CONTENT

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M. A. Mass Communication (2nd year)

MEDIA PRODUCTIONS MMC 202 Lesson: 1

PRINTING PROCESSES

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LESSON STRUCTURE

The invention of printing is a big milestone in the evolution of communication. Printing is considered to be the biggest invention since the invention of wheels. In this lesson we shall discuss the various aspects of printing. We shall start with* Relief Printing Process*. We shall then focus on the* Planographic Printing Process*. Finally, we shall focus on the* Screen Printing Process*. The lesson structure shall be as follows:

1.0 OBJECTIVES:

The main objectives of this lesson are;

- *To understand the Screen Printing Process,*
- *To understand the Planographic Printing Process, and*

- *To understand the Screen Printing Process.*

1.1 INTRODUCTION:

The art and science of making a large number of duplicate reproductions of an original copy is termed as printing. It may also be defined as the art of preserving all other arts. Printing is the medium for printed communication.

We start our days with newspapers, then we buy milk packets, every day we come across many books, currency notes and so many printed items. So, we can say that printing is a part and parcel of our life. Three major printing processes basically are used to print printed materials. These are *Relief Printing Process, Planographic Printing Process, and Screen-Printing Process.* In addition, there are many minor or highly specialized printing processes. These include Die Stamping, Thermo Printing, etc.

We shall discuss only the major printing processes in detail. In order to understand these processes, we must understand the following two terms clearly:

Image Area: It is that area on the printing surface that receives ink. For example: raised portions of a rubber stamp.

Non-Image Area: It is that area on the printing surface, which does not receive ink. For example: depressed portions of a rubber stamp.

1.2 PRESENTATION OF CONTENT:

There are three major printing processes. In this lesson we shall discuss about these three processes in detail. The content of this lesson shall be presented as follows:

- *Relief Printing Process,*
- *Planographic Printing Process, and*
- *Screen-Printing Process.*

1.2.1 RELIEF PRINTING PROCESS:

It is the oldest printing process and came into being with the invention of movable types in the fifteenth century by Johan Gutenberg. The matter, which is to be printed, is a mirror image (reverse) or is backward reading (right to left).

The image to be printed is raised and the non-image area is depressed.

The basic principle behind this process is that there is a physical separation between the image areas and the non-image areas. Image areas are raised, and catch ink to produce impression on paper while non-image areas are lowered and do not catch ink.

STEPS INVOLVED IN RELIEF PRINTING:

First of all, relief printing plates are prepared i.e. the master is prepared with a combination of metal or wooden types are assembled together. This is known as typesetting or composing. Also used are illustrations prepared by photomechanical methods called blocks. All the composed matter are combined and locked together in a frame. In this the image areas are raised while non-image areas are depressed on the master/printing surface.

Ink rollers on the master apply ink, image areas receive ink and non-image areas do not.

The printing surface or master is then pressed against the substrate to obtain the impression. Ink is transferred from image areas on the substrate. The non-image areas, which are depressed, don't come in contact with the inking rollers or the paper and so give no impression. Examples for this process are:

- *Letterpress*
- *Flexography*

LETTER PRESS PRINTING PROCESS:

Printing originated with the letterpress. The nomenclature "letterpress" brings to mind the images of raised *letters* pressing against a surface, on which their shape of ink is transferred. Actually letterpress printing is not just meant for printing only letters but also borders, rules, illustrations, etc. Letterpress is a relief printing process. On the basis of printing surface or master and the surface on which paper is placed, the letterpress printing machines can be classified in three main groups. These are:

- *Platen Press*
- *Flatbed Cylinder*
- *Rotary*

PLATEN PRESS: The surface on which the paper (to be printed) is placed for printing is flat and is called platen, and the *forme* or *master* or *printing* surface is also placed on a flat surface known as the flatbed. Since the paper is put on the platen (flat surface), therefore this group of machines is also known as platen press or platen machine or treadle machine.

Process Platen Press:

First of all a *forme* or printing surface is prepared for printing each letter and image is cast separately using wood (engraving/carving) or alloys made up of tin, antimony, lead etc. Then these letters and images are arranged together and locked in a frame firmly. This is technically known as the forme or chase. It acts as the printing surface.

The master frame is fixed in a plane surface and inking is done by inking rollers which pick up the ink from a revolving ink disc fixed above the machine and then pass it across the *forme*.

Paper is fed by inserting in between the two flat surfaces. The plane surface on which paper is placed for printing is known as platen.

Bringing the flat surfaces in contact with each other does printing. The whole composed matter comes under the pressure at the same time where a controlled pressure is required to transfer the ink from the matter to the paper clearly and correctly.

Types of Jobs Suitable for Platen Machines:

These types of machines are best suited for printing letter heads, cards, bill forms, leaflets, pamphlets, inserts, visiting cards, office files, serial numbering, etc. Platen presses can also do embossing, die cutting, creasing and foil stamping, numbering, etc. which other printing presses just can not.

Advantages of Platen Press:

- Flat to flat type of machines are available in different sizes to suit different jobs. The printing work can be stopped in between and any correction can be carried out.
- Small works in less numbers can be printed at very cheap rates.

Disadvantages of Platen Press:

- The speed of printing of flat-to-flat type of machines is very slow. The average speed is 1200 impressions per hour.
- Since the paper used for printing by these machines is in the form of sheets, a lot of time is wasted in changing the sheets of papers repeatedly. So printing becomes a very time consuming process.
- In flat-to-flat type of machines printing is possible only in one colour during one impression.

FLAT BED CYLINDER PRESS:

This group of letterpress machines is also known as flat bed cylinder presses. The surface of the printing surface remains flat while the surface carrying paper is cylindrical. Earlier these presses were operated by steam power. But now days they are operated by electrical power.

Process of Flat Bed Cylinder Press:

- The speed of printing of flat-to-flat type of machines is very slow. The average speed is 1200 impressions per hour.
- At first a matter is prepared in the same way as in the platen press and is placed on a plane surface called flat bed.
- This bed travels to and fro from one end to the other end of the machine. Inking is done by the ink rollers, which are rolled over the bed.
- The impression cylinder is a part of these machines, which is used to grip the paper and to apply the pressure. It revolves about it's own axis.
- Due to the to and fro motion of the flat bed and the pressure applied by revolving impression cylinder, the image areas are printed on the substrates.

Examples of Flat Bed Cylinder Press:

- *Stop cylinder machines.*
- *Swing cylinder machines.*
- *Single-revolution-cylinder machine.*
- *Two-revolution-cylinder machine.*

Types of Jobs Suitable for Flat Bed Cylinder Machines:

These machines are efficient enough to print considerably longer run jobs ie. in larger numbers and for much bigger paper sizes.

Advantages of Flat Bed Cylinder Press:

- Flat to cylinder type of machines are cheaper and flexible in printing.
- Since there is a revolving impression cylinder and is power driven, the printing speed quite high. The average speed of these machines is 4000 impressions per hour.

Disadvantages of Flat Bed Cylinder Press:

- Although speed of flat bed to cylinder type of machines is higher than platen ones, yet this speed is not optimum for larger printing jobs. These machines are comparatively very slow with respect to modern printing processes (offset, gravure, rotary letter presses etc.)
- Like platen machines, these machines also use individual sheets for printing, so they are also time-consuming.

CYLINDER-TO-CYLINDER (ROTARY):

In this group of machines, the printing surface as well as the platen is cylindrical. The printing surface is prepared by duplicating process in round shape/curved/flexible to wrap around the cylinder. As this plate is in the relief form, plate is made according to the circumference of the plate cylinder. The printing surface or the master has relief images. It is known as stereotype and electrotypes. These are prepared by electronic and mechanical techniques. The printing surface or cylinder and the impression cylinder maintain consistency and proportion with each other.

Process of Rotary Press:

- The master, which is first fixed on to the plate cylinder (stereotype and electrotype);
- Then one end of the paper web is fixed in between these two cylinders. When both the cylinders start revolving on their axis, the reel of paper is pulled according to the speed of the cylinder.

