New Media and Computer Application

SEMESTER V

JOURNALISM AND MASS COMMUNICATION

BLOCK - 2

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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BLOCK INTRODUCTION

The second block of the course consists of seven units, the first unit deals with the role of new media in open and distance learning, which is a major area of education in the present times. The second unit will help you in understanding the role of new media in bringing social change.

The third unit being the unit on 'Using Computers : Essential Concepts'. This unit will give you an introduction to computers, its concepts, types, applications and advantages and disadvantages.

The fourth unit includes the computer softwares basics, system and application softwares, and the legal restrictions on using softwares.

The fifth unit is 'Printing Technology and Typography' will help you to know the concept of printing technology, and offset printing. In fact, it provides an introduction to the printing machines, type of printing, typography and layout.

The sixth unit focuses on application and uses of computer technology in journalism, and the last unit of the course deals with media convergence and its related aspects.

While going through this course, you will come across some side boxes, which are put on the left side or right side of the text. These boxes give you the meaning of some words and concepts within the text. Apart from this, there are some broad and short questions included under 'Activity' and 'Check Your Progress' in every unit. Activities will increase your thinking capacity because qestions put in Activity are not directly derived from the text. However answers to the short questions are provided the section Answer to Check Your Progress. Besides, there are some text-related questions which are given as 'Model Questions'. These questions will help you to draw your attention to the probable topics for the examination so that you can prepare for the examination with confidence.

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Concept of Distance Education, growing importance of new media tools and technologies, advantages and disadvantages of new media in Open & Distance Learning, relation netween new media and ICT

UNIT 10: New Media as a Tool for Social Change **158-170**

Using new media to bring about a social change, social media, tools of social media, social media as a catalyst for social change and development

UNIT 11 : Using Computers : Essential Concepts **171-190 Pages :**

Concept of computers, organisation of a computer, different types of computers, classification of computer, port, file management, application of computer, advantages and disadvantages of computer

UNIT 12 : Software and Multimedia Applications **191-207 Pages :**

Computer software basics, system software, application software, integrated software, multimedia confronting, legal restriction on software

UNIT 13 : Printing Technology and Typography **208-231 Pages :**

History of printing, printing technology, Offset printing - advantages and disadvantages, types of Offset presses, CTP, Typography- page layout, tips for good typography, fonts and font families

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UNIT 15 : Media Convergence **246-257 Pages :**

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Unit - 9: ROLE OF NEW MEDIA IN DISTANCE EDUCATION

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Concept of Distance Education

9.4 Growing Importance of New Media Tools and Technologies

9.5 Advantages and Disadvantages of new media in the area of open and distance learning.

9.6 Relation between new media technologies and Information and Communication Technology.

9.7 Let us Sum up

9.8 Further Reading

9.9 Model Questions

9.10 Answers to Check Your Progress

9.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- discuss the concept of Distance Education
- analyze the role of New media tools and technologies in distance education
- explain the advantages and disadvantages of new media in distance education
- discuss the relation between new media and ICT

9.2 INTRODUCTION

One of the major manifestations of the use of technology in education is distance education or distance learning. This is because in conventional education, technology is a supplement to the teacher and used by the

teacher to make the content of the course more persuasive. In distance education, however, technology is a substitute for the teacher (and not just a supplement). The essential of distance education is that it replaces the interpersonal communication between the teacher and the taught and replaces it with a personal form of communication mediated by technology.

9.3 CONCEPT OF DISTANCE EDUCATION

Distance Education or Distance Learning refers to learning remotely without having a face-to-face interaction with a teacher in a classroom. Distance learning can be termed as a way of getting information/education without direct interaction with the provider of such information. This can be achieved by different methods, including through study centers located in places where the main provider is not based. However, the qualification gained by studying in such distance learning centers is considered as being provided by the main provider.

Distance learning is the preferred choice of individuals who are either working or cannot be physically present to attend classes. Education is offered here on virtual basis, where time and distance does not matter and the learner can access information at his/her own convenience. There are various modes which are covered under distance education such as evening classes provided by the universities or correspondence education where attending classes is not compulsory. Online classes via the Internet, educational DVDs and study material, including books and other reference material, also form a part of the educational content. This flexible system of education is considered to be less expensive, yet effective, and without any geographical constraints. Students still have access to their mentors/ teachers in some or the other way. For example, they have different forums for their questions, feedback or suggestions. They might also have teacher-student interaction periodically in certain correspondence classes.

Some of the different terms used for distance learning are: -

(a) Distance Education (b) Distance Teaching (c) Open Education (d) Open Learning (e) Open School (f) Open University (g) University of the Air (h) University without Walls

(i) Tele University (j) Out of School Education (k) Correspondence Learning (l) Correspondence Teaching (m) Correspondence School

9.4 GROWING IMPORTANCE OF NEW MEDIA TOOLS AND TECHNOLOGIES IN DISTANCE EDUCATION

Distance Education Technologies (DET) or New Media Tools are expanding at an extremely rapid rate. Modern technologies such as computer, communication and media are being utilized in various fields for data processing and quality improvement. Similarly, the same technologies are being utilized in conventional and non-conventional mode of education. The paradigm is slowly shifting from traditional classroom learning to open and distance learning. Since need of learners' increased towards new technologies, all pedagogical principles and theories are being changing their form and shape that would emphasize on open and Distance Education. Therefore, instructional designers and curriculum developers have become enamored of the latest technologies in the educational process.

With regard to cognitive learning goals, individual guidance over modern media and technology would appear to be valuable as a medium for fulfilling the certain teaching functions, which are:

- Activating Motivation
- Directing attention
- Stimulating recall of relevant prerequisites
- Providing learning guidance
- Providing feed back (Baath, 1979).

The interactive and non-interactive media and technologies which are the New Media Tools are being used in Distance Education for having seen to fulfill the above in one way or the other.

A distinguishing feature of New Media Tools in distance education system is its multi-media instructional system, which combines different forms of

media depending on need. It is learner based. In this system teachers are absent and learners are independent and mostly learn for themselves with the help of multi-media instructional packages.

However, implementation of any new media and technology in Distance Education depends up on the awareness, availability, adoptability, acceptability, accessibility and affordability level of students. These are again depending up on the socio-economic conditions, cultural aspects, and geographical factors. Especially, Indian society divided caste wise and class wise, for long generations the upper cast people are enjoying and lower caste people are denied to access or use the resources. The Open Universities in distance learning mode are providing such opportunities and slowly democratization of education is prevailing in rural area.

9.5 ADVANTAGES AND DISADVANTAGES OF NEW MEDIA IN THE AREA OF OPEN AND DISTANCE LEARNING

With the fast growth of the Internet, and the fast progress of communication, the World Wide Web is a new promising medium for distance learning. With the enormous number of resources available online, and the increasing number of people who have access to the Internet, web-based instruction is considered one of the fastest media for teaching and learning. The World Wide Web provides a cost-effective, technology rich, and interactive medium, but there are notable advantages and disadvantages as it is with any other medium.

Advantages of New Media in distance learning

1. It is flexible when issues of time and place are taken into consideration, as New Media form doesn't demand physical presence in one place and time. Every student has the luxury of choosing the place and time that suits him/her. According to Smedley (2010), the adoption of e-learning provides the institutions as well as their students or learners the much flexibility of time and place of delivery or receipt of according to learning information. With this possibility, one can pursue a job along with studies. A major chunk of students who actually opt for distance

education are those who don't want to give up their jobs but want a higher education, too. You can study on the weekends, when you're back from work or even in the middle of the night.

2. Learning in the new media platform is cost effective in the sense that there is no need for the students or learners to travel. It is also cost effective in the sense that it offers opportunities for learning for maximum number of learners with no need for many buildings. Students who are looking for economically viable options can go for a distance-learning program.

3. New form of media provides opportunities for relations between learners by the use of discussion forums. It helps eliminate barriers that have the potential of hindering participation including the fear of talking to other learners. This new media forum motivates students to interact with other, as well as exchange and respect different point of views. E- learning eases communication and also improves the relationships that sustain learning. Wagner et al (2008) note that e-Learning makes available extra prospects for interactivity between students and teachers during content delivery.

4. E-learning always takes into consideration the individual learners differences. Some learners, for instance prefer to concentrate on certain parts of the course, while others are prepared to review the entire course.

5. The use of e-Learning allows self-pacing. For instance, the asynchronous way permits each student to study at his or her own pace and speed whether slow or quick. It therefore increases satisfaction and decreases stress.

6. E-learning enhances the efficacy of knowledge and qualifications via ease of access to a huge amount of information.

7. You can study whenever and wherever you want. Except in situation where you have to attend an online tutorial at a given time or a lecture through videoconferencing, you choose to study whenever and

wherever you want to. You need not be stuck in a classroom, but you can go to study in your garden, on your living room couch or in the comfort of your own bed. Irrespective of whether you're a morning lark or a night owl, you can choose an optimum time to study whenever you're at your productive best.

Disadvantages of distance learning

1. Sometime new media form can be complicated for few. And overdependence on technology can be a major drawback in distance learning mode of education, especially when the learning takes place in an online environment. Any malfunctioning software or hardware can bring an ongoing class to a standstill and interrupt the learning process. Similarly, if a student is not computer and tech savvy, his learning experience can be dissatisfactory.

2. E-learning as a method of education makes the learners undergo contemplation, remoteness, as well as lack of interaction or relation. It therefore requires a very strong inspiration as well as skills with to the management of time in order to reduce such effects.

3. In this mode of learning chances of distraction is high. Advertisement may sometime pop in and distract your attention. Also with no faculty around for face-to-face interaction and no classmates who can help with constant reminders about pending assignments, the chances of getting distracted and losing track of deadlines are high. You need to keep yourself motivated and focused if you want to successfully complete your distance-learning course. Distance education is not a good idea if you tend to procrastinate and can't stick to deadlines.

4. For a regular Online course there is some hidden costs. Though the cost of a distance education program is usually cheaper than a regular program, there can be hidden costs involved. For example, if your distance-learning course is offered online, you might have to incur some initial expenses like installing a computer and getting a reliable Internet connection. You may need to buy additional resources such

as a printer, a web camera and so forth. Some expenses might be recurring, like maintenance and electricity costs.

5. New media form is a good platform of virtual interaction but still the quality of faculty can be compromised. Even if the instructor is good, he or she may not be comfortable with teaching in an online environment. Sometimes the technology might not do full justice to the delivery and design of the course. A student loses out in all these scenarios. Distance education providers should realize that it is not the technology, but good and effective teachers that teach students.

6. E-learning may also probably be misled to piracy and plagiarism, predisposed by inadequate selection skills, as well as the ease of copy and paste.

7. Also not all fields or discipline can employ the e-learning technique in education. For instance, the purely scientific fields that include practical cannot be properly studies through e-learning. Researches have argued that e-learning is more appropriate in social



CHECK YOUR PROGRESS

Q.1 Define Distance Learning in one line.

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Q.2 What are the educational content of distance education system?

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Q.3 How e-Learning allows self-pacing?

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Q.4 Why chances of distraction are high in e-learning process?

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science and humanities than the fields such as medical science and pharmacy, where there is the need to develop practical skills.

9.6 RELATION BETWEEN NEW MEDIA TECHNOLOGIES AND ICT.

Most technologies described as “new media” are digital, often having characteristics of being manipulated, networkable, dense, compressible, and interactive. Some examples may be the Internet, websites, computer multimedia, video games, virtual reality, augmented reality, CD-ROMS, and DVDs. New media are often contrasted to “old media”, such as television, radio, and print media, although scholars in communication and media studies have criticized rigid distinctions based on oldness and novelty. New media does not include television programs (only analog broadcast), feature films, magazines, books, – unless they contain technologies that enable digital generative or interactive processes.

Wikipedia, an online encyclopedia, is an example, combining Internet accessible digital text, images and video with web-links, creative participation of contributors, interactive feedback of users and formation of a participant

community of editors and donors for the benefit of non-community readers. ***Facebook*** is an example of the social media model, in which most users are also participants. ***Wikitude*** is an example for augmented reality. It displays information about the users' surroundings in a mobile camera view, including image recognition, 3D modeling and location-based approach to augmented reality.

ICT Stands for "Information and Communication Technologies." ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums.

Application of ICT in Education has precedence of development of Educational Technology. Since the present day ICTs have all the strengths of erstwhile, education technology, even the field of educational technology has renamed itself as ICT. In this sense, ICT includes both traditional as well as modern educational technology.

This integration of ICT in the field of education has been due to two major reasons. The *first* one is the paradigmatic change in the way we started looking at the process of learning and consequently the teaching practices. The *second* one is the evolution of new technology, which could meet the needs from the first change.

(a) The paradigm shift

The major part of the 20th century was dominated by behaviorism as a central theory, which governed the principles practiced in educational practice. The result of practices guided by behaviorist principles lead to educational practices, which could be broadly termed as "instructivism". In this form of practice, teaching models predominantly believed in "information transfer".

The last decade of 20th century onwards-educational practices started getting influenced highly by a theoretical position namely "constructivism". Constructivist paradigm of educational practice believed in knowledge creation by the learner. This necessitated the active involvement in the knowledge re-creation process i.e., learning. One of the variants of

constructivism, social constructivism positioned that knowledge creation while learning is a social process. *Social interaction* was identified as a necessity for learning to happen. This theoretical position took learning beyond the walls of the classroom. All these together opened up new pedagogic possibilities in and outside the classroom. The pedagogical practices changed from lecture mode to interaction mode.

(b) Convergence of technology and telecommunications

Parallel developments in the field of technology lead to convergence of technology and telecommunications. Social networking became a virtual reality. Interacting with people who are hundreds of thousands of kilometers away, especially, in real time became a reality. The barrier of distance to communicate dissolved. There were new avenues to express oneself in the form of blog and micro blog. Digital revolution made data processing very easy to handle. In other words, ICT provided an ideal platform for learning in the new paradigm.

Having learnt that ICT has penetrated every walk of our life, it is important to understand why ICT has such a penetration? What are the core relation between New Media Technologies and ICT?

Let us briefly discuss some important features of ICT which are facilitated with the new media form:

(i) *Speed*: The innovations in Internet and broadband have made the communication instantaneous. Modern mobile applications have allowed people to communicate with each other in real time. There is no time lag between two places, which are thousands of kilometers apart.

(ii) *Precision*: The information that is communicated through ICT is very precise. Since there is no time lag in the communication, there are fewer chances of miscommunications.

(iii) *Versatile*: ICT can help in doing multiple tasks. Data can be gathered, verified, processed, and managed. Information can be communicated. ICT provides a multi-media platform for such communication.

(iv) *Cost*: ICT tools seem very expensive. But when we account for their reach, they come out to be very cheap. For example, the cost involved in printing textbooks is very high economically as well as environmentally. On the other hand preparing and using digital form of the book need high one time investment in creating. But once created, it can be used by any number of users without incurring additional cost.



9.7 LET US SUM UP

- Distance learning can be termed as a way of getting information/ education without direct interaction with the provider of such information. This can be achieved by different methods, including through study centers located in places where the main provider is not based.
- The interactive and non-interactive media and technologies, which are the New Media Tools, are widely being used in Distance Education.
- Major reason for such a widespread use of ICT in various sectors, and various educational practices is the speed, accuracy, versatility and cost involved with ICT.
- ***Wikipedia***, an online encyclopedia, is a good example of Internet combining accessible digital text, images and video with web-links, creative participation of contributors, interactive feedback of users and formation of a participant community of editors and donors for the benefit of non-community readers.
- Parallel developments in the field of technology have lead to convergence of technology and telecommunication resulting social networking a virtual reality, interacting with people who are hundreds of thousands of kilometers away, especially, in real time became a reality and the barrier of distance to communicate have finally dissolved.

9.8 FURTHER READING

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9.10 ANSWERS TO CHECK YOUR PROGRESS

Answer 1: A way of getting information/education without direct interaction with the provider of such information.

Answer 2: Online classes via the Internet, educational DVDs and study material, including books and other reference material, form a part of the educational content of distance education.

Answer 3: The use of e-Learning allows self-pacing. For instance, the asynchronous way permits each student to study at his or her own pace and speed whether slow or quick.

Answer 4: In e-learning process, chances of distraction is high. Advertisement may sometime pop in and distract your attention. Also with no faculty around for face-to-face interaction and no classmates who can help with constant reminders about pending assignments, the chances of getting distracted and losing track of deadlines are high. You need to keep yourself motivated and focused.

9.9 MODEL QUESTIONS

A. Very short questions.

Q.1: What is distance learning?

Q.2: What is convergence of media?

B. Short Questions (Answer each question in about 150 words)

Q.1: How can distance learning help a financially challenged student?

Q.2: “Convergence of media has made distance learning easier”. Explain.

C. Long Questions (Answer each question in about 300-500 words)

Q.1: What are the merits of distance learning?

Q.2: Can distance learning solve the illiteracy problem of our country? Discuss.

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Unit - 10: NEW MEDIA AS A TOOL FOR SOCIAL CHANGE

UNIT STRUCTURE

10.1 Learning objectives

10.2 Introduction

10.3 Using New Media for bringing about a Social Change

10.4 Social Media

10.5 Tools of Social Media

10.6 Social Media as a Catalyst of Social Change and Development

10.7 Let us Sum up

10.8 Further Reading

10.9 Answers to Check Your Progress

10.10 Model Questions

10.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- discuss how New Media can bring about social change
- describe the social media and its features
- evaluate the popular tools of social media and
- analyze how social media can be used as a catalyst of social change and development

10.2 INTRODUCTION

The New media is an important means of social change and can also be rightly called a social institution. New Media caters social and economic needs of wider social groups, and it plays a vital role in developing countries likeIndia. Especially in the post globalization era, media has to educate people for changing their traditional attitude to complement the modern radical needs.

The term globalizationhas become to direct discourses of social, economic and cultural developments inpresent-day society. In a country like India the process of globalization has not onlyaffected urban societies, but it isalso influencing rural communities.

