess.dot/ accessed 23.03.2012
- [61] Serafimidou E. (2008), Open Access in digital repositories online at library.panteion.gr:8080/dspace/bitstream/123456789/1731/1/6PMS_DYN_KOI_SerafimidouEu.pdf/ accessed 12.05.2012
- [62] Open Access online at http://www.openaccess.gr/openaccess/ekt_openaccess.dot/ accessed 23.03.2012
- [63] Open Access online at http://www.openaccess.gr/openaccess/ekt_openaccess.dot/ accessed 23.03.2012
- [64] <http://www.opensource.org/> accessed 28.04.2012