Knowledge Society
DMLIS101

Unit-1
Knowledge Society

1. Introduction

Knowledge has been at the heart of growth and development since time immemorial. The ability to invent and innovate, and create new knowledge to trigger development of new products, processes and services that help improve the quality of life has been a principal occupation of mankind .The terms 'knowledge society', 'knowledge-based economy', however, are terms that were coined more recently. It is important for proper understanding to make a distinction between knowledge and information. Knowledge empowers its possessors with the capability for action- intellectual or physical. Knowledge is a matter of cognitive capability. Information, on the other hand, takes the shape of structured and formatted data that remain passive and inert until used by those with the knowledge needed to interpret and process them. The term knowledge society was probably first used by Peter Drucker in 1969 (1). It is not a mere coincidence that the idea emerged along with such notions as learning societies, life-long education, etc; the notion of knowledge society is closely related to these. In a broad sense every society has been a knowledge society as every society must have had its knowledge assets. However when the term is used in the present context ,it often refers to a society in which knowledge is a primary factor of economic productivity as contrasted with societies in which capital and labour still rule. There is another significant difference between 'knowledge society' as understood today and the earlier knowledge societies. The focus today is on human rights, inclusivity and participation of all sections of the society. A knowledge society generates shares and applies knowledge for the prosperity and well-being of its people and for overall development.

A closely related term 'Post-industrial society' was used as early as in 1914, i.e. 100 years ago. It was Daniel Bell who revived its usage in his well known book, The Coming of Post-Industrial Society (2). This term was the most frequently used one before the expression "information society" gained overall acceptance; it defined the newly emerged social-economic phenomenon by emphasizing the fact that the old structures of the industrial era were replaced by new ones rather than by focusing on its "content". Information Society is a closely related term and widely used today (3). Although the terms 'Information society' and 'Knowledge society' are often used interchangeably there is a difference that needs to be understood. The idea of 'Information society' as it is understood today, is primarily based on the technological breakthroughs that resulted from the revolution in information and communication technologies (ICT). While the idea of the Internet as a public network and as a platform for universal and equitable access to knowledge resources is at the core of the concept of 'Knowledge society', the

notion has much broader implications as it has social, political, cultural and even ethical dimensions. Plans to ushering in a Knowledge society' should be based on the clear understanding that even in today's technology driven society the control of knowledge and access to knowledge can go hand in hand with serious inequality, exclusion and social conflict. Ideally a true knowledge society should integrate all its members and promote new forms of solidarity involving both present and future generations. Nobody should be excluded from knowledge societies, where knowledge is a public good, available to every individual.

Abdul Waheed Khan of the UNESCO Division for Communication and Information says, "Information society is the building block for knowledge societies. Whereas I see the concept of 'information society' as linked to the idea of 'technological innovation', the concept of 'knowledge societies' includes a dimension of social, cultural, economical, political and institutional transformation, and a more pluralistic and developmental perspective. In my view, the concept of 'knowledge societies' is preferable to that of the 'information society' because it better captures the complexity and dynamism of the changes taking place. (...) the knowledge in question is important not only for economic growth but also for empowering and developing all sectors of society." (4)

2. Terminology and Definitional Issues

Perhaps a brief discussion on terminology and definitions of knowledge society is relevant. Some argue that Information Society is not an appropriate term as, 'to inform' refers to a unidirectional process intended to alter the state and / or behavior of a passive receiver. The suggestion is to employ, instead, the term 'information and communication societies'. It is argued that 'communication' places emphasis simultaneously on both reception and dissemination and leads to a social structure. As for the term 'knowledge society', those who uphold it feel that it evokes a more integral vision and an essentially human process. To some, the expression knowledge society denotes a more "progressive" state than information society. Too some, information society is one of the components of knowledge society, which is not surprising as information is one of the constituent parts of knowledge. There are, though, those who are not very happy with the use of the term; The term 'knowledge' extensively used in today's corporate sector places emphasis on the economic value and function of knowledge (as, for example, in the notion of 'Knowledge Management', which emphasizes an organization's or individual's claim to a piece of knowledge and how to take economic advantage of knowledge of employees of an organization); There is also the feeling that the

emphasis in 'Knowledge Management' is on the type of knowledge that is supposedly objective, scientific, and is amenable for digitization. Such an approach, it is argued that, tends to view knowledge and information as a commodity rather than as public good; this has been severely criticized by the civil society throughout the world which rejects the supremacy of the market over health, culture, environment, and development in general. That resistance is alive and active even today and is fighting for acceptance of exceptions to the rules of international trade and for respect of our common interests to ensure that they are not subordinated to intellectual property and market interests. Interestingly it is the liberalization movement that is fighting for recognition of information and knowledge as a public good; on the other hand , the same movement holds that only a free and open economy can ensure the speedy development and building up of the infrastructure necessary for universal access to information. Another interesting variants "shared knowledge society (ies)" .The emphasis is on the plural form (Societies rather than Society) recognizing the heterogeneity and diversity of human societies.

László Z. Karvalics lists the following definitions from among over 50 such definitions:(5)

- A society that organizes itself around knowledge in the interest of social control, and the management of innovation and change... (Daniel Bell)

- A new type of society, where the possession of information (and not material wealth) is the driving force behind its transformation and development ... (and where) human intellectual creativity flourishes. (Yoneji Masuda)

- The information society is an economic reality and not simply a mental abstraction ...The slow spread/dissemination of information ends ... new activities, operations and products gradually come to light. (John Naisbitt)

- A society where ... information is used as an economic resource, the community harnesses/exploits it, and behind it all an industry develops which produces the necessary information ... (Nick Moore)

- A social structure based on the free creation, distribution, access and use of information and knowledge ... the globalization of various fields of life. (Hungarian) National Strategy of Informatics, 1995

- A new type of society in which humanity has the opportunity to lead a new way of life, to have a higher standard of living, accomplish better work, and to play a better role in society thanks to the global use of information and telecommunication technologies." (BélaMurányi)

Evidently the definitions are based on different perceptions and what the author of the definition perceives as the aspect of life affected significantly. As is obvious from a reading of the above definitions, some focus on resources, some on products, or industries, or activities, or society and people. Some definitions consider the representation of global dimensions extremely important, while others do not. Some view political dimensions (control) as important; others do not even mention it. Partly the differences stem from the fact that both 'information' and 'knowledge' are ambiguous and have never really been clearly defined. Whichever term is used, it will be primarily to refer to a phenomenon – present, emerging or future. It is important, however, to realize that the term does not necessarily define the content. The content should emerge from usage after considering the concerned specific social context, which in turn influences perceptions and expectations.

It is, however, important to differentiate between an existing or an emerging reality (referred to as Information / Knowledge Society) and an ideal (Vision) one that we would like to realize. An understanding of the first will help us clearly identify and analyze the factors that have contributed to the reality , and the second – vision or goal – will assist us shape and formulate our policies and programmes that will help us get there. With regard to the first – an existing or emerging reality - Manuel Castells prefers the term 'informational society' to 'information society' (making the comparison with the difference between industry and industrial). Knowledge and information are decisive elements in all modes of development: "the term informational indicates the attribute of a specific form of social organization in which information generation, processing, and transmission are transformed into the fundamental sources of productivity and power, due to the new technological conditions that arise during this historic period." [6].

The documents that have emerged from the WSIS (The global summits on Information Society) are important. In fact developing a common vision of the Information Society' was one of the goals of WSIS. The declarations adopted at WSIS are significant as not only governments participated in these; but civil society has played a major role in shaping the outcome of WSIS. The Geneva Declaration of Principles [7] adopted by governments, with significant contributions from civil society, in its first article, says:

"We... declare our common desire and commitment to build a people-centered, inclusive, and development-oriented Information Society, where everyone can create, access, utilize, and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights."

The Civil Society Declaration [8] extends this vision and focuses on a commitment to building people-centered, inclusive, and equitable information societies, i.e. a society in which everyone can freely create, access, utilize, share and disseminate information and knowledge. The focus here is more on empowering people to improve their quality of life and to achieve their full potential. The principles of social, political, and economic justice, as well as capacity-building of the peoples are emphasized as essential for sustainable development, democracy, gender equality; and for ensuring fundamental human rights.

2.1 Approaches to Information Security

One also sees two slightly different approaches in moving towards Information Society. One approach views Information Society as a new development paradigm that looks at technology as causal and neutral factor in the social order and as a driving force in economic development. Many developing countries (and to a certain extent, even India) seem to have adopted this approach which places technology at the core of this development model expecting the telecommunications industry to lead this move towards an Information society. The digital content production industry also assumes significance in this approach. The second perspective contests the first one in certain respects. This approach emphasizes that the focus should be on human beings and conceived in terms of their needs and within a benchmark of human rights and social justice. It suggests that the new phase of human development that we are entering into is characterized by the predominance of information, communication, and knowledge in the economy as well as human activities. Technology has accelerated this process; but is not a neutral factor, as technological development is guided by games of interest. While the first perspective focuses on data, telecommunication channels, and

storage space, the second is about human beings, cultures, and communication; i.e. the information is determined in terms of society and not the other way.

The following could be inferred from the above discussions:

- The term 'Information Society' (or knowledge society) may not necessarily imply the same notion for all. It is therefore appropriate to think in terms of information societies considering the pluralistic, heterogeneous and diverse nature of societies. An equally important point is that in moving towards an information society a country will have to consider and employ technologies appropriate to tits development priorities;

- The term Information Society also means a society in which Information /Knowledge is a public good and not a commodity or private property; Information communication is a participative and interactive process; and technologies, a support for all this without being an end in itself.

- The true dimensions of information society will be visible not within telecommunications or informatics, but rather in education, science, innovation, the (new) economy, content and culture.

It is doubtful if it is meaningful to try and differentiate between the meanings of 'knowledge society' and 'information society'. The conceptual distinction between the two is only relative and is indeed very difficult to sustain as these terms are often used as synonyms. The difference is in the focus. One way to broadly understand the difference in the focus between the two is to view them as below[1]:

Information society is a society in which information is seen as a commodity that one can exchange, buy, sell, store, transport, process. In the Information society the problem of digital dividepersists. On the other hand, Knowledge Society is one which seeks to over come the problem of digital divide. A society in which knowledge should ideally bring justice, democracy, peace, etc. A society in which knowledge isused to transform the society in to a more equitable, just and democratic society with universal and enquit able access to information for all. A knowledge society, therefore, presupposes the availability and accessibility of

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[1]*Note* : The twotermswillbeused more or lessinterchangeably in thistext

knowledge resources relevant to the community under consideration and in a language and format understandable to the members of the society. In the Knowledge Society, every learner is a lifelong learner. The content and the methods of initial education must take into account preparation for lifelong learning. ICT is a key tool for developing lifelong learning. The development of lifelong learning needs an integration of education into the real world - ICT should be used for this purpose. Lifelong learning must be encouraged in all countries, as a tool for reducing the Digital Divide.

3. Traits and Characteristics of the Information Society

Before examining the traits and characteristics of knowledge society, it is useful to note some of the indicators that suggest that the knowledge society has indeed arrived.

- The single most important indicator is the unprecedented speed at which new knowledge is created, accumulated, and also the rate at which its economic value depreciates. This reflects the pace of scientific and technological progress;

- Increasingly the disparities in the productivity and growth of different countries have less to do with the availability of natural resources than with the capacity to improve the quality of their human resources to create new knowledge and ideas and incorporate them;

- Significant proportion of the workforce is getting involved in knowledge-related activities.

Daniel Bell is widely credited with defining the characteristics and traits of the information society and contrasting these with those of the industrial and pre-industrial societies. He categorizes societies into three broad groups based on a number of parameters. The three groups of societies according to Bell are:

- Pre-Industrial Society
- Industrial Society
- Post-Industrial Society

Society Parameter	Pre-industrial	Industrial	Post-industrial
Mode of Production	Extractive	Fabrication	Processing; Recycling
Economic sector	Primary: Agriculture; Mining; Fishing Timber; Oil and gas	Secondary: Production of Goods; Construction industry	Services; • Tertiary: Transportation; Utilities • Quaternary: Trade; Finance; Insurance; Real estate • Quinary: Health; education; research; government, recreation
The Principal Resource for transforming the Economy	Natural power wind, water, draft animals, human power	Generated energy Electricity - oil, gas, coal, nuclear power	Information & Knowledge Computer and data-transmission systems
Strategic Resource	Raw materials	Money	Human knowledge
Technology	Craft	Machine Tools	ICTs
Work Force	Artisans, Craftsmen, Farmer	Engineers, Skilled workers, Technicians	Scientists, Knowledge Workers, Those generating new knowledge

Methodology	Common sense, trial and error; experience	Empiricism, experimentation	Modeling, simulation, decision theory, system analysis
Time perspective	Orientation to the past	Adaptability	Future orientation: forecasting and planning
Axial Principle	Conserving and Maintaining the tradition	Economic development	Codification of knowledge

Table 1: Pre-Industrial, Industrial and Post-Industrial Societies

(Source: Adapted from Daniel Bell)

The three periods correspond to those defined by Alvin Toffler in his book, The Third Wave (1980) (9); They also match with the typology employed by TadaoUmesao, who divided the economy into endodermal (agriculture, fishing), mesodermal (transportation, heavy industry) and ectodermal (information, communication, training) sectors.

It is useful to examine briefly the traits and characteristic differences identified by some other important writers in the area. Masuda also compares industrial and information societies (10).

Aspect	Industrial Society	Information Society
Core Technology	Power; Steam Engine; Focus on replacement and amplification of physical labour	Computational Power: Focus on replacement and amplification of mental abilities
Products	Goods	Information, new technologies
Work Place / Production Centre /	The modern factory	Information utility; Information & Knowledge Industry

Industries		
Forces of Social change	Labour movements	Civil Society, Citizens' movements
Social problems	War, Labour strike, etc	Future shock, Digital divide, Terrorism

Table 2 Industrial & Information Societies

Schement and Curtis reduce the essential components to a few categories. (11) While their categories include the already known categories such as good, industry and work, they also introduce some entirely new ones, such as interconnectedness, media environment and community. Obviously there are different ways of looking at and characterizing the information society. Broadly we can conclude that information societies are characterized by the:

3.1. Emerging Patterns of Information Security

- **Focus on ideas:** Tangible goods are no longer the forces that drive the economy; New ideas and innovation that bring about changes in the quality of life of people are the factors that drive economic growth and development;

- **Focus on continuous education**: The new focus on information and technology emphasizes the importance of education and lifelong learning in the knowledge society;

- **Shift in workplace**: New communications /technology allows work to be performed from a variety of locations;

- **Focus on empowering people**: The focus is on ensuring that not only people are beneficiaries of the revolution brought about the new technologies, but are also empowered to actively participate in the process of development and decision-making.
- **Focus on service sector as the primary driving force of the economy**: Service is a more important factor of growth of the economy than production of goods. Communication and Technology have developed attracting employees to the service sector (white collar employees).

Most of us have been experiencing the changes that have come about in banking, airline / railway reservations, education, governance, shopping, etc areas - as a result of the impact of ICTs. The impact has been so pervasive that there is hardly any sector of human activity that has not been impacted the ICTs.

4. Some indicators of information security

There are distortions related to information society. Some place the dawn of the information society in the distant future; some argue that an information society existed as early as the late 19th century. Some even question the viability of the term as historically information and knowledge have always played an important role in the society. It is therefore better to understand 'information society as a historical notion and as referring to a social condition which a society can claim to have attained by taking various criteria into consideration as opposed to the prior stage of development it had achieved. In this section we will briefly examine some of these indicators. But before we begin it is important to understand that these indicators are just that, **'indicators'**. The measures are only indicative of the stage a country or society is in its transition to an information society. In fact one of the primary goals of the first phase of the WSIS meet was precisely to develop a common vision of the information society. There is at present no consensus among sociologists as to what variables should be examined in order to ascertain whether and when a country transited into the information society club. As technology has developed the measures suggested have also changed. For example the number of telephones for every 1000 population was considered a good indicator of interconnectedness some years back, while today the basic indicators for this are mobile phones, internet connectivity and usage.

Surely different countries are in different stages in terms of their transition to 'knowledge society'. Even within a country different regions and sections of the society usually are in different stages of transiting into the information society[2]. An idea of the proportion of population using Internet in the developed and developing countries of the world can be got from the graph below (Fig. 1).

The developed countries of Europe, North America, Australia, New Zealand and a few Asian countries could be said to have become information societies. However, a great part of Africa, Asia and Latin America cannot be regarded as information

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[2]The digital divide – a subject that will be dealt with in greater detail in another lesson in this package

societies. The transition is faster in small countries in which the internal penetration time for a new technology is minimal; whereas in large, complex and diverse societies a new technology takes much longer to become widespread and touch all sections of the society.
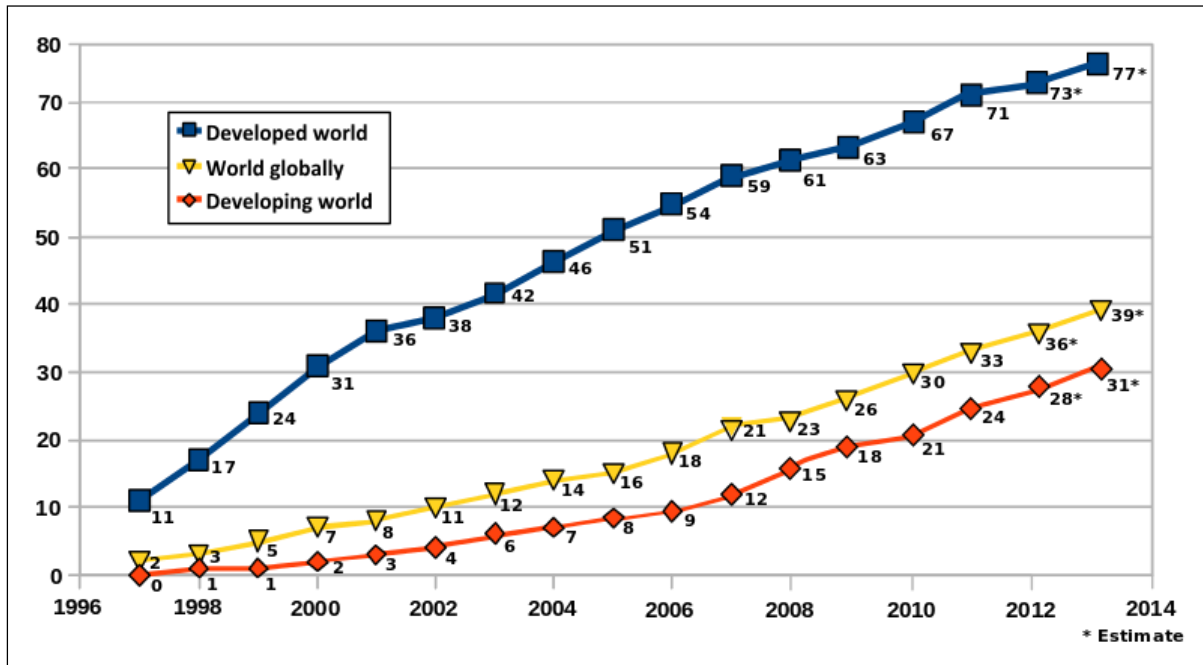

Fig. 1 Internet users per 100 inhabitants

(Source: International Telecommunication Union http://en.wikipedia.org/wiki/File:Internet_users_per_100_inhabitants_ITU.sv g)

In addition, literacy levels, culture and even geography play a major role in determining the speed with which informatization of different sections and regions of the society happens. Karvalics lists the following criteria for assessing the stage in which a society is in. These assume significance because they are measurable and could be quantified. (5)

Some are of the opinion that if a single year is to be mentioned as the beginning of the transition to information society ,it has to be the year 1961 when the prototype computer network forming the backbone of the networked society was built. This was the period when man entered space and began transmitting signals using satellites. The birth of the global information society is expected to happen around 2020.

Another area that will see far-reaching and fundamental changes – but an area in which changes are only beginning to happen, at least in most countries – is e-governance.

Basic category	Measure and "tipping point"	Metaphor
Production (Manufacturing)	The proportion of businesses forming part of the information sector and producing information and knowledge products in relation to other sectors (relative dominance: when it is the largest sector; absolute dominance: when the sector alone produces over 50%, i.e. it is larger than all the others put together).	Information industry, knowledge industry, information and knowledge industry, information economy, knowledge economy, knowledge-based economy
Employment	The number and proportion of those employed in the information and knowledge sectors in relation to other sectors (relative dominance: when it is the largest sector; absolute dominance: when the sector alone produces over 50%, i.e. it is larger than all the others put together).	White-collar workers, information and knowledge workers, immaterial workers, knowledge class intelligentsia
Work	How many people and to what degree are engaged in information activity "as a profession" according to the type of work done. (Threshold level: 50%)	Symbol manipulators (Reich, 1991), intelligence, brainworker/ mind worker
Resource and	Information and knowledge appear as resources and forms of capital in addition to traditional	intellectual capital, human

technology	forms - the theory of growth and accounting strive to mathematise this but so far there are no accepted algorithms. (However, the contribution of information and knowledge technology to growth is already measured).	capital, information capital, corporate information and knowledge assets

The significance of the Internet in governance is because ICTs have the potential to affect production (or capacity) as well as coordination, communication, and control. In other words they have the power to alter the fundamental nature of organizations and governments. While the corporate sector has brought in significant changes in the ways in which organizations function, the effect of IT on governance has not been as visible, especially in the developing and less developed countries; perhaps governments change much more slowly probably because market mechanisms that operate in the corporate world and weed out less competitive forms are not relevant here. It is also partly due to the complexities of government and bureaucracies.

5.   Issues in the Information Society

In the emergence of knowledge societies accelerated by rapid technological advances,both hopes and fears have been expressed. Of course the potential of the new technologies to represent the full diversity of knowledge and provide access to disseminate knowledge is something that is widely accepted. There are issues, however, such as privacy, social justice, peace and sustainable development. Clearly the benefits of living in knowledge-intensive societies are not equally felt by all sections of the society. Unless all citizens are enabled to evenly enjoy the new opportunities offered by ICTs, the new technologies may result in further widening the multi-layered digital divide experienced both between individuals and entire communities leading to social exclusion of certain sections of the society. It is important to address these issues, if a truly knowledge society has to be established. Let us briefly examine some of these issues:

- **Privacy and Freedom**: It is a paradox that while ICTs make people more free the technology also enables surveillance by governments and others.

The new technologies raise serious questions related to privacy and freedom. Such fear of loss of privacy could lead people to avoid using technologies and this could have serious consequences. There is therefore the important issue of whether in the name of openness and free access to information and knowledge, societies become societies of technological surveillance? Knowledge societies could lead to confusion between knowledge for all and knowledge on all? There should be a clear separation between the public and private domain to protect individuals against too intrusive an interest by others in what does not concern them.

- **Digital Divide:** It has been estimated that there are some 500 million of the world's population, three-fourths of them in developing countries, not benefiting from the knowledge resources and services of libraries and other information systems. This is an anachronism. There is not only a digital divide between nations but also within a country, For Example between urban and rural populations. Some believe that the digital divide will close naturally over time, others hold that there is nothing "new" about the divide as it only reflects existing structural disadvantage. These suggest the need for more profound social changes beyond those offered by technological skills. Looked at from a community perspective it is important to ensure that people have adequate knowledge to be able to use computers, the Internet, etc.