Types of Jobs Suitable for Rotary Press:

The paper printed is in rolling form. After printing it is cut in to sheets as per the requirement. This is a fast method of printing. These machines are suitable for printing of newspapers, magazines, books, etc. in a large quantity. The speed is about 20000 to 30000 impression per hour.

Advantages of Rotary Press:

- Cylinder to cylinder type of machines has higher speed in comparison to other letterpress machines.
- The use of paper in the web form allows continuous printing.
- Rotary movement of cylinders allows faster printing.

- Inline operations can be incorporated in these machines; these operations include cutting, folding of paper, trimming of paper, packaging etc.
- Two, three or four colours are possible in these machines. The number of colours that can be printed depends on the number of units through which the paper passes during printing.
- Since the cylinders are in continuous motion, energy is not wasted in accelerating them again and again.

Disadvantages of Rotary Press:

- It requires more time for make ready procedure before printing, labour and technical
- Skilled men are required for the preparation of master (stereo and electro- plates)
- Initial cost of setting up these machines is very high.
- These machines are not suitable for small size jobs i.e., less numbers of copies.

1.2.2 PLANOGRAPHIC PRINTING PROCESS:

It is based on the principle that water and oil do not mix and repel each other. The term planography means that the image and the non-image areas are on the same plane unlike in relief process (letter press) where the image areas are raised. In this process both image and non-image areas are chemically separated but both lie on the same plane. Image areas are prepared with certain greasy or oily materials. Non-image areas are prepared with some water absorbing materials.

Examples:

Lithography Press,

Offset Press.

OFF SET PRINTING:

Offset comes under a planographic printing process. It is based on the principle that water and oil do not mix with each other. The image areas are oily greasy in nature and readily accept oil or grease based inks. On the other hand, non-mage areas accept water and hence repel away oily or greasy inks. Thus image and non-image areas are chemically separated on the printing surface.

Offset machines make use of planographic printing process. The offset machines use a thin plate on which image and non-image areas are photo mechanically prepared on the thin plate. It is wrapped around the image cylinder. There are the three cylinders, which rotate

around each other. These cylinders are the plate cylinder, the blanket cylinder and the impression cylinder. The metal plate - on which the image and non-image areas are separated - is fixed on the plate cylinder which is fixed at the top, where the inking rollers and dampening rollers (which supplies water) apply or supply, ink to the image areas and water to the non image areas.

The inking system and dampening system are provided at the top of the plate cylinder. After that the ink is transferred from the plate cylinder to the blanket cylinder, which is arranged below the plate cylinder. From the plate cylinder to blanket cylinder the image is transferred in reverse i.e., it is the mirror image and backward reading. The image is readable on the plate cylinder but not on the blanket.

The paper then passes between the blanket cylinder and the impression cylinder. The impression cylinder exerts a little pressure, sufficient enough to transfer the ink from the blanket on to the paper. Offset machines are of two types:

- *Web offset*
- *Sheet fed offset*

In web offset the paper is in the roll form or web form. In sheet fed machines the paper is fed in the form of sheets. Both these machines are available in different sizes.

The main units of offset machines are:

- Feeding unit that takes care of the paper to be fed into the printing machines,
- Dampening unit, which contains cloth, covered rollers, installed at the plate cylinder. This unit supplies water to the non-image areas of the plate,
- Inking unit: which has inking rollers that apply the greasy ink onto the image areas of the plate. These rollers are in contact with the plate cylinder,
- Printing unit, which contains three cylinders called plate, blanket and impression cylinders, and
- Delivery unit, which collects all the sheets after printing.

Advantages of Offset Press:

- The use of rubber blanket facilitates printing on less expensive papers is possible and also allows perfect transfer of ink.
- The process is fast and can print more numbers of copies.
- Offset can also print on large size papers and on the other materials like tin, plastic, foil etc.
- The amount of ink and the thickness of the ink can be controlled.

- Master /plate/printing surface is prepared at a very fast speed using computers, photographic, electronic and mechanical techniques which go well with modern reproduction methods.
- Good quality of pictures, multi colours can be easily printed.

Disadvantages of Offset Press:

- Technical skill is required to operate on offset machines.
- Last minute corrections, which is some times very necessary, the master/ plate has to be re-prepared.
- The machine maintenance of an offset press is expensive, because it has large number of moving parts.
- More space is required to set up an offset machine.
- The initial investment is more.

Applications of Offset Press:

- Offset machines are used in almost all national daily newspapers.
- Used for printing of textbooks and other books and for general commercial printing.
- Can print very good quality multi coloured calendars.
- Can be used for printing of magazines posters catalogues.
- Fine line scripts as in Urdu languages can be printed easily by this method.
- Large size maps, plans and packaging materials can be printed properly.

1.2.3 SCREEN PRINTING PROCESS:

It is one of the major printing processes used these days for a wide range of printing jobs like the other printing processes. Artists for their creative works used silkscreen printing in the earlier times. It is also known as porous printing. Now days, silk is not only the fabric used. *Nylon, Dacron, Polyester, wire screens* are also being used. This process came into full-scale commercial use only in the early part of this century.

This process is based on the fundamental face that by forcing ink through the pores of selected areas of a silk screen mesh images can be formed on the substrate placed below the screen. The selected porous areas on the printing surface are the image areas while the blocked areas on it are the non-image areas.

Steps involved in Silk Screen Printing:

- The image areas are drawn or tracked on the screen and then the non-image area is blocked out on the fabric screen by using various methods. Thus at the first step, the master is prepared.
- The master or the screen mesh is fixed with the help of hinges on a tabletop. The ink or colour is forced through the porous image areas on the fabric screen and get deposited on the substrate. This force is applied using a rubber squeeze.

Suitability of jobs of Silk Screen Printing:

- By using this process, printing can be done on rubber, plastic, paper, glass etc. The image can be transferred to almost any surface, whether flat or odd shaped.
- The process is very simple and cost effective for small scale printing jobs.
- This process is best suited for package, display designs, stickers, containers etc.
- Wedding cards, visiting cards, letterheads etc. are printed with a good quality better than letterpress.
- Pictures can also be printed up to the certain extent.
- The printed image has a thick layer of ink and hence there is a little raised effect after printing that gives a good appearance.
- All the materials required for printing by the process are simple, inexpensive and easy to handle. So very little capital is needed to start screen-printing units.
- There are many new uses for screen process printing such as printing of electronic circuits.

Disadvantages of Silk Screen Printing:

- Drying of printing images takes time because of thick ink.
- Fine resolution colour pictures are difficult to print.
- Most of the screen-printing work is done manually and hence the speed of printing is very slow.
- The amount of ink used is more in this process when compared to the other printing process.

1.3 SUMMARY:

- Three major printing processes basically are used to print printed materials. These are *Relief Printing Process, Plano-graphic Printing Process, and Screen-Printing Process.* Minor or highly specialized printing processes include Die Stamping, Thermo Printing, etc.

- Image Area is the area on the printing surface that receives ink. For example: raised portions of a rubber stamp.
- Non-Image Area is the area on the printing surface, which does not receive ink. For example: depressed portions of a rubber stamp.
- The basic principle behind the relief printing process is physical separation of the image areas and the non-image areas. Image areas are raised, and catch ink to produce impression on paper while non-image areas are lowered and do not catch ink.
- On the basis of printing surface or master and the surface on which paper is placed, the letterpress printing machines can be classified in three main groups. These are: *Platen Press, Flatbed Cylinder Press, and Rotary Press.*
- Plano-graphic printing is based on the principle that water and oil do not mix and repel each other. The term planography means that the image and the non-image areas are on the same plane unlike in relief process (letter press) where the image areas are raised. In this process both image and non-image areas are chemically separated but both lie on the same plane. Image areas are prepared with certain greasy or oily materials. Non-image areas are prepared with some water absorbing materials.
- Offset printing is basically a planographic printing process. It is based on the principle that water and oil do not mix with each other. The image areas are oily greasy in nature and readily accept oil or grease based inks. On the other hand, non-mage areas accept water and hence repel away oily or greasy inks. Thus image and non-image areas are chemically separated on the printing surface.
- Screen printing process is based on the fundamental that by forcing ink through the pores of selected areas of a silk screen mesh images can be formed on the substrate placed below the screen. The selected porous areas on the printing surface are the image areas while the blocked areas on it are the non-image areas. It is also known as porous printing.