10.3 USING NEW MEDIA FOR BRINGING ABOUT SOCIAL CHANGE

The Internet is a source of information, communication and entertainment since the Web became available to the public. The introduction of Electronic Mail service, and invention of telephone has no doubt change the way people connect with each other in their social world. But the level of proximity has drastically changed with New Media platform rewarding its users an experience of all time connection with friends, family and people around the world.

Social change is a general phrase which refers to change in the nature, the social institutions, the social behaviour or the social relationships of a society, community of people, or other social structures, any event or action that affects a group of individuals that have shared values or characteristics, acts of advocacy for the cause of changing society in a normative way.

1. New Media a platform of Democracy

New Media supports public participation and democracy by bringing out the democratic norms and indoctrinating the same in the general public/polity. Providing live coverage of parliament proceedings, activities of politicians, programs on democracies are few of the examples. New media has changed the social standard of accountability with transparency.

2. New Media has increased the level of awareness in society.

The digital media and the Internethas increased the level of awareness in the society by providing a platform of shared knowledge, constitutional rights, government projects and schemes, and contributing a lot in increasing the general knowledge, who is who and what is what, knowledge of current issues etc. The programmers having media discussions, current affairs,

documentaries, etc. have been instrumental in enhancing the common man's awareness.

3.New Media in Educational Efforts.

New Media today is regarded as a source of information. The way people, especially student's reliability on Internet for information compared to printed materials like books and journals has shifted by far. New media is also used by the state, society, organizations to promote educational activity, and educational institutions for distance learning opportunities.

4. New Media and Public Issues/Affairs.

Media provides viewpoint of the public on public issues. Media has given voice to the public. With new media, the society has felt the experience of freedom of expression, which has become quite possible with new media, blogs and websites.

5. New Media and Development Efforts of State.

New Media has assisted in development efforts of state.Programmes like "Parah Likha Punjab", "Coverage of Earthquake", have contributed in projecting efforts being made towards state development.

6. New Media and Development of Public Opinion.

Discussions over the media highlight the issues, different opinion and interest of the people, and identifiesthe reasons/angles of different interest groups or people. Standpoints of different segments of society on key issues are also brought out which helps to make or develop public opinion on different issues.

7. New Media and Employment Opportunities

The abundance of media outlets has on one hand has created lot of employment opportunities but on the other has posed challenges to the media professionals to excel in their fields.

10.4 SOCIAL MEDIA

Social media is a web-based technology that allows people to generate content, engage in peer-to-peer conversations and exchange content. It

blends social interaction, user-generated content and Internet and mobile technology.

Facebook- Facebook is a social networking site that makes it easy for anyone to connect and share updates with family and friends online. Facebook is originally designed for college students, which was created in 2004 by Mark Zuckerberg while he was still studying at Harvard University. By the year 2006, anyone over the age of 13 with a valid email address could join Facebook. Today, Facebook is the world's largest social network, with more than 1 billion users worldwide.

There are already a lot of other ways to communicate with people online, such as email, instant messaging, and so on. But what makes Facebook distinctive is that Facebook allows sending messages and post status updates to keep in touch with friends and family. We can also share different types of content, like photos, videos, GIFs and links. Though there are a lot of ways to communicate and share moments with friends and family, Facebook gives the environment of being seen and recognize in an online world.

For many, having a Facebook account is now an expected part of being online, much like having your own email address. And as because Facebook is so popular, other websites have worked to integrate Facebook. This means you can use a single Facebook account to sign in to different services across the Web.

WhatsApp –WhatsApp messenger is a freeware and cross-platform instant messaging service for smartphones. It uses the Internet to make voice calls, video calls, send text messages, images, GIFs, videos, documents, user location, audio files, phone contacts and voice notes using standard cellular mobile numbers.

WhatsApp messages and calls are secured with end-to-end encryption, meaning that no third party including WhatsApp users can read or listen to them except the sender or the receiver. It also incorporates a feature called Status, which allows users to upload photos and videos to a 24-hours-lifetime feed that, by default, are visible to all contacts, similar to Snapchat, Facebook and Instagram Stories.

WhatsApp uses a customized version of the open standard Extensible Messaging and Presence Protocol (XMPP). Upon installation, it creates a user account using one's phone number as the username. WhatsApp software automatically compares all the phone numbers from the device's address book with its central database of WhatsApp users to automatically add contacts to the user's WhatsApp contact list.

In January 2015, WhatsApp introduced a voice-calling feature, this helped WhatsApp to attract a completely different segment of the user population. On November 14, 2016, WhatsApp added video calling feature for users across Android, iPhone, and Windows Phone devices.

WhatsApp follows a "store and forward" mechanism for exchanging messages between two users. When a user sends a message, it first travels to the WhatsApp server where it is stored. Then the server repeatedly requests the receiver acknowledge receipt of the message. As soon as the message is acknowledged, the server drops the message. It is no longer available in database of server. WhatsApp server keeps the message only for 30 days in its database for any inactive user when it is not delivered.

YouTube - YouTube is an American video-sharing website created by three former PayPal employees — Chad Hurley, Steve Chen, and Jawed Karim — in February 2005.

YouTube allows users to upload, view, rate, share, add to favorites, report, comment on videos, and subscribe to other users. The content of YouTube includes video clips, TV show clips, music videos, short and documentary films, audio recordings, movie trailers, live streams, and other content such as video blogging, short original videos, and educational videos. Content on YouTube are uploaded by its users, but media corporations including CBS, the BBC, Vevo, and Hulu offer some of their material via YouTube as part of the YouTube partnership program.

Unregistered users can only watch videos on the site, while registered users are permitted to upload an unlimited number of videos and add comments to videos. Videos deemed potentially inappropriate are available only to registered users affirming themselves to be at least 18 years old.

Twitter - Twitter is an online news and social networking service where users post and interact with messages, “tweets”, restricted to 140 characters. Registered users can post tweets, but those who are unregistered can only read them. Users access Twitter through its website interface, SMS or a mobile device app.

Twitter and ‘tweeting’ is about broadcasting daily short burst messages to the world, with the hope that your messages are useful and interesting to someone. In other words, micro blogging.

Inversely, Twitter is also about discovering interesting people online and following their burst messages for as long as they are fascinating. Thousands of people promote their recruiting services, their consulting businesses, their retail stores by using Twitter.

The modern internet-savvy user is tired of a television advertisement. People today prefer advertising that is faster, less intrusive, and can be turned on or off at will and Twitter is the type of platform.

Twitter has been matched to a web-based Internet Relay Chat (IRC) client. As a social network, twittercircles around the principle of followers. When you choose to follow another Twitter user that user’s tweets appear in reverse consecutive order on your main Twitter page. If you follow 20 people, you’ll see a mix of tweets scrolling down the page.

LinkedIn – LinkedIn is the largest professional networking site accessible today. LinkedIn provides a way to connect with other professionals and helps you stay in contact with millions of users. LinkedIn is entirely utilized for exchanging knowledge, ideas, and employment opportunities and has increasingly become a leading tool for helping individuals expand their networks as well as find jobs in their field.

LinkedIn is typically one of the primary sites to appear in Internet engine results and is therefore a great tool to establish your online presence and connect with professionals.

One can consider LinkedIn as a more dynamic and visual version of their resume. We can include information, such as education, expected

graduation date, work experience, college awards, clubs, and hobbies. But rather than just listing this information, LinkedIn allows to expand on each point. One can share projects you are particularly proud of, such as a PowerPoint you did for class or a brochure you designed for the non-profit where you volunteer.

Finally, one of the most grounded features of LinkedIn is the possibility to incorporate references and proposals.

For example, if you have past professors or managers who appreciated your work, you can request them to submit a recommendation, which will show up on your profile for potential employers to see.



CHECK YOUR PROGRESS

Q.1: How do New Media support democracy in society?

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Q.2: What is WhatsApp?

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Q.3: What do you mean by Social Change?

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Q.4: Which social media can be use to enhance our resume? How?

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10.5 TOOLS OF SOCIAL MEDIA

Tools of social media are applications that are design to maximize the social-media experience across its platforms.Social media tools are created and use for Developing content, scheduling shares, engaging with followers, repurposing content, sharing others' content, community management etc. The only way to effectively manage social media at scale is with the use of social media management tools that can improve efficiency, and over time earns better results. Here are few tools of social media, which are seen to be use very often by any social media users.

1. LikeAlyzer: LikeAlyzer is a tool design for Facebook. It analyzes Facebook pages, measures the potential and effectiveness of Facebook Pages,and generates reports highlighting areas for improvement. This tool is an invaluable resource for businesses new to social media. The page-rank section allows business to see how they stack up against similar brands and by industry standards.

2. Nuvi: Nuvi is a tool used by brands like Uber, Chevron, Nissan, and more. Nuvi is a social media-marketing suite that is unique in its impressive social media data visualizations. Nuvi streamlines social media data reporting and monitoring, so marketers can focus on shaping their social media strategy.

3. Tweetdeck:Tweetdeck is owned by Twitter, and is a simple and fully featured dashboard for Twitter. It organizes feeds, notifications, messages and more using an easy-to-follow column view, and supports management of multiple accounts, making it perfect for the social media-marketing enthusiast.

4. Adobe Spark: Adobe Spark is a web-based tool from Adobe that turns ideas into graphics, web stories, and animated videos. It simplifies these developments making it simple for creative and non-creative alike to create beautiful, engaging media in minutes for sharing on social networks. Spark also features three iOS apps so that it can be created on the go.

5. GIPHY: GIFs have become an integral part of the social media experience - it's seen almost everywhere. GIPHY is the web's largest GIF database, containing all of the moving images you'll ever need for sharing with your social media. As social media like Facebook does not allow users to directly share GIF on their updates, GIPHY lets users to directly post it through its database.

6.Keyhole: Keyhole is a hashtag-tracking tool that measures the performance of certain keywords on both Twitter and Instagram. It provides real-time analytics, influencer metrics, and suggests related hashtags to help drive discovery and engagement.

7.Instagram for Business: This is a feature within Instagram that allows brands to turn their accounts into Business accounts. This unlocks a "contact" button, business insights, and the ability to create ads and promote posts directly within the Instagram app.

10.6 SOCIAL MEDIA AS A CATALYST OF SOCIAL CHANGE AND DEVELOPMENT

There is no doubt that one of the most influential uses of social media has been the change that it has driven in society.Around the world, billions of us use social media every day, and that number just keeps growing. In fact, it is estimated that by 2018, 2.44 billion people will be using social networks.

Kim Garst the writer of HuffPost and Neal Schaffer of maximizesocialbusiness.com demonstrate few great examples of how social media was used as a catalyst of social change and development.

Haiti 2010 - On January 12th, a 7.0 magnitude earthquake strikes Haiti killing 220,000 and destroying 250,000 residences and 30,000 commercial buildings. Nearly immediately Facebook and Twitter launch communication and fundraising support campaigns. The American Red Cross collects $7 million dollars in 24 hours by allowing people to make $10 donations using

their cell phones. Numerous online poker sites hold online tournaments with all entry fees and winnings going to disaster relief.

Kony 2012 - On March 5th the organization, Invisible Children, launched an online video designed to start a social movement against African cult and militia leader Joseph Kony, an indicted war criminal. The campaign's stated goal was to have him captured and removed from power by the end of the year. The video went viral and reached 100 million views in six days. Invisible Children became the most "liked" non-profit on Facebook with 3.1 million "fans." The Kony 2012 Resolution was launched in the U.S. House of representatives eight days later. Joseph Kony's power has steadily decreased since.

Social Movement: Egypt's Digital Revolution

When the youth of Egypt decided that the 30-year reign of Hosni Mubarak was enough, nobody foresaw their weapon of choice – social media. It has been said that the revolution started with one Facebook post sent late in the evening of January 14, 2011. Roughly translated, it simply read: "Message to the people of Egypt: let January 25 be the torch of change in Egypt."

While some have downplayed the importance of social media in the Egypt Revolution, this post was one of the factors that led to the first massive protest in Tahrir Square. The government, which then had control over traditional media, shut down phone and Internet networks to keep a semblance of control, but the determined activists used everything from dial-up connections to proxy servers in order to stay connected. January 25 became one of the most famous Twitter hashtags in Egypt's history. Through Facebook, Twitter, and YouTube, and the world watched as history unfolded in real-time.

Relief Operations: Japan's 2011 Quake

In March 11, Japan was rocked by an 8.9 magnitude quake, followed by one of the most devastating tsunamis in history – and then a meltdown at a nuclear power plant which Japan is still trying to deal with. With telecommunications immediately after the tsunami down, most people relied

on the Internet through their mobile phones to connect with worried relatives, as well as to spread the word about the state of hard-hit areas.

The world monitored the calamity online. YouTube records more than 15,000 and earthquake and tsunami video uploads, each showing the magnitude of the disaster and relaying individual fears and desperation. Google created a web application called “Person Finder” in order to help families and victims connect. Twitter usage spiked – #Fukushima, #Sendai, #Japan and Text REDCROSS trended, as Netizens rallied for aid, attaching #prayforJapan in every tweet. Social media became a source of information, aid, and comfort.

With the birth of social media, connectivity has become instantaneous. Real-time communication and social will has turned into the masses’ most powerful weapon for social change that can topple governments and heal nations. It seems that social media has transcended its initial purpose of simply connecting friendsto becoming the doorway to the world. As people realize that the voice of one can reach billions, social media will go on reinventing itself into a faster, smarter, and sleeker mode of communication that will continue to build virtual bridges everywhere – and help societies deal with challenges in new and more communal ways.

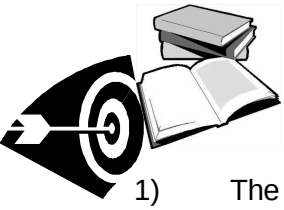


10.7 LET US SUM UP

Let us summarize some of the important points of this unit in the following way-

- We have learnt that, new media can be use to bring about social change. As new media support democratic participation, increased the level of awareness in the society, promotes education and distance learning possibilities, communicate public issues, mold or shape public opinions and provide employment opportunities.
- Facebook is the world’s largest social network, with more than 1 billion users worldwide.

- WhatsApp follows a “store and forward” mechanism for exchanging messages between two users. WhatsApp store its users message in server only for 30 days when inactive.
- We can use social media like LinkedIn to make our resume more dynamic and connect with professionals to share knowledge and job opportunities.
- GIPHY is the web’s largest GIF database, containing all of the moving images you’ll ever need for sharing with your social media. As social media like Facebook does not allow users to directly share GIF on their updates, GIPHY lets users to directly post it through its database.
- Social media can be wisely used as a catalyst to bring about social change by promoting and sharing updates and news when professional cannot take up the effort. Social Media can also motivate people to extend a helping hand to the needy or victim affected by natural calamities.



10.8 FURTHER READING

1) The Internet and Social Change By Carla G. Surratt, 2001, McFarland & Company, Inc. Publishers; ISBN 0-7864-1019-1.

2) Digitally Enabled Social Change: Activism in the Internet Age 2011, by Jennifer Earl and Katrina Kimport, ISBN 978-0-262-01510-3

3) The Internet, Social Media, and a Changing China, 2016; Edited by Jacques deLisle, Avery Goldstein, Guobin Yang, University of Pennysylvania Press-Philadelphia, ISBN 978-0-8122-2351-4

10.9 ANSWERS TO CHECK YOUR PROGRESS

Answer 1: New Media supports public participation and democracy by bringing out the democratic norms and indoctrinating the same in the general public/polity.

Answer 2: WhatsApp messenger is a freeware and cross-platform instant messaging service for smartphones. It uses the Internet to make

voice calls, video calls, send text messages, images, GIFs, videos, documents, user location, audio files, phone contacts and voice notes using standard cellular mobile numbers.

Answer 3: Social change is the change in nature, the social institutions, the social behavior or the social relationships of a society, community of people or other social structures, any event or action that affects a group of individuals that have shared values or characteristics, acts of advocacy for the cause of changing society in a normative way.

Answer 4: LinkedIn.

In LinkedIn we can include information, such as education, expected graduation date, work experience, college awards, clubs, and hobbies. But rather than just listing this information, LinkedIn allows to expand on each point. One can share projects you are particularly proud of, such as a PowerPoint you did for class or a brochure you designed for the non-profit where you volunteer.



10.10 MODEL QUESTIONS

A. Very short questions

Q.1: When did WhatsApp introduce a voice-calling feature?

Q.2: Who created YouTube?

Q.3: What is Nuvi?

Q.4:Name one social media hashtag-tracking tool.

B. Short Questions (Answer each question in about 150 words)

Q.1: Explain how new media can promote education.

Q.2:What are the two major differences between Facebook and Twitter?

C. Long Questions (Answer each question in about 300-500 words)

Q.1: Explain how new media can bring about changes in society.

Q.2: Discuss one event or situation where social media was used as a catalyst for social change.

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UNIT 11 : USING COMPUTERS : ESSENTIAL CONCEPTS

UNIT STRUCTURE

11.1 Learning Objectives

11.2 Introduction

11.3 Concept of Computers

11.4 Generation of Computers

11.5 Organisation of a Computer

11.6 Different Types of Computers

11.7 Port

11.8 File Management

11.9 Application of Computers

11.10 Advantages and Disadvantages of Computers

11.11 Let Us Sum up

11.12 Further Readings

11.13 Answers to Check Your Progress

11.14 Model Questions

11.1 LEARNING OBJECTIVES

After going through this unit you will be able to :

- explain what is a computer
- discuss about the generation of computers
- describe the organisation of a computer
- elaborate on the different types of computers
- explain what is a port
- discuss the concept of file management
- identify the areas of application of computers
- discuss the advantages and disadvantages of computer.

11.2 INTRODUCTION

Computer is the most powerful tool man has ever created. Computers have made a great impact on our everyday life. Today, computer technology has permeated every sphere of existence of modern human being. With the growing information needs computer has become one of the vital components for the survival of all organizations. Their presence is felt in almost every working place from the bus and railway ticket reservation counter to satellite launching, from retail stores to medical diagnosis and from home use to research and design organization - everywhere, we witness the elegance, sophistication and efficiency which is possible only with the help of computers.