- **Control of the Network**: Another issue that also needs to be addressed is the one that relates to network control. Issues such as those related to open standards, public control or proprietary systems and ownership come up here. It has been suggested that Information Age disaster comes from the network of networks not outer space.

- **Commercialization of Knowledge**: The increasing commoditization of knowledge and access to information is also seen in some quarters as a possible threat to the transition to knowledge society. There is no question that the emergence of information industry as a major player is primarily due to the commercial value of information on the one hand and the phenomenon of information overload on the other.

- **Legal and Rights Issues**: An important issue that will frequently crop up as possession of knowledge, access to knowledge and the ability to apply knowledge increasingly become factors of economic growth and development, relates to ownership of information and intellectual property

rights. This is closely related to the preceding issue (commercialization of knowledge).

Some of the other issues that will be at the centre of debate and discussions as countries progress and get closer and closer to becoming knowledge societies are:

- **Information Overload**: Too much to know, and little time do anything;

- **Organisation of Work**: The networked economy, Tele-working, Flexible Working, Portfolio workers, Virtual workplace have changed the wok environment; Many knowledge communities also cut across the boundaries of conventional organizations (businesses, research institutions, government agencies, etc.) and members are at the same time employed in different organizations.

- **Death of Distance**; The End of Time; 24 hour Global economy

5.1 Information Society: Challenges for India

The need to transform the society into an Information / knowledge society is evident. For a country such as India, clearly there are major challenges. Some of these have been addressed to a significant extent. But some are yet to be addressed. The transit into a knowledge society requires that:

- The country adopts a comprehensive national information policy that will particularly focus on bridging the digital divide between the haves and have nots; the importance of bringing in the marginalized sections of the society into the mainstream cannot be over emphasized. This in turn calls for clearly defined policies related to relevant digital content creation in the regional languages and scripts;

- The country puts in place an appropriate information, telecom and network infrastructure; The reach should extend to the remote regions of the country;

- The country puts in place appropriate legislation related to copyright and intellectual property

In recent times considerable progress has been made with regard to these aspects of these.

6. Summary

The growth of knowledge economy and its eventual transformation into a knowledge society across the globe depends largely on the proliferation of knowledge-intensive communities. These communities are linked to scientific and business projects. They are characterized by strong knowledge production and application capabilities, and extensive use of ICTs. Only when increasing numbers of communities displaying such traits and characteristics are formed across many countries and organizations, will the knowledge society become a reality rather than merely a vision.

In the following modules some of the major subthemes that have been emphasized above – e.g. the digital divide, communication processes and models, intellectual property rights, information infrastructure, information industry, the economics of information and knowledge, etc will be examined in greater detail.

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Unit-2
Theories & Models of Communication

1. Communication

The word communication has a rich history. Since the beginning of time, the need to communicate has been a part of man's inherent being. The successful survival of mankind was due to their ability to communicate. Human race has communicated though different techniques and methods; the use of symbols, gestures, sounds, drawings and sign languages were some methods of communication used by the early man. Archaeological evidence shows that the early men were good artists and have been effectively communicating through the visual sense, the transmission, reception, or reproduction of sound and the study of body movements. Through the years communication has advanced with the development of technology. Hence it is clear that communication has assumed an immense importance in our time. (Littlejohn, 2002)

Etymologically, the word 'communicate' is derived from the Latin verb - *communicare, adjective - communis* and old French adjective - *comun.* The key root is '*mun*' (and not 'uni') stemming from the Latin word *'munus'* meaning to share publicly/ impart/ make common. Communication is thus traced back to be derived from the old French term *comunicacion* and Latin word *communicatio (n-).* This clearly only means 'to share' and are 'common' to all. This word seems to have entered into English language in 14th and 15th centuries. The term originally meant sharing of tangible things; food, land, goods, and property. Today, it is often applied to knowledge and information processed by living things or computers. Communication connects people and places. Thus, it is clear to understand that communication allows people to exchange their thoughts and ideas through speech, signals, writing, or behaviour. Basically, communication is shared feelings/shared understanding. People have always communicated, but the process of communication became the subject of studies in the 20th century. The serious study of communication was triggered by the development of technologies.

1.1. Concept of Communication

Communication is a two-way process of reaching mutual understanding in which participants not only exchange ideas, feelings and information but also create and share meaning. It is the exchange of thoughts, messages, or the like, by speech, signals or writing. It is to express oneself in such a way that one is readily and clearly understood. It is a process of conveying information from the sender to the receiver with the use of the media in which the communicated information is understood.

Communication is the expression or exchange of information by speech, writing, gestures, conduct or electronic medium. It is a process of passing

information, ideas, facts, or opinions from two or more parties. It is the process by which an idea is brought to another's perception. The information that is so expressed or exchanged is also referred to as communication. It is a complex and dynamic process that allows organisms to exchange information by several methods.

To quote a few select definitions on communication:

US ARMY: "Communication is the exchange and flow of information and ideas from one person to another; it involves a sender transmitting an idea, information, or feeling to a receiver."

William Rice-Johnson: "A communication takes place when one individual, a sender, displays, transmits or otherwise directs a set of symbols to another individual, a receiver, with the aim of changing something, either something the receiver is doing (or not doing) or changing his or her world view. This set of symbols is typically described as a message."

Pranav Mistry: "Effective communication occurs only if the receiver understands the exact information or idea that the sender intended to transmit. Many of the problems that occur in an organization are the either the direct result of people failing to communicate and/or processes, which leads to confusion and can cause good plans to fail." Peter Drucker: "The most important thing in communication is hearing what isn't said."

Conrad & Poole: "Communication is the process by which people interactively create, sustain and manage meaning"

1.2. Components of Communication

Communication comprises of eight major components, which make the object of study of the communication theory. They are so integral and interdependent that they are considered as basic elements of any communication process. They include:

Source is that which "*produces a message or sequence of messages to be communicated to the receiving terminal.*"

Sender refers to *transmitter*, which "*operates on the message in some way to produce a signal suitable for transmission over the channel.*".

Channel is "*merely the medium used to transmit the signal from transmitter to receiver*".

Receiver "*performs the inverse operation of that done by the transmitter, reconstructing the message from the signal*."

Destination is "*the person (or thing) for whom the message is intended*".

Message is derived from Latin word *mittere*, meaning "to send". It refers to a concept, information, communication or statement that is sent in a oral/ graphic/written/audio/visual/audio-visual form to the recipient.

Feedback is the loop of making a two-way communication process related to the response to the message. It is simply the reaction of the Destination back to the Source, direct and/or indirect.

Context is considered as a very significant component as it decides the given communication process and fixes all the above said seven components. It refers to the background and the environment – immediate and far. Space and time play a larger role of a given communication. A good communication means different things to different (or even same) people at different times.

The other three elements associated in the process of communication are: **Entropy, Redundancy and Noise.** Entropy is a measure of the amount of uncertainty associated in the message/content. Redundancy is either knowingly or unknowingly enters the communication process. If deliberate, it serves the purpose of reiterating the message and otherwise receptiveness is undesired element. Noise is actually anything irrelevant, unwarranted, undesired and hence, a disturbance/interference to the effective transmission process. Noise is anything that disrupts or interferes with the effective communication process. Noise can be physical or psychological or semantic, it can disturb the communication process at any point, and it can be associated with any elements in the system.

- Physical noise or external noise which are environmental distractions such as poorly heated rooms, startling sounds, appearances of things, music playing somewhere else, and someone talking really loudly near you.
- Physiological noise are biological influences that distract you from communicating competently such as sweaty palms, pounding heart, butterfly in the stomach, induced by speech anxiety, or feeling sick, exhausted at work, the ringing noise in your ear, being really hungry, and if you have a runny nose or a cough. Psychological noise are the preconception bias and assumptions such as thinking someone who speaks like a valley girl is dumb, or someone from a foreign country can't speak English well so you speak loudly and slowly to them.

- Semantic noise is word choices that are confusing and distracting such as using the word tri-syllabic instead of three syllables.

1.3. Classification

Human communication may be broadly classified as:

- Intrapersonal
- Interpersonal
- Group Dynamics
- Public/Mass
- Organization
- Cross cultural

- **Intrapersonal communication** is a communicator's internal use of language or thought. It can be useful to envision intrapersonal communication occurring in the mind of the individual in a model which contains a sender, receiver, and feedback loop.
- **Interpersonal communication** is an exchange of information between two or more people. Interpersonal communication is the process by which people exchange information, feelings, and meaning through verbal and non-verbal   messages

- **Group dynamics** is a system of behaviours and psychological processes occurring within a social group (intra group dynamics), or between social groups (intergroup dynamics).

- **Mass communication** is the process by which a person, group of people, or large organization creates a message and transmits it through some type of medium to a large, anonymous, heterogeneous audience. Public communication includes mass media, public relations and public speaking, but can include any form of sending a message to a large group of people.

- **Organizational communication** is a subfield of the larger discipline of communication studies. Organizational communication, as a field, is the consideration, analysis, and criticism of the role of communication in organizational contexts.
- **Cross cultural communication** – It is a field of study that looks at how people from differing cultural backgrounds communicate among themselves, and how they endeavor to communicate across cultures. Intercultural communication is a related field of study.

Any of the above, depending on the choice of the medium, may be classified further as verbal, non-verbal/bodily and graphic communication.

Verbal communication: is the sharing of information between individuals using speech that employs a natural language like English and readily understood spoken words as well as ensuring enunciation, stress and tone with which the words are expressed appropriately and understood correctly.

Bodily communication: refers to various forms of non verbal communication, wherein a person may reveal clues as to some unspoken intention or feeling through their physical behavior. These behaviors include (but are not limited to) facial expressions, body posture, gestures, eye movement, touch, etc.

Graphic communication: uses graphic elements. These elements include symbols such as glyphs and icons, images such as drawings and photographs, and can include the passive contributions of substrate, colour and surroundings. It is the process of creating, producing, and distributing material incorporating words and images to convey data, concepts, and emotions.

Whatever may be the type, human communication focuses on discovering persons and is associated with subjectivity.

1.4. Theories and Models

A *theory* is intended to provide an abstract understanding of a process. It is simply a summary of a process. Hoover (1984) defines it as *"a set of inter-related propositions that suggest why events occur in the manner that they do"*. Foss, Foss and Griffin (1999) define theory as, *"a way of framing an experience or event—an effort to understand and account for something and the way it functions in the world"*. "Theories are not just things to be read and learned. They are constantly evolving works." (Littlejohn, 2002, p. 25). Any thoughts or ideas about how things work in the world or one's life are personal theories. Theories are essentially framework for how the world works, and therefore guide how to function in the world. The term communication theory may refer to a single theory or an entire set of theories related to communication.

The origin of the word **'Model'** could be traced back to the French word *modèle;* Italian *modello*; and the Latin *modus,* meaning measure or standard. Model refers to a representation / replica of the original. A model is a schematic description of a system, theory, or phenomenon that accounts for its known or inferred properties and may be used for further study of its characteristics. Thus communication models seek to represent the structure and key constituents of the process of communication.

2. Communication Theories

In a field like Communication, theories are important to understand because they directly impact our daily lives. There are several functions in guiding our

communication. The first function communication theories serve is that they help us understand our communication experiences. The second function is that they help us choose what communicative behaviours to study. The third function is that they help us broaden our understanding of human communication. The fourth function is that they help us predict and control our communication. The fifth function of theories is that they help us challenge current social and cultural realities and provide new ways of thinking and living. While theories serve many useful functions, these functions do not really matter if we do not have well-developed theories that provide a good representation of how our world works. A well-developed communication theory helps to better understand and explain the communicative behaviours of ourselves and others. Littlejohn considers a communication theory to be "any conceptual representation or explanation of the communication process".

2.1. Evolution

Communication theory is the discipline that studies the principles of transmitting information and the methods by which it is delivered (as print or radio or television, etc.). A "communication theory" is an attempted explanation of how and why humans communicate meaningfully with each other. Such theories have originated from a variety of different fields, including Psychology, Biology, and Philosophy, though the actual study of the nature of communication is a field in itself. At its core, It is generally devoted to explaining how exactly an individual is able to communicate meaning to another and the degree to which the speaker and the listener understand each other. Other theories are more focused on the historical and ritual significance of communication as an essential element of culture. Such theories may focus on the broad cultural effects of communication instead of the specific process of transmitting meaning.

Interest in communication grew directly from the invention of telegraph and telephone. In 1844 the American inventor Samuel F.B. Morse built a telegraph line between Washington, D.C., and Baltimore, Maryland. Morse encountered many electrical problems when the signals were sent through buried transmission lines, but fewer problems when the lines were suspended on poles. This attracted the attention of physicists. In a similar manner, the invention of telephone in 1875 by Alexander Graham Bell attracted scientists, such as Henri Poincaré, Oliver Heaviside, and Michael Pupin, to the problems associated with transmitting signals over wires.

The origin of communication theory is linked to the development of information theory in the early 1920s. The formal study of information theory did not begin until 1924, when Harry Nyquist, a researcher at Bell Laboratories, published a paper entitled "Certain Factors Affecting Telegraph Speed." Nyquist realized that communication channels had maximum data transmission rates, and he

derived a formula for calculating these rates in infinite bandwidth noiseless channels. Another pioneer was Nyquist's colleague R.V.L. Hartley, whose paper "Transmission of Information" (1928) established the first mathematical foundations for information theory. The real birth of modern theory of communication can be traced to the publication in 1948 of Claude Shannon's "A Mathematical Theory of Communication". Shannon realized that, in order to have a theory, communication signals must be treated in isolation from the meaning of the messages they transmit. This is in sharp contrast with the common conception of information, in which meaning has an essential role. Shannon also realized that the amount of information conveyed by a signal is not directly related to the size of the message. Shannon focused on the problem of how best to encode the information that a sender wants to transmit. He used tools in probability theory and also developed information entropy as a measure for the uncertainty in a message. Shannon is also credited with the introduction of sampling theory, which was essential in enabling telecommunications to move from analog to digital transmission systems in the 1960s and later.

Shannon realized that a useful theory would first have to concentrate on the technical problems associated with sending and receiving messages as, if a message could not be transmitted correctly, then the semantic problem (meaning of the message) was not likely ever to be solved satisfactorily. The practical stimuli for his work were the problems faced in creating a reliable telephone system. A key question in the early days of telecommunication was 'how to transmit the maximum number of telephone conversations over existing cables'. Shannon's work defined communication channels and showed how to assign a capacity to them, not only in the theoretical sense but also in practical cases where real channels were subjected to real noise. Shannon's formula showed how the bandwidth of a channel (that is, its theoretical signal capacity) and its signal-to-noise ratio (a measure of interference) affected its capacity to carry signals. In doing so he was able to suggest strategies for maximizing the capacity of a given channel and showed the limits of what was possible with a given technology. This was of great utility to engineers, who could focus thereafter on individual cases and understand the specific trade-offs involved.

Shannon also made the startling discovery that, even in the presence of noise, it is always possible to transmit signals arbitrarily close to the theoretical channel capacity. This inspired engineers to look for practical techniques to optimize performance in signal transmissions. Shannon's work clearly distinguished between gains that could be realized by adopting a different encoding scheme from gains that could be realized only by altering the communication system itself. Though Shannon's theory does not always make clear how to achieve specific results, people now know which questions are worth asking and can focus on areas that will yield the highest return.

Since the 1940s and '50s the principles of classical information theory have been applied to many fields. Subsequent to Shannon's Theory, several theories have evolved.

To quote from Robert T Craig's landmark article, *Communication Theory as a Field* in 1999, *although there exist many theories of communication there is no consensus on communication theory as a field"*. Craig takes a step toward unifying this rather disparate field and addressing its complexities. Towards this end Craig focused on communication theory as a practical discipline and shows how "various traditions of communication theory can be engaged in dialogue on the practice of communication." Craig identifies seven different traditions of Communication Theory and outlines how each one of them would engage the others in dialogue:

1. Rhetorical
2. Semiotic
3. Phenomenological
4. Cybernetic
5. Socio-Psychological
6. Socio-cultural
7. Critical

2.2.1. Rhetorical Theory

Rhetorical theory is said to have begun on the Island of Sicily when a dictator was overthrown, leaving former and current landowners to argue in court over who rightfully owned the land—the original owners or those who had been given the land during the tyrant's regime. Under the Greek legal system of the time, individuals had to present their own cases in court—they could not hire lawyers to speak for them—creating the need for individuals to become adept at the art of rhetoric. Corax can be credited with the first formal rhetorical theory; he wrote a treatise called '*The Art of Rhetoric'* to assist those involved in the land disputes. In his treatise, he highlighted the importance of probability to rhetoric; a speaker should argue from general probabilities or create a probable connection or basis for belief when actual facts cannot be established.

Rhetorical theory is no longer confined to the public domains of classical Greece and addresses all contexts in which symbol use occurs. This means studying everything from intrapersonal to interpersonal to public discourse to social movements and mediated discourse including study of visual and nonverbal elements, such as the study of art and architecture, buildings and all design elements of cities, and dress and appearance, to sports, to name only a few. There is hardly anything that is part of the human experience that cannot

be looked at from a rhetorical perspective. For some rhetorical theorists, all human symbol use is inherently **persuasive** — no matter what our intent, anything we say or write, whether intentional or not, affects those around us. Other rhetorical theorists continue to focus on delineating how persuasion works in the variety of new arenas for theorizing. Yet others question the **persuasive** act itself—is it appropriate to ask another to change?—and encourage research into other rhetorical modes, such as invitational rhetoric, that might be as or even more effective than persuasion. In general, then, the focus on persuasion and its possibilities has led to an ongoing interest among rhetorical theorists in rhetoric's relationship to social change.

2.2.2. Semiotic Theory

Using the Greek letters *σημιωτικὴ*, the term 'semiotics' was introduced into the English language by John Locke (1690) as a synonym for "doctrine of signs" (Latin: *doctrina signorum*, the oldest name for the study of what is now called 'semiosis' or "the action of signs"). There already existed in Locke's time the Greek term *Σημειωτικὴ*, "semeiotics", to name that branch of medical science concerned with the study of symptoms of disease or *σημεια*—'natural signs' in today's language.

Research into sign systems began with the ancient Greeks. In the modern world the major areas which have been the object of semiotic study are literature, social structures, visual arts, ritual, myth, pedagogy, and gesture. Consequently, semiotics is very much an interdisciplinary science as germane to Anthropology as it is to English, to Philosophy as it is to Art History, to sport as it is to media studies.

Semiotics is the science of communication and sign systems, in short, of the ways people understand phenomena and organize them mentally, and of the ways in which they devise means for transmitting that understanding and for sharing it with others. Although natural and artificial languages are central to semiotics, its field covers all non-verbal signalling and extends to domains whose communicative dimension is perceived only unconsciously or subliminally. Knowledge, meaning, intention and action are thus fundamental concepts in the semiotic investigation of phenomena.

2.2.3. Phenomenological Theory

Phenomenological theorists emphasize that each person actively constructs her or his own world. According to this, the specific ways each person perceives and interprets the world make up one's personality and guide one's own behaviour. People's view of reality/perspective is important in guiding their behaviour and is shaped by learned expectations. These expectations form

personal constructs which are generalized ways of anticipating the world. Carl Roger's Self Theory emphasized self-actualization which he described as the innate tendency toward growth that motivates all human behaviour. Rogers distinguished between the actual self and the ideal self. Problems develop when the two self concepts do not match or when one's expectations or ideals don't match reality

Abraham Maslow (Humanistic Psychologist) believed that self-actualization is not just a human capacity but a human need. Maslow argued that there was a hierarchy of needs that all humans have, and beginning at the bottom of the hierarchy, each need in the hierarchy must be satisfied before one can move to the next level in the hierarchy.

Phenomenological Theories are an optimistic approach that places faith in a person's ability to fulfil her/his ultimate capacities. Critics view the Phenomenological approach as naive, romantic, and unrealistic. They are also critical of the lack of emphasis on the importance of inherited characteristics, biological processes, learning, situational influences, and unconscious motivation in shaping personality. Phenomenological theories do a better job of describing personality than explaining it and, like psychodynamic theories, many phenomenological concepts are too vague to be tested empirically.

2.2.4. Cybernetic theory

In 1948, Norbert Wiener coined the term "cybernetics" to elaborate on the existing theory of transmission of messages by incorporating his idea that people send messages within a system in an effort to control their surrounding environment (Wiener, 1954). The basic function of communication, according to Wiener, is to control the environment in which one lives. This idea suggests that the goal of human communication is to become familiar with a certain environment while simultaneously influencing aspects of it. With this, Wiener asserts that, "the purpose of Cybernetics is to develop a language and techniques that will enable us indeed to attack the problem of control and communication in general, but also to find the proper repertory of ideas and techniques to classify their particular manifestations under certain concepts" (Wiener, 1954, p.16). Wiener (1954/,p.20) introduces the ideas of entropy and feedback into his theory. A shortcoming of Wiener's theory is the assumption that, since people are built like complex machines, they are capable of interpreting and processing feedback and making changes in order to fit in to an environment. Watzlawick et al. (1967) explain why relationships can be hard to change as they systematically resist change. This goes beyond Wiener's theory of Cybernetics to explain why problems in human relationships are not easily influenced by feedback.

2.2.5. Socio-psychological theory

Social Psychology is a branch of Psychology that studies individuals in the social context offering insight into the individual and society. One of the major currents of theory in this area sprang from the work since 1894 by philosopher and sociologist George Herbert Mead at the University of Chicago. Mead's colleague and disciple at Chicago, sociologist Herbert Blumer, coined the name of the framework in 1937.

Social exchange theory emphasizes that social action is the result of *personal choices* made to maximize benefits and minimize costs. A key component of this theory is the postulation of the *"comparison level of alternatives"*, which is the actor's sense of the best possible alternative (i.e., the choice with the highest benefits relative to costs). However, social exchange theories differ from economic theories by making predictions about the relationships between persons, and not just the evaluation of goods

2.2.6. Socio-cultural theory

Socio-cultural theory looks at the important contributions that society makes to individual development. This theory stresses the interaction between developing people and the culture in which they live. Socio-cultural theory grew from the work of Lev Vygotsky who believed that parents, caregivers, peers and the culture at large were responsible for the development of higher order functions. According to Vygotsky, "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter-psychological) and then inside the child (intra-psychological). Vygotsky was a contemporary of thinkers such as Freud, Skinner, and Piaget, but his early death at age 38 and suppression of his work in Stalinist Russia left him in relative obscurity until fairly recently. As his work became more widely published, his ideas have grown increasingly influential in areas including child development, cognitive psychology and education. Socio-cultural theory focuses not only on how adults and peers influence individual learning, but also on how cultural beliefs and attitudes impact how instruction and learning take place. An important concept in socio-cultural theory is known as the zone of proximal development, "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." Essentially, it includes all of the knowledge and skills that a person cannot yet understand or perform on their own yet, but is capable of learning with guidance.