1.4 KEY WORDS:

Printing Processes: Three major printing processes basically are used to print printed materials. These are Relief Printing Process, Plano-graphic Printing Process, and Screen-Printing Process.

Image Area: It is that area on the printing surface that receives ink. For example: raised portions of a rubber stamp.

Non-Image Area: It is that area on the printing surface, which does not receive ink. For example: depressed portions of a rubber stamp.

Relief Printing Process: The basic principle behind this process is physical separation of the image areas and the non-image areas. Image areas are raised, and catch ink to produce impression on paper while non-image areas are lowered and do not catch ink. On the basis of printing surface or master and the surface on which paper is placed, the letterpress printing machines can be classified in three main groups. These are: *Platen Press, Flatbed Cylinder Press, and Rotary Press.*

Platen Press: The surface on which the paper (to be printed) is placed for printing is flat and is called platen, and the *forme* or *master* or *printing* surface is also placed on a flat surface known as the flatbed. Since the paper is put on the platen (flat surface), therefore this group of machines is also known as platen press or platen machine or treadle machine.

Flat to cylinder Press: This group of letterpress machines is also known as flat bed cylinder presses. The surface of the printing surface remains flat while the surface carrying paper is cylindrical. Earlier these presses were operated by steam power. But now days they are operated by electrical power.

Cylinder-to-cylinder (Rotary): In this group of machines, the printing surface as well as the platen is cylindrical. The printing surface is prepared by duplicating process in round shape/curved/flexible to wrap around the cylinder. As this plate is in the relief form, plate is made according to the circumference of the plate cylinder. The printing surface or the master has relief images. It is known as stereotype and electrotypes. These are prepared by electronic and mechanical techniques. The printing surface or cylinder and the impression cylinder maintain consistency and proportion with each other.

Planographic Printing: It is based on the principle that water and oil do not mix and repel each other. In this process, the image and the non-image areas are on the same plane unlike in relief process (letter press) where the image areas are raised. In this process both image and non-image areas are chemically separated but both lie on the same plane. Image areas are prepared with certain greasy or oily materials. Non-image areas are prepared with some water absorbing materials.

Offset Printing: Offset printing process is based on the principle that water and oil do not mix with each other. The image areas are oily greasy in nature and readily accept oil or grease based inks. On the other hand, non-mage areas accept water and hence repel away oily or greasy inks. Thus image and non-image areas are chemically separated on the printing surface.

Screen Printing: It is one of the major printing processes used these days for a wide range of printing jobs. This process is based on the fundamental face that by forcing ink through the pores of selected areas of a silk screen mesh images can be formed on the substrate placed below the screen. The selected porous areas on the printing surface are the image areas while the blocked areas on it are the non-image areas.

1.5 SELF-ASSESSMENT QUESTIONS (SAQs):

1. What are the various major printing processes? Discuss at least any two major printing processes in detail.
2. Discuss in detail the relief printing process. Add a note on its advantages and disadvantages.
3. Discuss in detail the Plano-graphic printing process. Add a note on its advantages and disadvantages.
4. Discuss in detail the screen-printing process. Add a note on its advantages and disadvantages.

1.6 REFERENCES / SUGGESTED READINGS:

- **Letter Press Printing**, By Sh. C. S. Mishra.
- **Art and Production**, By Sh. N. N. Sarkar.
- **Advanced Printing Process**, By Sh. V. S. Krishnamurthy.
- **A Handbook of Printing and Packaging Technology**, By Vishwanath Chakrawarthy.
- **A Textbook of Photo Litho Offset**, By Sh. Anadoseal.
- **Photo Offset**, By Irwin T. Lathrap and Robert. J. Kunst
- **Commercial Screen Printing**, By Mrs. Bharti Bhamre.

M. A. Mass Communication (2nd year)
MEDIA PRODUCTION MMC 202 Lesson: 2

TYPESETTING METHODS

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LESSON STRUCTURE

Printing helps in getting multiple impressions of characters mechanically. The text and other matter to be printed are prepared. These are assembled either manually or by computer. This is known as typesetting or composition. We shall discuss about the various aspects of typesetting in this lesson. The lesson structure shall be as follows:

2.0 OBJECTIVES:

The main objective of this lesson is to study and understand the basic concepts of typesetting techniques or the composition methods. In this lesson we shall also discuss about the importance of the typesetting techniques in printing. We shall also try to understand the different

typesetting methods available with their merits and demerits. The specific objectives of this lesson are:

- *To get an Introduction to Typesetting*
- *To study about Hand Composition*
- *To study about Mechanical Composition*
- *To study about Composition Using Computers*

2.1 INTRODUCTION:

We have traversed a long way since mankind found writing to be the most tangible way of communicating ideas. Then printing came in to picture for producing multiple copies. But Johannes Gutenberg of Germany devised the first significant step to modern printing in the middle of 15th century by inventing movable types and designing the first mechanized printing press.

Printing at a basic level is getting impressions of characters on paper. The matter to be printed is prepared, i.e., assembled either mechanically or by computer. This is known as typesetting or composition.

2.2 PRESENTATION OF CONTENT:

The content of this lesson shall be presented as follows:

- *Typesetting- An Introduction*
- *Hand Composition*
- **Mechanical Composition**
- *Photo Composition (Composition Using Computers)*

2.2.1 TYPESETTING- AN INTRODUCTION:

Typesetting means arrangement of individual letters in the proper sequence. Typesetting technology has undergone tremendous change over the years. These days, typesetting is not the job of a low paid, semi-illiterate operator. Modern typesetting machines are friendlier for the creative people rather than the older generation for whom manual composition worked really fine.

The earlier methods of composition were slow, time consuming and prone to errors. Making corrections in this composed material was very difficult. The speed and sophistication of typesetting have brought drastic changes in the world of printing.

In the last few years particularly, the speed of typesetting has incredibly increased.

Typesetting methods are divided into two heads namely, "hot metal composition" and "cold composition". In hot metal composition, the type characters are prepared from molten metal. These readymade types are assembled using a variety of metals. In cold composition, there is no involvement of hot metal for the type character composition.

Hot metal composition is further divided into two types namely, manual and mechanical. Manual method is also known as hand composition. Mechanical method of composition is further divided into two categories, monotype and linotype. While there are many cold composition methods, including cut and paste, strike on letters, *justowriters* etc., and these days only computers are used.

2.2.2 HAND COMPOSITION:

Johan Gutenberg developed this method of composition about 500 years ago. This method involves manual assembly or arrangement of matter to be printed. This is why this method is called hand composition. The material and equipments used in this method are listed below.

Type: Type is any material from which impressions are transferred on to the printing surface. In the beginning wooden blocks were carved and used as types. Later on people started using metal pieces. Now photographic and digital types are being used. Unlike the metal types, digital types do not have any physical shape. However, we can see the characters on the screen or monitor of the computer. As we shall be discussing now, a variety of methods are used for composing i.e. sequential arrangement of types.

Type Case: Type cases are shallow wooden trays designed to hold types. They are all of a standard size, and contain different letters of the alphabets arranged in compartments or boxes, according to the frequency of their use by the compositor. This makes it easy and convenient for the compositor to select the type he/she wants. These are 80c.m. long and 40c.m. wide (back to front). The depth of the case is three cm. This case also contains other material like numerical (numbers) and punctuation marks. One case usually contains types of one variety.