In this unit, we will introduce you to the computer fundamentals including its various components and functionality. In this unit, we shall discuss the characteristics of computers including its evolution and generations. We will also discuss the categories of computers along with its application in the various fields of the modern world.

11.3 CONCEPT OF COMPUTERS

In ancient times people used fingers and pebbles for computing purposes. With the development of civilization, the computing needs also grew and the need to perform lengthy calculations led to the invention of some mechanisms and devices, first a calculator and then a computer.

The term ***computer*** is derived from the word ***compute***, which means ***to calculate.*** In the simplest form a computer can be defined as a ***programmable machine***. In a more formal way it can be defined as an ***Electronic machine*** capable of performing calculations and other manipulations of various types of data, under the control of a stored set of instructions. The machine itself is the **hardware**; the instructions are the program or **software**.

We can also define ***computer*** as an electronic device that operates under the control of a set of instructions that is stored in its memory unit. A computer accepts data from an input device and processes it into useful

information which it displays on its output devices. Actually, a computer is a collection of hardware and software components that help you accomplish many different tasks. ***Hardware*** consists of the computer itself, and any equipment connected to it. ***Software*** is the set of instructions that the computer follows in performing a task.

Most of today's computer designs are based on the concepts developed by John Von Neumann refered to as the *"Von Neumann architecture"*. Von Neumann proposed that there should be a unit performing arithmetic and logical operations on the data. This unit is termed as *Arithmetic Logic Unit (ALU)*. A control unit directs the ALU to perform specific arithmetic and logical functions on the data. Therefore, in such a system, by changing the control signal, the desired operation can be performed on data.

The Arithmetic Logic Unit(ALU) and Control Unit(CU) together are termed as the Central Processing Unit(CPU). The CPU is the most important component of a computer's hardware. The ALU performs the arithmetic operations such as addition, subtraction,multiplication and division, and the logical operations such as, >, <, >=. <= etc. The control unit interprets instructions and produces the respective control signals.

Computers are becoming a part of our daily life because of the following reasons:

1) A computer offers unmatched speed, performing computations faster than humans.
2) Computers undertake boring and difficult tasks.
3) Computers perform tasks repeatedly without errors, thereby avoiding fatigue that affects humans.
4) Computers can do critical and dangerous tasks that may be hazardous to humans.
5) Computers provide information which can be used in decision – making.
6) Computers offer services in medicine and science that previously did not exist.
7) Computers are an exciting entertainment medium, as well as educational tool.

8) Computers allow society to undertake activities in many fields and to functions more efficiently.

9) Computers can work in engineering fields where humans find difficulty and risk to life in performing certain activities, e.g. Robot welding, which is a relatively new area of robotics can be used in areas where human access is impossible (to perform in certain intricate places).

In short, computers allow people to become more productive whether used at the office or in homes. They offer features that just ten years ago were unheard of it. Computer technology developed in America has spread through out the world. Leaders in government and industry must master this technology to make sure the organizations are equipped to operate with the computers. Computer system today offer reliability, considering the stressful conditions in which they are used.

11.4 GENERATIONS OF COMPUTERS

We have already discussed about the evolution of computers in the previous block of this course. Now, evolution of modern computer is commonly considered in terms of generation of computers also. So let us discuss about the generation of computers.

First Generation (1940-1956) : Vacuum Tubes

The computers of this generation were made of vacuum tubes for circuitry and magnetic drums for memory. This made computers bulky and heavy. Punched cards were used to feed the information. Magnetic tapes were used as external storage devices. They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat and occupied a large amount of space. These machines used machine and assembly level language.

The UNIVAC (Universal Automatic Computer) and ENIAC computers are examples of first generation computing devices.

In 1951, the UNIVAC (Universal Automatic Computer) was introduced and became the first commercially available computer, with vacuum tubes, which was big and bulky, generated much heat and required air-conditioned rooms.

Second Generation (1956-1963) : Transistors

The computers of this generation were made up of transistors replacing vacuum tubes. They were small in size so the machines occupied a less amount of space. The use of transistors made the computers work faster. The transistor was far superior to the vacuum tube, allowing computers to become smaller, faster, cheaper, and more energy-efficient and is more reliable than their first generation predecessors. Though the transistors still generated a great deal of heat that subjected the computers to damage, it was a vast improvement over the vacuum tube. Transistors are made from materials called semi-conductors principally silicon (sand and rock) and germanium.

Second generation computers still relied on punched cards for input and printouts for output. The development of high-level languages like FORTRAN, COBOL and BASIC was possible.

Third Generation (1965-1971): Integrated Circuits

In the mid 1960's, the third generation of computers arrived and made the computer a major business tool. These were made up of IC (Integrated Circuits). Integrated circuit means incorporation of hundreds of transistors on a single silicon chip. The ICs had greater input-output capabilities and vast internal storage and operated in a billionth of a second. The third generation computers were still smaller than the computers of second generation. Heat generated was also less and occupied less space.

Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an operating system, which allowed the device to run many different application at one time with a central program that monitored the memory. Computers for the first time became accessible to mass audiences because they were smaller and cheaper than their predecessors.

Fourth Generation (1971 onwards): Microprocessors

The computers of this generation saw the advent of Large Scale Integration (LSI) and Very Large Scale Integration(VLSI), which incorporated several thousand transistor in a single chip.

ICs with the equivalent of more than 100 components are called LSI and those with more than 1000 components are called VLSI. The main

characteristics of the fourth generation computers is the evolution of the use of Microprocessors. Microprocessors had thousands of integrated circuits which were built into a single silicon chip. The computers using these chips are called microcomputers which are known as "Personal Computer" (PCs).

The Intel 4004 chip, developed in 1971, located all the components of the computer, from the central processing unit and memory to input/ output controls-on a single chip.

Fifth Generation Computers (Present and Beyond): Artificial Intelligence

Different types of modern digital computers fall under the category of fifth generation computers. The starting point for the fifth generation of computers has been set in the early 1990s. Though the process of developing fifth generation computers is still in the developmental stage., there are some applications such as voice recognitions that were already in use (that are being used today). These computers are based on the Ultra Large Scale Integration (ULSI) technology that allows almost ten million electronic components to be fabricated on one small chip. This technology helps to increase the power and speed of the microprocessor chips and the capacity of primary and secondary storage devices to a great extent. As such, the fifth generation computers are faster, cheaper and more efficient in comparison to the fourth generation computers. This generation is based on parallel processing hardware and AI (Artificial Intelligence) software. In parallel processing, a computer access several processing units. AI comprises a group of related technologies that tries to stimulate and reproduce human behavior, which also includes thinking, speaking and reasoning. Some of these related technologies are expert systems (ES), natural language processing (NLP), speech recognition, vision recognition and robotics.



CHECK YOUR PROGRESS

Q.1 : What do you mean by computer?

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Q.2 : State True or false :

a) A computer offers unmatched speed, performing computations faster than humans. (True/False)

b) A computer system includes hardware, peripheral devices and software. (True/ False)

c) Output device is a peripheral device that displays, prints or transfers the results of processing from the computer memory. (True/False)

d) The word computer is derived from the word 'compute', which means to calculate. (True/False)

Q.3 : What are the different generations of computer?

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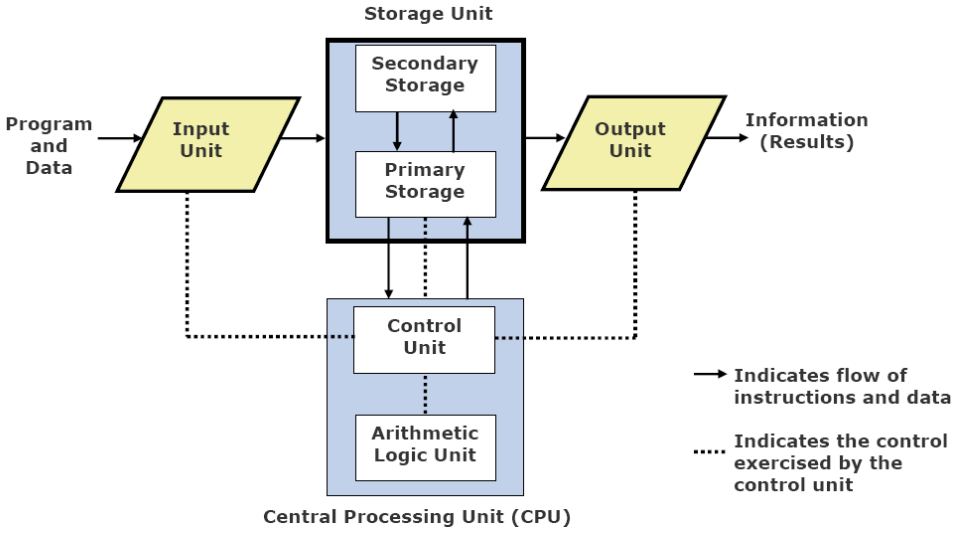
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11.5 ORGANISATION OF A COMPUTER

A computer is a fast and accurate device, which can accept data, store data, process them and give desired results as output. The computer is organized into four units as shown in the following diagram :



A) Input Unit : The input to the human brain is through devices like the eyes, ears and /or nose. Similarly, input to the computer is through

certain devices like a Keyboard, light pen and mouse. These devices which aid in the input of data and instructions into the computer are called input devices.

Function of Input Devices : The input device helps us to communicate with the electronic computer by converting the human understandable signals and numbers into appropriate electronic /electric signals.

Examples of Input Devices : Keyboard, Mouse, Lightpen, Touch Screen, Joystick, Scanners, Optical Character Readers (OCR), Magnetic Ink Character Reader (MICR), Mark sense Reader (MSR), Optical Mark Reader (OMR), Bar Code Reader.

B) Output Unit : Human beings communicate with each other by talking, writing or making actions. The computer communicates through devices like monitor (VDU-Visual Display unit) and Printers. These devices which aid in the communi-cation of data and information from machine to man are called output devices.

Function of Output Devices : The output devices help the computer to communicate with us by converting the electric signals to human understandable signals.

Examples of Output Devices : Visual Display Unit (VDU), Printers and Plotters. The output on the VDU is called Soft copy. Output on paper, which is produced by printers and plotters, is referred to as hard copy output.

C) Central Processing Unit : The Central Processing Unit (CPU) is the heart of the computer combined with the processing system of a computer. The CPU of a modern computer is fully electronic i.e. it does not contain any moving parts. It is made up of millions of electronic components attached on to a number of silicon chips. These chips are all assembled on a Printed Circuit Board called the Mother Board.

The CPU carries out actions with help of Arithmetic-Logic Unit (ALU). This is done following a detailed set of instructions written in the main memory. It also uses the main memory for temporary storage of information. The CPU instructs various parts called device

controllers to transfer data between secondary memory and the main memory. The CPU accepts the data from the input unit, process it and gives the result output to the output device. The data/result can be stored for the use by storing it in the secondary memory. The total operations of the computer are synchronized and combined by the CPU.

The processing capacity of a computer is measured in terms of the amount of data processed by the CPU in one operation .The CPU has three important sub-units.

1. **Arithmetic-Logic Unit (ALU) :** The ALU is an electronic circuit used to carry out the arithmetic operations like addition, substraction, multiplication and division. This unit carries out logical operation like greater than, less than, equal to etc. It performs the operation on the data provided by the input devices .A comparison operation allows a program to make decision based on its data input and results of the previous calculations. Logical operations can be used to determine whether a particular statement is TRUE or FALSE.

   The ALU operates on data available in the main memory and sends them back after processing again to main memory.

2. **Control Unit :** The control unit coordinates the activities of all the other units in the system. Its main functions are to control the transfer of data and information between various units and to initiate appropriate actions by the Arithmetic-Logic unit. Conceptually, the control unit fetches instructions from the memory, decodes them to various units to perform the specified task.

3. **Memory Unit :** The main memory is also called primary memory. It is used to store data temporarily. Although, the CPU is the brain behind all the operations in the computer, it needs to be supplied with the data to be processed and the instructions to tell it what to do. Once the CPU has carried out an instruction, it needs the result to be stored. This storage space is provided by the computer's memory. Data provided by the input device, and

the result of that processed data is also stored in the memory unit. This main memory is like a scratch pad. The storage capacity of the memory is generally measured in megabytes.

8 bits = 1 byte
1024 bytes = 1 Kilobyte (KB)
1024 Kilobytes = 1 Megabyte (MB)
1024 Megabytes = 1 Gigabyte (GB)

Different kinds of primary memory are Random Access Memory (RAM) and Read Only Memory (ROM). We can read and write data in RAM but the data is volatile or temporary, that is whenever the power is switched off, the contents of RAM are lost, so it is required to store the data in the secondary memory if the data is required for the future use. We can only read the data from ROM and we cannot write anything into it and the data is permanent.

D) Secondary Memory : The computer is provided with secondary storage devices. This is the permanent memory. The data, instructions and information stored in it are permanent. But we can delete them if we want to. There are different kinds of secondary storage devices available.

Examples :

Floppy disks : 1) to store files and retrieve files
2) Generally floppy disk is 3.5 inch floppy disk, which has the capacity of 1.44 MB

Hard disk : 1) to store files and retrieve files
2) These have the capacities in 40 Giga Bytes (GB), 80 GB etc.

Optical disks : 1) popularly known as compact disk (CD)
2) Different capacities are available; like 650 MB and 700 MB. Different forms of CDs are available. They are basically:

CD–ROM : Compact Disk Read Only Memory. On these the data is already recorded and we can view its contents when opened on the

computer. But the contents cannot be erased or altered and no new content can be added to it.

CD-R : In Compact Disk Recordable, the data can be written only once.

CD-RW : Compact Disk Rewritable. In this new data can be added several times. Also data can be erased from this disk.

DVD : Typically may contain at least 4.4 GB of data, nearly 7 times the amount of a CD-ROM. DVD capacities are given in decimal units. A “4.7 GB” DVD has a nominal capacity of about 4.38 GB.

USB Flash Drive/Pen Drive :

1) A USB flash drive is a memory data storage device integrated with a USB (Universal Serial Bus) inter face. USB flash drives are typically removable and rewritable, much smaller than a floppy disk, and most weigh less than an ounce (30 g).
2) Storage capacities can range from 64 MB to 256 GB with steady improvements in size and price per capacity. Some allow 1 million write or erase cycles and have 10-year data retention.

11.6 DIFFERENT TYPES OF COMPUTERS

Computers can be classified in many different ways. Some of them are as follows.

BASED ON PURPOSE AND USE

1) **General Purpose Computers :** General purpose computers can store large amounts of data and the programs necessary to process them. Digital computers work in highly specialized fields and perform complex mathematical formulae. Most business use them as they are versatile.
2) **Special-Purpose Computers :** A computer that is designed to perform a specialized task. The instructions to perform this task are permanently stored in the computer, e.g., cash register, STD billing machines etc.

   Special purpose computers have many features of general purpose computers, but perform highly specialized data processing tasks.

BASED ON TECHNOLOGY/ DESIGN

1) **Analog Computers :** A computer which measures continuously changing conditions, such as temperature and pressure, and converts them into quantities. These computers are used in scientific and engineering fields.
2) **Digital Computers :** A computer which measures digital data and performs arithmetic and logical operations on such data. These are most popularly used computers.
3) **Hybrid Computers :** They combine the best features of analog and digital and have the speed of both. They are used for special problems in which the input data, a form of measurement is converted into digits and processed by computers e.g. central national defense and passenger flight use hybrid computers. In Computer Assisted Manufacturing (CAM), etc., the hybrid computers can control robots on the production line.

BASED ON MEMORY (PHYSICAL SIZE)

1) **Personal Computers (Microcomputers) :** A computer is the smallest general purpose processing system. Functionally it is similar to any other large system. Microcomputers are self-contained units and usually designed for use by one person at a time.
2) **Mini Computers :** A minicomputer is medium sized computer that is more powerful than a micro computer. An important distinction between a microcomputer and a minicomputer is that a minicomputer is usually used to serve multiple users simultaneously.
3) **Mainframe Computer :** Computers with large storage capacities and very high speed of processing are known as mainframes. They support a large number of terminals for simultaneous uses by a number of users.
4) **Super computers :** These have extremely large storage area and computing speeds, which are many times faster than earlier discussed machines. While the speed of earlier discussed computers are measured in terms of million instructions per second, in super computers speed is measured as tens of millions of operation per second, an operation is made of many instructions.

These have more than one processor in it and the processing is carried out in applications which include large scale numerical problems in scientific and engineering disciplines like weather forecasting, atomic research, space research etc.

5) **Laptop/Note Book Computer :** These are the computers, which are small in size and weight few Kgs. These computers can be carried from one place to another easily. The people who are always on the move mostly use this. This has all the capabilities of a personal Computer. It has a LCD screen and has rechargeable batteries. Now we can even get computers which can be placed on our palm hence the name “Palm Top Computer”.

11.7 PORT

A **port** is a connector (or socket) which is used to connect the processor to the peripheral device. Any part of the computer’s circuitry that the processor needs to talk to, is given a port number, and the processor uses that number like a telephone number to call up the required part. Two types of ports are : a) Parallel port and b) Serial port.

Data can be sent either one bit at a time or several bits at a time. When data is transferred one bit at a time using one data line, the data transfer is said to be **serial**. When data is transferred several bits at a time, using many data lines (usually 9), the data transfer is said to be **parallel.**

Serial data transmission is usually chosen for long distance data communication and microcomputers will have at least one serial port based on the standard connector, RS-232C. A serial port is used to connect to either a telephone line (through a modem) or to a printer or the mouse.

Parallel data transmission is faster. Since many data lines are used, many characters can be transferred at a time. Most microcomputers will have at least one parallel port. A parallel port is designed specially to work with a printer.

The parallel port is specialized for controlling but a serial port is more generalized and it can be used for a variety of purposes (the mouse and telephone being the most common things to be connected to it).