2.2.7. Critical theory

Critical theory was first defined by Max Horkheimer of the Frankfurt School of Sociology in his 1937 essay *Traditional and Critical Theory*. Critical theory is a social theory oriented toward critiquing and changing society as a whole, in contrast to traditional theory oriented only to understanding or explaining it. Horkheimer wanted to distinguish critical theory as a radical form of Marxian theory. The core concepts are that Critical social theory should:

- Be directed at the totality of society in its historical specificity (i.e. how it came to be configured at a specific point in time); and
- Improve understanding of society by integrating all the major Social Sciences, including Geography, Economics, Sociology, History, Political Science, Anthropology, and Psychology.

At the same time, "critical theory" also always involves questioning and challenging the passive acceptance that "the way things are" -- or "the way things seem" -- simply "is" the "natural" way. Critical theory is always particularly concerned with inquiring into the problems and limitations, the mistakes, the contradictions and incoherence, the injustices and inequities in how human beings operate within particular kinds of structures and hierarchies of relations with each other, facilitated and regulated by particular kinds of institutions.

More theories: In addition to the traditional theories outlined above, two other major theories include are General System Theory and Information Theory.

Ludwig von Bertalanffy put forth the **General System Theory** as a way to determine the underlying rules governing all systems. There are six main criticisms of General System Theory. First, it is too general to be usefully applied to the real world since nearly anything (or everything together) can be said to be a system. Second, it is so open as to allow contradictory findings in different fields; it is not unifying. Third, it is just a perspective, since it doesn't adequately explain why systems do what they do. Fourth, it doesn't suggest new research. Fifth, it's not clear whether the theory models nature (in which case apparently dissimilar events are actually the same) or if it is only a conceptual model (in which case it is only a representation, and similarities do not actually exist in the world). Finally, some claim the world is not as complex as system theory purports it to be.

Inspired by developments in systems theory and cybernetics, Shannon and Weaver formulated a new communication model in 1949 that they called **Information Theory**. In information theory, information is viewed as a measure of the entropy or uncertainty in a system. In the information theory model of communication, a source produces a message to be transmitted via a

channel to a receiver. Essentially, Shannon and Weaver's information theory reflects a cybernetic view of communication that is entirely focussed on "nodes" (speakers and hearers), connected only to each other and not with their contexts. In the information theory model, meaning is in the message; this message transmits from point to point in a linear fashion, self-regulated via feedback loops between source and receiver. This concept of meaning was taken to an extreme level of analysis by Osgood, who developed a mathematical model for finding where meaning is located. Osgood created the concept of "semantic spaces", which are effectively cognitive locations of meaning, and analysed the relationships between these spaces through a process of 'factor analysis' (Osgood, 1957). Information theory assumes that all communication travels from point to point, either from one source to one receiver or from many sources to many receivers. Extraneous information is considered to be noise, which the receiver must filter out in order to discern the meaning of the message.

It is interesting to note that there are a number of theories and perspectives characterising the field of communication studies. Theories are constantly evolving. It is important to recognize that no theoretical perspective is the right perspective, although most communication scholars do favour particular theoretical approaches over others, and conduct communication research from their preferred perspectives.

3. Communication Models

A communication model is chiefly a process in which information in the form of a package is channelled by the sender to the receiver through a medium. When the receiver gets the information he or she decodes the message and gives the sender a certain feedback. Models of communication refer to the conceptual model used to explain the human communication process.

3.1. Evolution

There are many models of communication developed by noted theorists of different disciplines: Aristotle, Lasswell, Shannon, Weaver, McLuhan, MacLean, Rileys, Westley, Gerbner, Rothstein, Schramn, Berlo, Osgood, Johnson, Cherry are the renowned ones. Some important and well-known contributions are explained below:

Aristotle (300 B.C.) developed a communication model focused on public speaking than interpersonal communication. Today, the Aristotelian model of communication is still widely used and accepted. In this model of communication, the sender sends the message to the receivers in an attempt to influence them to respond accordingly. The message has to be very impressive

and convincing. Therefore, the sender must know and understand the audience well. In this model, the sender is an active participant and the receiver is passive. This concept is used in public speaking, seminars, and lectures.

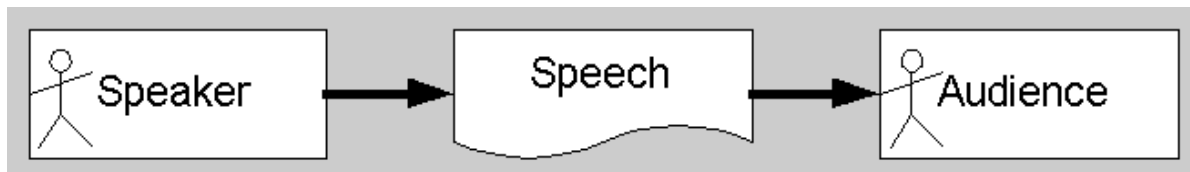Aristotle Model of Communication is formed with three basic elements: (i) Speaker, (ii) Speech, (iii) Audience

Figure 1 Aristotle's Model of communication

Aristotle advises speakers to build speech for different audiences, different occasions and for different effects. Speaker plays an important role in public speaking. The speaker must prepare his speech and analyze audience needs before he enters the stage.

Harold Dwight Lasswell (1948), a political scientist and communication theorist, was a member of the Chicago school of sociology. In his work '*The Structure and Function of Communication in Society*' (1948) he defined the communication process as '*Who (says) What (to) Whom (in) What Channel (with) What Effect*'. The model was known as Dance Model.

The studies on information theory in 1949 by Claude Shannon, Warren Weaver and others, prompted research on new models of communication from other scientific perspectives like Psychology and Sociology. Shannon and Weaver's information theory has had a significant influence on the development of communication theories and models. Shannon's model of communication process is, in important ways, the beginning of the modern field. It provided, for the first time, a general model of the communication process that could be treated as the common ground in such diverse disciplines as journalism, rhetoric, linguistics, and speech and hearing sciences.

The Newcomb's model of communication was introduced by Theodore M Newcomb of the University of Michigan in 1953. The main purpose is to introduce the role of communication in a social relationship (society) and to maintain social equilibrium within the social system. He concentrates on the social purpose of communication, showing all communication as a means of sustaining relationships between people. Sometimes it's called as an "ABX" model of communication.

Wilbur Lang Schramm (1954) called by communication theorist Everett Rogers as the *founder of communication study*, focused his studies on the experience of the sender and receiver (listener). He also indicated that communication is possible only upon a common language between sender and receiver and the impact that a message has on the target of the message.

In 1955, Elihu Katz and Peter Lazarsfeld's model inserted 'mass media' into the scheme. In 1956, George Gerbner attempted general purpose of communication models. He stressed the dynamic nature of communication in his work and also the factors affecting the reliability of communication. Bruce Westley and Malcolm S MacLean's signal processing model (feedback) proposed in 1957 attempted to introduce the complexity of the communicative interaction moving away from a simplistic pattern.

The 1950s was the period of 'interdisciplinary' exchanges. Information Theory, Artificial Intelligence and Cybernetics all surfaced in networked institutional settings in the 50s.

Another famous communication model is Berlo's model put forth in 1960. In this model, he stresses on the relationship between the person sending the message and the receiver. David Kenneth Berlo expanded Shannon and Weaver's linear model of communication and created the *Sender/Source-Message-Channel-Receiver Model of communication* (SMCR Model), where communication appears as a regulated process that allows the subject to negotiate with his living environment.

Other models, including a helical-spiral model developed by Frank Dance (1967), a circular model proposed by Lee Thayer (1968), and a "sawtooth" model advanced by Paul Watzlawick, Janet Beavin, and DonJackson (1967), emphasized the dynamic and evolutionary nature of the communication process rather than the components or the directions of influence.

Dean C Barnlund (1970) proposed a transactional model of communication. The basic premise of the transactional model is that individuals are simultaneously engaging in the sending and receiving of messages. Communication is viewed as a conduit; a passage in which information travels from one individual to another and this information becomes separate from the communication itself.

The evolution of communication theories and models leap from 1970 to 2003. In 1980s and 1990s, there was an increasing interest in information as an economic good or commodity. At the turn of the 21st century, Davis Foulger introduced his Ecological Model of the Communication Process (EMPC, 2002

& Restructured in 2004) and DeVito (2003) introduced his interactive/interpersonal model of communication.

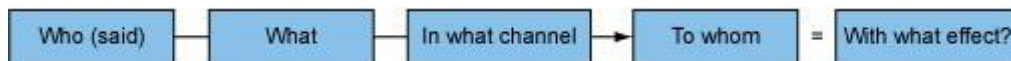The field of communication studies has changed considerably over the years with the impact of technology.

3.2. Types

In this section, three models of communication are described:

- Linear model
- Interactive model
- Transactional model

3.2.1 Linear Model

Laswell's (1948) model was based on five questions which collectively describe how communication works:

Shannon and Weaver's (1949) model includes noise or interference that distorts understanding between the speaker and the listener. Figure 2 shows a linear model of communication:
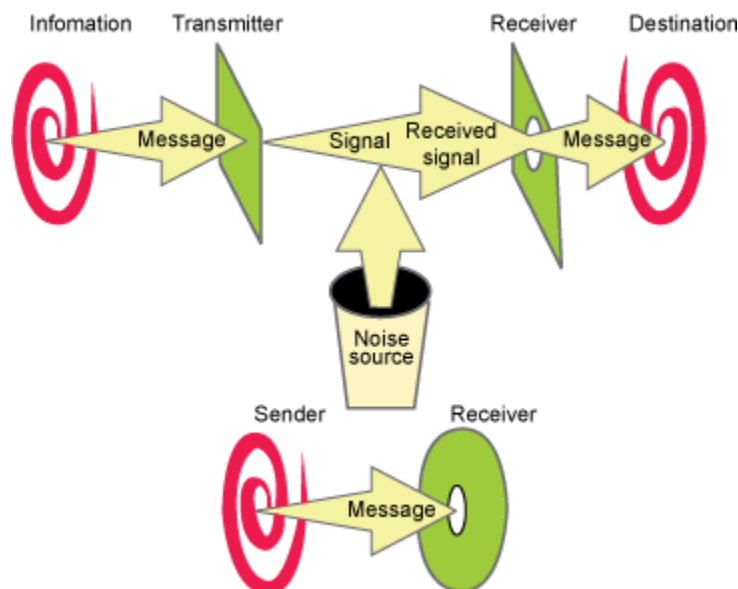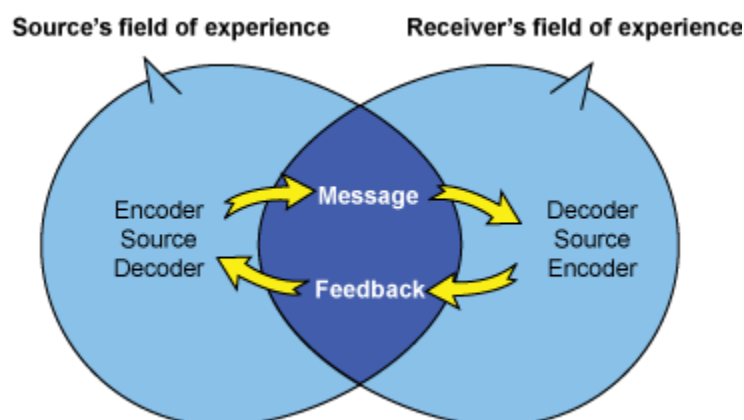

Figure 2 A Linear Model of Communication

Source: Wood, J. T. (2009). Communication in our lives (4th ed.). Belmont, CA: Thomson-Wadsworth

It is a one way model and consists of the sender encoding a message and channelling it to the receiver in the presence of noise. The linear model assumes that there is a clear beginning and end to communication. It is a method in which there is no possible way for feedback (even nonverbally). Letters, text messages, and e-mail can be responded to. A lecture would not fit in this model because listeners can still give feedback nonverbally.

3.2.2   Interactive Model

The main flaw in the linear model is that it depicts communication as a one-way process where speakers only speak and never listen. It also implies that listeners listen and never speak or send messages.

Schramm (1955) and Wood (2009) came out with a more interactive model that saw the receiver or listener providing feedback to the sender or speaker. The speaker or sender of the message also listens to the feedback given by the receiver or listener. Both the speaker and the listener take turns to speak and listen to each other. Feedback is given either verbally or non-verbally, or in both ways. This model also indicates that the speaker and listener communicate better if they have common fields of experience, or fields which overlap (Figure 3):

Figure 3 An Interactive Model of Communication

Source: Wood, J. T. (2009). Communication in our lives (4th ed.). Belmont, CA: Thomson-Wadsworth

This can be seen as two linear models stacked on top of each other. This model indicates that communication is not a one way but a two way process. There is feedback but it is not simultaneous. For example, Instant Messaging (IM). The sender sends an IM to the receiver, and then the original sender has to wait for the IM from the original receiver to react.

3.2.3   Transactional Model

The main drawback in the interactive model is that it does not indicate that communicators can both send and receive messages simultaneously. This model also fails to show that communication is a dynamic process which changes over time. The transactional model shows that the elements in communication are interdependent. Each person in the communication act is both a speaker and a listener, and can be simultaneously sending and receiving messages. There are three implications:

- "**Transactional**" means that communication is an ongoing and continuously changing process.
- In any transactional process, each element exists in relation to all the other elements. There is this interdependence where there can be no source without a receiver and no message without a source.
- Each person in the communication process reacts depending on factors such as their background, prior experiences, attitudes, cultural beliefs and self-esteem.

Figure 4 shows a transactional model of communication that takes into account "noise" or interference in communication as well as the time factor. The outer lines of the model indicate that communication happens within systems that both communicators share (e.g., a common campus, hometown, and culture) or personal systems (e.g., family, religion, friends, etc.). It also takes into account changes that happen in the communicators' fields of personal and common experiences. The model also labels each communicator as both sender as well as receiver simultaneously.
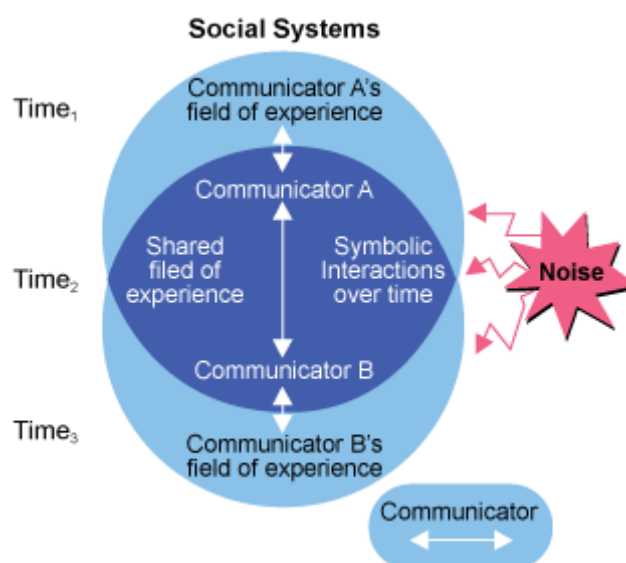

Figure 4 Transactional Model of Communication

Source: Wood, J. T. (2009). *Communication in our lives (4th ed.). Belmont, CA: Thomson-Wadsworth.*

This model assumes that:

- People are connected through communication; they are engaged in a transaction.
- Each player is a sender-receiver, not merely a sender or a receiver.
- Communication affects all players

The transactional model also contains ellipses that symbolize the communication environment.

3.3. Models

The ideas in Aristotle's rhetoric model and Freud's theory of psychology led way for the development of a host of models from Shanon & Weaver (1949) to DeVito's model of communication (2013). Some of the well-known models that are frequently referred to are explained in the following sections.

3.3.1. Harold Lasswell's Model of Communication (1948)

Harold Lasswell, an American political scientist and communication theorist, and author of *Structure and Function of Communication in Society* could be said to be the beginning of the theory of communication. He adopts Aristotle's' rhetoric in his model adding channel/medium; both view communication as an 'object". Lasswell observed messages in the mass media and Aristotle observed Orators. Lasswell wrote in 1948 that "a convenient way to describe an act of communication is to answer the following questions." (Figure 5):

- **W**ho
- Says **W**hat
- In **W**hich Channel
- To **W**hom
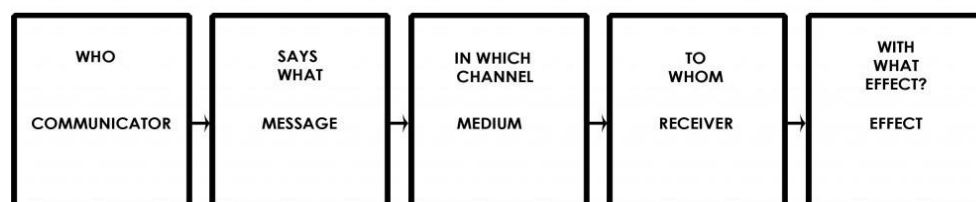- **W**ith **w**hat effect?

Figure 5 Lasswell's Model of Communication

According to Lasswell, there are three functions for communication:

1. Surveillance of the environment
2. Correlation of components of society
3. Cultural transmission between generations

Lasswell's 5 Ws model considers message flow in a multicultural society with multiple audiences. The flow of message is through various channels. Though this model is found to be easy and simple; it suits almost all types of communication; the major drawbacks are: Feedback and Noise are not mentioned.

3.3.2. Shannon and Weaver Model of Communication (1949)

The first major model for communication came in 1949 by Claude Elwood Shannon and Warren Weaver for Bell Laboratories. This laid the foundation for the different communication models, and has greatly helped and enhanced the communication process in various fields. Following is a simple illustration (Figure 6) of this model.
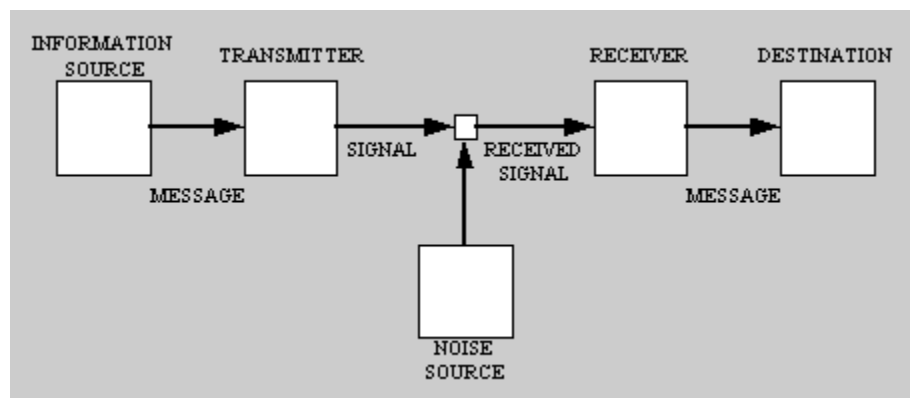
Figure 6 Shannon & Weaver's Model of Communication

The features of this model are:
- A linear process.
- A simple model (Technical)
- Content/message is easy to identify but hard to solve (Semantic)
- Source is dominant factor/decision maker (Impact/Effectiveness)
- Noise, a disturbing factor (Impact/Effectiveness)

Critics opine that Shannon's model isn't really a model of communication. It is, instead, a model of the flow of information through a medium, and an incomplete model that is far more applicable to the telephone or telegraph systems, than to other media. It suggests, for instance, a "push" model in which

sources of information can inflict it on destinations. However, in the real world of media, destinations are self-selecting "consumers" of information with the ability to select / turn off messages based on their interest, focus on one message in preference to other in message rich environments. Shannon's model depicts transmission from a transmitter to a receiver as the primary activity of a medium. In the real world of media, messages are frequently stored for elongated periods of time and/or modified in some way before they are accessed by the "destination". The model suggests that communication within a medium is frequently direct and unidirectional, but in the real world of media, communication is almost never unidirectional and is often indirect.

3.3.3. Theodore M Newcomb's Model of Communication (1953)

Theodore Newcomb of the University of Michigan published, in 1953, "*An Approach to the Study of Communicative Acts*" which, later became known as Newcomb's model. The model of communication adopts a different approach to the communication process. The main purpose of this theory is to introduce the role of communication in a social relationship (society) and to maintain social equilibrium within the social system. *Message* is not shown as a separate entity in his diagram, but is implied by use of directional arrows. He concentrates on the social purpose of communication, showing all communication as a means of sustaining relationships between people. Sometimes it's called as an "ABX" model of communication, as it works in a triangular format or A-B-X system (Figure 7).
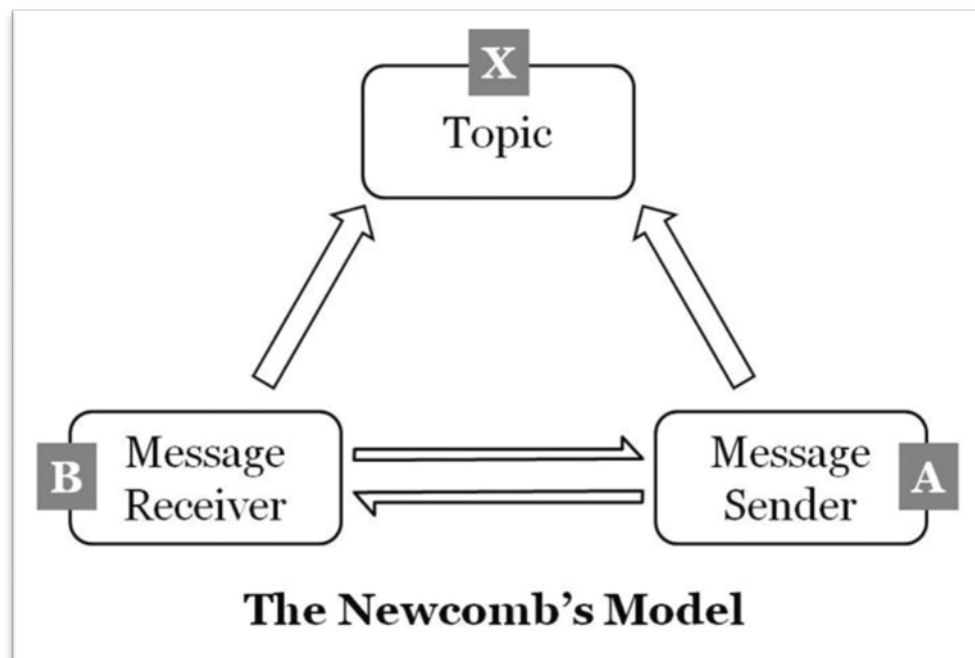