Case Stand: These are open frames made of wood or metal, having a slopping top to support the upper and lower cases of type, and storing space below to accommodate other cases.

Composing Stick: This is the most basic hand-composing equipment. It is a small metal stick little bigger than a foot scale. This stick can hold types for composition. It is accurately graded in picas (measuring unit of column width), making it easy to set this stick to the desired width.

Pica and Point: These are units of measurement of column widths and type sizes. One pica is equal to 12points. One inch is equal to 72 points. One inch is also equal to 6 picas.

Galleys: These are shallow trays in which complete lines of composed type are placed after removal from the composing stick. Galleys are made of steel or brass with rims at the head and sides, the foot or the lower part being open to facilitate easy removal of the composed type.

Rule Cutter: It is used to trim lead, slugs and rules. These three have to be cut often to various sizes according to the measures used in the setting up of type.

Proofing Machine: It is normally operated by hand and is used to produce proofs of the composed type. These proofs help to see if there are any mistakes and thus ensure accuracy.

Chases: These are metal frames, which enclose the type to be locked up for printing. Chases are available in a variety of sizes to fit all the makes of the presses. The chases ensure that the ' *forme* ' or the composed matter remains bound together and types do not fall off.

Quoins: These are used to lock *formes* for printing. They are small wedge shaped devices, which are tightened with a key to hold the composed matter securely in place while printing.

Quads: These are rectangular blocks of metal less than type height, and are used to fill up spaces in composition.

Leads: These are strips of metal used between lines of type to adjust the ' leading ' or the space between the lines. They are normally made in thickness of 2 points, 3 points and 4 points, and are less than type height, so they do not print.

Fonts: Any given family or group of type invariably has all the letters in the alphabet and such accessories as numerals and punctuation marks.

PROCESS OF HAND COMPOSITION:

Types purchased from the foundry along with pieces of type quad, spaces and leads are stored in the compartments of wooden trays called type case. The length of line to be composed is first set in picas (1 pica = 12 points =1/6 of an inch) and the composing stick is adjusted or locked accordingly.

The compositor picks up types of each character from the respective compartment of the case and places it in the composing stick. When a line is almost filled, increasing or decreasing the space between the words, which is termed as “justification” or the process of making the lines of the type equal to the measure of the stick, justifies it.

The aim while justifying is to adjust the line in such a way that the space appearing between words is equal. In order to justify the line there are three possible alternatives, either to increase the spacing between the words or to decrease the spacing between the word or to divide the word in to two parts and carry the second part to the second line.

However the division of words should be avoided as far as possible. After setting few lines, the composed material is transferred in to a galley tray and then another set of lines are composed. This process is continued till the galley tray is full of composed lines.

The galley matter is then cut into pages of required size. To prevent the matter from being separated, a chord is wrapped round the matter two to three times tightly. Tied up matter should be handed gently as it is liable to break or fall through. The galley containing the matter is placed on the bed of a proofing press. With the help of a small hand roller, a sheet of paper is printed., which is known as "proof".

Then the typographical errors are corrected by comparing the proof sheet with the original manuscript.

Advantages of Hand Composition:

- The same type characters can be used again and again.
- Correction of typographical errors is simple.
- The cost of production is less.
- Number of persons can work simultaneously, with different jobs.

Disadvantages of Hand Composition:

- It is tedious and time consuming.

- Great deal of concentration is required to carry out this operation.
- The person should be well conversed with the typographical details.
- It is hazardous to health, because of the lead content of type alloy.
- The process is very slow.
- A lot of space is required for carrying out of this operation.

2.2.3 MECHANICAL COMPOSITION:

Manual or hand composition involves readymade types, which are composed by hand. On the other hand, mechanical composition involves machines. It also involves hot or molten metal, which is cast into new types every time. This method is of two types: linotype and monotype.

LINOTYPE:

One of the most profound developments in typesetting technology was the invention of the linotype machine by Ottmar Mergenthaler in 1886. This machine represented the first great step towards typographic automation. It is so named because it produces a single line of type to a predetermined length specified by the keyboard operator. This method does not involve readymade types. It involves 'casting' of types from metallic moulds called 'matrices'. In this method complete lines are cast as single units. These solid cast lines are termed as slugs. It comprises of three inter-woven mechanisms. It casts a line at a time. This machine has the following sub-units:

Keyboard: This is like a normal type writing machine keyboard. However, its keys are attached to a case of matrices. When the keys are pressed matrices of type are released from the matrices case and arranged in line form.

Casting mechanism: Here the line of matrices and space bands is aligned, justified and a cast is taken by pouring hot molten metal in to the matrices. Matter is composed in the form of complete lines. These lines are called 'slugs'.

Distribution mechanism: This helps in returning the matrices and space bands to their original position in the matrices case.

PROCESS OF LINOTYPE:

- Matrices leave the magazine, in the order required by the operator, having been released by the depression of keys.
- Matrices and space bands are assembled in a line formation.
- Completely assembled matrices are transferred in to the casting machine for justification and casting. Molten metal is poured in to the moulds and slugs come out.
- The matrix line after casting, is carried upward for it's transfer to a position, where space bands are separated from the matrix line and transferred back to the space band box.
- The matrix line is lifted to the level of the matrices case and the individual matrices are transferred to their respective places.

All these work is done in a few seconds while the operator begins to assemble the next line.

The linotype produces a series of composite lines of types, which, after casting, are arranged in the galley tray. Pages are prepared from these lines for printing. After use, these slugs are melted down and used for recasting in to other slugs. A standard linotype machine casts lines up to 30 picas that is about five inches in length.

Advantages of Linotype:

- It is faster and more accurate.
- Distribution of matrices and space bands are easier.
- Slugs can be melted and used again and again.
- Justification of line is automatic.
- It cast a complete line at a time.
- Each time fresh slugs are cast.

Disadvantages of Linotype:

- Produces lot of heat and smoke.
- The molten metal is hazardous to health.
- Power consumption is more.
- If there is single mistake, the whole line has to recast again.

MONOTYPE:

Another significant achievement leading to fully automated typesetting was the monotype machine, invented by Tolbert Langston in 1887. This machine casts one character at a time rather than an entire line.

The monotype machine consists of two units:

- *Key board unit, and*
- *Casting unit.*

In monotype machines moulds or matrices are not released when keys are pressed. Instead, a special paper tape is used here, on which the instructions are coded in the form of perforations as in case of "Braille" language of blinds. The tape is then fed into the casting machine.

The motor power of the keyboard is compressed air, supplied by an air compressor, which is part of the equipment.

The keyboard consists of 3 parts;

- Two sets of keys, corresponding to the characters in the fount of type used and arranged like the keys of standard typewriters.
- A series of punches, for perforating a paper ribbon.
- A counting mechanism, for estimating units of letters and spaces in each line and indicating them automatically on a drum like justification scale, which is called a cylinder.

The depression of the keys by the operator perforates the paper ribbon in such a way that, when it goes to the casting machine, the perforation causes the casting machine to select the matrix of the character represented by the key depressed and cast the particular character.

When the setting is completed, the spool bearing the perforated ribbon is lifted from the keyboard and placed on the casting machine. Compressed air passes through these holes and thus puts in motion parts, which locate the required matrix.

These matrices are carried in a frame where the type is cast from the matrix. The types are then ejected from the mould into a carrier from which they are ejected into a channel until the line is completed. The completed line automatically moves into the galley, there by making room for the next line.

Advantages of monotype:

- As the type is cast by individual letters, it is always convenient to carryout any copy correction.
- After printing, these types can be reused by melting.

- Complex typesetting, such as scientific data and tabular information, is easier.
- Casting speed is much more higher, i.e., 150 characters per minute.
- As there are two units, two persons can work independently.

Disadvantages of monotype:

- The composed lines cannot be seen before casting.
- Correction of composition matter is difficult.

2.2. COMPUTER TYPESETTING:

This can be divided into two types;

- *Phototypesetting, and*
- *Digital type setting*.