CHECK YOUR PROGRESS

Q.4 : Computers are organized in four units, they are :

a) .....

b) .....

c) .....

d) .....

Q.5 : What are the different types of computer?

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Q.6 : What do you mean by Port?

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11.8 FILE MANAGEMENT

A **filename** is a unique set of letters and numbers that identifies a file and usually describes the file contents. Files are stored in clusters. A cluster is a group of sectors and is the smallest storage unit the computer can access. The number of sectors that form a cluster depends on the type of computer. IBM-compatible computers form a cluster from two sectors. Each cluster is numbered and the operating system maintains a list of which sectors correspond to each cluster.

A file is defined as a named collection of program instructions or data that exists on a storage medium such as a hard disk, a floppy disk, or a CD-ROM. There are several kinds of files. For example, data file, and program file which includes executable files, source files and batch file.

Data file : A data file contains words, numbers and pictures that we view, edit, save and print. Typically we create data files when we use application software. For example, we create a data file when we store a document we have written using word processing software or when we store a picture we have drawn using graphic software.

We probably won't create all the data files we use: we might receive data files as part of a software package we purchase. For example, word processing software often includes a dictionary data file that contains a list of words the software uses to check spellings.

Executable Files : An executable file contains the instruction that tells the computer how to perform a specific task. For example, the word processing program that tells our computer how to display and print text, is stored on the disk as an executable file. Other executable files on our computer system include the operating system, utilities and programs for application software.

The programs we run are one type of executable file. Our computer also has executable files that are executed at the request of a computer program, not the user. For example, a word processing program might request that the computer use an executable file called GRAMMAR.DLL to check the grammar in a document.

Source Files : A source file contains instructions that a computer user can understand and that must be translated before a computer can execute them. A computer user can request that a specific source file be run. The computer does the translation, so it seems as if the source program is being executed just like an executable file. But this is not the case; behind the scenes, a translator program is busy converting the source program into commands the computer can execute.

A valid file-name is created by following specific rules. The rules for creating a valid filename are referred to as file naming conventions. Each operating system has a unique set of file naming conventions. A filename usually has two parts: the file name itself and the file name extension. The extension is separated from the file name with a period, called a dot.

11.9 APPLICATION OF COMPUTERS

Computers have a very big impact on our day-to-day life. They can be used for a number of application like Business, Education, Research, Office, Accounting, Military, space, Entertainment, Medical etc. We can use it for any of the applications. Computers are becoming an integral part of

our life, which enhances our efficiency and productivity. In this competitive world the usage of computer to carry out day-to-day work will give us an edge over the others.

Following are the broad application areas where computers are used extensively:

1) **Entertainment :** It can be used to make cartoon movies, animation and special effects in movies, games etc.
2) **Day-to-Day Life :** It can be used in institutions like colleges, Hospitals, Railways and Airline Booking System, Shops, Banks etc. to carry out day-to-day work. For example train ticket bookings can be done with the help of computers. If we want to book a ticket to a particular destination instead of a human being searching for the availability of the tickets in books or by calling a respective station, the computer can do that job as computers of different stations are connected in a network.

   Most of the jobs which human beings do using paper, are done by the computer without the use of computer. For example, when a sale bill is made in shop the entry is made in the computerised Ledger, cash/ Bank book, stock etc automatically.
3) **Communication :** Now-a-days internet is becoming an integral part of life to gather information about different topics or to send and receive e-mails etc.
4) **Science :** It can be used for research purpose, space programs, nuclear programs etc.

11.10 ADVANTAGES AND DIS-ADVANTAGES OF COMPUTERS

Advantages of Computer : The following are some of the advantages of computer:

1) **Speed :** Computers carry out the jobs in microseconds or even lesser time. The human beings cannot think of doing the jobs with such speed. Few lakh calculations can be done in a second.

2) **Accuracy :** While doing a job human being may commit mistakes whereas if the data given to the computer is correct then the computer does the job without any mistakes.
3) **Efficiency :** Unlike human beings efficiency is very high in computers. As it is a machine it does not get tired or bored of doing a job. It can do the same job repeatedly any number of times without any mistakes and with the same amount of time. Each time the job is repeated with same kind of result. For example if letters to parents of all the students are to be printed then it will do the job monotonously.
4) **Storage :** A computer has a memory in which the data can be stored for future use. For example, the details of the students, customers, suppliers etc. can be stored in the computers to be used whenever it is required. A letter can be stored so that the same letter can be used in the later date. Retyping of that letter need not be done unlike in the case of type writer. Any number of copies of that letter can also be produced.

Disadvantages of Computer : The following are the disadvantages of computer:

1) Computers cannot think by themselves and they require human direction to perform specific task.
2) If the data given is wrong then it gives the wrong result. For example if we want to add two numbers say, 400 and 300, (here 400 and 300 are data) and instead of typing 400 and 300 if we give the data as 400 and 350 then the result will be wrong.
3) Instructions given also should be correct, that is instead of addition if we ask it to multiply it will multiply.
4) It will not work without electricity.
5) Investment and maintenance in this equipment is also required.



CHECK YOUR PROGRESS

Q.7 : What do you mean by file?

.....

.....

.....

Q.8 : What are the different kinds of files?

.....

.....

Q.9 : What are the application areas where computers are used extensively?

.....

.....



11.11 LET US SUM UP

- Computer is an electronic device that is used to perform diverse operations with the help of instructions to process the data in order to produce desired results.
- Speed ,accuracy, reliability, versatility, diligence, lack of intelligence are the characteristics of computers.
- Computer development is divided into five generations.
- The first generation of computers used **vacuum tubes** for circuitry and **magnetic drums** for memory, and were often enormous, taking up entire rooms.
- In the second generation of computers, **transistors** replaced vacuum tubes.
- The **integrated circuits** were used in the third generation of computers.
- The fourth generation of computers are based on **microprocessors.**
- Fifth generation computers are based on ***artificial intelligence.***

- A file name is a unique set of letters and numbers that identifies a file and usually describes the file contents. File management implies the combination of file-naming conventions and storage of files.
- Computers have application in all walks of life that is in Business, Education, Research, Science, Entertainment etc.



11.12 FURTHER READINGS

1) Parameswaram, R. (2008), *Computer Applications in Business*, S. Chand Limited.
2) Rajaraman, V. (2010), *Fundamentals of Computer*, PHI Learning Private Limited, New Delhi.
3) Saxena, Sanjay & Chopra, P., *Computer Application in Management*, Vikas Publishing House Pvt. Ltd.



11.13 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1 : A Computer can be defined as an electronic machine that is designed to accept data and instructions, store the data and instructions, process the data according to the instruction to produce desired results.

Ans. to Q. No. 2 : a) True, b) True, c) True, d) True

Ans. to Q. No. 3 : a) First Generation (1940-1956) : Vacuum Tubes
b) Second Generation (1956-963) : Transistors
c) Third Generation (1965-1971) : Integrated Circuits
d) Fourth Generation (1971 onwards) : Microprocessors
e) Fifth Generation Computers (Present and beyond) : Artificial Intelligence

Ans. to Q. No. 4 : a) Input Unit b) Output Unit
c) Central Processing Unit d) Secondary Memory

Ans. to Q. No. 5 : a) Analog Computers b) Digital Computers
c) Hybrid Computers d) Special Purpose Computers

e) General purpose Computers

Ans. to Q. No. 6 : A port is a connector (or socket) which is used to connect the processor to the peripheral device.

Ans. to Q. No. 7 : A file is defined as named collection of program in structions or data that exists on a storage medium such as a hard disk, a floppy disk, or a CD-ROM.

Ans. to Q. No. 8 : a) Data file b) Executable Files c) Source Files

Ans. to Q. No. 9 : a) Entertainment b) Day-to-day life
c) Scientist d) Communication

11.14 MODEL QUESTIONS

A) Very Short Questions

Q.1 : Whose concepts are referred to as *"Von Neumann architecture"*?

Q.2 : What is the full form of ALU?

Q.3 : Which generation of computers is known after 'Integrated Circuits'?

Q.5 : What is a USB Flash Drive?

Q.6 : What is a file?

B) Short Questions (Answer in about 150 words)

Q.1 : What advancements were made in the computers during the fifth generation of its development?

Q.2 : What are the different types of computers based on the technology and design?

Q.3 : Write a short note on ALU.

Q.4 : How are Super computers different from Laptop or Notebook computers?

Q.5 : What is a port? What are its different types?

C) Long Questions (Answer in about 300-500 words)

Q.1 : What is a computer? What is the difference between a computer and a computer system?

Q.2 : Explain different generations of computers

Q.3 : Explain the organization of a computer with the help of a block diagram.

Q.4 : Discuss the application areas of computers.

Q.5 : Discuss the advantages and disadvantages of computers.

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UNIT 12 : SOFTWARE AND MULTIMEDIA APPLICATIONS

UNIT STRUCTURE

12.1 Learning Objectives

12.2 Introduction

12.3 Computer Software Basics

12.4 System Software

- 12.4.1 Operating System
- 12.4.2 Utilities Software
- 12.4.3 Device Drive Software
- 12.4.4 Programming Language

12.5 Application Software

- 12.5.1 Productivity Software
- 12.5.2 Education Software
- 12.5.3 Entertainment Software
- 12.5.4 Business Software

12.6 Integrated Software

12.7 Multimedia Computing

12.8 Legal Restriction On Software

12.9 Let Us Sum Up

12.10 Further Readings

12.11 Answers to Check Your Progress

12.12 Model Questions

12.1 LEARNING OBJECTIVES

After going through this unit you will be able to :

- discuss computer software
- define system software and application software
- differentiate between system software and application aoftware
- explain different types of system software and application software
- define Multimedia Computing
- outline Software licenses and copyright agreements.

12.2 INTRODUCTION

In this unit we are going to discuss about computer software and its applications.The computer is the most successful and versatile machine in history. A computer's versatility is possible because of software. The software is an interpreter which translates the user's command into the understandable machine language codes which can be executed by the central processing unit. There are two major categories of software. They are system software and application software. **System Software** helps the computer to carryout its basic operating tasks. **Application Software** helps the human user to carry out a task. System software and application software are further divided into sub categories. We will discuss how a computer uses software and the difference between system software and application software.

The term multimedia isn't really anything new. It refers to the integrated use of multiple media, such as slides, video tapes, audio tapes, records, CD-ROMs, and photos. Computer technology is replacing or controlling many of the technologies and media that were previously used for multimedia presentations. Advances in computer technology have made it possible to combine text, photo images, speech, music, animated sequences, and video into a single interactive computer presentation. To display realistic graphic and video, your computer system must have a high resolution monitor and a CD-ROM drive.

12.3 COMPUTER SOFTWARE BASICS

Computer software determines what a computer can do; and in a sense, it transforms a computer from one kind of machine to another, from a drafting station to a type setting machine, from a flight simulator to a calculator, from a filing system to a music radio and so on.The distinction between software, programs, and data is important.

COMPUTER PROGRAM : A computer program is a set of detailed, step by step instructions that tell a computer how to solve a problem or carry out a task. The steps in a computer program are written in a language

that a computer can interpret or understand. At one time, computer users had to invest the time and expense of writing many of their own programs. Today, people rarely write programs for their personal computers, preferring to select from thousands of commercially written programs.

DATA : Data are the words, numbers and graphics that describe people, events, things, and ideas. Data can be included in the software, like the data for a dictionary in a word processing program, and you can create data such as numbers you provide for a graph.

SOFTWARE : We define Software as instructions and associated data, stored in electronic format, that direct the computer to accomplish a task. Under this definition, computer software may include more than one computer program, if these programs work together to carry out a task. Also under this definition, software can include data, but data alone is not a software. For example, word processing software might include the data for a dictionary, but the data you create using a word processor is not referred to as software.

Two major categories of software : System Software and Application Software with their strategies are displayed in the following figure :

12.4 SYSTEM SOFTWARE

These are software designed for the satisfactory operation of the system. The major categories of system software are :

1) Operating System;
2) Utilities Software;
3) Device Drive Software;
4) Programming Language.

12.4.1 Operating System

An Operating System (OS) is the software that controls the computer's use of its hardware resources such as memory and disk storage space. An operating system works like an air traffic controller to coordinate the activities within the computer. Just as an airport cannot function without air traffic controllers, a computer cannot function without an operating system.

The operating system works as a liaison between the computer hardware and application software. An operation system helps you start an application, then it works "behind the Scene" while the application software is running to perform tasks essential to the efficient functioning of the computer system.

Functions of Operating System : The functions of the Operating System are as follows :

- To control input/output operations i.e. use of keyboard, display screen and printer so that people can easily enter data and receive output.
- To control movement of data in the primary storage.
- To locate and load programs from secondary storage.
- To manage a large task in a smaller primary memory by using the technique of virtual memory.
- Management of Input/Output devices.
- Management of CPU time in (1) Multitasking (2) Multiprogramming and (3) Multiprocessing.
- Management of memory.

Some Popular Operating System : The names of the most popular micro computer operating system are DOS, Microsoft Windows, OS/2, MacOS, UNIX, VMS and MVS. Operating systems for micro, mini and mainframe computers perform many similar tasks. Many microcomputer users can recognize an operating system by looking at the first screen that appears when they turn the computer on or by recognising the operating system prompt.

DOS : DOS which stands for Disk Operating System, is marketed under the trade names PC-DOS and MS-DOS. Both PC-DOS and MS-DOS were developed primarily by Microsoft Corporation and are essentially the same operating system. Microsoft corporation stopped upgradation of DOS in 2001.

Windows : Microsoft took a more graphical approach to operating systems when it designed windows. Different versions of windows such as Windows 3.1, Windows 95, Window 98, etc. were developed. But the most sophisticated and the developed one is Windows XP and Windows Vista which is the latest version of Microsoft Corporation. MS-Windows provide icons that you can directly manipulate on the screen using a positive device, and menus you can use to issue commands. The application you use with Windows all have a consistent look, so it is easy to learn how to use new software. Windows also lets you run more than one program at a time in separate Windows on the screen and lets you easily transfer data between them. In addition to programs designed especially for Windows, the operating system also runs softwares designed for Windows and DOS.

Windows NT : The network version of the Windows operating system is Windows NT. With Windows NT you can connect your computer to other computers to share software programs and data.

OS/2 : OS/2 was designed jointly by Microsoft and IBM. If your computer uses OS/2, you can use most DOS and Windows software, as well as software designed specifically for OS/2.

UNIX : UNIX is an operating system that was developed by AT & T's Bell Laboratories in 1969 and is now used as one the foundation

technologies on the information superhighway. UNIX was originally designated for minicomputers, but is now available for microcomputer and mainframe. Many versions of UNIX exist, such as AIX from IBM, XENIX from Microsoft, and ULTRIX from Digital Equipment Corporation.

12.4.2 Utilities Software

Utilities are system software designed to augment the basic capabilities of your computer's operating system. Utilities provide computers with a way to control two allocations and use of hardware resources. Some utilities that are included with the operating system pertain to tasks such as preparing disks to hold data, providing information about the files on a disk, and copying data from one disk to another. Additional utilities can be purchased separately from software publishers and vendors. For example, Norton Utilities, published by Symantec; is a very popular collection of utilities software. Norton Utilities can retrieve data from damaged disks, make your data more secure by exempting it and help troubleshoot problems with your computer's disk drives.

12.4.3 Device Drivers

Device Drivers are system software that helps the computer control a peripheral device. When you purchase a new peripheral device, the installation instruction that come with the device usually tell you how to install both the device (hardware) and necessary device drivers (software). In order for your computer to use a device driver, you must install it according to the instructions. Once the device driver is installed correctly, the computer uses it to communicate with the device.

12.4.4 Programming Language

Programming language is a system of communication in the software technology. As such all the types of programming languages

such as machine language, assembly language and procedure and object oriented language – high level languages are considered to be system software.

CHECK YOUR PROGRESS

Q.1 : Fill in the blanks with appropriate words :

i) ..... system is the software that controls the computer's hardware functions.

ii) Computer based satelite control is an example of ..... software.

iii) ..... is a communication facility within a city.

iv) the network version of the windows operating system is .....

v) ..... is an operating system developed by AT &T's Bell Laboratories.



APPLICATION SOFTWARE

These are customer oriented software suitable for specific area of application. Application software helps you produce documents, perform calculations, manage financial resources, create graphics, compose music, play games, maintain files of information and so on. We can classify the application software using the following categories :

1) Productivity Software.
2) Education and Reference Software.
3) Entertainment Software.
4) Business Software.

The following figure shows you an expanded view of the application software branch of the software hierarchy chart.

12.5.1 Productivity Software

Productivity software helps you work more effectively. The classification of this software are : (a) Word Processing, (b) Spread sheets, (c) Database Management, (d) Electronic Mail, (e) Graphics, (f) Desktop Publishing and (g) Scheduling.

a) **Word Processing Software** helps you to produce documents such as reports, letters, papers and manuscripts. To use word processing software you type in the text of a document. As you type, you can easily edit your work and make corrections. You can also move text to improve the logical flow of ideas in your document. Word processing is the most popular type of application software.

b) **Spreadsheet Software** helps you work with numbers. The software displays a grid of rows and columns on the screen. Each box formed by this grid is called a cell. Each cell shows an address that indicates its row and column position. For example, cell address B3 means a cell in column B, row 3. You enter number and formulas in the grid and the computer automatically performs the calculations. Spreadsheets are frequently used by financial analysis to examine investment opportunities, by managers to create budgets, by entrepreneurs to create business

plans, and even by the educators to keep track of student grades.

c) **Database Management Software** helps you work with facts and figures, such as the customer names and addresses you might store on file cards or in a Rolodex. Database management software helps hospitals and doctors to keep track of patient records; the IRS to keep track of tax payments, the phone company to keep track of names, addresses, and phone numbers; and the record clubs and book clubs to keep track of members and sales.

d) **Electronic Mail Software** provides you with a computerized mail box that collects documents or "mail" you receive electronically from other computers users. You can send electronic mail messages, you can read you electronic mail on your computer screen, you can save or throw away your electronic mail after you read it or you can compose electronic reply's to the mail you receive.

e) **Graphics Software** helps you draw pictures, 3-D images and animations. If you have limited artistic ability, you can use graphics software to retrieve pre-drawn images called clip art, which you can use as it is or modify. Presentation graphics software helps you represent information using screen-based slide shows of bulleted lists, graphics and charts.

f) **Desktop Publishing Software** provides you with computerized tools for page payout and design that combine text and graphics. Although many desktop publishing features are available in today's sophisticated word processing software, desktop publishing software provide additional features to help you produce professional looking, quality output for newspaper, newsletters, and brochures.

g) **Scheduling Software** helps you keep track of appointments, due dates, and special dates such as birthdays and holidays. You can use the scheduling software to print a daily, weekly or monthly calendar.