Figure 7 Newcomb's Model

3.3.4. Wilbur Schramm & Osgood Model of Communication (1954)

In an effort to rectify the earlier linear models of communication, Wilbur Schramm and Charles Osgood developed a Circular Model to show how communication works between two or a few persons (1954). It can happen within oneself (Intra personal) or between two people (Inter personal); each person acts as both sender and receiver. Wilbur Schramm stated that the communications process does not start and end somewhere, but is endless. Therefore, the Circular model is devoted to two actors who reciprocate in identical functions throughout: encoding, decoding, and interpreting. Additionally the model offers some explanation of semantic noise and interpersonal communication and how these might affect the communication process. The model (Figure 8) presented by Osgood and Schramm shows not only the transmission and hearing of a message, but offers explanations on how it can be perceived and understood. The process of understanding what has been said can vary widely from person to person as there will always be a degree of semantic noise, such as cultural differences, background, socioeconomics, education and values.
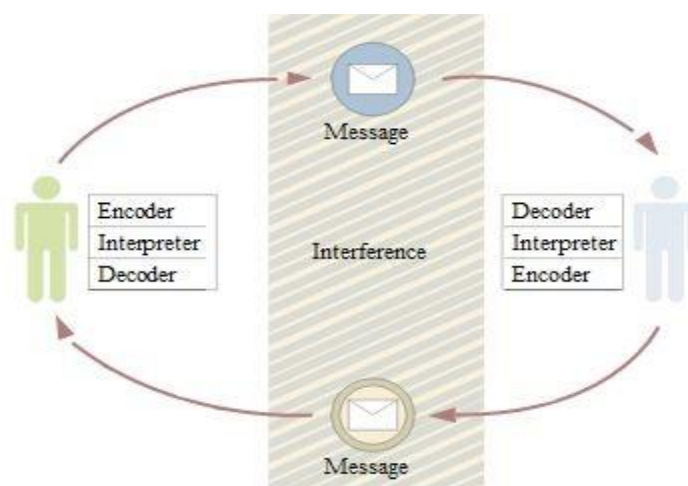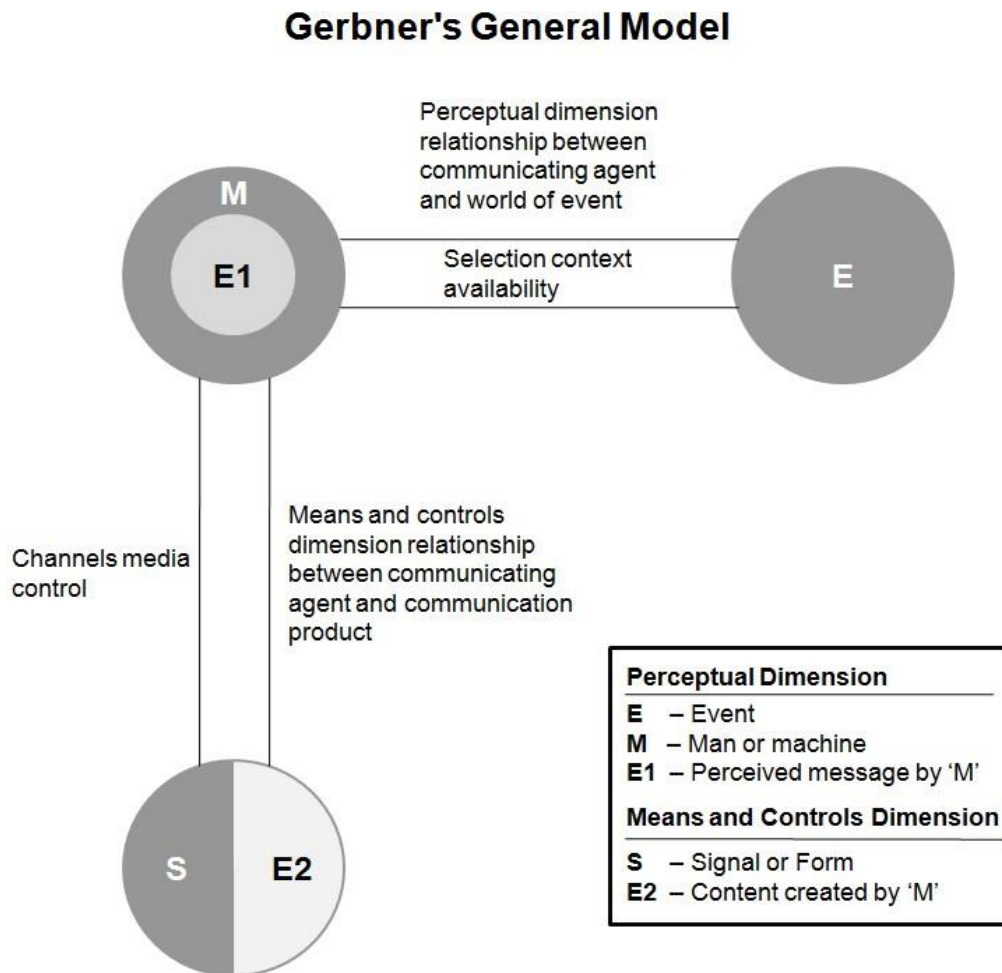

Figure 8 Schramm's Model of Communication

The merits of the model are that: it is dynamic, includes redundancy, the same person is both sender and receiver, feedback is an integral part of the process and so assumes communication to be circular in nature. The limitation is that it does not talk about semantic noise.

3.3.5. George Gerbner's Model of Communication (1956)

George Gerbner, a Professor at the Annenberg School of Communications in the University of Pennsylvania, is a pioneer in the field of communication research. His works are descriptive and easy to understand. In 1956, Gerbner

attempted the general purpose of communication models (Figure 9) stressing the dynamic nature of communication and also factors affecting reliability of communication.

Gerbner's General Model

Perceptual dimension relationship between communicating agent and world of event

Selection context availability

Means and controls dimension relationship between communicating agent and communication product

Channels media control

Perceptual Dimension
E – Event
M – Man or machine
E1 – Perceived message by 'M'

Means and Controls Dimension
S – Signal or Form
E2 – Content created by 'M'

(*Note: This model can be best understood when read along with the diagram beginning at E – Event.*)

Figure 9 Gerbner's Model

(i) Perceptual Dimension: 'E' is an event in real life and the event content or message is perceived by 'M' (Man or a Machine). After perception by "M", the message is known as "E1". E1 is not the same as 'E'. Because any man or machine cannot perceive the whole event and they perceive only part of the event (E1). This is known as "Perceptual Dimension". The 3 factors involved between 'E' and 'M' are: Selection, Context, and Availability.

M (man or machine) cannot perceive the entire content of the event "E". So M **selects** the interesting or needed content from the entire event after filtering

out the others. How the *message* is perceived is based on 'M's attitude, mood, culture and personality. For example, how a journalist perceives the messages from an event and filters the unwanted or unrelated content from the event. This filtered content is not same as the actual event content because the journalist edits the content based on his attitude, mood and cultural background or press policies.

(ii) Means and Controls dimension: E2 is the event content drawn by M and M becomes the source of a message about E to send it to someone else. M creates a statement or signals about the message and Gerbner termed its Form and content as "SE2" - S (Signal or Form) it takes and E2 (Man's content). M has to use channels (or media) to send the message over which he has a greater or lesser degree of control. The question of 'control' relates to M's degree of skill in using communication channels. If using a verbal channel, how good is he at using words? If using the Internet, how good is he at using new technology and words? This process can be extended to infinitum by adding on other receivers (M2, M3etc.) who have further perceptions (SE3, SE4 etc.) of the statements about perceived events.

For example, in case of news reporting, E can be any event that has happened and the reporter (M) selects a particular part of event (E1) that may provide his channel higher ratings or the news may boost the party his channel supports. This SE2 is sent through a medium to mass audience. Then different members of audience distribute the message (SE2) with their interpretation and the process continues.

3.3.6. Westley and Maclean's Model (1957)

Westley and MacLean realized that communication begins only when a person receives a message from surroundings (Figure 10). .
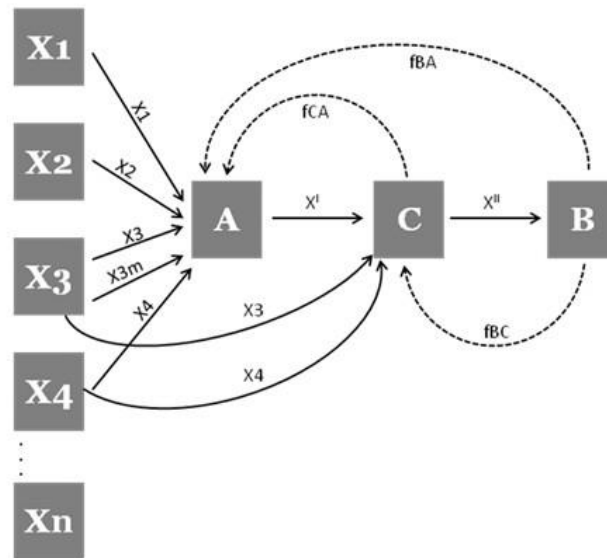
Westley and MacLean's Model of Communication

Figure 10 Westley and MacLean's Model

X1, X2, X3 ... .. Xn are news items, articles or information; Feedback (f); Clients (A); Reader or Audience (B); and Gate Keeper (C). Feedback Loop between Reader (B) and Newspaper (C) – fBC; Feedback Loop between Newspaper(C) and Client (A)- fCA; and Feedback loop between Reader (B) and Client (A)- fBA.

The merits of this model are:

- It accounts for Feedback.
- It accounts for different modes of communication, i.e., for both interpersonal communication and mass communication.
- It is a predictive model of communication and very descriptive also.
- It also accounts for non binary interactions; this means that it will remain good even for communications involving more than two sources.
  The limitation is that it is two dimensional and cannot account for multi dimensions; this means that the model will not be applicable for typical communication events that involve broader context and wide range of communication messages

3.3.7. David Berlo Model of Communication (1960)
Another famous communication model is Berlo's model. In this model, he stresses on the relationship between the person sending the message and the receiver. According to this model, for the message to be properly encoded and decoded, the communication skills of both the source and the receiver should be good. The communication will be at its best only if the two points are skilled.

Berlo's (SMCR) Source, Message, Channel, Receiver model has four main components and each component has its own sub components describing the assisting factors for each. Following is the illustration of his model (Figure 11).
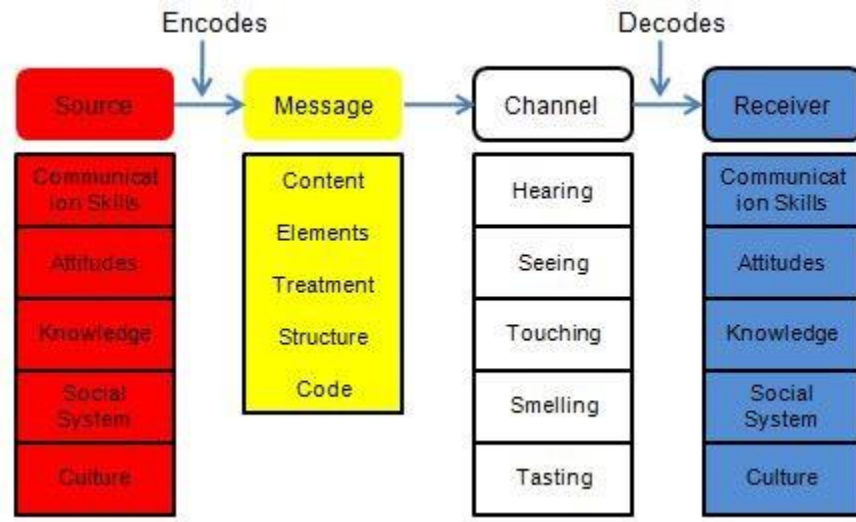

Figure 11 Berlo's Model

Berlo's model includes a number of factors under each of the elements:

a. **Source**: The source is where the message originates.

- **Communication skills** – It is the individual's skill to communicate (ability to read, write, speak, listen etc…)
- **Attitudes** – The attitude towards the audience, subject and towards oneself e.g. for the student the attitude is to learn more and for teachers to help / to teach.
- **Knowledge** - The knowledge about the subject one is going to communicate e.g. whatever the teacher communicates in the class about the subject; having knowledge about what is being communicated.
- **Social system** – The Social system includes the various aspects of society such as values, beliefs, culture, religion and general understanding of society. It is where the communication takes place.
- **Culture** - Culture of a given society also comes under social system.
- **Encoder -** The sender of the message (message originates) is referred as encoder, so the source is encoding the message here.

b. **Message – It refers to the subject matter under transfer.**
- **Content** – A message comprises of its content. Content is accompanied by some elements.
- **Elements** – It includes various things like language, gestures, body language etc, so these are all the elements of the particular message.

- **Treatment** – It refers to the packing of the message; the way in which the message is conveyed or the way in which the message is passed on or delivered.
- **Structure** - The structure of the message; how it is arranged / sequenced.
- **Code**- The code of the message means how it is sent and in what form; it could be e.g. language, body language, gestures, music and even culture; through which the communication takes place or being reached.

c. **Channel**: It refers to the five senses, which are as follows:

- Hearing
- Seeing
- Touching
- Smelling
- Tasting

Despite not mentioning a medium we need to assume that as communication is taking place through any of the 5 senses or combinations.

d. **Receiver**: The receiver needs to have all the things like the source. **And he is referred to as a decoder, w**ho receives the message and decodes it.

This model believes that for effective communication to take place the source and the receiver need to be in the same level, only if the source and receiver are on the same level communication will happen or take place properly. So source and receiver should be similar.

The major criticism of Berlo's SMCR model of communication is:

- Lacks feedback
- No mention of barriers to communication like Noise
- Complex model
- Linear model
- Needs people to be on same level for communication to occur but that may not be true in real life
- Main drawback of the model is that the model omits the usage of sixth sense as a channel which is actually a gift to the human beings (thinking, understanding, analyzing etc).

3.3.8. Dance's Helix Model (1967)

Another very important model of communication is the Helical Model of communication, proposed by Frank Dance in 1967 (Figure 12). Helix means an

object with a three-dimensional shape like that of a smooth curve that goes upwards also comes downwards. It is a non-linear model of communication.
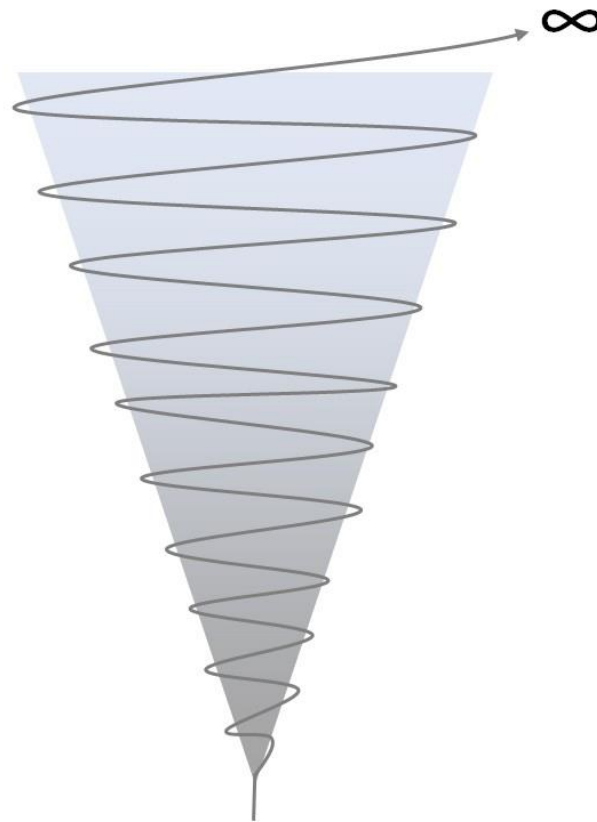
Helical Model of Communication

Figure 12 Helical Model of Communication

Frank Dance explains the communication process based on this Helix structure, the bottom or starting is very small; then it gradually moves upward in a back and forth circular motion forming bigger circles. The whole process takes some time. Like helix, the communication process starts very slowly and communicators share small portion of information only with a few. It gradually develops into next level; but this will take some time to reach and expand its boundaries to the next level. Frank Dance included the concept of time in his theory. This theory of communication was the subject of a number of experimental researches. Even though this model of communication clarifies everything there is the problem of over simplification.

3.3.9. DeVito's Interactive Model (2003)

DeVito's model is derived from the 'information processing' models of the 1960s and differs from the earlier rhetorical model by amplification, adding feedback, medium and noise.
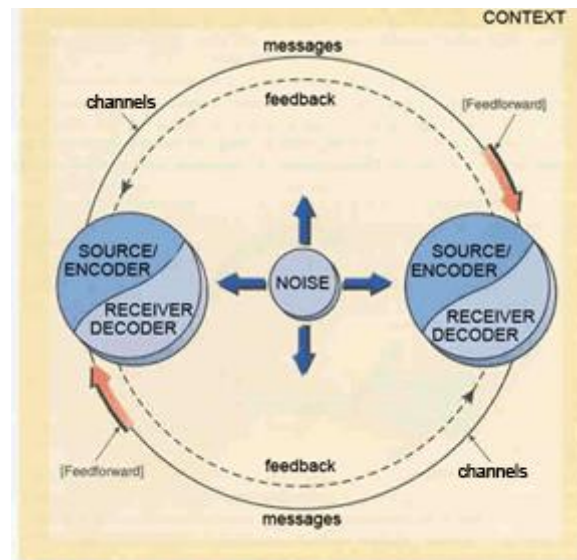

Figure 13 DeVito's Model

This representative model has eight components: Sender, Receiver, Message, Channel, Coder (Encoder and Decoder), Context, Feedback and Noise (Figure 13).

3.3.10. Davis Foulger (2004)

Foulger introduced his Ecological model in 2002 and restructured it in 2004. This is, in many ways, an elaboration of Lasswell's classic outline of communication. The fundamental statements of relationship establish a series of general relationships between people, messages, language, media, and the communication they enable. The relationships are summarized, in somewhat greater detail than these propositions suggest in Figure 14. In this figure, communication between people (creators and consumers) is mediated by three constructs, with language used to build messages within media. The model graphically depicts all of the propositions described above. Specifically, it depicts people communicating (Definition of Communication) through the mediation (proposition 1) of messages (Proposition 4) that are created and consumed (proposition 3) using language within media (propositions 2, 5, and 4.1). Languages and media are depicted as being both learned (proposition 6) and created (proposition 7). Ten relationships are summarized in the figure. While several of these relationships are described above, several derivative relationships are yet to be described, and some of the above relationships need to be broken in greater detail. It asserts that communication occurs at the

intersection of four fundamental constructs: communication between people (creators and consumers) is mediated by messages which are created using language within media; consumed from media and interpreted using language.
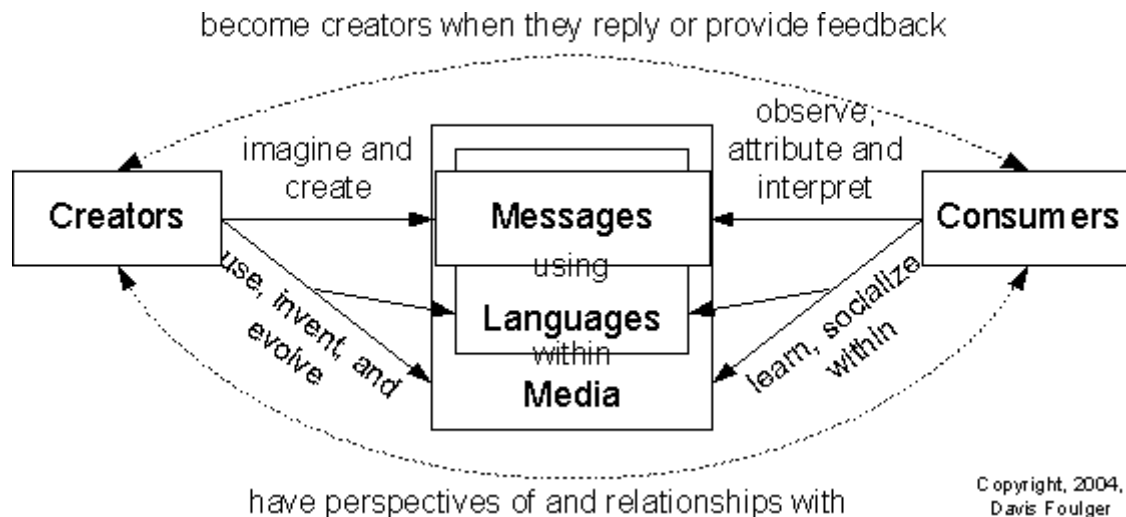

Figure 14 Davis Foulger's Model

4. Summary

This module is in two parts. Part 1 traces the evolution of communication theories and outlines the major theories of communication. Part 2 proceeds to describe the different types of communication models and demonstrates the major models of communication. Models are a fundamental building block of theory. They are also a fundamental tool of instruction. Shannon's information theory model, Weiner's Cybernetic model, and Katz' two step flow each allowed the decomposition of the process of communication into discrete structural elements. Each provides the basis for considerable bodies of communication theory and research. Each model also provides a powerful pedagogical tool for teaching students to understand that communication is a complex process in which many things can, and frequently do, go wrong.

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Unit-3
Application of Social Media for Library Services

1. Introduction

Today, we cannot take social media dispassionately. Having seen our friends, family, faculty, functionaries, etc, and with our own experience, we know that it is easy to learn and use. We may have experienced social media already to a great extent for personal affairs. When we attempt to get our libraries or organizations to have social media presence, we should have a clear understanding about pros and cons, use and misuse, merits and demerits of these tools bring along with its implementation. Further, we should be aware about the requirements, responsibilities, and commitment needed for implementing social media for libraries.

Social media is a way current world would create & publish the content, interact, and have web presence. In this new world, everyone is a creator or publisher of information. The content on different social media types with

different tools – Communication, Collaborative Content Building, Multimedia Sharing, Review & Opinions, Entertainment; and, Monitoring – made this world live and real time. In the literature, Facebook, Twitter, Drupal, MySpace, LibraryThing, YouTube, Flickr and so on, are some of the tools found used by libraries. Having thorough knowledge about how to use these tools to make our library website, OPAC, reference service, alert service and our interaction with users more interactive, effective, and elegant is the need of the hour for Librarians 2.0.

A wise saying by Alvin Toffler utters 'the illiterate of the future will not be the person who cannot read. It will be the person who does not know how to learn'. This is going to be true especially in case of internet usage, which only shows the power of internet in shaping our future.

The Internet has given ample opportunities for information industry in general and libraries in particular to communicate and engage with the information users using free online resources. Social media is just a name for how the internet looks nowadays and the way people use it. This change is particularly dueto the social media tools. In a general sense we can say 'social media are media for social interaction, using highly accessible and scalable publishing techniques' (Morgan, 2012). Social media makes our information search, accessing, organizing, creating, disseminating and analyzing more interactive. Kaplan and Haenlein (2010) define social media as "a group of Internet-based applications that build on the ideological andtechnological foundations of Web 2.0, which allows the creation and exchange of user-generated content." We can see the concept of 'Co-creation' coined by C.K. Prahalad effectively in social media where the concept is materialized using the technology and social interaction.

2. Why Social Media for Libraries?

The social media revolution is changing the way individuals and organisations interact and libraries are not immune from this. In the late 90's and early 2000's, the Internet was a monolithic passive medium. It was more a medium to provide content, not for interaction. With the introduction of tools for user to comment, engage, share and enhance the content on Internet, it became dynamic and interactive. So, we can understand the social media in simplest form as 'a web-

based medium through which people can share content, personal opinion, spread news, swap perspectives and generally communicate with other people'.

As we understand from the above description, the whole social media brings the newer, better and more useful systems that are for everyone. Libraries have historically been places to receive information, create an environment to disseminate the information, but their role was very less in contributing information. With social media, the information is adding to the web every second and as information scientists, we should be part of this information flow for – organizing, disseminating, archiving, evaluating and systematizing for a better world. It is an ironic fact that libraries are part of the solution, but are not part of the problem.But as information professionals we are bound to deliver information service for the betterment of the society. Therefore, it is an imminent responsibility to understand social media and its implementation in service delivery and to be connected with our users.