PHOTOTYPESETTING:

Phototypesetting is one of the most significant developments in the assembly of type characters. This method of typesetting is different completely from conventional typesetting in that three dimensional piece of type or slug is replaced as end product by a two dimensional positive or negative image on film. There are three methods of image formation in this system;

- The keyboard operates in the usual manner for typing purpose. In this method, the fonts of type (the whole alphabet and numerals in various style, upper and lower case, bold, Italic) are carried in the form of film strips or disks, and most machine allow more than one fount to be carried, so that bold and Italic of a face can be set at the same time as the Roman. More sophisticated machines carry several type faces.
- In digitized CRT, the character is produced either by a contact process, where the film or paper is placed over the front of the CRT itself (on to which the image is projected) on by optical transmission of the tube beams directly on to the film or paper.
- The digitized laser method uses a laser instead of a CRT to produce the image. This method is very fast than the earlier.

ADVANTAGES IF PHOTO TYPESETTING:

- *Highly flexible and very fast.*
- *Type generated from this system takes very little physical space; because it's final form is a film or paper proof.*

- *Text input uses computerized editing capabilities.*
- *Typography created by this system is free of the physical restriction.*
- *There is much flexibility in the spacing of typographic elements through kerning, letter spacing, overlapping, inter line spacing, etc.*
- *Enlargement or reduction is much easier.*

DISADVANTAGES IF PHOTO TYPESETTING:

- *Requires trained talent to operate the system.*
- *Investment is very high.*
- *Due to the complicated design, maintenance costs more*.

DIGITAL TYPESETTING:

Digital computers have no mechanical parts and are entirely composed of electronic components. When the operator presses a key to enter a letter or issue a command (such as to enter the line or to save the typed matter), the computer receives it as a binary code. Once the information has been entered, it can be stored, edited and sent to a peripheral device for typesetting. A digital typesetting system encodes typographic character digitally on a grid, defining the shape of each letter as a certain number of distinct points.

One major difference between digital type and phototype is the manner in which type is stored, rather than storing master founts on photographic disks, drums, grids or strips, digital master founts can be stored electronically as bit pattern on a magnetic disk. Some machines are capable of storing hundreds of founts, with each size stored independently.

In this system, with the help of particular software (D.T.P. or Page Maker) the size of the page is fixed and then the required characters are typed with the help of keyboard. After typing, typographic manipulations are carried out easily, and it provides more accuracy and speed.

ADVANTAGES IF DIGITAL TYPESETTING:

- *It provides more accuracy.*
- *The speed is of higher in nature.*
- *Huge number of typefaces with point size can be stored.*
- *Typographic manipulations are carried out easily.*
- *The same composed matter can be stored for further use*.

DISADVANTAGES IF DIGITAL TYPESETTING:

- *Cost of installation is more.*
- *Person should be well versed with the system.*
- *Cost of maintenance is more.*

2.3 SUMMARY:

- Printing at a basic level is getting impressions of characters on paper. The matter to be printed is prepared, i.e., assembled either mechanically or by computer. This is known as typesetting or composition.
- Typesetting methods are of two types: hot metal composition and cold composition. In hot metal composition, the type characters are prepared from molten metal. These readymade types are assembled using a variety of metals. Hot metal composition is further divided into two types namely, manual and mechanical.
- Manual method is also known as hand composition. Mechanical method of composition is further divided into two categories, monotype and linotype.
- Ottmar Mergenthaler invented linotype machine in 1886. It produces a single line of type to a predetermined length specified by the keyboard operator. It involves 'casting' of types from metallic moulds called 'matrices'. In this method complete lines are cast as single units. These solid cast lines are termed as slugs.
- Tolbert Langston invented Monotype machine in 1887. This machine casts one character at a time rather than an entire line.

2.4 KEY WORDS:

Typesetting: Typesetting is assembling or arrangement of individual letters in the required sequence for the purpose of printing. Typesetting technology has undergone tremendous change over the years. The earlier methods of composition were slow, time consuming and prone to errors. Making corrections in this composed material was very difficult. In the last few years particularly, the speed and sophistication of typesetting has incredibly increased. This has brought drastic changes in the world of printing.

Type: Type is any material from which impressions are transferred on to the printing surface. In the beginning wooden blocks were carved and used as types. Later on people started using metal pieces. Now photographic and digital types are being used. Unlike the metal types, digital

types do not have any physical shape. However, we can see the characters on the screen or monitor of the computer.

Type Case: Type cases are shallow wooden trays designed to hold types. They are all of a standard size, and contain different letters of the alphabets arranged in compartments or boxes, according to the frequency of their use by the compositor.

Composing Stick: This is the most basic hand-composing equipment. It is a small metal stick little bigger than a foot scale. This stick can hold types for composition. It is accurately graded in picas (measuring unit of column width), making it easy to set this stick to the desired width.

Pica and Point: These are units of measurement of column widths and type sizes. One pica is equal to 12points. One inch is equal to 72 points. One inch is also equal to 6 picas.

Galleys: These are shallow trays in which complete lines of composed type are placed after removal from the composing stick. Galleys are made of steel or brass with rims at the head and sides, the foot or the lower part being open.

Proofing Machine: It is normally operated by hand and is used to produce proofs of the composed type. These proofs help to see if there are any mistakes and thus ensure accuracy.

Leads: These are strips of metal used between lines of type to adjust the ' leading ' or the space between the lines. They are normally made in thickness of 2 points, 3 points and 4 points, and are less than type height, so they do not print.

Fonts: Any given family or group of type invariably has all the letters in the alphabet and such accessories as numerals and punctuation marks.

Linotype: Ottmar Mergenthaler invented linotype machine in 1886. It produces a single line of type to a predetermined length specified by the keyboard operator. It involves 'casting' of types from metallic moulds called 'matrices'. In this method complete lines are cast as single units. These solid cast lines are termed as slugs.

2.5 SELF-ASSESSMENT QUESTIONS (SAQs):

1. Explain the term "typesetting" and it's role in printing.
2. Discuss the different typesetting techniques.
3. What are the equipments that are used in a hand composition room? Describe.
4. List down the merits and demerits of hand composition method of type setting.
5. List down the advantages and disadvantages of Monotype and Linotype.
6. What are the merits and demerits of computer typesetting?
7. Compare hand composition and mechanical composition.
8. Compare mechanical composition and computer typesetting.

2.6 REFERENCES / SUGGESTED READINGS:

- **Theory and Practice of Composition** - A. C. Goel.
- **Printing: A Practical Introduction to Graphic Arts** - Hartley E. Jackson.
- **The Printer's Hand Book** - Charles Thomas Jacobi.
- **Art and Production** - N.N. Sarkar.

M. A. Mass Communication (2nd year)

MEDIA PRODUCTIONS MMC 202 Lesson: 3

DESK TOP PUBLISHING (DTP)

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LESSON STRUCTURE

In this lesson we shall discuss the various aspects of Desk Top Publishing. In this lesson we shall start with the basic concept of Desk Top Publishing. We shall then focus on the process of Desk Top Publishing. The lesson structure shall be as follows:

3.0 OBJECTIVES:

The main objectives of this lesson are:

- *To understand the Advantages of DTP*,
- *To understand the Hardware Requirements for DTP,*
- *To understand the Software Requirements for DTP, and*

- To understand the Major *Applications of DTP*.

3.1 INTRODUCTION:

Desk Top Publishing is an electronic publishing system, which puts the user in-charge of the complete process of typesetting, producing graphics, and carrying out the page layout. This can even help produce the camera-ready copy. DTP gets its name from the fact that all the pre-printing processes (including creating camera-ready copy) can be carried out at the user's desk. It has revolutionized the way we look at the whole process of getting words and images into print.

In this lesson we shall discuss about the various aspects of DTP including advantages of DTP, hardware requirements for DTP, software requirements for DTP, and some applications of DTP.