12.5.2 Education and Reference Software

Education Software is designed to help you learn more about a particular topic. One sub category of education software is called CAI or tutorial software. CAI stands for "Computer Aided Instruction". Other terms used to describe tutorial software include "Computer-based instruction", "Computer-based learning" and "Computer-mediated learning", CAI software can help you learn how to do things – how to type, fix your car, use your word processor, speak French, or prepare for the GMAT/GRC exam.

Reference Software, such as electronic encyclopedia, helps you look up facts on any topic. Other reference software includes collections of classic literary works, electronic dictionaries, the phone directories, a trip planner with maps of a country, and medical reference guides.

12.5.3 Entertainment Software

It is no surprise that entertainment software is designed to entertain you. With entertainment software, you can play different types of games, battle monsters or explore new worlds. For example, the "Paper Planes" software is entertaining while showing you how to construct several types of paper airplanes.

12.5.4 Business Software

Business Software is divided into two categories : horizontal market software and vertical market software.

a) **Horizontal Market Software :** A "horizontal market" is a group of different types of business that, despite their difference, have some of the same software needs. Horizontal market software refers to generic software packages that can be used for many different kinds of business. Productivity software, such as word processing, spreadsheet, or database management applications, can be considered horizontal market software because they can be used in virtually any business.

Accounting and payroll applications are also good examples of horizontal market software. Accounting Software is designed to computerise the bookkeeping and financial reporting tasks typically required in most business. Payroll software keeps track of employee houses and produces the reports required by the government or any organization for income tax reporting.

b) Vertical Market Software : A "vertical market" is a group of a similar business – travel agencies, for example – that need specialised software. Vertical market software is designed for specialized tasks in a specific market or business.

12.6 INTEGRATED SOFTWARE

A software publisher sometimes combines several productivity software into a single package called integrated software. Typically integrated software include word processing, spreadsheet, database, and presentation graphics applications. Electronic mail is also included in some integrated software. Integrated software is often called a suite, office or works. Some popular integrated software package include Microsoft works, Claris works, Lotus SmartSuite, Novell Perfect Office, and Microsoft Office. Integrated software makes it easy to cut and paste data between applications.

12.7 MULTIMEDIA COMPUTING

Multimedia Computing refers to the integrated use of multiple media, such as slides, video tapes, audio tapes, records, CD-ROMs and photos. Computer technology is replacing or controlling many technologies and media that were previously used for multi-media presentations. Advances in computer technology have made it possible to combine text, photo image, speech, music, animated sequences, and video into a single interactive computer presentation. To display realistic graphic and video, your computer system must have a high resolution monitor and a CD-ROM drive.

Multimedia is defined as an integrated collection of computer-based text, graphics, sound, animation, photo images and video.

Multimedia applications : One example of a multimedia application

is a multimedia encyclopedia. It contains articles and pictures on a wide range of topics like a traditional encyclopedia, but a multimedia encyclopedia has more. A multimedia encyclopedia provides you with a rich selection of text, graphics, sound, animation, and video.

Hypertext is a key element of many multimedia products, and has been used effectively in non-multimedia products as well. You are likely to use hypertext with many computer application. The term hypertext was coined by Ted Nelson in 1965 to describe the idea of documents that could be linked to each other. Linked documents make it possible for a reader to jump to a passage in another document.

Hypermedia : The links in today's applications often involve graphics, sound and video, as well as text. This type of multimedia hypertext is referred to as hypermedia. Hypertext and hypermedia are important computer-based tools because they help you easily follow a path that makes sense to you through a large selection of text, graphical, audio and video information.

12.8 LEGAL RESTRICTIONS ON SOFTWARE

Like books and movies, most computer software is protected by a copyright. In addition to copyright protection, computer software is often protected by the terms of a software license. Some of the major aspects for legal restrictions on software are as follows —

a) **Copyright Material :** A copyright is a form of legal protection that grants certain exclusive rights to the author of a program or the owner of the copyright. The owner of the copyright has the exclusive right to copy the software, to distribute or sell the software and to modify the software. If you are not the owner of the copyright, it is illegal to copy, distribute, or sell the software unless you obtain permission from the copyright owner.

b) **Copyright Act :** The copyright act states under what circumstances you can and cannot legally copy copyright software. When you purchase copyrighted software, you do not become the owner of the copyright. Instead, you own only a copy of the software. Your purchase allows you to use the software on your computer, but you

cannot make additional copies to give away or sell the restrictions. Copyright Act applies only to the programs and data included as part of the original software. The data you enter, the documents, files, and graphics you create can be copied without restrictions.

c) **Copyright Symbol :** Copyrighted materials, such as software, display a copyright notice that contains the word "Copyright" (or the (c) symbol), the year of publication, and the name of the copyright holder. When you start a computer program the copyright notice usually appears on the first screen; it is also usually printed in the reference manual.

d) **Licensed Software :** A software license is a legal contract that defines the ways in which you may use a computer program. For micro-computer software, you will find license on the outside of the package, on a separate card inside the package, or in the reference manual. Mainframe software licenses are usually separate legal documents, negotiated between the software publisher and a corporate buyer. It is important to distinguish the concept of licensing from that of purchasing a copy of software. When you pay for licensed software, you do not buy and then own a copy of the software. Instead, you are buying permission to use the software. You can think of it as renting software, rather than buying it.

e) **Public Domain Software** is owned by the public rather than by the author. The program is available to everyone for use without restriction. Public domain software may be freely copied, distributed, and even sold. The primary restriction on public domain software is that you are not allowed to apply for a copyright on it. Public domain software is fairly rare.

f) **Shareware** is copyright software marketed under a "try before you buy" policy. Shareware usually includes a license that allows you to use the software for a trial period. If you went to continue to use it, you must become a registered user by sending a registration fee. When you send the fee to become a registered shareware user, you are grated a license to use the software beyond the trial period.

You might also receive a free copy of the latest version of the software or printed documentation for the program. A typical share policy allows you to make copies of the software and distributes them to other.



CHECK YOUR PROGRESS

Q.2 : Write true or false for the following statements :

i) Word processing software helps you to work with numbers.

ii) Business software is devided into two categories as horizontal and vertical market software.

iii) Graphics software helps you to produce documents.

iv) Multimedia is defined as an integrated collection of computer based text, graphics, sound, animation, photo images and video.

v) Shareware is copyright software marketed under a “try before you buy” policy.

12.9 LET US SUM UP

- In this unit, we have defined computer software as instructions and associated data, stored in electronic format, that directs the computer to accomplish a task. There are two types of software.
  1) System Software
  2) Application Software
- System software helps the computer to carry out its basic operating tasks. System software is also divided into subcategories such as Operating system, device drivers, utilities etc.
- Operating System acts as an interface between the user and computer. There are different types of operating system like batch

processing, multiprogramming, time-shared programming, multiprocessing etc. Examples are DOS, UNIX, WINDOWS etc. Utilities software and device driver software are both system software.

- Application software helps the human user to carry out a task. Application software are further divided into sub categories such as productivity software, entertainment software, business software, education and reference software etc.
- Application software is utilized with different categories to accomplish different specific tasks using the computer. Different categories are developed for different purposes.
- Multimedia means being able to communicate in more than one way for better communication. The executive of text, sound graphics and animation simultaneously is called as Multimedia. To have multimedia in a computer they must have a sound card, proper graphics adapter and speakers to have the sound heard all around. A microphone can also be used to record something. Multimedia technology has a lot of potential and can be used in a variety of sectors : Education, Entertainment, Commerce etc.
- Computer software is protected by a copyright which is a form of legal protection that grants legal rights to the author of a program or the owner of the copyright. Computer software is also protected by the terms and conditions laid down in the software license.

12.10 FURTHER READINGS

1) Parameswaram, R. (2008), *Computer Applications in Business*, S. Chand Limited.
2) Rajaraman, V. (2010), *Fundamentals of Computer*, PHI Learning Private Limited, New Delhi.
3) Saxena, Sanjay & Chopra, P., *Computer Application in Management*, Vikas Publishing House Pvt. Ltd.

12.11 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1 : i) Operating, ii) Real time processing, iii) Metropolitan Area Network, iv) Windows NT, v) UNIX.

Ans. to Q. No. 2 : i) False, ii) True, iii) False, iv)True, v) True.

12.12 MODEL QUESTIONS

A) Very Short Questions

Q.1 : What is data?

Q.2 : What do you understand by DOS?

Q.3 : What is UNIX?

Q.4 : Who coined the term 'hypertext' and when?

Q.5 : What do you know about public domain?

Q.6 : What is programming language?

B) Short Questions (Answer in about 150 words)

Q.1 : What is Operating System? What are its functions?

Q.2 : Name the most popular micro computer operating systems. Discuss any one of them.

Q.3 : What do you understand by productivity software? What are its classifications?

Q.4 : Write short notes on: (Answer in about 150 words)

a) Spreadsheet Software

b) Horizontal Market Software

c) Copyright Act

Q.5 : What do you know about Shareware?

Q.6 : What does multimedia computing mean?

C) Long Questions (Answer in about 300-500 words)

Q.1 : What is a Software ? Discuss the importance of software in a computer system.

Q.2 : Discuss different types of operating systems.

Q.3 : What is application software ? Explain why application software is so important to the computer user.

Q.4 : What is multimedia ? Discuss the application of Multimedia with examples.

Q.5 : Discuss the legal restrictions on software.

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UNIT 13 : PRINTING TECHNOLOGY AND TYPOGRAPHY

UNIT STRUCTURE

13.1 Learning Objectives

13.2 Introduction

13.3 Printing Technology

- 13.3.1 History of Printing
- 13.3.2 Types of Printing Technology

13.4 Offset Printing

- 13.4.1 Advantages and Disadvantages of Offset Printing
- 13.4.2 Types of Offset Presses

13.5 CTP (Computer to Plate)

13.6 Typography

- 13.6.1 Page Layout
- 13.6.2 Tips for Good Typography
- 13.6.3 Fonts and Font Families

13.7 Let Us Sum Up

13.8 Further Readings

13.9 Answers to Check Your Progress

13.10 Model Questions

13.1 LEARNING OBJECTIVES

After going through this unit you will be able to :

- define printing technology,
- discuss the history of printing,
- explain the different types of printing technology,
- discuss CTP technology,
- explain what typography means,
- enlist the ways to achieve good typography,
- explain the various font families.

13.2 INTRODUCTION

In the previous unit we have discussed computer software basics, the system software and application software as well as the legal restriction on software. As media students it is important for you to know about every stage of the modern communication process. That includes having the technical knowledge about printing as well. Because in every media field be it print journalism, advertising or PR, you will have to come across computers and computer related designing as well as printing know-how. You have to be accustomed to the various technologies that facilitate communication.

This unit will give you an understanding of what printing means and what are the various types of printing technologies available in the industry. You will also learn about Offset printing, which is the most favoured technology and about CTP. The unit will also focus on typography and what makes a good typography. Font families and page layout are the other aspects that you will come across in this unit.

To start with, you need to have a brief understanding of printing because even though we all know what printing generally means we tend to ignore its importance in today's world. The next section will take you through the world of printing.

13.3 PRINTING TECHNOLOGY

The process of reproducing text and images using ink on paper on a printing press is called printing. Printing is basically a large scale industrial process and it is a significant part of the publishing industry. Before printing technologies came about, the only way people could copy words and pictures was by hand. But after printing machines were invented the job of copying text and images have become much easier and less time consuming.

The printing press uses ink to put words and images on paper. This ink is very much like the ink we see in our pens. But press ink comes in hundreds of colours. Before you start to print, you need the content, i.e., text and images. The text can be anything, facts, stories, reports etc. while the images may be photographs, drawings or graphics. The content is then put

on a thin sheet of metal known as the printing plate which then goes to the press. Most new press now gets their content straight from the computer. They are called the digital press.

Once the content is put on the plate, the press is fed with paper and the printing plate then puts ink on this paper to copy the content. The paper then comes out with the inked / printed content. Once the paper comes out it is sent for cutting. The cutter is actually a big blade which can cut many sheets of paper at one go and make them into proper sizes. After the pages are cut, they are then folded properly as per requirements. The folders fold the pages into books or magazines or newspaper sheets. Your printed material is now ready for use.

13.3.1 History of Printing

Printing goes back a long way as instances of wood block printing date back to before 220 AD in China. Woodblock printing is the process of printing content on textiles with blocks of wood which were carved out into shapes of letters and images. They were then inked and pressed on to a sheet of cloth or latex. It originated in China and was used all across East Asia. By 593 AD the first printing press was invented in China and Kaiyuan Za Bao became the first newspaper to be printed from China in 713 AD. The Tiananmen scrolls were also printed in China in 868 AD.

Woodblock printing on cloth was also seen in Egypt during the 4th century but it is not known whether the Egyptians learnt this style form the Chinese or developed it on their own. Evidences suggest that some of these blocks were also made of metals like tin, lead and cast iron.

Then came moveable type printing which involved moving pieces of metal type for printing. This type of printing allowed more flexibility than hand copying or block printing. Even in this regard the Chinese were ahead of the whole world as the first known movable type system was created in China by Bi Sheng in 1040. But he used porcelain to create the types which would break easily. So Wang

Zhen later modified this by using wood for the moveable types. This was in 1298 AD.

However, the biggest name in the history of printing technology is undoubtedly Johannes Gutenberg. He was the one to introduce moveable type in Europe in1450. He created type pieces from alloy of lead, tin and antimony, the components which are still used today. One of the first books he printed was the Bible.

Gutenberg's movable type printing was quicker than wood block printing and the metal pieces were more durable and the lettering more uniform. Even the printing cost was less compared to the previous methods. Present day moveable type printing is mostly based on Gutenberg's invention.

Apart from Gutenberg's moveable type, there were some other types of printing which evolved over the years. One such technique was the Rotary printing press invented by Richard March Hoe in 1847. This technique uses a cylinder which has impressions cast around it to print on long continuous rolls of paper.

There are several other printing technologies which have come up in the recent decades. The next section will tell you a bit more about the different types of printing.

13.3.2 Types of Printing

Commercial printing industry is a booming business and there have been several advancements in the last two decades. Many types of printing machines have been invented and introduced into the market. Some printing techniques are very popular like Offset Printing while Letterpress printing is the oldest of the lot. Following is a list of the most popular printing techniques:

- **Digital Printing :** This does not involve any plate or film to produce images. It makes use of digital imaging technology through computers to provide high quality printing. It eliminates the cost of making plates, film etc. Digital printing can be used to reproduce digital images and text on paper, film, cloth plastic

etc.

- **Embossed Printing :** This is also called Blind or Relief Printing. This technique transfers text or images as a relief onto various surfaces like paper, metal foils and cardboard. The embossing is done behind the surface while the actual image is seen as relief on the front. The image stands out giving it a three dimensional effect.
- **Flexography Printing :** This technique is mainly used to print packaging materials. It can be used to print on materials like boxes, folding cartons, plastic bags, paper sacks etc. It employs flexible printing plates made of rubber or plastic.
- **Letterpress Printing :** In use since the 13th century this is the oldest technique to be still in use. In this process pages are printed by the "relief" types printing plates where the printing area is raised above the non-printing areas. Inked rollers then pass the page to be printed onto a separate ink-bed where a fresh film is picked for the following sheet of paper.
- **Screen Printing :** This technique is special because it uses a porous fabric and a stencil to create a sharp-edged image. This technique developed in early 19th century and was used extensively to make banners and flags during the First World War.
- **Electrostatic Printing :** It is a type of printing technique which is done without any plate, ink or type form. A thin layer of zinc oxide is used to coat the paper, which then becomes an insulator in the dark and also a conductor of electricity when exposed to light. Electrostatic printers are mostly used to print geographical maps.
- **Engraving Printing :** In comparison to the other techniques, this technique produces the sharpest, and the finest images. The method is a type of gravure printing which involves pushing the paper against a recessed plate. The paper is slightly moistened and the cylinder pressure forces the ink from the

recessed area to the paper.

- **Gravure Printing :** It is mainly used for high volume printing of wallpaper, packaging and gift-wraps.
- **Offset Printing :** One of the most common printing techniques, Offset printing is used by many industries. Although the machines and the set-up is expensive the printing expense is nominal. We will discuss offset printing in detail in the next unit.
- **Thermography Printing :** This process relies on heat to print letters or create images on a sheet of paper. Special thermography paper is spread over the paper after it is removed from an offset printing press. This powder is then dusted off the paper leaving only the part with the inked image. This sheet is then passed through a heat tunnel which melts the powder and a raised impression is left behind. It is used mainly on envelopes and business cards.



CHECK YOUR PROGRESS

Q.1 : What do you understand by the term 'printing'?

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Q.2 : What is Woodblock printing?

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Q.3 : Why did Johannes Gutenberg's moveable type printing become so popular?

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Q.4 : What are the different types of printing?

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Q.5 : The first printing press was invented in .....

Q.6 : The first known movable type system was created in China by ..... in 1040.

Q.7 : Present day moveable type printing is mostly based on ..... invention.

Q.8 : The ..... was invented by Richard March Hoe in 1847.