Before we discuss on social media in libraries, let us understand Social Media and Web 2.0. Andreas Kaplan and Michael Haenlein (2010) say 'social media is a group of Internet-based applications that build on the ideological and technological foundation of Web 2.0, which allows the creation and exchange of user-generated content'. This conveys that the collective term of Web 2.0 application for information exchange is called Social Media.
Paul Miller (2005) in his work 'Web 2.0: Building the New Library,' says "Libraries should be seizing every opportunity to challenge these perceptions, and to push their genuinely valuable content, services and expertise out to place where people might stand to benefit from them; places where a user would rarely consider drawing upon a library for support."

Now it's time to understand what the computer and the Internet has introduced to our users, our libraries, and our profession. Let us question our self 'are we technologically and culturally ready for these changes?'; 'are we ready to deliver our service to iPods, laptops, smartphones, interactive webpages?

The next sections of this unit will help you to understand these technologies and explain how we can introduce them to library culture.

3. Are we ready for Social Media?

It is easy to learn the basics of Social media and get our library to have its presence up and running. At the same time, it brings responsibility and commitment which

should not be taken lightly. You should provide a short period of time to spend on social media application. The tools available in social media to respond to your user, to interact, to upload the content, to share and to disseminate is very easy. Since the user has the privilege to allocate or share the activity to one or more persons, it helps us to distribute the workload among our staff or library supportive committees. This will bring the interaction, shared content, and make the web presence fresh.

The rich features in social media demands the librarians to – understand and learn the features; connect to the users for discussion, conversation, and community participation; adopt to different communication modes of choice (telephone, Skype, Instant Messaging (IM), Short Message System (SMS), texting, email, virtual reference, tweets, postings, etc.,); use of user-driven and user-developed content and commentary; and, to understand the activity of the social media crowd. This demands us (librarians) to know about the technology, its application, and user behavior.Hence, Stephen Abram (2005)says "Librarian 2.0 is the guru of information age".

The best thing any librarian can do is to learn more about these tools and how they figure into our professional lives and our libraries. Learning to learn and taking time to play with such social media tools will help us to make our self ready for the next generation users and to prepare ourselves to be called as Librarian 2.0.

(Some of the terms used in the description of social media tools are described in the glossary provided at the end of this unit. Before reading the next section, please visit the glossary section.)

4. Types of Social Media and their use in Libraries

In this section, let us learn about how to use social media tools for library services. We will learn about one tool in each of the category of social media identified by Kaplan and Haenlein (2010) and later will discuss about Library 2.0 Website and OPAC 2.0. Before learning about the social media tools, we will discuss about types of social media.

Social media is called "social" for a reason. It enables information exchange and gives direct access to our peer group for a person or customers/users for an organization / library. Social media can take many different forms, including internet forums, weblogs, social blogs, micro blogging, wikis, podcast, pictures, video, rating and social book marking. Based on the presence, features, processes

and community involved, 6 typesof social media are identified – Communication, Collaborative Content Building, Multimedia Sharing, Review & Opinions, Entertainment; and, Monitoring. The services and the tools identified by Kaplan and Haenlein (2010) under each of the typeare discussed at the end of this unit as Types of Social Media.

Now, let us discuss some of the social media tools under each of the types.

5. Type 1: Communication

Communication type considers those sites which are the ways many people connect and interact online today. We use these tools to connect with friends, strangers, group with same interests, communities, and interested brand / product companies. Members send messages, post content or photo or image, video, express views, vote/ promote events and so on. In this type, let us discuss Facebook for library activities, which are listed under the sub-category Social Networking.

In this sub-section, we will learn about the brief history of the tool, its general features, and application to library. Further, it will introduce some references to suitable case studies to understand the implantation / application. References to selected videos which explain the concept and application are also provided for better understanding.

5.1.   Facebook
http://www.facebook.com

Facebook is a social network service and website launched in February 2004, owned by Facebook Inc. As on December 2013, Facebook has 650 million active users. Facebook was founded by Mark Zuckerberg with his college roommates and fellow computer science students Eduardo Saverin, Dustin Moskovitz and Chris Hughes (Carlson, 2005) at Harvard University to share the photographs of community to get comments. Initially, it was open for the Harvard community, later it was opened to other universities in Stanford, Columbia and Yale, further to the high schools in these university region and employees of Apple Inc. and Microsoft. Sean Parker, an entrepreneur who was the advisor to Zuckerberg for Facebook, found Facebook incorporated in 2004. On September 26, 2006, Facebook was opened to everyone of age 13 and older with a valid e-mail address (Abram, 2006).

Facebook is equipped

- To share the user profile, photo, personal information, contact information
- To share the public or private message
- To chat
- To create groups
- To express like or unlike on the content place or posted
- To send files as attachments
- To provide news
- To tag the content (both image and text)
- To create blogs (allow the user to import data or posting from other blogs like xanga, blogger, livejournal, etc.)
- To send virtual gifts
- To provide personal name connected to facebook (www.facebook.com/sdmimd)

5.2. Application in Library

Libraries have always tested and implemented any new phenomenon or technology for their users. Facebook seems to be topic for research in library and information science since 2007 (Jacobson, 2011), the works mainly concentrate on sharing the experience of librarian, explaining the applicability of Facebook for library services and sharing the users feedback about the experience of library services in Facebook.

- **Instant messaging system** – to answer the user queries over chat. This will help to attend the student reference queries. Further, this will help to attend to users beyond desk hours. The feature to indicate the 'status' (available, busy, online) will help to inform the students about your availability for services.
- **Developing user database** – using the feature to create group, libraries may have the students' profiles under different categories like undergraduates, graduates, postgraduates, faculty, staff, alumni, guests, etc.
- **Event posting-** libraries can conduct online events in which users can share their thoughts on the topic of the event. The World Book Day, Librarian's Day, Copyright Day, Social Media Day, Science Day, Father's Day, Teacher's Day, Mother's Day, Friends Day, etc., celebrations of birth and death anniversary of prominent authors, Institute foundation day, alerting the user about the upcoming institute events, etc., can be conducted virtually using this tool.
- **Posting photographs** – posting the photographs relevant to the events, photographs captured during the institute events, student achievements, faculty

achievements, memorable photographs of the yester years of the institute, etc., will attract the student community and help the library to archive the information over the time-line.

- **Providing news –** libraries can create the alert system using Google Alert by giving Keywords related to Institute, subject domain the user community is interested, the hot topic in the news, etc. Selected alerts from these can be shared with the community. This will enhance the visibility and visitors likes for the library Facebook page.
- **Blog** – we can use the blog features in Facebook to inform the student about – the new arrivals, most borrowed book, collection available in relevance to the online event (please refer point 3 above), core reference books for a course, most cited article in an area of research, statistics on the use of database, introducing open access resources, etc., this will help the students to know about the collection and to comment on the posting made.
- **Sending virtual gifts**–Facebook alerts us about the birthday, anniversary, and special occasion or about the student or faculty achievement. Libraries may send virtual gifts to these community members which make them to be part of library family. Such initiatives will bring librarian close to the community.

5.3. Case Studies

New York Public Library	**University of Birmingham Library**	**The University of Queensland Library**
https://www.facebook.com/newyorkpubliclibrary	http://www.facebook.com/UniBirminghamLibrary	https://www.facebook.com/uniofqldlibrary

5.4. Videos

Create a Facebook Page for Your Library

https://www.youtube.com/watch?v=tQ9CcIGNuFM

Creating an account

https://www.youtube.com/watch?v=hvwM2aaggJM&list=PLDD96CECE89E01DFD

5.5. To know more

Facebook for Libraries.(2012). Retrieved April 14, 2014, from
        http://www.americanlibrariesmagazine.org/article/facebook-libraries
Facebook in the Library: Enhancing Services and Engaging Users. (2010).Scribd.
        Retrieved April 14, 2014, from
        http://www.scribd.com/doc/71288686/facebook-in-the-library-enhancing-
        services-and-engaging-users
Jacobson, T. B. (2011). Facebook as a Library Tool: Perceived vs. Actual Use.
        College & Research Libraries, 72(1), 79–90.

6. Type 2: Collaborative Content Building

In this type, let us learn about the Content Management Systems (CMS) as it is much used social media tool for organizing and disseminating content. A content management system is equipped with the add-on social media tools which allow the user for publishing, editing and modifying content. The administration of the entire operations is from a central interface. CMS has a well-defined procedure and workflow management for collaborative environment. In this sub-section, let us discuss Open Source Content Management System – Drupal and its adaptability in libraries. Since Drupal has the well-defined content management application

(CMA) and the content delivery application (CDA) it has been introduced. Other CMS which can be considered are Joomla and Wordpress.

6.1. Drupal

Dries Buytaert released Drupal as an open source project in 2001.Drupal is an English rendering of the Dutch word "druppel", which means "drop" (as in "a water droplet"). Drupal is the widely accepted CMS across the world. It is deployed by the US Government and many other countries for managing content about the ministry. Drupal has his presence in the company websites too. As of February 2014, more than 1,015,000 sites are using Drupal, which includes corporations, companies, government, non-profit organizations, educational institutes, libraries and individuals. Drupal is now developed by a community. The releases, modules for different applications, interoperability standards, act as an evidence for its popularity and wide spread applications. Drupal has won several awards including the popular Packet Open Source CMS Awards and the Webware 100 (three times in a row).

6.2. Features in Drupal:

Drupal offers a sophisticated set of content management features, all of which are available through a web based administrative interface.

- **Interactive Web-based Publishing**–The content can be published using web-based editor or rich text editor, which is similar to a word processor. Hence, barrier to know the code and web development language to place the content is not available.
- **Blocks for Content Organization**–The content organization is controlled by providing Blocks. Hence, the user has an option to place the content as per his requirements. Further, it provides options to make the content visible or publish non-visible, to have URL as required. This feature helps the user to organize the menu under different sets and organize in different blocks.
- **Interactive Contact Forms**–The web-based interactive forms are available in different formats for gathering information from users, conducting survey, opinion polls, etc. The system supports exporting the data in MS Excel and

other formats for analysis. The basic reports generated by Drupal greatly meet the requirement of libraries.

- **Attractive Templates**–Drupal suggests templates for different domains / areas, like education, corporate, entertainment, advertisement, etc., which ensure the consistent presentation of contents. These templates are available for free and offer interoperability of content in selected sets.
- **Tagging** –Option to tag the content for easy classification, organize information into sections based on assigned tags, taxonomy, and cloud formation, is best among the other CMS. This feature helps Drupal to automatically display links to the most popular information in your site.
- **Page Layout**–The rich features to create multi-column, multi-row layouts for presenting information, and deploy dynamic content within pre-defined regions on each page help the content developer to place information as per his requirements.
- **Workflow**–Well defined approval workflows for content publication ensure the information properly reviewed before going live. Further, this feature supports the easy workflow and content transfer among team members.
- **Alert and Comments** – Supports the administering and deployingof RSS feeds, Blogs, comments, forums and other user participative modules.
- **Pagination**–The content or documents in the website are available for easy navigation and access through pagination. This feature greatly helps the visitor for easy reading and developer to create story for a specific period.
- **Access statistics and logging** – The usage, visit, hits, downloads, logs, and other core statistical reports are well presented.
- **Content Search** – The content search feature is very rich. It supports the search engine optimization and indexing to get hits for the site.
- **Updates and Support** – Theupdates regarding security, templates, modules and other services are available through the active developer community. The multi-site support both in the system (Drupal) and from the community is very strong.
- **Security** – The well-defined system to capture the information about the user and to allocate the privileges to control the access at various features.

6.3. Features specific to library

The library specific module in Drupal greatly supports metadata functionalities, controlled vocabularies, XML publishing, content creation, content management, publishing, and presentation. The following modules are available for Drupal -

- MARC: http://drupal.org/project/marc
- Bibliography (orDrupal Scholar): http://drupal.org/project/biblio
- Z39.50: http://drupal.org/project/z3950
- OAI-PMH: http://drupal.org/project/oai2
- OAI2 for CCK: http://drupal.org/project/oai2forcck
- Faceted Search: http://drupal.org/project/faceted_search
- the eXtensible Catalog (XC) Drupal Toolkit: http://drupal.org/project/xc
- Dublin Core to CCK: http://drupal.org/project/dc2cck
- EZProxy: http://drupal.org/project/ezproxy
- Millenium OPAC Integration: http://drupal.org/project/millennium

Drupal being open source and tuned to adopt social media tools, it is possible to bring library specific modules easily. These modules are implemented in the examples shared at the end of this sub-section.
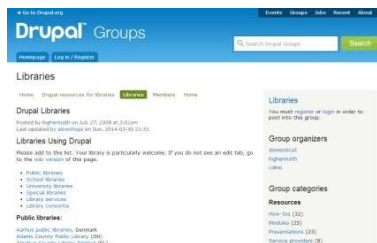
6.4. Application on Library

Drupal has the capability to help (academic) libraries in resource discovery, promotion, education, and advancement. It can also put a cohesive interface on information coming from different sites (catalog, digital collections, blogs, calendars, website) (Coombs, 2009). Apart from The AskUsservice, Library calendar (containing working hours, library events, library instruction, etc.), Links to subject guides, promoting resources (showcase of book jackets, new services, special announcements, etc.), Library News and Events blog, Promotion of the unique resources (Special Collections, Institute Archives), Integration with social media,
Requests for feedback on library services or resources, and, Site Search, following are the services which can be introduced using modules available for library in Drupal.

- The flexible page layout helps libraries to organize the resources and services in different panels and blocks. Example: About us, Resources, Services, Collections, Contact us.
- The templates based design help the libraries to include modules for dates, calendars and events. This will help the library to provide information about events, library instructions, schedules, activities, etc. The add-on features like applying flag, adding to calendar, setting the schedule for discussion, etc., will make the librarian's job easy.

- Libraries can allow user to comment on the posting made in node or page. This helps to track the user behavior and feedback for each of the post or the activity.
- The blog module helps to integrate the blogs present in blogger, wordpress, etc. It also provides rich feature to have the library blog.
- The OPAC module helps to integrate the library OPAC on to the website. The OPAC will be treated as Block which can be placed as per the convenience of the library website structure.
- The instant messaging system and status display greatly help the libraries to interact with the community. Sending message to a group or to an individual about the event, activity, alert, etc., is very easy when compared to other CMS.
- We can create user friendly or search-engine friendly URL's for making our library website compatibles for search engine optimization. This will also help us for having Faceted Search too.
- The use of Tags created by the user community or the content developer in Drupal is appreciable. For creating cloud, for organizing content, for creating store, for directory listing, etc., the tags are the key source and it is well structured.
- Other user friendly,salient features are RSS, creating survey, polls, flexibility to change the template, image handling, creation of contact forms and Webform with Captcha, and, defining workflow.
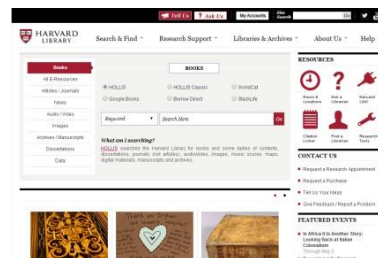
In a nutshell, we can say Drupal is the perfect CMS for having a Library 2.0 Website.
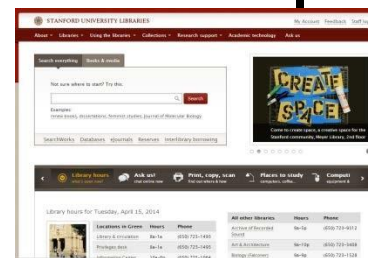
6.5. Case Studies

Libraries using Drupal

https://groups.drupal.org/libraries/libraries

Harvard Library

http://library.harvard.edu/

Stanford University Libraries

http://library.stanford.edu

6.6. Videos

Site building with Drupal

http://drupalize.me/videos/introduction-site-building-drupal
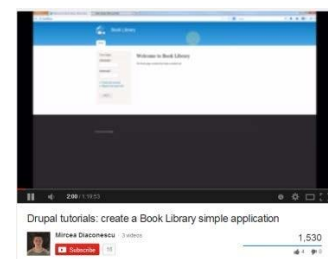
Shh! This is a (Drupal-powered) Library Site!

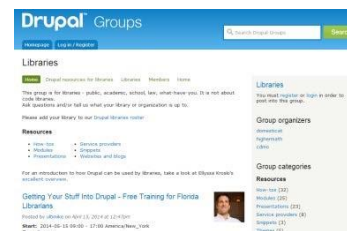http://sf2010.drupal.org/conference/sessions/shh-drupal-powered-library-site.html

Drupal tutorial: creating a book library simple application

https://www.youtube.com/watch?v=OeHdcBFk2Os

6.7. To know more

Drupal Modules for Library

http://drupalib.interoperating.info/library_modules

Drupal Library Group

https://groups.drupal.org/libraries

Drupal – Library Websites Made Easy

http://www.slideshare.net/cutemiffy/drupal-

Drupal – Features

https://drupal.org/features

library-web-sites-made-easy

Alejandro Garza, (2009) From OPAC to CMS: Drupal as an extensible library platform, *Library Hi Tech, 27*(2), 252 – 267.

7. Type 3: Multimedia Sharing

The multimedia resources like presentations (PPT, prezie, animated clip, cartoon clip, mythological serial clip, etc.,), video (movie clip, YouTube video, process explaining video, case study, etc.,) audio (the explanation of the concept by the author, audio book, etc.,) and photographs / graphics (photographs, table, maps, charts, etc.,) play a major role in teaching methodology. This further helps in innovation in the way the concepts are explained, discussed and put into practice. These resources have wider application from publishing industry to hospitals to engineering. Hence, providing awareness, access and availability at the right time to the right user become a challenging job for librarians. Social media tools greatly support this activity. In this section, let us understand what YouTube and Flicker can do for us.

7.1. YouTube

In February 2005, Steve Chen, Chad Hurley and Jawed Karim the former employees of PayPal developed YouTube using Adobe Flash Video technology. The user-generated video content like movie clips, TV clips, music, education presentations, lectures, public videos, short films / videos are shared on YouTube. The user community includes individuals, companies, educational institutions and others. YouTube is a subsidiary company of Google Inc. after it was bought by the latter in November 2006. This video sharing provides options to the person uploading, to give title, tag, add a description, which make people to search the videos by keywords, and then set the security for the video. Options to make the video public or to a group is similar to that of Picasa, Flickr and other photo/image hosting services.

YouTube has certain user friendly features like playback, quality codes, 3D videos, content accessibility, platform independence, localization (regionalizing the accessibility of content), user reviews and comments, tagging, downloading the

interested video, availability of video on Copy Left policy or Open Access policy, etc. These features have also made YouTube to attract certain criticism about copyright, privacy, controversial content, user comments, etc. Keeping these issues's the librarians should have due-diligence in selection of content and providing service using YouTube to our community.

7.2. Application on Library

- Developing Digital Video Library – the videos supporting the course curriculum and the teaching pedagogy can be identified from YouTube. After checking for the copyright, content and community requirements these videos can be embedded in a CMS page. The page can be properly titled to indicate the Digital Video Library of the subject relevance. Such aggregation will help the teaching community to a great extent. 100 Awesome YouTube Videos for Libraries is the best example.
- Introducing Much Downloaded Video – the library website may share the most downloaded video relevant to the celebration – world book day, environmental day, father day, mother day, etc., to build awareness about the celebration and importance. The Library of Congress account in YouTube has the well-organized video resources.
- Training Videos Library – YouTube is known for having good collection of training videos on the application of software, user education, guides and tutorials supportive videos. Libraries may use these videos integrated to the OPAC with proper Metadata description. This will enhance the richness of OPAC
- Uploading Institutional Videos – the video clips of the guest lectures, institute events, important celebrations / meet like conference, seminar, library guides, walk-through of institute, user orientations, etc., captured at the institute or organization or company may be uploaded to the YouTube. This will help to share among the community, alumni and other stake holders. The library service introduction video by MMU is cited as case study below.

7.3. Case Studies

100 Awesome YouTube Videos for Libraries

http://www.accrediteddldeg
rees.com/2008/100-
awesome-youtube-vids-for-
librarians/

Library of Congress

https://www.youtube.com/
user/LibraryOfCongress

MMU Library Services

https://www.youtube.co
m/user/MMULibrarySe
rvices

7.4. To know more

Clark, J. (2013). Developing a digital video library with the YouTube data API. *Code4Lib*, *20*. Retrieved April 14, 2014, from http://journal.code4lib.org/articles/7847

100 Awesome Youtube Videos for Librarians - Accredited Distance Learning Degrees. (2008). *Accredited Distance Learning Degrees RSS*. Retrieved April 16, 2014, from http://www.accrediteddldegrees.com/2008/100-awesome-youtube-vids-for-librarians/

7.5. Flicker

Stewart Butterfield and Caterina Fake of Ludicorp launched Flickrin2004. Flickr is an image hosting social media service provider. It is also known for sharing video also. In 2005 Yahoo took over Flickr and made it more interactive. Flickr supports the sharing of photographs on public or to a group or to an individual and provides tools for organizing the photograph in more presentable manner. The content provider / user have option to tag the content, comment, review and polling. Option to provide relative metadata for the uploaded content (photo or image) is

also available. The content uploaded in Flickr can be embedded to a website, blog, Facebook or any other social media platform. Flickr is said to be the most liked and powerful photo storing and sharing social media tool available for free.

7.6. Application on Library

- The services identified and listed for YouTube can be introduced using Flickr

7.7. Case Studies

The British Library
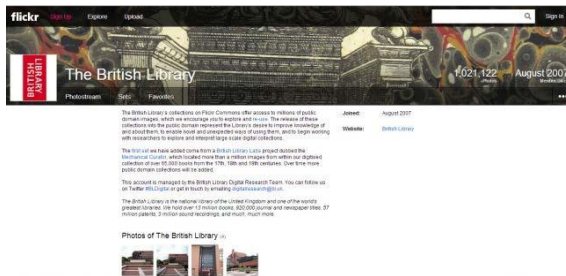
https://www.flickr.com/people/britishlibrary/

7.8. To know more
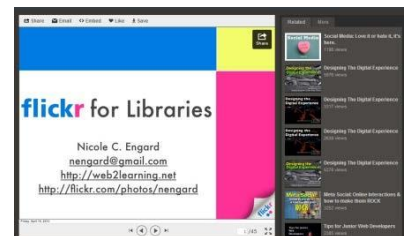

31 Flavor Things to do with Flickr in Libraries

http://www.webjunction.org/documents/webjunction/31_Flavors_045_Things_to_Do_With_Flickr_in_Libraries.html

How to make Flickr work for Libraries

http://www.collegedegrees.com/blog/2008/06/24/how-to-make-flickr-work-for-your-library-50-resources/

Flickr for Libraries

http://www.slideshare.net/nengard/flickr-for-libaries

8. Type 4: Review & Opinion

The reviews & opinion of the community (user community) is the key source to decide the future action or creation of blueprint for future. Since the tools discussed above under Communication, Collaborative Content Creation, and Media sharing have provided the usage data, reviews by users, survey and poll data, etc. additional tools are not discussed here. Also, the data provided by these tools are exhaustive and could provide sufficient information for librarians for decision making.