3.2 PRESENTATION OF CONTENT:

The content of this lesson shall be presented as follows:

- *Advantages of DTP*
- *Hardware Requirements for DTP*
- *Software Requirements for DTP, and*
- *Applications of DTP*

3.2.1 ADVANTAGES OF DTP:

The advantages of DTP system over conventional type setting, designing and master copy preparations are given below.

Complete control:

With DTP, the user can maintain complete control over the entire production, since all the steps are concentrated within his desk.

More flexibility:

The layout on the computer monitor provides immediate information as to whether a design needs to be changed or not. Since the changes can be made much more quickly and easily, and the design may be changed repeatedly until it becomes acceptable.

Fewer errors:

The keyboard helps create text. So possible sources of introducing new errors are removed. Again, because the number of persons involved in making the camera-ready copy is less, the

possibility of introducing errors is low. In DTP last minute changes are not a problem.

Simpler and faster:

Number of columns, size of margins, line spacing, type font, etc., can be specified or changed by the click of the mouse with DTP and the result is immediately visible on the screen. Where earlier one had to manage the page makeup with scissors, scale, glue and other chemicals, now all one has to do is to place text and pictures on the screen using input devices like mouse, scanner and keyboard. This saves both time and money.

Moreover there is no time consuming composing involved. Also there is no need to read proof repeatedly and to check the layout several times. Many tasks, which had to be carried out else where, are either not required at all or carried out by the DTP user himself. Finally, considering all the advantages, the capital investment in DTP system is relatively low.

3.2.2 HARDWARE REQUIREMENTS FOR DTP:

Desktop Publishing is done using computers having either IBM/PC or Macintosh based operating system. Each system has its own special advantages and disadvantages. Many users today employ Mac systems. In corporate publishing, IBM and HEWLETT-PACKARD (HP) have immense customer bases. For DTP Following are the minimum requirements of hardware:

- Pentium board computer With 256MB RAM
- 20 GB to 120 GB Hard Disk
- Input devices like Keyboard, Mouse, and Scanner, etc.
- Output devices like VOA or EGA colour monitors, Printers, etc.

But there are numerous other components used in the DTP system for successfully preparing a high quality camera-ready copy. The major components of a DTP system are:

Central Processing Unit (CPU): The *control unit* and the *arithmetical logic unit* (ALU) are together known as the *CPU*. It is the brain of any computer system. The ALU is the place where the instructions are actually executed during the processing operation. All calculations are performed and all comparisons are made in the ALU. The type and number of arithmetic and logical operations that a computer can perform is determined by the engineering design of the ALU.

The control unit is responsible to maintain order and direct the operation of the entire system. Although it does not perform any actual processing on the data, it acts as a central nervous system for the other components of the computer. It obtains instructions from the

programme stored in main memory, interpretes the instructions and issues signals that cause other units of the system to execute them.

The main memory or the primary storage can be considered as the third part of the CPU. It provides space for storing data to be processed and instructions required for processing, space for intermediate results of processing and space for the final results of processing before these are released to an output device.

Data is stored and retrieved by the control unit in the main memory. RAM (Random-Access Memory), ROM (Read Only Memory), PROM (Programmable Read Only Memory), EPROM (Erasable Programmable Read Only Memory) and Cache Memory are various types of memories. Presently, a number of processors (CPUs) are available in the market. Most popular among them are Pentium I, Pentium II. Pentium III and Pentium IV.

INPUT DEVICES:

Input devices are used to accept the information for processing and convert the information in to a machine-acceptable form. These are:

Key Board:

It is the most common input device, which allows a user to enter letters, numbers, symbols, punctuation marks and commands into a computer in form of electrical signals by following action of key switches.

- *Alphanumeric keys*: It looks like a typewriter usually arranged in a standard 'QWERTY' keyboard layout as in normal typewriters.
- *Numeric keypad*: It looks and acts like a calculator with 10 digits and mathematical operations; usually located on the right side of the keyboard. When working on DTP involving spreadsheets, a numeric keypad close to the alphanumeric keys makes for easy movement back and forth between text and number entry.
- *Function keys*: These keys allow a user to give computer commands without typing long strings of characters and are usually arranged in a row along the top of the keyboard and designated as F1, F2 and so on. A good keyboard has twelve to fifteen such F-keys to save time. A task might require pressing a command key, then the shift key, then a letter. The F-key can be set to do all that by itself F -keys can be set to open, close and save documents, add boldface, italic or underlining to text, call up a spell-checking program or print a document.

- *Cursor movement keys*: To change the position of the cursor on the screen, these keys are used. This cluster of keys has arrows pointing up, down and to either side, which move the cursor in those directions.

Some keyboards also have one more group of keys called set-function keys. These allow the user to edit text and send the cursor to the beginning and of the page or document as well as to move the page up or down.

While selecting a keyboard for a DTP system, the user must check that the keys have optimum softness, optimum distance between them, are of optimum size, make clicking sound that suits him and that the keyboard is constructed at an angle which is comfortable for him.

Mouse:

It is an input device that allows a user to get the cursor on the screen and to control the cursor by pointing and clicking while moving it around on a flat, smooth surface. It is so-called because of its small, squat, palm-size shape and the tail-like chord that connects it to the CPU. Using the mouse involves four simple techniques:

- *Pointing*: means to place the cursor on the top of an object or position on the screen by moving the mouse on the desktop.
- *Clicking*: means to press and release the mouse button once thus selecting the item or location to which the arrow cursor is pointing on the screen.
- *Double-clicking*: means to point to an item or location with the cursor and to press release the mouse button twice in rapid succession.
- *Dragging*: means to position the mouse cursor over an item, then press the button and hold it down as one moves the mouse.

At the bottom side of the mouse there is a ball that make contact with the sensors which converts the rolling- movement of mouse across the desktop into the rapid movement of the cursor on the computer screen.

A mouse allows the user to create graphic element on the screen, such as lines, curves and freehand shapes and also make use of menus and message boxes easier.

Image-scanner:

It is an input device that converts printed or original images into digital form that can be stored and manipulated in a computer with the appropriate software. Often, it is called scanner only. It is the eyes of the DTP system. It looks at and reads photographs and other art and text in a way the computers can recognize, accept and use.

A scanner shines light on the image and senses the intensity of the reflection of light of every point, and than digitizes it. This means converting image into binary numbers, which are then read by CPU. The converted image is then displayed as dots and lines on the screen. Using an entire family of application software, called image-processing software, one can alter the shape, size, specifications and color scheme of the images.

The capacity to produce sharpness of a scanner is measured in terms of DPI (dots-per-inch) or PPI (pixel-per-inch). A resolution of 300 DPI is usually more than good enough for most DTP work. Colour scanners use filters to separate the components of colour into the primary additive colours (Red, Green, Blue) for each dot.

Scanning is a very convenient way to bring an illustration into DTP page layout.

Light pen, Joystick and trackballs are other input devices.

OUTPUT DEVICES:

Output devices are used to get the soft and hard copy of the prepared material for the purpose of proof reading the master or camera-ready copy. These are also used for making the film for printing. The following are the output devices used in a DTP system:

Monitor:

It is an output device that has a screen like that of a television on which the user may see displayed information.

Two basic types of monitors are used with microcomputer:

Cathode Ray Tube Monitors (CRT): These are the most popular display devices for desktop computers. A CRT monitor has a picture tube element similar to the one inside standard TV set. It is a vacuum tube with an electron cathode gun at one end and a phosphor-coated plate at the other end. When it receives the digital instructions from the computer, the electron gun shoots a beam of electrons through a magnetic field, which deflects and aims the beam at the front of the monitor. Phosphor glows when it is exposed to the electron beam.

The back of monitors screen is organized into a grid of dots called pixels. The electron

beam scans the screen in a series of parallel back-and-forth sweeps. It is programmed to either switch on or off, depending upon the digital instructions of the computer. In this way, the desired item or character is displayed on the CRT screen monitor. This type of monitor provides best and clear quality picture.