13.4 OFFSET PRINTING

Offset printing is the most popular form of printing in the present scenario. It was invented by an American - Ira Washington Rubel in 1903. It is used in most big industries and press. Major newspapers use offset printing and as such it is necessary for a media student to know in detail about this type of printing.

In this process ink is spread on a metal plate with etched images. This metal plate is then transferred onto an intermediate surface, mostly a rubber blanket. The plate is then applied to paper by pressing it against the intermediate surface. Due to its high quality printing and capacity to print

high volumes, offset printing is the most common form of printing. The machine and the set-up may be a bit expensive but the cost of printing is very less. The major expense goes into the preparation before the actual printing takes place. The more one prints, the less one pays per page because every additional paper print will only require the cost of paper and ink which is very minimal.

Even though modern digital presses are competing with offset printing in terms of cost/benefit but digital press cannot get closer to offset in terms of the sheer volume of product that the latter can produce. And now-a-days, most offset presses are using CTP (Computer to Plate) systems as opposed to older computer to film. This further increases the quality.

13.4.1 Advantages and Disadvantages of Offset Printing

Advantages : The fact that this process of printing is the most common in today's industry is due to its several plus points. It scores over the other techniques in several ways. Some of these major advantages are discussed below:

- Superior image quality at a consistent rate. Offset printing produces high quality prints much more easily than letterpress printing. This is because of the rubber blanket which conforms to the texture of the printing surface.
- The production of printing plates is quicker and easier.
- The plates have a longer life in comparison to those in litho presses because in offset, the plates are not in direct contact with the printing surface.
- Offset printing is the cheapest way to produce volumes of high-quality prints.
- Other than paper, this technique can be used on other surfaces as well, including wood, cloth, metal, leather etc.

Disadvantages : Offset printing has several benefits no doubt, but it has a few disadvantages as well. Some of these are discussed below:

- In comparison to photogravure printing, the image quality is

slightly inferior.

- The set-up and cost of offset press is very high. And it also takes a good amount of time to be set up.
- It is good mainly for high volume work. Smaller printing jobs are not feasible or cost-effective here. As a result smaller printing jobs are going to digital presses.

Despite the few anomalies of offset printing, the advantages are enough to make it the most popular printing mechanism.

13.4.2 Types of Offset Presses

Offset presses are primarily of two types:

1) Sheet-fed Offset Printing Press: Here the printing is carried out on single sheets of paper as they are fed to the press one at a time. It is used to print brochures, letterheads, short-run magazines and other commercial printing. This doesn't require continuous reams of paper.
2) Web-fed Offset Printing Press: In this process, the printing is carried out on a single, continuous sheet of paper which is fed from a large roll. The sheet is then cut into individual sheets of desired sizes. Web printing is mostly used for excess of 10 or 20 thousand impressions. Printing of newspapers, newspaper ads, magazines, books etc involve web-fed offset printing.



CHECK YOUR PROGRESS

Q.9 : Who invented the offset press?

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Q.10 : Why is offset printing highly preferred?

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Q.11 : What is the full form of CTP?

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Q.12 : What are the types of Offset press?

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ACTIVITY 13.1

1) Visit a printing press near your place and make a report on how the printing process is carried out.

2) Visit a newspaper press and find out how newspapers are printed.

13.5 CTP (COMPUTER TO PLATE)

CTP or Computer to Plate is an imaging technology used in most modern printing processes. Through this process, an image that has been created on a computer with desktop publishing (DTP) can be directly sent to the printing plate. CTP has been developed as a replacement for the earlier technique of CTF or Computer to Film.

Before CTP was developed, most printing was done through CTF, where the computer created image was transferred to a photographic film first. This film was then used to make a printing plate. So CTF is a much longer process than CTP because in CTP one step is completely skipped.

CTP eliminates the stage where the image is developed on film and this increases the image sharpness and details. The omission of this step also removes the need for film and the other chemicals necessary to develop the film. CTP ensures better quality printing because the potential loss of quality during the film processing is avoided. In CTF the photographic film may be exposed to harsh light or it may get scratches. In CTP the plates are produced in less time, are more consistent and they come at a lower

cost. CTP also ensures better registration of images even if they are repeated over and over.

CTP's benefits are aplenty but there are certain drawbacks too. The most significant drawback is its restriction to the digital format. CTP production requires the printed matter as well as the imposition to be digital. Besides this, another major drawback is that in CTP, if a plate gets damaged or if something has to be corrected after the plate is exposed, a completely new imposed plate has to be created.

CTP, however, is still the most common form of imaging technology used in the present times. The drawbacks are very little in comparison to its positives. Since most industries now use computers for work, CTP is a much easier option. Besides, it is less time consuming and cheap as well.

Now that you have come across all the major techniques and processes involved in printing, you also need to have an understanding of the building blocks of printing—the elements which form the basis of any document, i.e the **typography**. The next section will take you through the world of typography and how significant it is.



CHECK YOUR PROGRESS

Q.13 : What is CTP?

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Q.14 : What are the advantages of CTP?

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Q.15 : What is CTF?

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Q.16 : CTP has been developed as a replacement for the earlier technique of .....

13.6 TYPOGRAPHY

The simplest meaning of typography is that it is the art of print. It combines communicative and artistic elements to create a print which is both easy to read as well as pleasing to the eye. Typography is made up of fonts, lettering and print types. A small font or a fuzzy font will be hard to read and will make the message difficult to comprehend. It is a mark of good typography if the print is legible and easy to read. The choice of typography depends on the material to be printed. So, if it is for a newspaper then the typography will be simple and straightforward but if it is a wedding card, the print has to be ornate and elegant to suit the happy occasion.

The arrangement of type includes the choice of typefaces, point size, line length, line spacing or leading, tracking or adjusting the spaces between groups of letters and kerning or adjusting the space between pairs of letters. Typography is done by typographers, graphic designers, art directors, typesetters, compositors, comic book artists etc. Before the advent of computers, it was a specialised occupation. But now with the spread of digitization, typography is open to a new generation of visual designers and layman users.

13.6.1 Page Layout

In the previous unit and even in this unit we have mentioned the term ‘page layout’ a number of times. But what exactly does it mean? Simply put, page layout is the process of arranging text and graphics on a page. This can be for a newspaper, a brochure or for a book. Every printed material needs to have a proper layout with some text and some images that are designed using good typographies.

You have read about desktop publishing software programs in the previous unit. The primary desktop publishing software are also known as page layout applications because they help create a page using the available tools. Before DTP was developed, page layout was done by pasting blocks of text and picture cutouts on sheets of paper.

But now with the spread of desktop publishing, page layouts are not such a messy ordeal. You might only have to know a few tricks of the trade. In DTP page layout, grids and templates are of extreme importance. Grids allow the user to align the material on the page. They are basically columns and rows which help place the text and images in an appropriate manner. Grids are visible only during the designing process. Templates make minimal modification of background elements and frequent adjustment of foreground content.

Now good typography goes a long way in making a page layout look pleasing to the eye. The elements of typography become evident only through a page design or layout. So what exactly is a good typography? The next section will give you some answers.

13.6.2 Tips for Good Typography

Typography is an intrinsic part of page design and design is an intrinsic part of typography. One cannot merely throw a body of text on a page. It has to be placed in a neat and organised manner so that it adds to the importance of the information on the page. If a typed message has to make the maximum impact, the typography of the page matters a lot. So designers need to know how to create a good typography. Some of the tips that can make up a good typography are discussed below:

- **Grid-Based Layouts :** Grids are the basic structure of all printing design. They are simply a structure of columns and rows. Use grids as you set out to design a page. Do this even before you get to the type. A well-structured layout will use one or two

columns. You can be original by using three or maybe four or five column layout. But do remember that the columns must fit into the page and every time you add a new column the other columns will shrink in size.

- **Alignment :** Maintaining correct alignment of text and images works wonders for a layout. A standard print layout is normally left aligned. For the headline central alignment is often considered ideal but centered headers can often throw off the layout. Sticking to left alignment with bold text is a safer option. A page with complete right aligned text is a bit jarring to the eye. Right alignment can be used for footnotes or captions. While maintaining the alignment you should be careful about making everything line up at the same spot. This is where the grids come handy. Make sure that every text object should be at the same exact distance from the left or the right, depending on the alignment.
- **Margins, Kerning, Leading and Spacing :** Appropriate spacing and perfect line margins are an important aspect of printing and typography. Even a tiny little space can spruce up or mar the design. The content is important so make sure that you space it out well so that the content is given focus. The space between the individual alphabets, which is called kerning, and the space between the baselines of text, called leading are essential to typography. The leading and kerning have to be balanced. Too much leading can leave a lot of white space and less leading can make the words unintelligible.
- **Colour Contrasts :** The text colours and their degree of contrast are also important facets to be looked into. If the colour contrasts are not perfect, the readability will be affected. It's challenging to find the right balance of contrast for the body text because it needs to be strong enough to be visible and yet not that strong that it becomes distracting. For headlines, it is advisable to use strong contrasts to make them prominent.

- **Consistent Style :** If you are making a multiple page layout, be consistent with the fonts, colours and point sizes. You can try to change the look of every page but stick to the basic feel of the layout. You can try out different number of columns or rows and even alter their sizes but try to have uniformity in all the pages.
- **Graphics and Text go Hand-in-Hand :** A page layout is not just about the text. Graphics and images are also essential to give it a balanced look. The type or text must be in perfect harmony with the images. Lay the text in such a manner that it flows with the graphic elements. Maintain appropriate spacing between the text and the images by having margins.
- **Maintaining Hierarchy :** Hierarchy in typography means the difference between headlines and body text. In other words, the headers and the body text need to be of different point sizes. This is necessary because it enables the reader to distinguish between the two. Headings are generally placed on top but you can experiment and place it in the middle or anywhere else. The size and variation of heading style will make it distinct from the remaining text even if it comes in between the body text.
- **White Space :** It is always better to stick to a minimalist typographic style and white space helps you achieve that. Proper white spacing adds a professional, clean look to any page layout. But you need to know how much is too much.

13.6.3 Font and Font Families

A major element of typography is font. Fonts are basically the various typefaces that are available for printing. It is a collection of characters like alphabets, numerals, symbols and punctuation marks. And then there are various types of this collection of characters. Selecting a particular font type goes a long way in determining the look of any page layout.

All font types have some similar characteristics. Some of

these basic font properties are:

- Name: Every font has a distinct name. Eg: Times New Roman, Courier, Arial etc. The font used on this page is Arial.
- Size: The size is determined by the height of the characters which is expressed in points. Each point is 1/ 72 of an inch. The text size in this page is 11 points.
- Style: The style of a basic font is referred to as Roman. The other styles are bold and italic.

When a group of fonts exhibit similar characteristics they are said to belong to a font family. It is a group of fonts that can be used in combination and that which exhibit similarities in design. These families may be grouped in different categories. Some with or without serifs, some that look like fantasy fonts, some that resemble handwriting while some others whose characters are or are not proportionately spaced out. In the same family, one member may be italic, one bold, and another condensed or using small caps.

Some font family names are Helvetica, New Century Schoolbook.

There are basically two types of font family names:

- Family-name: The name of a font-family of choice, like “Times”, “Courier”, “Arial”, “Helvetica”, etc.
- Generic-family: The name of a generic-family, like serif (Times), sans-serif (Helvetica), cursive (Zapf-Chancery), fantasy (Western) and monospace (Courier).



CHECK YOUR PROGRESS

Q.17 : Why is typography important?

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Q.18 : What is a font family?

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Q.19 : Fill in the blanks :

1) The simple structure of columns and rows are called .....

2) The space between two individual letters is known as .....

3) Fonts are a ..... of characters.

4) Headers and body text help establish the ..... in typography.

5) DTP software programs are also known as ..... applications.



13.7 LET US SUM UP

- The process of reproducing text and images using ink on paper in a printing press is called printing.
- For a page or document to be printed it must have content. Content can be only text or only images or both.
- Once the content is put on the plate, the press is fed with paper and the printing plate then puts ink on this paper to copy the content. The paper then comes out with the inked / printed content.
- The Chinese were the first ones to introduce printing as instances of wood block printing date back to before 220. They used to print on textiles or latex earlier with the help of blocks of wood which were carved out in the shape of letters or images. These blocks were

then inked and placed on the sheet of cloth or latex.

- Even the Egyptians used wood blocks to print as far back as the 4th century.
- After woodblock printing, came moveable type printing. Even this was invented by a Chinese, Bi Sheng, in 1040. Sheng would use porcelain to make the type pieces for printing and these would break easily. So another Chinese, Wang Zhen later modified this by using wood for the moveable types in 1298 AD.
- It was Johannes Gutenberg, a German, who revolutionised printing by introducing moveable type in Europe in1450. He created type pieces from alloy of lead, tin and antimony, the components which are still used today.
- Gutenberg's movable type printing was quicker than wood block printing and the metal pieces were more durable and the lettering more uniform. Even the printing cost was less compared to the previous methods.
- Now-a-days, there are several printing technologies available in the market. Some are used extensively while some are used by specific industries. The major printing technologies are: Digital Printing, Embossed Printing, Flexography Printing, Letterpress Printing, Screen Printing, Electrostatic Printing, Engraving Printing, Gravure Printing, Offset Printing, Thermography Printing.
- Offset printing is the most popular of the lot because it is cheap, it saves time and it produces high quality prints in volumes.
- Newspaper presses are mostly based on offset printing.
- In offset printing process, ink is spread on a metal plate with etched images. This metal plate is then transferred onto an intermediate surface, mostly a rubber blanket. The plate is then applied to paper by pressing it against the intermediate surface.
- The machine and the set-up for offset printing may be a bit expensive but the cost of printing is very less.
- Offset presses are two types: Sheet-fed offset and web-feed offset.

- In sheet-fed process the printing is carried out on single sheets of paper as they are fed to the press one at a time.
- In Web-fed process, the printing is carried out on a single, continuous sheet of paper which is fed from a large roll.
- CTP or Computer to Plate is an imaging technology that enables an image created on a computer with desktop publishing (DTP) to be directly sent to the printing plate. CTP has been developed as a replacement for the earlier technique of CTF or Computer to Film.
- In CTF the computer created image is transferred to a photographic film first. This film is then used to make a printing plate. So CTF is a much longer process than CTP.
- Typography is the art of print which combines communicative and artistic elements to create a print which is both easy to read as well as pleasing to the eye. Typography is made up of fonts, lettering and print types.
- A good typography will include the choice of typefaces, point size, line length, line spacing or leading, tracking or adjusting the spaces between groups of letters and kerning or adjusting the space between pairs of letters.
- A good typography is possible only when one follows some basic tips. Try to make grid based layouts. Grids are basically the structure of rows and columns. Use grids as you set out to design a page. Do this even before you get to the type.
- Maintaining proper alignment is another important task. A standard print layout is normally left aligned. While maintaining the alignment you should be careful about making everything line up at the same spot.
- The spacing between words, between letters and in between lines is very essential. So, use margins and manage the kerning and leading spaces appropriately.
- Using colour is another choice you have to make. Ensure that the colour contrasts are pleasing to the eye. It shouldn’t be too harsh; neither should be it too soft.

- If you are making the typography for a multiple page layout, maintain uniformity throughout by being consistent with the fonts, their point sizes and colours.
- Use graphics and text in harmony. They need to be balanced out to make a page look neat and readable.
- Maintain hierarchy between the headlines and the body text. The headers need to be distinctly created so that readers can identify the two even if you do not put the header on top of the text.
- Give ample white space. Too much clutter on the page is not at all pleasing to the eye. White space enables some breathing space to the content on the page.
- Fonts are a basic element of typography. They are basically a collection of characters or typefaces that are used for printing text. A particular font collection will have alphabets, numerals, symbols and punctuation marks.
- Every font will have a name, a size and a style.
- Some fonts have certain distinctive characteristics and these characteristics make them a part of a family. They are the font families. Some families may be without serif (sans serif), some with serif, some families will look like handwriting etc.
- There are basically two types of font family names:
  - Family-name: The name of a font-family of choice, like “Times”, “Courier”, “Arial”, “Helvetica”, etc.
  - Generic-family: The name of a generic-family, like serif (Times), sans-serif (Helvetica), cursive (Zapf-Chancery), fantasy (Western) and monospace (Courier).
- Page layout is a basic part of printing. It refers to the process of placing text and images in a proper manner so as to create a page. The various desktop publishing software helps us in creating page layout with minimum fuss.
- It is while making a page layout that the various typographical elements come into play. A proper use of typographical elements will create a proper page.



13.8 FURTHER READINGS

1) Chakravarty, Bishwanth, *Digital Colour Printing Technology*, Asian Books.

2) *Modern Printing Technology*, National Institute of Industrial Research.



13.9 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1 : Printing is basically the process of reproducing text and images using ink on a sheet of paper. And the process is carried out in a printing machine. Before printing evolved the only way to copy text was by way of writing it down. This would take time and it was also very cumbersome. Printing technology, however, changed all that. Now printing machines can print reams and reams of paper within minutes.

Ans. to Q. No. 2 : Woodblock printing is the earliest form of printing where the prints were made not on paper but on textiles or cloth and latex. This type of printing dates back to China before 220 AD and in Egypt during the 4th century.

Ans. to Q. No. 3 : Johannes Gutenberg's moveable type became popular because he created the type pieces from the alloy of tin, lead and antimony. Before Gutenberg the Chinese had invented the moveable type of printing but they had used porcelain to make the type pieces. These would break very easily. The Chinese also made type pieces out of wood but it was Gutenberg's invention of metal type pieces which made a major difference to printing technology. His components are still in use because they are durable and the lettering is more uniform.

Ans. to Q. No. 4 : The different types of printing are Digital Printing, Embossed Printing, Flexography Printing, Letterpress Printing,

Screen Printing, Electrostatic Printing, Engraving Printing, Gravure Printing, Offset Printing, Thermography Printing.