Drupal recommends and provides modules to integrate and get data from sources which use the social media tools discussed in this section.

For information about social media tools under this category, MouthShut.com for product reviews; Yahoo Answers, Askville and WikiAnswers for community Q & A; are the most popular ones.

8.1. To know more
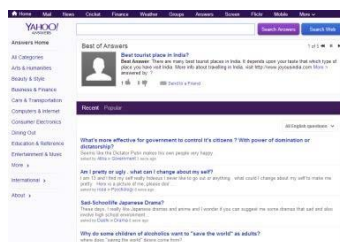
MouthShut.com   **Yahoo Answers**   **WikiAnswers**

http://www.mouthshut.com/   https://in.answers.yahoo.com/   http://wiki.answers.com/

9. Type 5:Entertainment

We should understand that libraries are not only for reading and reference.It reconnects communities around the educational segment. Libraries are also places for recreation and social value which create community gathering, socialization, and cultural enrichment. Libraries always look for ways to reach beyond their traditional patron base to reach more users. Entertainment is the key tool for such initiatives. Providing information about games, storytelling, cultural events, etc. which can generate interest and give knowledge about the act is one of the

activities which can be part of the library outreach program. Use of social media tools in this outreach activity will be a cost-effective and user-effective solution.

Integrating media and entertainment platforms like Cisco Eos in Drupal is attempted in libraries in US. This helps to get the information /solutions from media and entertainment companies through which users will get information about the products, interact and have online communities for the product. Eos supports all entertainment genres and incorporates social networking, content management, site administration, and audience analytics features into a single operating environment, using CMS like Drupal.

To give an experience of Virtual worlds, we can introduce our users to Active Worlds or Second Life. The game sharing through Sims Online, Kongregate, Miniclip, etc. will help the user to get recreated and move out of academic stress.

9.1. To know more

Gaming in Library

Games in Libraries

The Sec

http://www.ala.org/tools/atoz/gaming/gaming   http://www.gamesinlibraries.org/   https://join.se

The Virtual Worlds

https://www.activeworlds.com/index.html

The Sims Online

http://www.thesims.com/

10.   Type 6: Monitoring

When we adopt social media tools and have our presence on the web, we are committed to spend time, resource and cost for the community. This applies for libraries too. We spend time on creating content, posting updates; engage with our community, updating the pages, enhancing the web properties, etc. At some point we should stop and look back and evaluate to see – Is our effort is paying (getting) the result as expected? This demands the numbers pertaining to your online community, the posts, the hours spent on chat, the survey data, poll data, like or unlike data, the traffic, hits, user opinions, etc. Proper analysis of these data will help us to understand our community, know the effectiveness of service and helps in decision making.

Social media tools are inbuilt with certain analytical tools which provide substantial data and analysis. The Facebook insight, YouTube analytics, Drupal Reports, provide reports with substantial information for decision making. There are certain tools which support the social media page analysis and reporting like Attensity, Statsit, Sysomos, Vocus. These tools demand minimal level of knowledge about data synchronization, statistical analysis and web analytics.

10.1. To know more

Facebook Insight

https://www.facebook.com/help/search/?q=insights

YouTube Analytics

https://www.youtube.com/yt/playbook/yt-analytics.html

In the earlier sections, we discussed and understood how to use social media tools for extending library services. Except the library website developed using Drupal, other services are independent services for specific activity. The discussion we made above on the said 6 types / categories of social media gave us an understanding about what are the social media tools available in each of these

categories? What are the features available in these tools? How can we bring / introduce these tools for library services?

However, the use of social media tools also brings responsibility, commitment, adherence to best practices, criticisms, and appreciations too. We should implement these tools with due-diligence for the services. We should always keep in mind that we are representing an organization or institution in our web presence; and for community, we will be representing the stake holders of the organization. All these demand a strategic plan in the implementation of social media tools.

10.2. Integration of Social Media Tools in to OPAC

In the subsequent section, we will study about (OPAC) Online Public Access Catalogue 2.0. OPAC, which is termed as the information gateway for the entire library resources, need to be equipped with social media tools for better search, presentation, retrieval and interaction. Integrating OPAC with the library website is the trend for the day and, hence, this section is introduced. Before discussing how to integrate social media tools into OPAC to make it as OPAC 2.0, let us understand what makes OPAC 2.0?

10.3. What is OPAC 2.0?

OPAC, as a distinct module of Integrated Library System (ILS) has made appearance substantively in the mid-1980s. The OPAC basically fulfills two functions – locating documents based on known details (e.g. subject / keyword, author, etc.); and, identifying the documents in the database that cover a given search term and providing the details on the document to the user. The OPAC has its importance as the window to access information about library collection; supporting administration in housekeeping activities; and, service presentation layer to the user community. The OPAC is expected to be 'user centric' than 'librarian centric' by layout, presentation, services, options and usability.

OPAC 2.0 is the evolved /matured library search window of OPAC. It is expected to have sophisticated search technology; relevancy ranking; faceted search; user participation for tagging, review, comments, liking, polling; interaction with library with chat, instant messaging; integration with other web sources like Amazon, Google, etc., for information enhancing; and, dynamic for interoperable standards.

To address these requirements, the discovery layer was superimposed on to the existing OPAC making it OPAC 2.0. MitaWiliams was the first to use the concept

'discovery layer' in connection with OPACs. Even though we see a lot of activity towards developing, introducing and deploying next generation catalogs or discovery tools, there is no single definition of what constitutes a next generation catalog or OPAC 2.0 (Breeding, 2007). However, for understanding and to introduce the concept, let us consider following definitions:

> "The next generation library catalogue is expected to gather a broader set of information, resources, and services into a single interface that is more comprehensive in scope and more modern in presentation." (Breeding, 2007)

> "The next generation library catalogue provide search and discovery functionality, and may include features such as relevance ranking, spell checking, tagging, enhanced content, search facets" (OLE Project, 2009)

> "The discovery tool promise to provide a single interface to multiple resources based on using a centralized consolidated index to provide faster and better search results." (Hane, 2009)

Being aware of the developments in the Web 2.0 technologies by the use of Facebook, Twitter, and other social networking tools; and having used Amazon, Google Scholar, EBSCO Discovery Service and other discovery embedded sites; the author opines that the term 'current-generation catalogue' will be more appropriate instead of 'next-generation catalogue'. This was also opined by Breeding (2007) in explaining the concept of 'Discovery Tool'.

With the importance highlighted about OPAC in the above paragraphs, let us study the salient features of OPAC 2.0. These basic features should be considered while selecting suitable OPAC 2.0 tool or discovery layer tool.

- *Design and Layout:* The home page or the OPAC page should be framed for suitable navigation and should support the user in better understanding of search functionality and features available.
- *Single Search Box:* Instead of confusing the user with the option for basic search, advanced search, field search, etc. it should provide a single search window, which leads the user to narrow down his search by options available with the search results categorization.
- *Integration of databases:* While the library collections have shifted towards proportions of electronic content, the traditional approach to library catalogue

failed to accommodate the article level searching, integration of subscribed databases, digital repositories available in the institute and on Open Archive repositories. OPAC 2.0should accommodate different database(s).

- *Search results categorization:* The key dissatisfaction about the ILS OPAC was the display of search results. The ILS OPAC dump the search result without any organization, this demanded the human intervention to understand the result and location of document. The search results of the discovery tool should be categorized into different sets such as Location, Language, Date / Period, Format, Author(s) with number of documents, Subject heading, Type, etc. This will greatly help the user to refine their results by clicking on the various d facets.

- *Catalogue Display:* This feature is totally dependent on the catalogue display or individual record display of Amazon. The catalogue display is expected to present the detailed information about the resource, the cover image of the content – in case of published sources, comments, ratings, referring to other resource of the same category, electronic resources appended, information about the supplements accompanied if any, etc.,

- *Spell Checking and Leading:* The current users being tuned to the SMS (**S**hort **M**essage **S**ervice - communication service component of GSM mobile communication system) English, the computer auto spell feature and due to problem with the language expression, it is observed that they greatly fail to express the correct spelling in the search box. To overcome this, user expects the OPAC to guide them towards the correct word and lead them to place the correct string. This feature was examined with the search feature available in Google.

- *Integration with library house-keeping modules:* The level of integration with the library house-keeping modules greatly depends on the success of the discovery tool. Providing details about a resource is the primary aim of the OPAC, but discovery tool should perform better by informing about the location; status; if issued, then option to reserve; if library does not hold the document, the option to place request; request for holds; etc. Further, the discovery tool should be able to use the Web 2.0 features to provide alerts service about the request and the services.

- *User Participation***:** The key characteristic for the success of Web 2.0 based services is allowing user to participate, contribute and distribute his content, views, comments, etc. The discovery tool should provide option to comment, present reviews, ratings, rankings, tag, and cloud to create access points, etc. These features greatly contribute in organizing, archiving and disseminating the user contribution *on* library collection and services.

- *Alert Services:* This feature was examined by the service available in social network sites such as Facebook, twitter, etc. Here, the discovery tool is expected to support the alert services pertaining to comments on the postings made, reservation status, hold status, requested document status, alerts from the library, etc.
- *Implementation Support:* The issues pertaining to the support extended by the developers concerning to implementation; customization; code and schema; the license for distribution and upgrade support should be considered in selecting the discovery layer. Further, the aspects pertaining to community, number of download, age, the versions, etc. d should be considered.

The two discovery tools - VuFind and LibraryFind are equipped with above listed features, thus these two are competent enough to offer OPAC 2.0 for libraries (Harinarayana, 2010). The other tools in the open source arena Blacklight, Fac-Back-OPAC, Rapi, Scriblio (WPopac), SOPAC (Social OPAC), have shown good attempt.

Often it is criticized that OPACs are developed keeping 'librarians operational convenience' in mind. Tennant (2005) puts across this criticism sarcastically by saying "After all, you can put lipstick on a pig, but it's still very much a pig". Thus by saying this, he tries to highlight the uselessness of the glorified monolithic ILS OPAC features. Keeping this criticism on the back of mindone has to evaluate the above listed features in the discovery tools before selecting and implementing for library. The evaluation should be driven by user needs rather than the librarian operational convenience. Analogous to this, the librarians should contribute greatly to bring the features that are available, introduced and framed in the search engines, e-commerce portals and commercial products. Gradually the key features like standards, interoperability and openness, in discovery tools should be examined in bringing features available in social media tools in OPAC.

10.4. Case Studies
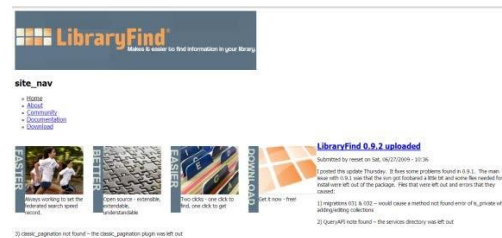
VUFind developed byVillanova University's Falvey Memorial Library

http://vufind.org/

LibraryFind developed by Oregon State University.

http://www.libraryfind.org

10.5. To know more

William Denton, Sarah J. Coysh, (2011) Usability testing of VuFind at an academic library, *Library Hi Tech, 29*(2), 301 – 319.

Birong Ho, Keith Kelley, Scott Garrison, (2009) Implementing VuFind as an alternative to Voyager's WebVoyage interface: One library's experience, *Library Hi Tech, 27*(1), 82 – 92.

John Houser, (2009) The VuFind implementation at Villanova University, *Library Hi Tech, 27*(1), 93 - 105

10.6. LibraryThing

If you want to experience what OPAC 2.0 looks like and to create a test-bed for your collection, Gurulib, LibraryThing and Shelfari are the freely available tools. It is easy to have your collection on to any of the three if your bibliographical database obeys Z39.06 compliance. These applications make your OPAC visible on Web equipped with Web 2.0 features. All the 3 tools are similar in service, however LibraryThing shows wider acceptance. This may be due to its capacity to integrate wide range of library catalogues, Unicode compliance, not allowing advertisements, and, easy interface. LibraryThing allows you to add 200 titles without any fee and charges $15 per year to increase from 200 to 5000. Ofcourse, there are no hosting and support charges.

10.7. To know more
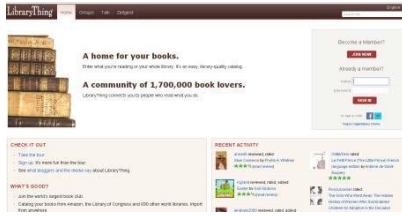
LibraryThing
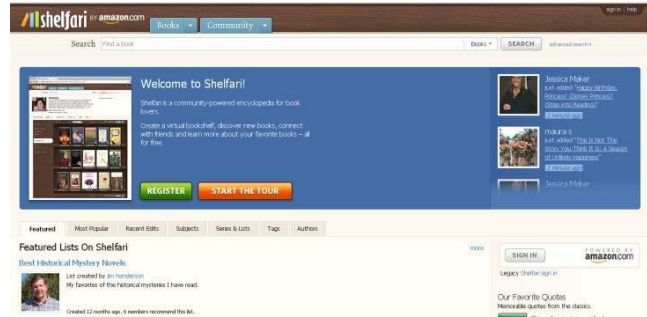
https://www.librarything.com/

Shelfari

http://www.shelfari.com/

Jezmynne Westcott, Alexandra Chappell, Candace Lebel, (2009) LibraryThing for libraries at Claremont, *Library Hi Tech, 27*(1), 78 – 81.

10.8. Case Studies

Danbury Public Library

http://cat.danburylibrary.org/

11. Summary

Adopting social media in library enhances the visibility of the collection, service and importance of library; along with these benefits it also brings responsibilities too. These service demands commitment, update about the current technological trends, regular monitoring, and marketing of the service or product. Developing social media enabled services will go a long way towards developing a dynamic and interactive library.But this demands constant monitoring of user needs and expectations. So, as said in the beginning of this unit, 'we are not the part of the problem, but we are the part of solution', hence implementation, service delivery and enhancement of any library service should have a structured Strength,

Weakness, Opportunity and Threat (SWOT) analysis to have a win-win situation for both the information service providers and information users.

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Unit-4

Information Security issues in the Networked environment

1. Information and Networked Environment – An Introduction

In the present society, it is a proven fact that information is 'power', information is 'wealth'. Information is almost like air that continuously flows. Information flows from human to human, human to machine, machine to machine. Information takes different forms namely handwritten documents, printed documents, voice, text, image, video, etc. The Internet is the core of the Information Society.

The Internet is not a single network, but a worldwide collection of loosely connected networks that are accessible by individual computer hosts, in a variety of ways, to anyone with a computer and a network connection. Thus, individuals and organizations can reach any point on the internet without regard to national or geographic boundaries or time of day. However, along with the convenience and ease of access to information come risks. Among them are the risks that valuable information may be lost, stolen, altered, or misused. If information is recorded electronically and is available on networked computers, it is more vulnerable than if the same information is printed on paper and locked in a file cabinet. Intruders do not need to enter an office or home; they may not even be in the same country. They can steal or tamper with information without touching a piece of paper or a photocopier. They can also create new electronic files, run their own programs, and hide evidence of their unauthorized activity.

Computers have become an inevitable and essential component of information society today. One cannot imagine a professional life or personal life without computers. Once upon a time, computer used to be an expensive, bulky machine that was used only for number crunching purposes and for handling complicated mathematical operations. Computers were the property of only big and rich organizations. They were available in the form of mainframe computers and mini computers wherein terminals (input/output devices) had to be connected to get the work done. But today computers are available in different forms like desktop, laptop, tablets, smart phones, and 'Google glass', etc. It's amazing to note that there has been a paradigm shift in the functionality of computer. Present day computer does:
* Number crunching;
* Information (content) generation;
* Information processing;

- Communication;
- Provide entertainment;
- Monitoring and many more.

Out of these functions, the 'magic role' played by computers is to create Information Networked Society. The largest engineered system ever created by mankind, namely Internet, binds or connects or networks millions of such computers to create Information Networked Society. Internet has converted the whole world in to what is known as 'global village'. Let us look at the basic elements of internet.

- User end machines / Hosts
- Network
- Protocols

User end machine could be a desktop, laptop, a smart phone that creates and exchanges information in the form voice, text, image, video or a combination of these. In other words, information is also called 'content'. Network deals with how the machines / gadgets creating and exchanging information are connected using a set of hardware and software. The process of exchanging information is popularly known as protocol. Figure below presents a macro-view of the building blocks of the internet.

What's the Internet: "nuts and bolts" view

- millions of connected computing devices: *hosts = end systems*
- running *network apps*
- *communication links*
  - ❖ fiber, copper, radio, satellite
  - ❖ transmission rate = *bandwidth*
- *routers:* forward packets (chunks of data)

router   workstation
server   mobile
local ISP
regional ISP
company network
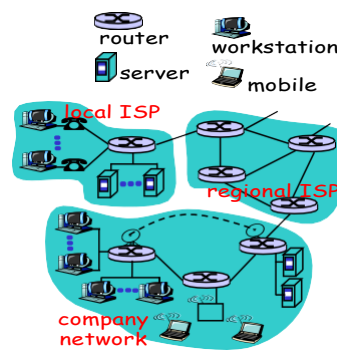
Courtesy : Computer Networking – Kurose & Ross

2. Informatio

"Information security is the practice of defending information from unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction. It is a general term that can be used regardless of the form the data may take (electronic, physical, etc...)" (Wikipedia)

Many organizations realize that one of their most valuable assets is their data, because without data, an organization loses its record of transactions and/or its ability to deliver value to its customers. Protecting data in motion and data at rest are both critical aspects of information security. An effective information security program is essential to the protection of the integrity and value of the organization's data.

Two major aspects of information security are:

- **IT Security:** Information Technology Security is information security applied to technology (most often some form of computer system). IT security specialists are almost always found in any major enterprise/establishment due to the nature and value of the data within large businesses. They are responsible for keeping all of the technology within the organization secure from malicious cyber attacks that often attempt to breach into the critical private information or gain control of the internal systems.

- **Information Assurance:** The process to assure that data is not lost when critical issues arise. These issues include but are not limited to: natural disasters, computer/server malfunction, physical theft, or any other instance where data has the potential of being lost. Since most information is stored on computers in the modern era, information assurance is typically dealt with by IT security specialists.

2.1 **The challenges to provide Information Security:** Let us look at simple day-to-day example of browsing the Internet. End user, typically called as client, invokes a browser like internet explorer, google chrome, enters the address of the web site (the address of the server computer) to be browsed and presses enter key. After a few seconds, the first page of the web site, typically called as home page, is displayed on the monitor. In this process, there is a complex sequence of actions that takes place in the background. The request for the page travels through a complex Internet infrastructure that makes use of private and public infrastructure and reaches the server at the other end. The home page is returned to the client.

An important point to be noted from this simple example is that securing the information has to be done a 4 levels, end-to-end namely:

- Data
- Application
- Host
- Network
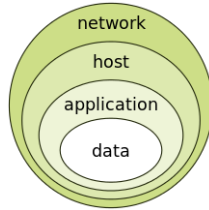
2.2. **Why should information be secured?:** The answer is simple: a mentioned earlier, information is wealth. It's obvious to secure the wealth if an organization has to survive and grow. Broadly information security:
1. Prevents data theft
2. Avoids legal consequences of not securing information
3. Maintains productivity
4. Foils cyber terrorism
5. Prevents identity theft

2.3. **Three Elements of Information Security:** The three key elements of information security are:
- **C**onfidentiality,
- **I**ntegrity
- **A**vailability

Referred to as the C-I-A triad or information security triad**.** Let's look at the meaning of each of these elements.

2.3.1. **Confidentiality:** Confidentiality means that information that is not in public domain should stay secret and be accessible to only those persons authorized to access it. Unauthorized access to confidential information may have devastating consequences, not only in national security applications, but also in commerce and industry. Main mechanisms of protection of confidentiality in information systems are cryptography and access controls. Examples of threats to confidentiality are malware, intruders, social engineering, insecure networks, and poorly administered systems.

2.3.2. **Integrity:Integrity** is concerned with the trustworthiness, origin, completeness, and correctness of information as well as the prevention of improper or unauthorized modification of information. Integrity in the information security context refers not only to integrity of information itself but also to the origin integrity—that is, integrity of the source of information.

Integrity protection mechanisms may be grouped into two broad types:
Preventive mechanisms such as access controls that prevent unauthorized modification of information,

Detective mechanisms**,** which are intended to detect unauthorized modifications when preventive mechanisms have failed. Controls that protect integrity include principles of least privilege, separation, and rotation of duties.

2.3.3. **Availability:**Availability of information, although usually mentioned last, is not the least important pillar of information security. Who needs confidentiality and integrity if the authorized users of information cannot access and use it? Who needs sophisticated encryption and access controls if the information being protected is not accessible to authorized users when they need it? Therefore, despite being mentioned last in the C-I-A triad, availability is just as important and as necessary a component of information security as confidentiality and integrity.

Attacks against availability are known as denial of service (DoS) attacks, Natural and man made disasters obviously may also affect availability as well as confidentiality and integrity of information, though their frequency and severity greatly differ—natural disasters are infrequent but severe, whereas human errors are frequent but usually not as severe as natural disasters. In both cases, business continuity and disaster recovery planning (which at the very least includes regular and reliable backups) is intended to minimize losses.

3. Main controls aimed at protecting the C-I-A triad.

Central to information security is the concept of controls, which is categorized as physical, administrative, technical and functional.

Physical **controls** include doors, secure facilities, fire extinguishers, flood protection, and air conditioning.

Administrative controls are the organization's policies, procedures, and guidelines intended to facilitate information security.

Technical control includes measures such as firewalls, authentication systems, intrusion detection systems, and file encryption, among others.

Functional control is again classified in to:

- **Preventive**
- **Detective**
- **Corrective**
- **Deterrent**
- **Recovery**
- **Compensating**

- **Preventive Controls:** Preventive controls are the first controls met by the adversary. Preventive controls try to prevent security violations and enforce access control. Like other controls, preventive controls may be physical, administrative, or technical: doors, security procedures, and

authentication requirements are examples of physical, administrative, and technical preventive controls, respectively.

- **Detective Controls**: are in place to detect security violations and alert the defenders. They come into play when preventive controls have failed or have been circumvented and are no less crucial than detective controls. Detective cont rols include cryptographic checksums, file integrity checkers, audit trails and logs, and similar mechanisms.

- **Corrective control:** try to correct the situation after a security violation has occurred. Although a violation occurred, not all is lost, so it makes sen se to try and fix the situation. Corrective controls vary widely, depending on the area being targeted, and they may be technical or administrative in nature.

- **Deterrent** Controls are intended to discourage potential attackers and send the message that it is better not to attack, but even if you decide to attack we are able to defend ourselves. Examples of deterrent controls include notices of monitoring and logging as well as the visible practice of sound information security management.

- **Recovery** Controls are somewhat like corrective controls, but they are applied in more serious situations to recover from security violations and restore information and information processing resources. Recovery controls may include disaster recovery and business continuity mechanisms, backup systems and data, emergency key management arrangements, and similar controls.

- **Compensating: These** are intended to be alternative arrangements for other controls when the original controls have failed or cannot be used. When a second set of controls addresses the same threats that are addressed by another set of controls, the second set of controls are compensating controls.

Let us now look at the typical process followed to ensure information security.