Flat Panel Monitors: These are also of several types, but the most common is the liquid crystal display (LCD) monitor. The LCD monitor creates images with a special kind of liquid crystal, which is normally transparent but becomes opaque when in charged condition. LCD monitors are compact, light and only about one inch thick. These require low power in comparisons with CRT monitors. These types of monitors are used in portable laptop computers and handwriting recognition devices.

For DTP work, three kinds of monitors may be used depending upon the requirement and nature of work.

- *Monochrome (B& W) Monitor*: It displays only one colour against dark background. A monochrome screen provides topmost quality for basic text work. Line drawings, logos, and certain images created, or obtained by using a scanner can also be displayed fully on it. These are less expensive monitors, but since these have only two shades black and white any graphic displayed on the screen are limited to these two choices.
- *Green Monitor*: It can also display only one colour Green or Amber on a black background. These can have moderate resolution and are good for word processing only.
- *Colour Monitor*: It shows a multicoloured display. In this monitor, three electron beams are used for the formation of one dot instead of one beam as in case of monochrome monitors. The three guns represent the primary additive colours (red, green and blue). Each dot on the screen is actually made up of three tiny red, green and blue phosphor coatings arranged in the shape of a triangle. When the beams from each of these guns are combined and focused on a point on the screen, the phosphor at that point light up to from a tiny spot of white light. Different colors can be displayed by combining various intensities of the three beams. Here what you see on a monitor may not be what you get in print. It is difficult, but not impossible, to reproduce the screen-generated colour on the printed page.

Following are the factors, which affect a monitor’s output:

- *Resolution:* The sharpness of a monitor's image depends to a large extent on the number

of pixels per inch (PPI) on the screen, as well as the total number of pixels the screen displays. Pixels (picture elements) are the dots on the screen that are either turned on (white-gray or colour) or turned off (black) to produce what you see. A display resolution of 640 x 480 pixels means that the screen consist of 640 columns by 480 rows of dots i.e., 640 x 480 = 3,07,200 pixels. Today, most monitors have maximum resolution of at least 800 x 600 pixels. High-end monitors can have resolution of 1024 x 768 pixels or even 1280 x 1024 pixels.

- *Flicker*: Means the apparent rapid pulsating of a screen of a monitor that scan too slowly. It is an annoying side effect and too much of it can cause eyestrain and headache.
- *Refresh rate*: The image on the screen, which appears solid and static, is in reality an image constantly in flux, being drawn in to the screen many times in a second. The number of times a monitor scans the entire screen each second is called the refresh rate. Most monitors operate at a minimum of 60 Hz, meaning they refresh the screen 60 times per second, and the better monitor operate at 70-90 Hz or more than that.
- *Brightness*: It is better to choose a screen as bright as possible for it is easier to see the images on the screen and as monitors become old, one of the first thing to go is brightness. If it is too bright, the user can always turn it down with the adjustable brightness control but if it is too dark, there is not much, he can do to improve the picture.
- *Size*: The user should have a monitor that displays at a minimum of one full page in size, i.e. as close to true 1: 1 scale as possible; i.e., the image on the screen is as exactly the same size as the printed image. It is better to select a screen that show two pages side by side; which are absolutely necessary for book, magazine or multiple brochure work. Monitor size is measured diagonally. For e.g.: a 19" monitor is 19" from top left corner to bottom right corner. WYSIWYG (what you see is what you get) is a display mode that shows a document, as it will appear when printed. WYSIWYG monitors let the user see on the screen what a printed page will look like.

Printers:

The computer provides coded information or result to the printer when the user needs a physical or hard copy. Before it can send data for printing, the computer must check the printer's status, whether the printer is turned on and ready to accept command, paper is present or not.

Dot-Matrix Printer: These are the first kind of printers used with PCs. These operate by wires

striking on paper through an inked ribbon to create an image. These are noisy and produce lower image quality (resolution) in printing than the other type of printers, but are also far less expensive, and used for proofing hard copy or data base outputs.

Ink Jet Printer: It creates image directly on paper by spraying ink through as many as 64 tiny nozzles. It provides better print resolution of around 360 DPI. It cost's only about half as a laser printer.

Laser Printer: Although laser printers are more expensive than their counter-parts but their print quality is highest. As the name implies, a laser is at the heart of these printers. In this a LASER (Light Amplification by Stimulated Emission of Radiations) ray passes through a finely tuned optical system and falls on a light sensitive and negatively charged rotating drum. It scans the surface of the drum as the computer activates it.

Whenever laser beam strikes, it neutralizes the spot and dots are formed at the-points on the drum. A series of dots create an image to printed, and a negatively charged roller containing powdered ink, known as toner, is used to form the image, when it rolls over the drum. The neutralized area of the drum adheres to the powder from the toner, whereas the negatively charged areas repel the ink.

This is in accordance with the principle of electricity that positive and negative attracting whereas positive-positive or negative-negative repel. The paper receives a positive charge as it enters the printer and dots formed on the drum are transferred to the paper. The heated rollers fuse the dots on the paper to form a permanent image.

The resolution of laser printer is measured in dots per inch (DPI). A printer that uses 300 DPI is considered as a low-resolution printer, whereas 600 DPI is considered good resolution suitable for fine quality printing. Some high-end models have resolution of 1200 DPI. The printing industry stipulates a resolution of at least 1200 for top quality professional printing.

3.2.3 SOFTWARE REQUIREMENTS FOR DTP:

The software that allows a user to perform designing, typesetting, and paste up functions with a single application programme and to produce high quality camera-ready printed pages is termed as Desk Top Publishing software.

DTP software enables one person to do a task on a personal computer what earlier required the expertise and technical skills of a term of professionals like graphic designer type

setter, paste-up artist etc. Thus, DTP software includes features to specify the publication's design, to set the type to be used, and to arrange type and graphics on pages ready for the printer. Hence, the complex and time-consuming operation of producing publication of any kind has been made much simpler and faster by the DTP software.

Moreover, since DTP often combines the activities of author, publisher, copy editor, typographer, graphic designer and computer expert into one, therefore, it makes the user alone responsible for what is going to be printed. He alone produces the layout and makes all the decisions.

TYPES OF DTP SOFTWARE:

The main features of DTP software can be grouped into four major categories:

- *Typesetting Based,*
- *Graphics Based,*
- *Page Layout Based,*
- *Pre-press Based.*

TYPESETTING BASED: DTP software provides the user many essential controls for professionals typesetting:

- Setting text in multiple columns, like a newspaper.
- Formatting text in different fonts using both Postscript and True type.
- Formatting tables.
- Setting headlines, sub heads, footers and page numbers.
- Generating tables of contents and indexes automatically.
- Combining multiple text files into a single document.
- Creating and placing footnotes.
- Setting equations and other mathematical and special symbols in type.
- Kerning: The selective removal of while space between discrete character airs in a line of type. For example space between a capital 'T' and a small 'O' can be decreased and that between an 'm' and an 'n' can be increased because the former look too separated while the later too congested.
- Tracking: The consistent removal of white space between characters in a line of type. It is general a setting for an entire block of text. Tight tracking squeezes all the letter close together filling more type in a given space. Loose tracking expands the space between

letters, making the page look lighter.

- Drop caps and Initial caps: These are enlarged capital letters at the beginning of a paragraph that either occupy two or more lines (drop cap) or stand higher than the rest of the line (initial cap).
- Rotating text: This lets you set type at any all angles.

GRAPHICS BASED: As it is with text, DTP software provides many capabilities for controlling graphics:

- Import graphics in electronic form using file formats and placing them on the page.
- Scaling and cropping graphic (determining their size and cutting them to fit).
- Attaching captions to graphics.
- Creating simple graphics within a document.
- Applying borders, lines and shading to text and graphics according to user specifications.
- Running text around graphics: DTP programs do not require the figure to be rectangular but make the text wrap precisely around an irregular shape graphic by setting the custom control points.
- Applying colour to a black and white or grey scale image and adjusting brightness, contrast and half tone screens for scanned photographs and other bit-map images.
- Linking graphics to text elements so that they move with the text and making negative images for imported graphics.