Ans. to Q. No. 5 : China

Ans. to Q. No. 6 : Bi Sheng

Ans. to Q. No. 7 : Gutenberg's

Ans. to Q. No. 8 : Rotary printing press

Ans. to Q. No. 9 : Offset printing was invented by an American Ira Washington Rubel.

Ans. to Q. No. 10 : Due to its high quality printing and capacity to print high volumes, offset printing is the most preferred form of printing. The machine and the set-up may be a bit expensive but the cost of printing is very less.

Ans. to Q. No. 11 : Computer to Plate.

Ans. to Q. No. 12 : Offset presses are primarily of two types: Sheet-fed Offset Printing Press and Web-fed Offset Printing Press.

Ans. to Q. No. 13 : Computer to Plate which is commonly known as CTP is basically an imaging technology which enables the direct transfer of pages created on a computer to a printing plate. CTP technology connects the computer to a printing plate unlike the earlier CTF (Computer to Film) technology which necessitated the involvement of photographic film to transfer pages from computer to plate. Whatever pages are created on a computer using desktop publishing software can now be directly put on a plate and printed by the use of CTP technology.

Ans. to Q. No. 14 : The advantages of CTP are that in CTP the plates are produced in less time, are more consistent and come at a lower cost. CTP also ensures better registration of images even if they are repeated over and over.

Ans. to Q. No. 15 : It is an imaging technology where the computer created

image is transferred to a photographic film first. This film was then used to make a printing plate. CTF was used before CTP emerged in the printing scenario.

Ans. to Q. No. 16 : CTF

Ans. to Q. No. 17 : Typography is important because it establishes the look of a page or document. It is the art of print which involves both artistic and communicative elements to put across the message. Typography includes the selection of fonts, point sizes, spacing between the alphabets and the lines etc. If you can select the appropriate typography for your document, half your job is done. Good typography will make the message on the document readable as well as pleasing to the eye.

Ans. to Q. No. 18 : A font family refers to a group of fonts which have similar characteristics. A particular font family might be characterized by 'serifs' like the Times font family. Another font family may have fonts that look like handwriting; some families might be 'sans serif' etc.

Ans. to Q. No. 19 : a) grids, b) kerning, c) collection, d) hierarchy, e) layout.

13.10 MODEL QUESTIONS

A) Very short questions

Q.1 : Name the first newspaper printed from China.

Q.2 : Who was Johannes Gutenberg?

Q.3 : Who invented Rotary printing press and when?

Q.4 : Mention any one advantage of Offset printing.

Q.5 : What do you understand by Grids?

B) Short Questions (Answer in about 150 words)

Q.1 : Why is offset printing the most common printing technique?

Q.2 : What makes up a good typography?

Q.3 : Write a short note on Letterpress printing.

Q.4 : Write short note on Alignment.

Q.5 : Mention the types of Offset press. Discuss any one of them.

C) Long Questions (Answer in about 300 to 500 words)

Q.1 : What are the different types of printing? Discuss in detail.

Q.2 : Discuss in detail the advantages and disadvantages of Offset printing.

Q.3 : Discuss in details the tips that can make up a good typography.

Q.4 : Will digital printing overshadow offset printing in the years to come? Discuss with relevant examples.

Q.5 : What are the basic font properties? What is a font family? Give examples.

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Unit -14 : USE OF COMPUTER TECHNOLOGY IN JOURNALISM

UNIT STRUCTURE

14.1 Learning objectives

14.2 Introduction

14.3 Application of Internet

14.4 Use of Hypermedia - Browsing and Navigation

14.5 Tools of Hypermedia

14.6 Advantages and Disadvantages of Hypermedia

14.7 Computer assisted broadcast reporting

14.8 Let us Sum up

14.9 Further reading

14.10 Answers to check your progress

14.11 Model Questions

14.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- discuss the difference between multimedia and hypermedia
- Analyse the basic applications of Internet
- Discuss the browsing pattern and navigation in hypermedia
- Explain the tools of hypermedia
- Describe the advantages and disadvantages of hypermedia
- explain the concept of Computer Assisted Broadcast Reporting

14.2 INTRODUCTION

Ted Nelson first quoted the term hypermedia in 1965. Hypermedia is a style of building systems for organizing, structuring and accessing information around a network of multimedia nodes connected together by links (Conclin, 1987). The general structure of hypermedia allowed hypermedia to be applied to a wide variety of task domains. We can divide

hypermedia systems in two generations (Halasz, 1988). **First generation** hypertext systems were mainframe based, text-only systems for increasing the performance of information processing environments, storing the whole world's literature or for supporting traditional writing and reading. With the **Second Generation,** transition from hypertext to hypermedia took place with the Systems. These systems were quite similar to the first generation hypertext systems, but they were workstation and PC based, with more complex graphics interfaces and support to other forms of information such as graphics, sound, animation, and video.

Multimedia is a presentation that contains numerous types of media such as still images, graphics, text, audio and animations used to communicate information. Whereas hypermedia connects media making it possible to navigate to another media form within the presentation through the use of embedded buttons and mouse clicks. Briefly hypermedia is computer mediated, random accessible, user interactive, digital and a hybrid medium.

14.3 APPLICATION OF INTERNET

The Application of Internet can be roughly divided into: Online communications, Online information search, online communities, online media, online entertainment, e-business, online finance and other applications.

Some of the important Internet applications are:

(i) Email - Email is a paperless means of sending messages, notes or letters from one person to another or even many people at the same time through Internet. Through Email pictures, documents and other files are sent as mail attachment. Email is takes just few seconds to arrive at its destination. It can be send at anytime of the day and does not require physical presence of the recipient.

(ii) *Data Transfer* - FTP (File Transfer Protocol) in Internet made the possibility of transferring large amounts of data across the Internet. A file can be mail as an attachment, uploaded to a websites, or save in a remote

computer drive for downloading it later.

TELNET (Remote Computing) is another example of file sharing over the Internet. Telnet or remote computing is telecommunication utility software, which uses available telecommunication facility and allows you become a user on a remote computer.

(iii) *Instant Messaging* - Instant messaging (IM) is a form of communication over the Internet, that offers an instantaneous transmission of text-based messages from sender to receiver. The push mode between two or more people using personal computers or other devices, along with shared clients. Instant messaging basically offers real time uninterrupted written language based online chat.

(vi) *Skype* - Skype is a proprietary voice-over-Internet Protocol service and software application created by Niklas Zennström and Janus Friis, and owned by Microsoft since 2011. This service allows users to communicate with peers by voice, video, and instant messaging over the Internet. Phone calls may be placed to recipients on the traditional telephone networks. Calls to other users within the Skype service are free of charge, while calls to landline telephones and mobile phones are charged via a debit-based user account system.

(v) *Web Browser* - A web browser is an application that helps a computer user gain access to all the content that is on the Internet and the hard disk of the computer. It can view images, text documents, audio and video files, games etc. One can install more than one web browser on a single computer. Few common web browsers are: Google Chrome, Safari, Internet Explorer, Opera, Firefox, Safari, Netscape etc.

14.4 USE OF HYPERMEDIA - BROWSING AND NAVIGATION

Hypermedia can be consider an advance tool of information where someone who wishes to learn about a particular topic can browse through and be pleased with the findings. However, hypermedia is also dogged by

drawbacks that were identified early in its origin and are still present, which is the chances of users getting lost in the process of browsing for information.

The hypermedia study have developed a prototype of hypermedia system Hypernet, which seeks to assess the user browsing sources of information in two different ways, “content-based” and “content-less” information.

“Content-based” assessment tries to identify what the user is interested in, by extracting keywords from inside hypermedia nodes and “Content-less” study the patterns of browsing made by a user as a clue of what the user is doing.

The common browsing pattern interpreted so far under “Content-less” studies are:

(i) Scanning - users seek to cover large area but without depth.

(ii) Searching - users motivated to find a particular target.

(iii) Browsing - users are happy to go wherever the data takes them until their interest is caught.

(iv) Exploring - users are seeking the extent and nature of the field.

(v) Wandering - users strolls along and inevitably reconsiders nodes in a free journey.

Navigation:

In the hypermedia network, users browse around from one topic to other in search of information. Navigation is a defining feature of Hypermedia systems and necessary for characterizing them along three fundamental dimensions, scope, target task domain, and target user domain. The skill to navigate makes Hypermedia a powerful tool for handling information. Navigation is not something, which happens exclusive of problems, and it is directly related to numerous hypermedia problems like user disorientation and cognitive overhead.

1. *Guided Tours* - Guided tours in hypermedia offer possible results to the navigation problem by eliminating spontaneously explorative navigation. A guided tour is a predefined path of nodes. Hypermedia users handpicked a

guided tour from a list of offered tours and they submissively visit all the nodes that are included in tour's path.

2. *Backtracking Mechanism* - An important element of navigation control is the ability to withdraw from an area of confusion to familiar ground. The easiest way to do so is incorporated in present hypermedia systems by a history and backtracking mechanism. Backtracking is the facility to move along the path of earlier visited nodes. The ability to backtrack balances the history mechanism. This mechanism registers in a meaningful method all the earlier visited nodes.

3. *Bookmarks* - Bookmarks act a overall symbols to position the hypermedia user. The difference between history lists and bookmark lists is that a node is included in the bookmark list only if the user desires to do so. This state means that bookmark lists are lesser and thus more handy than history lists.

4. *Path* - A path is a mechanism for permitting the creator to insert a sequence. Path has been initiated as a mechanism for solving navigation problems. The significant power of path is determined both by the sequencing model and the characteristic of the articles that

CHECK YOUR PROGRESS

Q.1: What is hypermedia?

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Q.2: What is the first generation of hypermedia?

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Q.3: What is TELNET?

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Q.4: What is Web Browser? Give example.

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can show-up along the path. The notion of paths is based on the programming paradigm.

14.5 TOOLS OF HYPERMEDIA

Hypermedia programs have become increasingly more powerful and user friendly. New features are added and capabilities with every new version are released. Developers now can draw on a wide variety of resources to put a full range of sound and motion in their hypermedia presentation. The latest feature available in hypermedia creation is the ability to insert Internet links into presentation. Users can click on these links and go immediately from software screen to Internet site. However the elements or tools of hypermedia are resources like text, audio, video, photographs, graphics, and animation.

(i) Text - In spite of the attention paid to other components of hypermedia, text still remains one of the most powerful ways of communicating ideas. All hypermedia pro- grams have the features of standard word-processing that enable users to write text. Text is one of the best tools to explain ideas and concept. Wise use of text can give a depth and strong visualization to the readers.

(ii) Photographs - It is a well-known fact that picture is worth a thousand words when its use to communicate any elsewhere or hypermedia. Photographs provide a powerful resource for authors in all subject areas. A photographs or images in hypermedia are obtain by scanning old photos, digital cameras, captured from video sources, or imported from CD-ROMs.

(iii) Audio - Audio in hypermedia are increasingly use to enable communication with differently abled group of people. Audio in hypermedia can be recorded interview, lectures, songs, music, tutorials, political speech, news, telephone conversation, dialogue etc.

(iv) Video - Motion video clips can add a whole new dimension to a program and provide authors with many new communication possibilities. With video, contextual explanation is easier. However, video sequences should be use for broader, abstract material (that with emotional impact) and for advance organizers rather than for presenting detailed information.

(v) Graphics - Graphics or drawings offer another tool for authors to communicate their ideas. Illustration can demonstrate a point that is difficult to get across with words. This aspect of hypermedia application is particularly appealing to artistically inclined users. But graphics should not be use to entertain or amuse its users.

(vi) Animation - Animation is a highly effective tool for illustrating a concept. Animation are use to graphically explain things which cannot be practically shown or demonstrated by human. A student might create an animation of a seed germinating as part of a project on plants.

14.6 ADVANTAGES AND DISADVANTAGES OF HYPERMEDIA

Hypermedia like any other tools, have certain advantages and disadvantages. Few notable points are listed below:

Advantages of Hypermedia:

1. One of the major advantages of hypermedia is the ability to quickly track associations and look up related information.

2. References can be traced both backwards and forward in hypermedia. In addition, the user can interpret the material and create new references.
3. Information can also be structured in a variety of ways. Multiple organizations of the same material allow for specialized structures for different user categories.
4. The student can browse the material and find new information, which he/she may not intend to, as she explores a subject area.
5. Hypermedia systems are usually considered as fun to use.
6. Increases learning effectiveness.
7. Is more appealing over traditional or lecture-based learning methods.
8. Lowers training costs.
9. Offers system portability.
10. Constructs knowledge networks.

Disadvantages of Hypermedia:

1. Simplicity of browsing might raise the risk that the learner skips through the material much to hasty and thus get a shallow and fragmented conception of the subject.
2. The chance of getting disoriented can result in confusion rather than understanding, especially if the user jumps around between different nodes in a more or less random manner.
3. Using a hypermedia involves a certain intellectual overhead. The problem is that the user has to interact with the system in order to complete anything, which can be more or less complex.
4. Expensive
5. Not always easy to configure
6. Requires special hardware
7. Not always compatible
8. Complex to create
9. Requires educators to have self-discipline, motivation and ability to manage time effectively.
10. Requires educators to have adequate writing skills and the ability to adjust to the absence of face-to-face interaction by developing a supportive learning environment.

14.7 COMPUTER ASSISTED BROADCAST REPORTING

Computer Assisted Reporting (CAR) or Computer Assisted Broadcast Reporting (CABR) is the acquisition and analysis of electronic information and data- bases. It is the collection or compilation of information electronically from online and digital media.

These days Journalists are trained to use CAR methods of reporting with deadlines. A normal journalist cannot do a CA-Reporting because he need to be proficient at finding the latest information, filter, sort and analyze public records electronically. In the past, journalists might have taken days to look at a few hundred records; now they can examine tens of thousands of records in a few hours.

With knowledge of CAR, a journalist has a distinct advantage over the competition. The journalist with CAR skills can bring more depth, context, and credibility to a story. CAR often provides a journalist with an exclusive story. In addition, the explosion of public information on the Web, the simplification of software, and the increased speed in computer processing permits a CAR journalist to outdistance others on breaking stories.

The three basic tools of CAR used by journalist are:

(i) Online Resources (ii) Spreadsheets and (iii) Database Managers.

(i) Online resources - This include the Internet and commercial databases. Reporters use them to find people, background businesses, monitor discussion groups on special topics, and acquire relevant data for a story. The effective use of the Web is a critical skill because, as everyone knows, it’s possible to “surf” for hours without results. Equally important is the focused use of commercial databases because of the potential high cost of their services.

Commercial databases are available online and on CD-ROMs. For online pay services, many journalists use LexisNexis, which has news stories and many legal resources. They also buy Autotrack services from Database Technologies or CDB Infotek services to get information about corporations

or individuals that is not on the Web or that is not easy to find on the Web. But until a journalist becomes skilled at searching commercial databases, it is advisable to approach an experienced research librarian for help rather than wasting time and money.

The Web also plays a crucial role for journalists covering disasters. Whether you're looking for information on bombs, explosions, hurricanes, or floods, both breaking news and context are available. Many journalists log onto electronic discussion groups to get material and tips they may not hear at the scene of a catastrophe.

Many reporters check daily on Websites that relate to their beats or topics they cover. For example, a journalist reporting on Congress would make http://thomas.loc.gov a daily stop. That site carries extensive information on legislative bills and other information on Congress. To keep track of campaign contributions, the interested journalist would also check the Federal Election Commission site, www.fecinfo.com, to keep track of campaign contributions, and other nonprofit sites, such as the Center For Responsive Politics at www.crp.org. Broadcast journalists with CAR skills download information often on campaign finance to monitor and report independently on local politicians and their supporters.

(ii) Spreadsheets - With spreadsheet software, such as Microsoft Excel, a reporter can quickly calculate, sort, and filter electronic data. Tabular data (i.e., data in columns and rows like a stock table or sports rankings) can be efficiently downloaded into a spreadsheet from the Internet. A reporter also can easily enter data into a spreadsheet. Reporters often use spreadsheets to analyze and examine crime statistics, track population figures, budgets, salaries, housing costs etc.

A journalist can quickly perform calculations with a spreadsheet because a spreadsheet can copy and apply the calculated formulas to other data. A spreadsheet also can store the information, unlike a calculator, for later use.

(iii) Database Managers - A database manager (e.g., Microsoft Access) lets a reporter quickly search, summarize, and compare public records. Although a database manager is more difficult to learn to use than a spreadsheet, it is a powerful tool. A database manager can search hundreds of thousands of electronic records for a specific item, summarize those records to determine if patterns exist, or compare separate files of information to find records that match. Broadcast reporters have used database managers to discover the day of the week that public employees most often call in sick, to identify dangerous bridges and dams, or to find teachers who are also convicted felons.

Journalists often use databases for political campaign finance records.

Sometimes there is no data available on certain search topic, and only few hard copy may be in hand. In this case, broadcast reporters have to built their own databases from hard (printed) records and entered data into them.

The use of Computer Assisted Reporting techniques has been steadily rising among both print and broadcast journalists. This techniques can be applied on most stories and add more context and depth to those stories. In some cases, CAR techniques allow journalists to come up quickly with new information on breaking stories.

On the other hand, journalists need training to make sure that they understand how to apply these skills with accuracy, but they should not be reluctant to use tools that can improve their credibility.



14.8 LET US SUM UP

Let us summarize some of the important points of this unit in the following way-

- A hypertext system is the first generation of hypermedia, which gradually evolved to workstation and PC, based platform, which is the present day, second-generation hypermedia.

- Internet applications are roughly design for online communications, online information search, online communities, online media, online entertainment, e-business, online finance and other applications.
- The hypermedia study have developed a prototype of hypermedia system Hypernet, which seeks to assess the user using sources of information in two ways, “content-based” and “content-less” information.
- Navigation is a defining feature of Hypermedia systems and necessary for characterizing them along three fundamental dimensions, scope, target task domain, and target user domain.
- The latest feature available in hypermedia creation is the ability to insert Internet links into presentation. The elements or tools of hypermedia are resources like text, audio, video, photographs, graphics, and animation.
- Hypermedia is dynamic, informative, more effective, creative but it also has certain demerits. It can be distractive to some users, confusing, expensive, not compatible or demands intellectual overhead.
- The three basic tools used by a Computer Assisted Broadcast Reporter are: (i) Online Resources (ii) Spreadsheets and (iii) Database Managers.