- Identification
- Authentication
- Authorization Processes

3.1. Identification: Identification is the first step in the identify-authenticate-authorize sequence that is performed every day countless times by humans and computers. While particulars of identification systems differ depending on who or what is being identified, some intrinsic properties of identification apply regardless of these particulars. Just three of these properties are the:

  i. Scope

ii. Locality
iii. Uniqueness of IDs

Identification name spaces can be local or global in scope. To illustrate this concept, let's refer to the familiar notation of Internet e-mail addresses. while many e-mail accounts named **john** may exist around the world, an e-mail address john@company.com unambiguously refers exactly to one such user in the company .com locality. Provided that the company in question is a small one, and that only one employee is named John, inside the company everyone may refer to that particular person by simply using his first name. That would work because they are in the same locality and only one John works there. However, if John were someone on the other side of the world or even across town, to refer to john@company.com as simply john would make no sense, because user name john is not globally unique and refers to different persons in different localities. This is one of the reasons why two user accounts should never use the same name on the same system—not only because you would not be able to enforce access controls based on non-unique and ambiguous user names, but also because you would not be able to establish accountability for user actions. What it means is that, for information security purposes, unique names are required and, depending on their scope, they must be locally unique and possibly globally unique so that access control may be enforced and accountability established.

3.2. Authentication: Authentication, which happens just after identification and before authorization, verifies the authenticity of the identity declared at the identification stage. In other words, it is at the authentication stage that you prove that you are indeed the person or the system you claim to be. The three methods of authentication are:

- What you know
- What you have
- What you are.

The aim is to obtain reasonable assurance that the identity declared at the identification stage belongs to the party in communication. It is important to note that reasonable assurance may mean different degrees of assurance, depending on the particular environment and application, and therefore may require different approaches to authentication: authentication requirements of a national security–critical system naturally differ from authentication requirements of a small company. Because different authentication methods have different costs and properties as well as different returns on investment, the choice of authentication method for a particular system or organization should be made after these factors have been carefully considered.

What You Know: Among what you know authentication methods are passwords, passphrases, secret codes, and personal identification numbers (PINs). When using what you know authentication methods, it is implied that if you know something that is supposed to be known only by X, then you must be X (although in real life that is not always the case). What you know authentication is the most commonly used authentication method thanks to its low cost and easy implementation in information systems. *However, what you know authentication alone may not be considered strong authentication and is not adequate for systems requiring high security.*

<u>**What You Have:**</u> Perhaps the most widely used and familiar what you have authentication methods are keys—keys we use to lock and unlock doors, cars, and drawers; just as with doors, what you have authentication in information systems implies that if you possess some kind of token, such as a smart card or a USB token, you are the individual you are claiming to be. Of course, the same risks that apply to keys also apply to smart cards and USB tokens—they may be stolen, lost, or damaged. What you have authentication methods include an additional inherent per-user cost. Compare these methods with passwords: it costs nothing to issue a new password, whereas per-user what you have authentication costs may be considerable.

<u>**What You Are:**</u> What you are authentication refers to biometric authentication methods. A biometric is a physiological or behavioral characteristic of a human being that can distinguish one person from another and that theoretically can be used for identification or verification of identity.

Biometric authentication methods include
- Fingerprint
- Iris, and Retina Recognition
- Voice and Signature Recognition

Biometric authentication methods when used correctly, in addition to what you have or what you know authentication, may significantly contribute to the strength of authentication. Biometrics is a complex subject and is much more cumbersome to deploy than what you know or what you have authentication. Unlike what you know or what you have authentication methods, whether or not you know the password or have the token, biometric authentication systems say how much you are like the subject you are claiming to be; naturally this method requires much more installation-dependent tuning and configuration.

3.3. Authorization

After declaring identity at the identification stage and proving it at the authentication stage, users are assigned a set of authorizations referred to as rights, privileges, or permissions that define what they can do on the system. These

authorizations are most commonly defined by the system's security policy and are set by the security or system administrator. These privileges may range from the extremes of "permit nothing" to "permit everything" and include anything in between. As you can see, the second and third stages of the identify-authenticate-authorize process depend on the first stage, and the final goal of the whole process is to enforce access control and accountability.

6.4. Accountability

Accountability is another vital principle of information security that refers to the possibility of tracing actions and events back in time to the users, systems, or processes that performed them, to establish responsibility for actions or omissions. A system may not be considered secure if it does not provide accountability, because it would be impossible to ascertain who is responsible and what did or did not happen on the system without that safeguard. Accountability in the context of information systems is mainly provided by logs and the audit trail.

Logs: System and application logs are ordered lists of events and actions and are the primary means of establishing accountability in most systems. However, logs (as well as the audit trail, which is described next) may be considered trustworthy only if their integrity is reasonably assured. In other words, if anyone can write to and/or erase logs or the audit trail, they would not be considered dependable enough to serve as the basis for accountability. In case of networked or communication systems, logs should be correctly **timestamped** and time should be synchronized across the network so events that affect more than one system maybe correctly correlated and attributed.

Audit Trail: Logs usually show high-level actions, such as an e-mail message delivered or a web page served, whereas audit trails usually refer to lower-level operations such as opening a file, writing to a file, or sending a packet across a network. Another aspect by which logs and audit trails differ is their source: logs are usually and mostly generated by particular system software or applications, and an audit trail is usually kept by the operating system or its auditing module.

6.5. Privacy

Privacy normally refers to the expectation and rights of individuals to privacy of their personal information and adequate, secure handling of this information by its users. Personal information here usually refers to information that directly identifies a human being, such as a name and address, although the details may differ in different countries. In many countries, privacy of personal information is protected by laws that impose requirements on organizations processing personal data and set penalties for noncompliance. The European Union (EU) in particular has strict personal data protection legislation in place, which limits how organizations may process personal information and what they can do with it. The

U.S. Constitution also guarantees certain privacy rights, although the approach to privacy issues differs between the United States and Europe.

IV. Threats to Information Security

Threat is nothing but an object, person, or other entity that represents a constant danger to an asset. Management must be informed of the different threats facing the organization. By examining each threat category, management effectively protects information through policy, education, training, and technology controls.

TABLE 2-1 Threats to Information Security[4]

Categories of threat	Examples
1. Acts of human error or failure	Accidents, employee mistakes
2. Compromises to intellectual property	Piracy, copyright infringement
3. Deliberate acts of espionage or trespass	Unauthorized access and/or data collection
4. Deliberate acts of information extortion	Blackmail of information disclosure
5. Deliberate acts of sabotage or vandalism	Destruction of systems or information
6. Deliberate acts of theft	Illegal confiscation of equipment or information
7. Deliberate software attacks	Viruses, worms, macros, denial-of-service
8. Forces of nature	Fire, flood, earthquake, lightning
9. Deviations in quality of service from service providers	Power and WAN service issues
10. Technical hardware failures or errors	Equipment failure
11. Technical software failures or errors	Bugs, code problems, unknown loopholes
12. Technological obsolescence	Antiquated or outdated technologies

Malicious code: includes execution of viruses, worms, Trojan horses, and activeWeb scripts with intent to destroy or steal information

Back door: gaining access to system or network using known or previously unknown/newly discovered access mechanism

Password crack: attempting to reverse calculate a password

Brute force: trying every possible combination of options of a password **Dictionary**: selects specific accounts to attack and uses commonly used passwords(i.e., the dictionary) to guide guesses

Denial-of-Service (DoS): attacker sends large number of connection or information requests to a target

- Target system cannot handle successfully along with other, legitimate service requests

- May result in system crash or inability to perform ordinary functions

Distributed Denial-of-Service (DDoS): coordinated stream of requests is launched against target from many locations simultaneously

- Spoofing: technique used to gain unauthorized access; intruder assumes a trusted IP address
- Man-in-the-middle: attacker monitors network packets, modifies them, and inserts them back into network
- Spam: unsolicited commercial e-mail; more a nuisance than an attack, though is emerging as a vector for some attacks
- Mail bombing: also a DoS; attacker routes large quantities of e-mail to target
- Sniffers: program or device that monitors data traveling over network; can be used both for legitimate purposes and for stealing information from a network
- Social engineering: using social skills to convince people to reveal access credentials or other valuable information to attacker
- Buffer overflow: application error occurring when more data is sent to a buffer than can be handled
- Timing attack: relatively new; works by exploring contents of a Web browser's cache to create malicious cookie

4.1. – a mandate for the organizations. Information security is not an 'IT problem', it is a business issue. Obviouslycompliance with legal and regulatory requirements is important. It provides a verygood reason for reviewing your information security practices, but it should not initself be the sole or even the main driver. If a business wishes to survive, let aloneprosper, it must grasp the importance of information security and put in placeappropriate measures and processes.

An information security policy is a set of rules and practices that define how the sensitive information of a company should be managed, protected, and distributed within the organization. The different aspects of an information security policy include labeling the information, modification of the information, accountability, and information ownership.

Each organization has an organization structure and the staff members at different levels needs to access different types of data. The information classification and the data distribution policies are therefore important for a company, so that the staff members at lower level should not be allowed to access data stored for higher level staff.

The main objectives of information security policy are:

- **Integrity**: The data is not tempered and modified undetectably.
- **Availability**: Data is available when it is required. This means that all the systems that are involved in data security, data access or processing or data distribution function properly.
- **Disclosure**: The disclosure of data should be as much, as it is important for the user to perform his task.

4.2. Best Practices to Help Protect Digital Assets.
It is essential to install:
- Anti-Virus Software
- Anti-Spyware Software
- Applications Updates
- Security Bundles
- Personal Firewalls

4.3. Other simple best practices
It is very important to follow simple best practices as part of creating information security:
- When not using your PC, turn it off
- View your E-mail as text only; disable the function that automatically views E-mail as HTML
- Do not automatically open attachments
- Do not run software programs of unknown origin
- Delete chain E-mails and junk mail. Do not forward or reply to any of them
- Never reply back to an E-mail to "unsubscribe" or to remove yourself from an unknown list. This lets the spammers know that they have reached a live E-mail address and your spam mail will increase
- Back up your critical data and documents regularly – thumb drives and CDs are cheap

5. Wireless World Creating Serious Security Vulnerabilities
Wireless technologies have empowered IT users to access information anytime, anywhere. At the same time, creating serious security vulnerabilities like:

- Unauthorized users can access the wireless signal from outside a building and connect to the network
- Attackers can capture and view transmitted data (including encrypted data)
- Employees in the office can install personal wireless equipment and defeat perimeter security measures

6. The security and privacy issues associated with social networking sites

Social networking sites have become very popular avenues for people to communicate with family, friends and colleagues from around the corner or across the globe. While there can be benefits from the collaborative, distributed approaches promoted by responsible use of social networking sites, there are information security and privacy concerns. The volume and accessibility of personal information available on social networking sites have attracted malicious people who seek to exploit this information. The same technologies that invite user participation also make the sites easier to infect with malware that can shut down an organization's networks, or keystroke loggers that can steal credentials.

Common social networking risks such as spear phishing, social engineering, spoofing, and web application attacks attempt to steal a person's identity**.** Such attacks are often successful due to the assumption of being in a trusting environment social networks create.

Security and privacy related to social networking sites are fundamentally behavioral issues, not technology issues. The more information a person posts, the more information becomes available for a potential compromise by those with malicious intentions. People who provide private, sensitive or confidential information about themselves or other people, whether wittingly or unwittingly, pose a higher risk to themselves and others. Information such as a person's social security number, street address, phone number, financial information, or confidential business information should not be published online. Similarly, posting photos, videos or audio files could lead to an organization's breach of confidentiality or an individual's breach of privacy.

6.1. Precautions to be taken

- Below are some helpful tips regarding security and privacy while using social networking sites:

- Ensure that any computer you use to connect to a social media site has **proper security measures** in place. Use and maintain anti-virus software and keep your application and operating system patches up-to-date.
- Use caution when clicking a link to another page or running an online application, even if it is from someone you know. Many applications embedded within social networking sites require you to share your information when you use them. Attackers use these sites to distribute their malware.

- Use **strong and unique passwords**. Using the same password on all accounts increases the vulnerability of these accounts if one becomes compromised.
- If screen names are allowed, do not choose one that gives away **too much personal information.**
- Be careful who you add as a "friend," or what groups or pages you join. The more "friends" you have or groups/pages you join, the more people who have access to your information.
- Do not assume **privacy on a social networking** site. For both business and personal use, confidential information should not be shared. You should only post information you are comfortable disclosing to a complete stranger.
- **Use discretion before posting** information or commenting about anything. Once information is posted online, it can potentially be viewed by anyone and may not be retracted afterwards. Keep in mind that content or communications on government-related social networking pages may be considered public records.
- **Configure privacy settings** to allow only those people you trust to have access to the information you post. Also, restrict the ability for others to post information to your page. The default settings for some sites may allow anyone to see your information or post information to your page; these settings should be changed.
- **Review a site's privacy policy.** Some sites may share information such as email addresses or user preferences with other parties. If a site's privacy policy is vague or does not properly protect your information, do not use the site.

7. Summary

Modern society is completely dependent on information and information technology. Internet is the part and parcel of both professional and personal life. Anywhere, anytime access, with the advent of wireless technology, is really a boon. Variety of security threats may convert the boon to bane. It is extremely important to protect the information through variety of solutions. It should be the right blend of technologies, policies, education and culture.

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Unit-5
Social Media in a Knowledge Society

1. Introduction

Libraries are experiencing technology transformation. Right from the typewriter to cloud computing libraries have used technologies to improve service and visibility. These technology transformations have been reported, recorded and read by librarians to understand how to position ourselves in this ever-changing technology-driven society. Information society demands the strategic positioning of information in - content organization, information services, knowledge dissemination and archiving of resources. This demand has elevated the position of librarians from 'information provider / facilitator' to the 'custodians of facts'. These demands have made it imperative for librarians to learn, implement and use the technology which is in force for effective and efficient service delivery.

Libraries are among the early adopters of social media in order to connect with their patrons. Libraries will continue to be a community hub in this network world just as they were in the traditional environment. As Michael Stephens (2006) said 'to remain viable, interesting and relevant, libraries should seek methods to get out into the community, engage users with services and conversations, and offer collaborative spaces both online and in beautiful physical buildings. But here's the other side of the coin: Librarians should embrace the social tools as well on a professional and even personal level. It's the logical first step to put us on the way to Library 2.0'.

2. What is Social Media?

Social media is a blurred term that is used to refer to different technologies in different ways. As a norm we consider any online platform which provides options for collaborative content development and sharing as social media. On the whole, the general understanding of social media is all about a platform which facilitates sharing, collaboration, and conversation. It is a platform for creating content - called 'user-created content' - directly and often collaboratively. Social media has to be understood through the technology on which it is developed; what makes social media? Let us understand the technology first and then its applicability.

In the next section, we will look briefly at Web 2.0 technologies, the difference between Web 1.0 and Web 2.0 technologies and finally we will focus on understanding what makes social media.

2.1 Web 2.0 Technologies

Web 2.0 is the buzzword of all the conferences, seminars, discussion forms and literatures published on technology adoption in libraries during 2002 to 2012. Web 2.0 could be thought of as the set of ever-evolving tools that benefit online users (Stephens, 2006) and used by them to connect, communicate, collaborate, converse and create content. Further, Web 2.0 can be considered as the upgraded, improved, and modernized World Wide Web. It is a term used loosely to apply to everything from the explosion of social networking websites like MySpace and YouTube, to the rich, interactive software applications being served online, and even to the specific programming languages and technology tools that make the "new" web possible (Funk, 2009).

The term 'Web 2.0' was coined by Darcy DiNucci (DiNucci, 1999) who said: "The Web we know now, which loads into a browser window in essentially static screenfuls, is only an embryo of the Web to come. The first glimmerings of Web 2.0 are beginning to appear, and we are just starting to see how that embryo might develop. The Web will be understood not as screenfuls of text and graphics but as a transport mechanism, the ether through which interactivity happens. It will ... appear on your computer screen, ... on your TV set ... your car dashboard ... your cell phone ... hand-held game machines ... maybe even your microwave oven" (Wikipedia, 2014). Tim O'Reilly and Dale Dougherty of O'Reilly Media popularized it by comparing the monotype web technologies (old) which they term as 'Web 1.0' with the dynamic and interactive web technologies. It was an attempt to describe the web technology in business models which demanded the interactive, dynamic, real-time and transparent (O'Reilly Media, 2005). Web 2.0 is also seen as Tim Burners-Lee's vision of collaborative information space, which is the base for technologies such as blog, wikis, RSS feeds, etc., where an online user is able to add, edit and create content (Anderson 2007). These help us to get the layman definition: "Web 2.0 is the second stage of development of the Internet, characterized especially by the change from static web pages to dynamic or user-generated content and the growth of social media".

Tim O'Reilly (2005) explains Web 2.0 as "Web 2.0 is the network as platform, spanning all connected devices; web 2.0 applications are those that make the most

of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an 'architecture of participation' and going beyond he page metaphor of Web 1.0 to deliver rich user experience".

For our study, let us consider the definition given by Michael Stephens in his post "Web 2.0 for Librarians" defines it as 'Web 2.0 is the next incarnation of the World Wide Web, where digital tools allow users to create, change, and publish dynamic content of all kinds. Other Web 2.0 tools syndicate and aggregate this content. We will all be publishers and creators of our own information and entertainment channels with these applications' (Stephens, 2006).

Difference between Web 1.0 and Web 2.0

In Web 1.0, the users were the consumers of content, whereas in Web 2.0 users are content creators and consumers. To get more clarity, let us study the key differences between these two technologies. Tim O'Reilly while defining Web 2.0 has tried to draw an imaginary line between these two technologies. The differences identified by Tim O'Reilly are shown in Table 1.

Web 1.0		Web 2.0
DoubleClick	→	Google AdSense
Ofoto	→	Flickr
Akamai	→	BitTorrent
mp3.com	→	Napster
Britannica Online	→	Wikipedia
personal websites	→	blogging
Evite	→	upcoming.org and EVDB
domain name speculation	→	search engine optimization
page views	→	cost per click
screen scraping	→	web services
Publishing	→	participation
content management systems	→	wikis

	directories (taxonomy) $\rightarrow$	tagging ("folksonomy")
	stickiness $\rightarrow$	syndication

Table.1: Difference between Web 1.0 and Web 2.0 Technologies

Source: O'Reilly, T. (2005, September 30). What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software.

Let us consider Britannica Online and Wikipedia for our discussion. Wikipedia's entry for Web 2.0 itself gives the history, development, improvements and revisions that happened in Web 2.0 technologies. The community collaboration in content creation / development, interactive features, tags, RSS feeds, is how Wikipedia took shape. This collaborative effort has made Wikipedia more informative, robust, updated and a popular source of information. Britannica Online being a publisher site acts as a source of information but does not allow user participation. Another example is the photo gallery website listed in Table 1. Ofoto from Kodak provides option to upload photographs and share with friends. This website is compared with Flickr which provides rich features to share photographs with assigned privileges, allow comments, tagging of images to describe the image, RSS feeds, etc. These additional features allowing the user community to interact and inform is what makes Web 2.0. The features of web 1.0 and web 2.0 are listed in Table 2.

Features	Web 1.0	Web 2.0
Coined by	Tim Berners-Lee in 1989 introduced World Wide Web (www) generally called as Web	Darcy DiNucc in 1999 used Web 2.0 in her article "Fragmented Future". Later it was popularized by Tim O'Reilly.
Introduced to users in	1995	2005
Objective	Sharing of Information	Community Participation & Interaction; to connect, collaborate and create content
Content Creation	Publisher or the Company; Users are consumers	Publishers & User community ; Both publishes and users are consumers
User Participation	Read only	Read, Write & Share
Type of Information	Text & Graphic	Text, Video, Graphic,

shared		Photographs, Instant Messages, Wikis, Blogs, etc.,
Target	Millions of Users	Billions of Users
Output Expected	Providing information and Business Connect	Community interaction; Real-time experience; Collaborative content development
Linking of resources and Navigation	Complex	Simple and Advanced
Use of Technology	Creation of Website, Email and Personal Webpage	Interactive Website, Social Media, E-Learning Systems, etc.,

Table.2: Features defining Web 1.0 and Web 2.0

There are some YouTube Videos that give an idea of the differences between Web 1.0 and Web 2.0

- Web 1.0 vs. Web 2.0 (http://www.youtube.com/watch?v=YXFYkbQRgY4)
- Web 2.0 (http://www.youtube.com/watch?v=nsa5ZTRJQ5w)
- Evolution Web 1.0, Web 2.0 to Web 3.0 (http://www.youtube.com/watch?v=A5d61xYzdv0)

2.2 Web 3.0 Technologies

Having experienced the collaborative web, the users are demanding new look, feel and richer experience. In response to this innovative of web technologies like 3D visualization, real web, etc have come up. This experience is certainly the extension or the next level of Web 2.0 technologies. Technologists suggest these developments as the third generation of the World Wide Web, Web 3.0. John Markoff of the New York Times coined the term "Web 3.0" and defined it as the third generation of internet-based web technologies which emphasize machine-facilitated understanding of information in order to provide productive and intuitive user experience. This rich experience comprises the use of semantic web, microformats, natural language search, data-mining, machine learning, recommendation agents, and artificial intelligence technologies. John Markoff calls Web 3.0 as 'Intelligent Web' (Markoff, 2006).