14.9 FURTHER READING

1. Restful Web Clients: Enabling Reuse Through Hypermedia by Michael Amundsen, 2017; O’Reilly Media, Inc. Publication (Also available in Google Books)
2. Understanding Hypermedia 2.0 by Bob Cotton and Richard Oliver, 1993.

3. Rethinking hypermedia by Wendy Hall, Kluwer Academic Publishers, 1996 (Also available in Google Books)
4. Adaptive Hypermedia and Adaptive Web-Based Systems, 4th International Conference, AH 2006; Vincent Wade, Helen Ashman, Barry Smyth (Eds.), Springer publication, ISSN 0302-9743

14.10 ANSWERS TO CHECK YOUR PROGRESS

Answer to Q. No. 1: Hypermedia is a style of building systems for organizing, structuring and accessing information around a network of multimedia nodes connected together by links.

Answer to Q. No. 2: Hypertext. Hypertext systems were mainframe based, text-only systems for increasing the performance of information processing environments, storing the whole world's literature or for supporting traditional writing and reading.

Answer to Q. No. 3: Telnet or remote computing is telecommunication utility software, which uses available telecommunication facility and allows you become a user on a remote computer.

Answer to Q. No. 4: A web browser is an application that helps a computer user gain access to all the content that is on the Internet and the hard disk of the computer. Example: Google Chrome, Safari, Internet Explorer, Opera, Firefox, Safari, Netscape etc.



14.11 MODEL QUESTIONS

A. Very short questions

Q 1. What is FTP?

Q 2. Who coined the term hypermedia and when?

Q 3. Who developed Skype Application?

Q 4. What do you mean by “wandering”?

B. Short Questions (Answer each question in about 150 words)

Q 1. What is the difference between multimedia and hypermedia?

Q 2. What is navigation? Explain briefly the *Backtracking Mechanism*?

C. Long Questions (Answer each question in about 300-500 words)

Q 1. Discuss the role of Internet Applications in communication.

Q 2. Critically discuss the scope and role of Computer Assisted Broadcast Reporting in today’s society.

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Unit -15: MEDIA CONVERGENCE

UNIT STRUCTURE

15.1 Learning Objectives

15.2 Introduction

15.3 Concept of Media Convergence

15.4 Advantagesof Media Convergence

15.5 Rising concerns about media convergence

15.6 Convergence of technology and mass communication

15.7 Let Us Sum Up

15.8 Further Reading

15.9 Answers to Check Your Progress

15.10 Model Questions

15.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- discuss how media convergence takes place
- Analyse the Advantages of Media Convergence
- Explain therising concerns/effects of Media Convergence
- Describe the technological convergence and mass communication

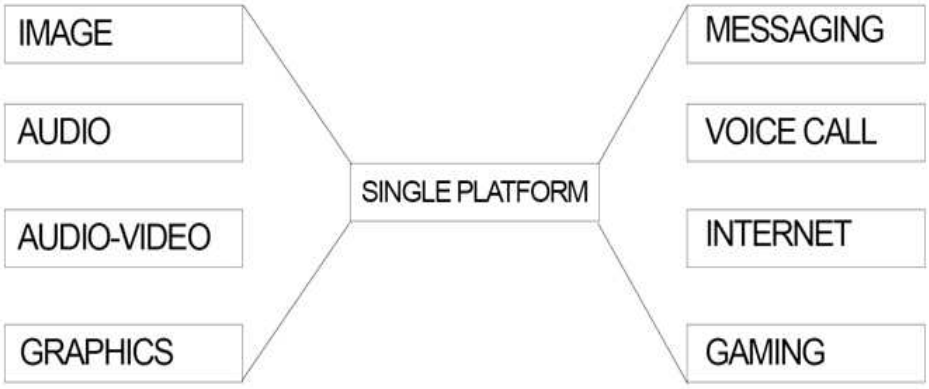
15.2 INTRODUCTION

In this last unit of the course, we are going to discuss media convergence. Do you remember, until few years back, if you were going on a vacation, you would need to carry a number of things to enjoy the trip and capture the memorable moments. You would require a GPS for routing you the right way, a camera and a camcorder to capture pictures and videos, a CD player or a DVD player for entertainment, a book to read in leisure, a wallet to buy stuff, and so on. But today, you require only one device i.e. a smartphone to take care of all your above mentioned needs and much more. Media convergence is the joining or converging of technologies into one.

Convergence is an ambiguous term used by various disciplines to describe and analyzeprocesses of change toward uniformity or union. Its application in the communications sector,often referred to as media convergence, also encompasses valuable approaches and insights todescribe, characterize and understand the digital creative economy.Convergence is not only used and discussed in academia but also by policy-makers and the industry, however, with differing objectives, interests, definitions and accentuations. For theindustry, convergence is predominantly a strategic objective and a business challenge. Forpolicymakers it is a policy goal and challenge. For academics it is mainly an analytical concept applied to understand and explain important aspects of media change in general and numerous detailed developments in particular.

15.3 CONCEPT OF MEDIA CONVERGENCE

Media convergence involves the interconnection of information and communications technologies, computer networks, and media content. It brings together the “three C’s”—computing, communication, and content—and is a direct consequence of the digitization of media content and the popularization of the Internet.



Media convergence is the merging of mass communication outlets – print, television, radio, the Internet along with portable and interactive technologies through various digital media platforms.

- Media convergence allows mass media professionals to tell stories and present information and entertainment using a variety of media.
- Converged communication provides multiple tools for storytelling, allowing consumers to select level of interactivity while self-directing content delivery.

15.4 ADVANTAGES OF MEDIA CONVERGENCE

With the development of technology in different platforms, Media convergence has become a vital element of life for many people.Due to the convergence of media,technology has become more Portable, Cheap, Faster, Easier to access, Reliable, andoptions for varietyof choices.

Advantages of Media Convergence:

- **Connectivity:** The convergence of media has made the possibility of staying in touch with people near and far. With the convergence of media, people can work from any place and also monitor their location in any unknown location, which help them not to get lost.
- **Convenience:** Due to the convergence of media, we don't have to carry lots of equipment these days. A single device is sufficient to meet all the needs. For example, if a person needs to write an application letter in word, receive or reply E-mail, capture a picture or record a video or even sit down and relax with a song in a park, it is all possible with just one device like a Smart Phone.
- **Access:** Accessibility of media content is much more inexpensive, efficient, convenient and faster due to media convergence. There is no obstacle to shift from one form of medium to other.
- **Immediacy:** With all the possible means to access any information from anywhere, immediacy has become of the characteristics of new media form, which is a converged media. If anything has happened nearby or on the other side of the globe, the information can be access in no time.

15.5 RISING CONCERNS ABOUT MEDIA CONVERGENCE

We now live in a world, where instead of purchasing a newspaper, people in search of news can find it online equipped with videos and other media, where a person's cell phone can act as a phone, an mp3 player, a web surfer, a news source and more.

Over the past few decades, the media hasn't changed, it hasn't altered, and it hasn't evolved. Rather, it has completely converged. The news that used to be printed in newspapers and magazines are now viewed online. The music that was once in the form of a CD can now be downloaded in an mp3 format anywhere the consumer wishes, whenever the consumer wants. The letters and mail that used to come in the mailbox can now be communicated in an email, on social media like Facebook, or via text.
Now the rising concerns taking Media convergence are:
(a) Survival of traditional TV Content. With various options available, there is an increase number of "cord cutting" in TV content, which means the viewers decide to cancel traditional bundled TV services and replace them with cost-saving streaming media alternatives, e.g. Amazon Instant Video, Hulu or Netflix.

(b) Problems of measurement or setting benchmark has become more challenging. Convergence of services has broken the traditional methods of tracking and analytics. Measuring the "what" and "how" that explains the user experience is paramount for content providers whether they are embracing or rejecting the content. This process is now infinitely more complex since the traditional methods that worked before in the TV and digital domains do not function the same. So, it ends up with a question that, How Can You Manage If You Cannot Measure?

(c) One of the areas of particular concern when examining positive and negative consequences of media convergence is media ownership. Nowadays the power to control media industry is concentrated in the hands of private owners and relatively small number of big media corporations.

For example, companies, such as Warner Bros., which used to focus on the film industry, nowadays have control over various aspects of entertainment industry in general, such as computer games, books, magazines, web sites and toys, which is all part of the process of media convergence.

(d) Digital Domination. Almost all the discussions surrounding media convergence are dominated by digital media, due to both the possibility of creation and the ability to deliver data at an extremely granular level.In fact, digital now accounts for more than half of daily media time. All the traditional media are rapidly shifting towards new media form. Though few are still hooking into the traditional form. The digital media are also more preferable form traditional media as they are more environment friendly to some extent.

(e) Technological convergence also faces the challenge of reaching and protecting public interests, and avoiding being used politically and artificially to protect vertically integrated markets by the broadcasters and their regulators. Regulators have to respond to technological innovations and deal with changes in their frameworks and legislation. This requires a transition to a cross-product, cross-platform, and cross-sectional licensing.



CHECK YOUR PROGRESS

Q.1 What are the three C's of Media Convergence?

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Q.2 Due to the convergence of media, technology has become more_____.

Q.3 Give an example of advantages of convenience due to media convergence.

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Q.4 What do you mean by “cord cutting”?

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15.6 CONVERGENCE OF TECHNOLOGY AND MASS COMMUNICATION

The technological dimension of convergence is the most readily understood. With the World Wide Web, smartphones, tablet computers, smart televisions, and other digital devices, billions of people are now able to access media content that was once tied to specific communications media (print and broadcast) or platforms (newspapers, magazines, radio, television, and cinema).

Since a diverse array of content is now being accessed through the same devices, media organizations have developed cross-media content. For example, news organizations no longer simply provide just print or audiovisual content but are portals that make material available in forms such as text, video, and podcasts, as well as providing links to other relevant resources, online access to their archives, and opportunities for users to comment on the story or provide links to relevant material.

These developments have transformed journalism by breaching longstanding boundaries—between a professional journalist and a non-professional citizen journalist, giving rise to “citizen journalism”.

Citizen journalism is a type of journalism that is initiated by people who are not professional journalists but who disseminate information using Web sites, blogs, and social media. Citizen journalism has expanded its worldwide influence despite continuing concerns over whether citizen journalists are as reliable as trained professionals. Citizens in affected or disaster zones provides instant text and visual reporting from the scene. People in countries affected by political upheaval and often in countries where print and broadcast media are controlled by the government have used a variety of technological tools to share information about hot spots. The term “citizen journalism” and the practice crystallized in South Korea, when the online entrepreneur Oh Yeon-ho declared in 2000 that “every citizen is a reporter.”

Oh Yeon-ho and three South Korean colleagues started an online daily newspaper in 2000 as they were not happy with the traditional South Korean press. Unable to afford the costs of hiring professionals and printing a newspaper, they started OhmyNews, a Web site that used volunteers to generate its content. In a speech on the site’s seventh anniversary, Oh Yeon-ho, the firm’s president and CEO, noted that the news site began with 727 citizen reporters in one country and by 2007 had grown to 50,000 contributors reporting from 100 countries.

Since then the Internet has spawned thousands of news sites and millions of bloggers. Traditional news media, while battling declining readership and viewership, leapt into the fray with their own Web sites and blogs by their own journalists, and many newspapers invited readers to contribute community news to their Web sites. Some groups started their own “hyper local” online news sites to cover happenings in their neighborhoods or specialized topics of interest that were not reported by larger media organizations.

Social media is a new driver of the convergent media sector. The term social media refers to technologies, platforms, and services that enable individuals to engage in communication from one-to-one, one-to-many, and

many-to-many. While the Internet has always allowed individuals to participate in media not only as consumers but also as producers, the social aspect of media convergence did not flourish until the 2000s, with the rise of Web 2.0 sites that aimed to be user-focused, decentralized, and able to change over time as users modified them through ongoing participation.

Social media is exemplified by the rise of online communication services that include the social network Facebook, the micro blogging service Twitter, the video-sharing Web site YouTube, blog software such as Blogger and WordPress, and many others. The scale of growth of these social media platforms has been phenomenal. Facebook first became publicly available in 2006, and by 2012 it had over one billion users. In 2012 it was estimated that over 72 hours of video a minute were being uploaded onto YouTube, and over four billion videos a day were being viewed from that site alone.

An American media writer &scholar Howard Rheingold has identified three important characteristics of social media. First, social media make it possible for everyone in the network to be simultaneously producer, distributor, and consumer of content. Second, social media's power comes from the connections between its users. Third, social media allows users to coordinate activities between themselves "on scales and at speeds that were not previously possible."

An important shift associated with convergence and social media is the rise of user-created content, with users changing from audiences to participants. Australian media scholar Axel Bruns referred to the rise of the "producer," or the Internet user who is both a user and a creator of online content, while British author Charles Lead beater discussed the "pro-am revolution" and "mass collaboration," where the tools of content creation become cheaper and simpler to use, distinctions between amateurs and experts become blurred, and media content production becomes increasingly shared, social, and collaborative in nature. The Organization for Economic Co-operation and Development has identified user-created content as a "significant disruptive force that creates both opportunities and challenges for established market participants and their strategies,"

One-way that professional media has engaged with media convergence is through *transmedia storytelling*, in which stories are told across multiple platforms. Although it is intimately connected to brands and franchises being spread across media by corporate conglomerates (e.g., Star Wars, The Matrix, Harry Potter, various Disney franchises), it does not simply refer to the adaptation of content from one platform to another (e.g., films and film characters providing the basis for toys and games).

Rather, as Spanish media scholar Carlos Scolari has observed, transmedia storytelling "is a particular narrative structure that expands through both different languages (verbal, iconic, etc.) and media (cinema, comics, television, video games, etc.)." While transmedia storytelling can be a source of brand extension for media corporations, and hence further revenues and profits from reaching new audiences and selling more products, it has also functioned as a form of fan engagement with particular media content as they put together a richer and more complex narrative around it.

Media convergence has also thrown up new challenges for policy. For most of the 20th century, media content was delivered through particular platforms, such as books, newspapers, magazines, radio, television, cinema, and video games. These different media were subject to different levels of regulation based upon whether they were distributed in public or consumed in private, whether children could access the content, whether a particular medium may have more impact on its audience, and so on.

In the 21st century the content and platforms have separated, with content now accessible in digital form across multiple devices. Moreover, as noted above, users themselves are not just the consumers of content but increasingly its producers and distributors. The environment in which media policy and regulation are undertaken has been radically shifting as users more easily control their own media environments and younger users ("digital natives") are often most familiar with convergent media technologies.

The nature of media companies has also changed. For example, the computer company Apple, Inc., has become by far the world's largest

distributor of music. The search-engine firm Google, Inc., plays a key role in making both news and TV content available to global audiences. How to achieve long-established principles of media policy, such as ensuring diversity of ownership and content, regulating access on the basis of community standards, and meeting local content requirements in an age of global media, is a major challenge for policy makers in the age of media convergence.



15.7 LET US SUM UP

Let us summarize some of the important points of this unit in the following way-

- Media convergence involves the interconnection of information and communications technologies, computer networks, and media content. A combination of computing, communication, and content.
- Due to the convergence of media, technology has become more Portable, Cheap, Faster, Easier to access, Reliable.
- Few advantages of Media Convergence are: Advantages of ConnectivityConvenience, Access and Immediacy
- The rising concerns taking Media convergence are:(a) Survival of traditional TV Content(b) Problems of measurement or setting benchmark has become more challenging. (c) Media ownership(d) Digital Domination(e) Challenges of reaching and protecting public interests
- Due to the diverse array of content is being accessed through the same devices, media organizations no longer simply provide just print or audiovisual content but provides material available in the forms of text, video, and podcasts, as well as a links to other relevant resources, online access to their archives, and opportunities for users to comment on the story or provide links to relevant material.

- An important shift associated with media convergence and mass communication is the rise of user-created content, with users changing from audiences to participants.



15.8 FURTHER READING

1. G Meikle and S Young, Media Convergence: Networked Digital Media in Everyday Life (2011).
2. M Castells, The Rise of the Network Society: The Information Age—Economy, Society and Culture Volume 1 (1996), 60–61.
3. Storytelling in the Media Convergence Age: Exploring Screen Narratives by by Roberta Pearson and Anthony N. Smith. Publisher: Palgrave Macmillan; 2015 Edition.

15.9 ANSWERS TO CHECK YOUR PROGRESS

Answer to Q. No 1: The three C's" of media convergence are: —computing, communication, and content.

Answer to Q. No 2: Due to the convergence of media, technology has become more Portable, Cheap, Faster, Easier to access, Reliable, andoptions for variety of choices.

Answer to Q. No 3: Advantages of convenience: if a person need to write an application letter in word, receive or reply an E-mail, capture a picture or record a video or even sit down and relax with a song in a park, it is all possible with just one device like a Smart Phone.

Answer to Q. No 4: "Cord Cutting" in TV content, means the viewers decide to cancel traditional bundled TV services and replace them with Cost-Saving streaming media alternatives, e.g. Amazon Instant Video, Hulu or Netflix.



15.10 MODEL QUESTIONS

A. Very short questions

Q.1: How does an industry regard media convergence?

Q.2: What are the aspects of treatment for media convergence by an Academic institution?

Q.3: What is “citizen journalism”?

B. Short Questions (Answer each question in about 150 words)

Q.1:What are the advantages of a smart phone?

Q.2: What are the three important characteristics of social media identified by Howard Rheingold?

C. Long Questions (Answer each question in about 300-500 words)

Q.1: Answer in your own word, how “citizen journalism” can contribute to the creation of news. How far such news source can be reliable?

Q.2: “*Social media* is a new driver of the convergent media sector” Discuss.

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