Nova Spivack in his article (2006) says: 'Web 3.0 will be more connected, open, and intelligent, with semantic Web technologies, distributed databases, natural language processing, machine learning, machine reasoning, and autonomous agents' gives a holistic picture of Web 3.0.The visual comparison of web technology by Nova Spivack is presented as Figure 1.
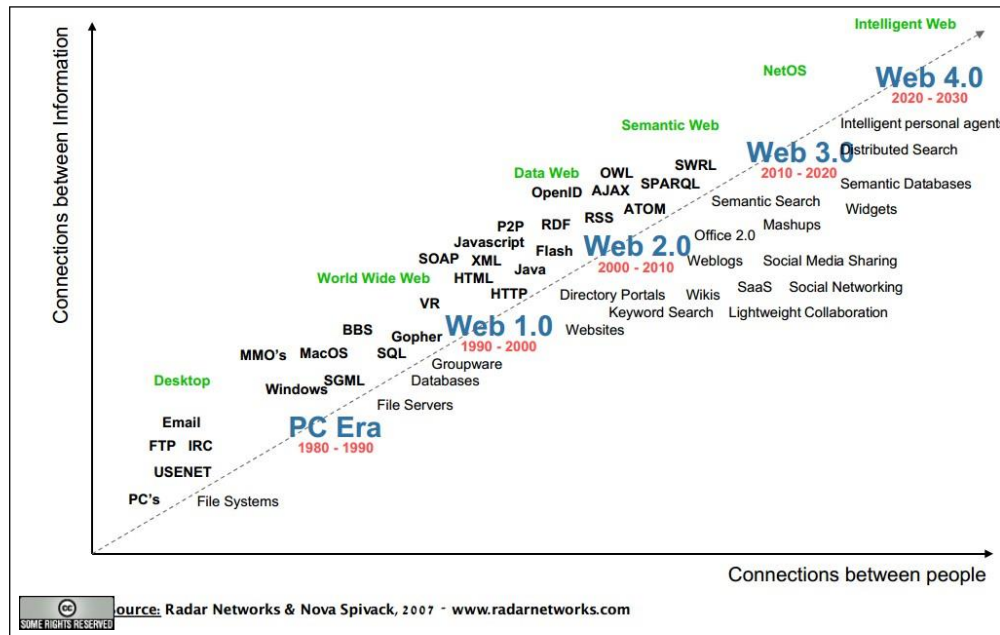

Fig.1: Visual Comparison of Web technology development

(Source: Spivak, N., & Tucker, L. (2007). Developing Web 3.0 (Session BOF 6746). JavaOne Conference 2007. Retrieved July 12, 2014, from http://bblfish.net/work/presentations/2007/BOF-6747.pdf)

Again there are some interesting videos / presentations on Web 3.0:

- Nova Spivack – Making sense of Semantic Web (http://vimeo.com/684381)
- Developing Web 3.0 (http://bblfish.net/work/presentations/2007/BOF-6747.pdf)

3. Social Media[1]

Social media are the websites and applications that enable users to create and share content or to participate in social networking. Andreas Kaplan and Michael Haenlein (2010) say: 'social media is a group of Internet-based applications that build on the ideological and technological foundation of Web 2.0, which allows the creation and exchange of user-generated content'. This suggests that Social Media is the collective term for Web 2.0 applications for information exchange. The Conversation Prism presented below as Figure 2 presents the different social media universe available for different activities. The prism is organized based on the category to which the social media belongs and how people use.
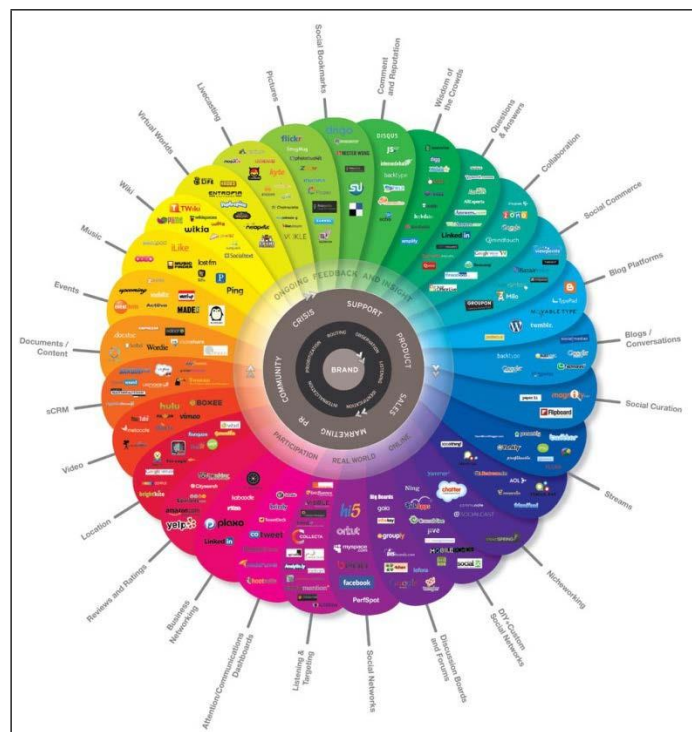

Fig.2: The Social Media Conversation Prism

Source: Doyle, M. (2013). The Conversation Prism. The Website Marketing Group. Retrieved July 12, 2014, from http://blog.twmg.com.au/the-conversation-prism/

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[1] Many of these have been discussed in greater detail in another unit on 'Social Media in Libraries' in this package course.

The conversation prism gives the holistic view of social media which comes in many forms. We will focus here on eight most popular forms, viz.,: blogs, micro-blogs, social networks, media-sharing, social bookmarking, voting and review sites, forums, and virtual worlds as listed by Dan Zarrella (2009) in his book "The social media marketing book". (Zarrella, D. (2009). The social media marketing book. Beijing: O'Reilly. http://danzarrella.com/Social_Media_Marketing_Book_ch1_3.pdf). For each of the eight forms we will briefly examine the purpose, a brief history and the most popular tools available for service.

3.1 Blogs

History: Jorn Barger coined the term 'Weblog' during 1997 for a personal website or web page on which an individual records opinions, links to other sites, etc. on a regular basis is posted. Later it was called 'Blog' for convenience by Peter Merholzby breaking 'Weblog' to 'We Blog' (Economist, 2006). Since 1999 blog became popular with LiveJuournal and reached a wider audience with the entry of 'Blogger' by Evan Williams.

Purpose: A blog is a type of content management system (CMS) that makes it easy for anyone to publish short articles called posts. A 'Blogger' is someone who blogs or writes content for a blog; and 'Blogging' is the act of writing a post for a blog. It is generally introduced as an online personal diary or online journalism. Blog software provides a variety of social features, including comments, blogrolls, trackbacks, and subscriptions. Blogs make great hubs for other social media services as they can be easily integrated with nearly every other tool and platform.

Use of Blogs in Libraries

- To update on the upcoming releases in publishing and entertainment industry
- To post select book reviews and encourage the user community for discussion and share their thoughts
- To introduce users to subject specific information available on collaborative weblogs.
- To announce news, events, activities, etc., related to library.
- To answer user queries and to share available information resource to the user.

- To link to online resource, information gateways, knowledge portals and other information repositories
- To get feedback, suggestions on specific service or for acquisition of title
- To make library staff members to interact and collaborate
- To provide online reference services. By identifying the online resources freely available or accessible on campus, libraries can provide reference service
- To promote library services through regular post on usage, services offered, users remarks, etc.,
- To provide necessary guidelines, tutorials and instructions on services and use of services.
- Blogs act as channels to offer Information Literacy Programmes.

Popular Blogging sites:
- **Blogger (**https://www.**blogger**.com/start**)**
- **Tumblr (**https://www.tumblr.com/**)**

To know more about Blogs:
- http://en.wikipedia.org/wiki/Blog
- http://www.economist.com/node/6794172

3.2 Micro-blogging

History: Like 'Xerox' is the pseudo name for 'Photocopying', 'Twitter' is for 'Micro-blogging'. Political protest carried out in 2004 using online tool called TXTMob which sends SMS to the cell phones of a group of people was the idea trigger for 'Twitter'.

Purpose: Many surveys have found that online users don't spend reading long texts, long emails, and lengthy advertisements or product presentation. Publishers also want to reach the users without much time, investment and content. The best solution is 'Twitter'. The Micro-blogging which limits the size of a post to 140 characters demands the user to convey the message in as short a manner as possible. This is the widely used social media tool to reach large audience in a very short time.

To Know more about Micro-blogging

- http://www.youtube.com/watch?v=gfsYBMt4vqk
- http://en.wikipedia.org/wiki/Microblogging

Use of Micro-blogging in Libraries:

- To reach the larger community who are on social media for promoting the activities, events, happenings of the institute in general and library in particular
- To send library alerts regarding new arrivals, book talks, change in library working schedule, etc.
- To know about what our user community speaks about service, activities and collection
- To inform the community about trends in topics covered in dailies (newspapers), social media platforms, discussions, etc.

3.3 Social Networks

History: Bulletin Board Systems (BBSs) which are used to send messages to the known community with option to share the software and data were the blueprints for current Social Networks. The BBSs were in use during 1980's; the usage was very much restricted to specific local communities. The rich features of Web 2.0 technologies made the BBSs reappear as Social Networks.

Purpose: Social Network websites are topic for the day. It may be for a political party, company, service industry, celebrity, marketers, or even to a school student social network websites have become a means to connect with friends, interact, share, create groups, publish, etc.

Use of Social Networks in Libraries:

- To share information about library news/events
- To share the photographs and video clips of institute events, visitors of campus with views, student activities, happenings at the institute, etc.,
- To market the library services with regular posts and sharing of links
- To provide online reference service
- To facilitate the searching OPACs
- To update the users with the new acquisitions for libraries

3.4 Media-sharing

History: The release of IFILM.net in 1997 to share short videos with options to browse the same using plug-ins such as QuickTime, RealPlayer and Window Media Player provided the blueprint for today's YouTube. The launch of Youtube in 2005 overcame the difficulties in browsing, streaming, searching in the earlier site.

Coming to photo sharing Ofoto was the first photo-sharing website started in 1999. Later Photobuket, Image Shack made their entry in 2003 with improvised features like user profile, keywords, sharing privileges, etc. The entry of Flickr with tagging and social networking functionality made the user to experience the sharing of photos live and enjoyable.

Apart from the videos and photographs, another medium which was sought by the academic community was the Presentations or PPT's in general. SlideShare made this possible by allowing users to upload and share presentations. The uploaded slides or presentation slides were converted to Flash widgets and the link is made available to the user for sharing the same via other social network sites, blogs, websites, etc. to reach large numbers.

Use of Multi-media sharing in Libraries

- To provide information literacy instruction/library tutorials
- To share library news/events
- To share the interviews conducted at campus, speeches, guest talks, student activities, institute events, etc.
- To share the information about audio / video collections available
- To share book reviews, presentations, photographs, etc.

3.5 Social Bookmarking

History: Social bookmarking is making its noise since 1996 allowing online users to isolate interesting links and rank them. In this effort, ITList is the first attempt seen in the literature. Later in late 1990s it was Slashdot which made great impact in social bookmarking. It was Delicious introduced in 2003 and Digg in 2004 which have large audiences connected for social bookmarking serving them information updates in the relevant fields every day.

Use of Social Bookmarking Sites in Libraries

- To inform users about library news and developments in a way that resembles the "news service"
- To update the users about changes in library working schedule, new acquisitions, exhibitions, etc.
- To share items published on library blog
- To inform about updates in the information literacy instruction
- To provide information about new acquisitions
- To provide information about podcasts / vodcasts
- To Provide information about databases / e journals / TOCs

3.6 Rating / Voting Review sites

History: Amazon.com is the trendsetter for online reviews, ratings and sharing user opinion. During 1995, Amazon provided option to the user to add reviews for products. In later years rating, voting, etc, were introduced to make it easier for users to express their views. This idea was captured by many sites and implemented with additional features.

Purpose: The tourism, hotel industry, consumer industry especially online marketing portals, libraries, service industry, etc, used these sites. The reviews or user opinion has helped the users to present collect the consumer / user opinion, market analysis, marketing of services and products, and advertising.

3.7 Forums

History: The concept of social media originated from the concept of online Forum. Usenet, a joint project of University of North Carolina and Duke University in 1979, was the first Forum traced in the literature. Usenet facilitated the online community of both the Universities for conversation and sharing of information. The conversation was termed 'message threads' in the post-and-response pattern, the pattern seen in many social media sites. Tim Berners-Lee announced the launch of World Wide Web on Usenet (Zarrella, 2009). The subsequent developments seen in Forums are the bulletin board, discussion board, tags, etc. which adopted the Web 2.0 technologies to a great extent. There are forums for general discussion

as also subject specific forums. vBulletin and Invision Power Board are the popular software for Forum building. PhpBB and the open source content management system – Drupal are known for supporting Forum.

Purpose: Forums are online platforms which bring subject specialists and information users together by providing for virtual interaction between them. The content developed in the Forums provides a holistic picture or answer for specific questions through the message threads.

Use of Forums in Libraries:

Libraries can extend support to forums managed by student or research community. Libraries can act as facilitators and share information regarding the discussion topic, sell the services, market their resources, and get valuable feedback which can enhance the value of library's presence.

3.8 Virtual worlds

History: The online users expect the real-time, real-life and real-world experience on their desktops. Virtual Worlds made their entry in the beginning of this century giving users a new experience in games and social activities. The computer games, avatars on computers, Google Earth, are some examples to experience the virtual world. Second Life launched in 2003 by Philip Rosedale provides rich experience of Virtual World.

Purpose: Virtual Worlds make the user to have a real-time, real-life and real-world experience. This helps the user to have more information and clarity on what the publisher of the site wants to tell. It may be a product, apartment flat, geographic location, hotel room, service offered, software feature, computer game or an online book, it gives a three-dimensional experience to the user.

Libraries were in the forefront to bring these technologies to their users branding themselves Library 2.0 and Librarian 2.0.

4. Library 2.0 and Librarian 2.0

There is a revolution in web technologies transforming the static monolithic web pages to dynamic interactive web sites. This has also transformed the way libraries

function. This environment has made users to expect the same freedom, ease and service from libraries also. Since, users are already equipped to use web 2.0 technologies in general and social media in particular through their desktops, laptops, mobile phone, iPods and other virtual modes, it is easy for librarians to reach them through these.

4.1 What is Library 2.0?

Library 2.0 is a term to indicate the way libraries are expected to function in response to the developments in web technologies. Efforts to define this term concentrate on user expectations; multi-media experience, instructiveness, and technologically innovative services.

Michael Casey was the first to use the term "Library 2.0"in his blog Library Crunch while discussing the impact of Web 2.0 technologies on libraries as it did for e Commerce making it Business 2.0. Casey suggested that libraries, especially public libraries, are at crossroads where many of the elements of Web 2.0 have applicable value within the library community, both in technology-driven services and in non-technology based services. In particular, he described the need for libraries to adopt a strategy for constant change while promoting a participatory role for library users. Maness (2006) discusses the concept of Library 2.0 and defines it as "the application of interactive, collaborative, and multi-media web-based technologies to web-based library services and collections".

- **It is user-centered**. Users participate in the creation of the content and services they view within the library's web-presence, OPAC, etc. The consumption and creation of content is dynamic, and thus the roles of librarian and user are not always clear.

- **It provides a multi-media experience**. Both the collections and services of Library 2.0 contain video and audio components. While this is not often cited as a function of Library 2.0, it is here suggested that it should be.

- **It is socially rich.** The library's web-presence includes users' presences. There are both synchronous (e.g. IM) and asynchronous (e.g. wikis) ways for users to communicate with one another and with librarians.

- **It is communally innovative.** This is perhaps the single most important aspect of Library 2.0. It rests on the foundation of libraries as a community service, but understands that as communities change, libraries must not only change with them, they must allow users to change the library. It seeks to continually change its services, to find new ways to allow communities, not just individuals to seek, find, and utilize information.

Having expected our library to have a turnaround with the application of Web 2.0 technologies, as librarians we have to make ourselves prepared to face this change. The learning in this change is expected to transform us from 'Librarian' to 'Librarian 2.0'. Let us discuss what makes us Librarian 2.0.

4.2 Librarian 2.0

The technological developments on the Web have had a major influence on user behavior and expectations from libraries. This poses new requirements on librarians' competencies and skills which will impact on our work identity and knowledge. The key qualities expected of library professionals in this Web 2.0 world include:

- Ability to understand and select appropriate Web 2.0 technologies for various services;
- Developing a successful implementation strategy of Web 2.0 technology which is financially feasible, technologically robust and user friendly;
- Flair to understand user behavior in Web 2.0 environment and developing skills to meet the information needs of the user
- Skills to market library services using Web 2.0 technologies
- Talent to enhance the quality of administration, management and service delivery with the Web 2.0 application
- Capable of measuring library services provided through Web 2.0 applications and strategizing service management to enhance the effectiveness of and response to the service offered.
- Awareness about the legalities and etiquettes of Web 2.0
- Team member and leadership qualities in offering collaborative web based services
- Communication, Confidence and Competitiveness are the core motivational components needed to bring Web 2.0 technologies

These are the essential skills expected of a library professional to be successful in Web 2.0 environment.

4.3 Use of Web 2.0 in libraries

Application of Web 2.0 technologies in library website doesn't make our libraries Library 2.0. It is the mash-up of traditional library services with the Web 2.0 technology in service, administration, access to resources, interaction with users and the experience of user in information accessing which makes Library 2.0. The following paragraphs introduce the application of Web 2.0 technologies in Library Websites. We will also examine how social media is brought into library service in general and library website in particular.

The library website is the gateway to resources and services. The development in Web technologies has encouraged librarians to introduce new services. The change in library website has been appreciated and accepted by the user community who want to experience social media in library websites also. The common Web 2.0 technologies seen in the library website are RSS, Blogs, Wikis, user tagging site, instant messages (IM), social networking sites like Facebook, Twitter, MySpace, etc. It is an effort by libraries to give the Library 2.0 experience to its users which focuses on user-centered; a multi-media experience; socially rich; and communally innovative service (Maness, 2006).

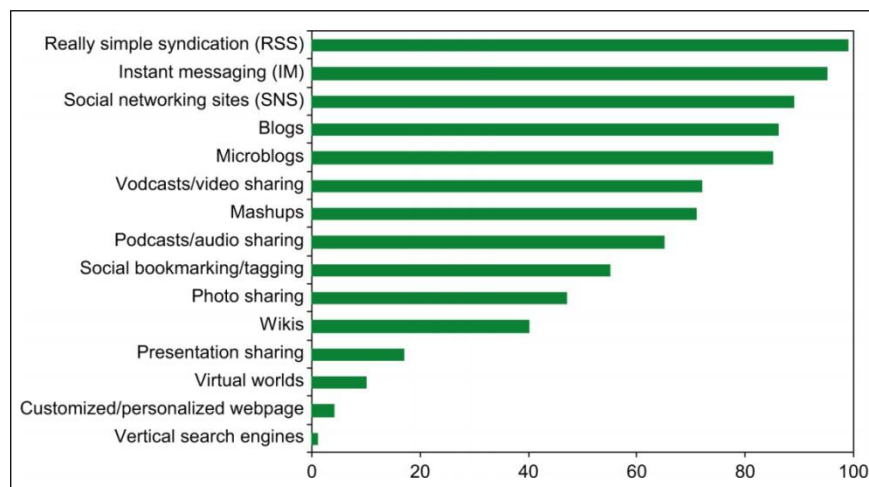The usage levels of Web 2.0 technologies in library websites can be seen in Figure 3.

Fig.3: Use of Web 2.0 technologies in library websites
Source: Khalid Mahmood, John V. Richardson Jr, (2011)

Let us now list the salient features / services which we can /(offer/ed to users through library websites. These/(be features / services are extracted from the library websites indicated for reference after the listing.[2]

Apart from the listed services that can be offered by libraries under in each of the above said Web 2.0 technologies, we can offer the following additional services in library websites -

- Integration of Google Maps to provide the location of library
- Embedding the Search interface of WorldCat
- Providing search interface of Google Scholar
- Creating knowledge portal to provide access to subscribed and open content with suitable categorization. Further it can provide information about the access and searching techniques of the indicated resources
- Providing search interface of Google Books
- Availability of Google Calendar which can provide information about the upcoming activities / event from the institute and library
- With the suitable login privileges the users should be able to resources restricted as "on campus"
- Providing access to instructor resources, subject guides, academic materials, institute / company rules and regulations, etc. the registered and privileged users
- Structured FAQs and providing instant messaging feature for user to reach library staff
- Training materials for students, staff, academic community and general public can be made available. \

A study analyzing web 2.0 features in university library websites by Harinarayana and Vasantha Raju (2010), details the performance of 57 universities and presents case studies of best performers in the identified Web 2.0 technology. The screenshot of top 3 universities listed in this study is presented below along with the URLs for your reference.

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[2] To obtain more information about how it is implemented, the usage rate, requirements and other modalities of web 2.0 implementation please refer the links indicated in the section Selected Readings for Social Media in Libraries.

5. Strategic implementation of Social Media

In the earlier section we understood the concept of Web 2.0, social media and for what purpose we can have it in our libraries. These conceptual knowledge and ideas presented will give a holistic view about the current situation in our profession. However, in real life situation to bring these ideas into reality it demands a good strategic plan of action. The knowledge, wider reading of case studies of implementation, the success stories, and the technical documents in the specified areas will be the key sources to develop a good strategic plan for implementation of any services. Before discussing how to make good strategic plan, we should have answers to the following questions:

- Why should we consider social media for our library?
- Are our library users ready to expect Library 2.0?
- Is my library ready to provide Library Services 2.0?
- Am I capable and do I possess skills to offer service in this Web 2.0 world?
- Finally ask yourself - what do you want to achieve, who would you like to target, which user group will be most interested in the information you are sharing?

Like any other technology which we have implemented in libraries, different social media and Web 2.0 too have different strengths and weaknesses. It is important to remember that Social Media or Web 2.0 technologies are tools and they are not the finished products like Integrated Library Systems or Library Automation System. Hence it is important to understand - the technology, who are our audience, decide which channel to use, what service to offer and how to implement these technologies in library services.

The strategic plan of action for effective implementation of social media in libraries has the following five steps –

a. **Understanding social media and the tool planned for implementation** – Listen to what people say in online forums, blogs, discussions in micro-blogs, media-sharing platforms, articles in technical journals, case studies and from the websites which have implemented. Please remember social media is a tool for communication and not the service itself. Finally experiment with any one of the tools to understand what and how it can work best for your library.

b. **Defining our goal and the audience for the service planned** - Coordinate with other authorities and staff who are good in technology to identify the services that have been offered and the associated pros and cons. Also consider your users who are active on social network and get the feedback about their expectations from library. Finally discuss with the decision making authorities about the services planned. Please ensure that the goal is specific, measurable, achievable, relevant and time-based.

c. **Evaluating the identified tool / technology with other parallel products and identification of proper tool** – there are a lot of social media tools as presented in the conceptual prism (Figure 2) that might be useful and popular, but you need to consider your own goals to determine what's likely to actually work for you. Consider the service planned and the features expected in the tool for evaluation. Create a test-bed or pilot study to understand and evaluate the tool.

d. **Defining the process of implementation covering** – technological infrastructure, manpower, services, marketing, legalities, evaluation and review. There is no clear thumb-rule to define the implementation process this depends on the organization, level of implementation, financial aspects and the available skilled manpower.

e. **Check on Return on Investment (ROI)** – Ultimately a check on effectiveness of our effort made is very important. The effort may be the hours we spent, money invested, information shared, number of satisfied information users, mileage to the library, etc. A proper periodic measurable system should be in place to evaluate the Library Service 2.0.

6. Summary

Gone are those days when social media was merely used as a platform for sharing personal photographs, vacation clicks and informing your first circle about your likes, dislikes happenings in the family and your views on current events and happenings. Today, social media is used to make buying decisions, to stay in touch with friends and family, to develop new relationships, to get updates and to be in society — both personal and professional.

This unit is designed to learn about technology that makes social media, application of social media in libraries and library services. The sections will

introduce open resources and provide information about libraries which have implemented Web 2.0 technology for offering Library Service 2.0. Like any other technology different social media and web 2.0 too have strengths and weaknesses. Social Media or Web 2.0 technologies are tools and they are not the finished products like Integrated Library Systems or Library Automation System. Hence, it is important to understand - the technology, who are our audience, decide which channel to use, what service to offer and how to implement these technologies in library services.

Expectations of library users have changed. They expect libraries to engage them with online personalized services and conversations. Libraries have no other option but to go digital and reach out to their user community. Social media come handy in this situation. The buzzwords Web1.0, Web 2.0 and Social media (sometimes equated with Web 3.0) are many a time used, confused and abused on a regular basis. Web 1.0 is a one-to-many online platform where as concept of Web 2.0 is many-to-many content. Web-based sharing and easy-to-use platform are the distinguishing features of Social media. The technologies should never be implemented without proper technical and economical feasibility examinations. Not all Social media technologies may be useful for libraries. When implemented - keeping in view users' expectations and proper estimation of ROI - Social media will be very effective in libraries.

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