PAGE LAYOUT BASED: DTP programmes equip the user with special tools for designing and printing and provide him more sophisticated and convenient controls for setting up the format of documents like:

- Aligning in different ways e.g., Left, Right, Center or Justified.
- Adjusting line spacing i.e. distance between the line.
- Defining sets of characters and paragraph formatting (such as tab and indents)
- Master pages: These are special pages within a document that are set aside for placing elements common to all pages in the document, such as page numbers, headers and footers, ruling lines, margin features special design and layout guides. After setting all the items on the pages, they are automatically placed on all pages. This helps the user to look at all the elements collectively and see the over all design of the document and adjust it intelligently.

PRE-PRESS BASED: Depending upon the quality required by the user, he makes use of the various features of DTP software to prepare a document for printing. DTP is a must for producing a colour publication. All DTP software handle the CMYK (cyan, magenta, yellow, black) colour model used by the printers for process colours. DTP software allows the user to Specify) colours according to printing industry standards, some of the pre-press issues handled by DTP software are:

- Spot colour and process colour separations.
- Crop marks and registration marks: Crop marks show precisely where the corners of the page are and registration marks allow precise alignment of colour separations and multiple page layouts used on the press, called signatures.
- Trapping: It is the process of adding a tiny overlap to adjacent colour elements on a page to account for possible misalignment for the press.

SOME RELATED SOFTWARE:

- **Microsoft (MS) office & MS Word:** for word processing
- **Power Point:** for presentation:
- **MS Excel:** for spreadsheets/accounting:
- **Photoshop:** It is software for colour separation and colour correction and works with bit map images.
- **Illustrator, Freehand & Corel Draw:** These are based on vector graphics, which work with geometric principles. These packages help create visuals.
- **Page Maker & Quark XPress:** For page makeup.

3.2.4 APPLICATIONS OF DTP:

The first kind of application of DTP includes any publication integral to an organization's internal administration. The publications can range from corporate literature, financial reports, technical documents, manuals, bulletins, newsletter~ and forms, to items even intended for sale or distribution to customers. This is a low cost operation and therefore allows people and groups with limited budgets to produce magazines for many specific interests.

In second kind of application of DTP, the final product is intended specifically for sale to customers. Books, magazines and newspapers are the usual examples. Since the integration of the publication process saved a lot of time and money, newspaper, book and magazine

publishers have turned to DTP to increase their efficiency, production capacity and profits. They also use DTP and electronic pre-press technology to automate their process further, however commercial applications of DTP also include any field that ties in with commercial industries such as advertising, packaging and graphic design.

FUTURE OF DTP:

Desktop Publishing is a developing field and new features are being added to it with each passing day. Going by the present trends in the market, it seems that the difference between D.T.P and word processing will become so minute that will become extremely hard for us to distinguish them as separate software. And a new class of software may appear in future integrating things like editing, word processing, drawing, colour correction and typesetting and many other features with efficiency.

3.3 SUMMARY:

- Desk Top Publishing is an electronic publishing system. This system puts the user in-charge of the complete process of typesetting, producing graphics, and carrying out the page layout. It has revolutionized the whole process of getting words and images into print.
- The advantages of DTP system include the following. It gives the user complete control. It is more flexible. There are fewer errors. It is simpler and faster. Also, considering all the advantages, the capital investment in DTP system is relatively low.
- Input devices in a DTP system are used to accept the information for processing and convert the information in to a machine-acceptable form. These are: key Board, mouse, and image scanner.
- Output devices used in a DTP system are monitors and printers. Output devices are used to get the soft and hard copy of the prepared material for the purpose of proof reading the master or camera-ready copy. These are also used for making the film for printing.
- The major application of DTP is in the field of publications including corporate literature, financial reports, technical documents, manuals, bulletins, newsletter, and forms, etc. Additionally, DTP is also used for books, magazines and newspapers. Since the integration of the publication process saved a lot of time and money, newspapers, books and magazines use DTP to increase their efficiency, production capacity and profits.

3.4 KEY WORDS:

Desk Top Publishing: DTP is an electronic publishing system, which puts the user in-charge of the complete process of typesetting, producing graphics, and carrying out the page layout. DTP gets its name from the fact that all the pre-printing processes (including creating camera-ready copy) can be carried out at the user's desk. It has revolutionized the whole process of getting words and images into print.

Advantages of Desk Top Publishing: The advantages of DTP system include the following. It gives the user complete control. It is more flexible. There are fewer errors. It is simpler and faster. Also, considering all the advantages, the capital investment in DTP system is relatively low.

Input Devices: Input devices in a DTP system are used to accept the information for processing and convert the information in to a machine-acceptable form. These are: key Board, mouse, and image scanner.

Output Devices: Output devices are used to get the soft and hard copy of the prepared material for the purpose of proof reading the master or camera-ready copy. These are also used for making the film for printing. The following are the output devices used in a DTP system: monitors and printers.

Types of DTP Software: The main features of DTP software can be grouped into four major categories: Typesetting Based, Graphics Based, Page Layout Based, and Pre-press Based.

Applications of DTP: The first kind of application of DTP publications. These can range from corporate literature, financial reports, technical documents, manuals, bulletins, newsletter, and forms, etc.

3.5 SELF-ASSESSMENT QUESTIONS (SAQs):

1. What are the main advantages of DTP?
2. Explain the requirements of hardware for DTP
3. Explain the input and output devices used with DTP
4. Explain the capabilities and types of DTP software.
5. List the names and uses of some important software.

3.6 REFERENCES / SUGGESTED READINGS:

- **Art and Production** (N.N. Sarkar)
- **Introduction to Computers** (Peter Norton)
- **A Handbook of Printing and Packaging Technology** (B. Chakravarty)

- **Computer Fundamentals** (B. Ram)
- **Computer Fundamentals** (P. K. Sinha)

M. A. Mass Communication (2nd year)
MEDIA PRODUCTION MMC 202 Lesson: 4

RADIO BROADCASTING

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LESSON STRUCTURE:

In this lesson, we shall discuss about radio broadcasting. We shall first discuss about the *basic concepts of broadcasting*. Then we shall focus on *signal processing*. The lesson structure shall be as follows:

4.0 OBJECTIVES:

The objectives of this lesson are as follows:

- *To Understand the Basic Concepts of Broadcasting, and*
- *To Study Signal Processing*

4.1 INTRODUCTION:

A *Danish* Scientist *Professor Hans Christian* discovered in 1819 that current created magnetic waves. Ten years after *Professor Alessander Volta* recorded the production of electricity by chemical means. Nearly six decades later *James Clark Maxwell* published his *theory of electromagnetism*.

Maxwell's theory predicted the existence of radio waves. German Physics *Professor Heinrich Hertz* worked on this in 1880s and proved that variations in electrical current could be projected into space as radio waves similar to light waves. The theory of modern radio transmission is based on a paper published by *Hertz* in 1888.

Guglielmo Marconi worked further on *Hertz*'s research. Until this time the transmission of *Morse code* (telegraph) had required the laying of strings of wires from one reception point to

another. *Marconi* set his radio waves in motion using Hertz's method. Thus wireless communication was born. Transmission of voice became possible with the development of *vacuum tube* by *John Flaming* in 1904. *Reginald Fessenden* and *Lee De Forest* later developed the *vacuum tube* further. *De Forest*'s *audion tube* was an improved version of *Fleming*'s *vacuum tube*. This became the most crucial key to voice transmission.

In this lesson, we shall discuss about the various concepts and equipment related to broadcasting of radio and television programmes.

4.2 PRESENTATION OF CONTENT:

The content of this lesson shall be presented as follows:

- *Basic Concepts of Broadcasting*
- *Signal Processing*

4.2.1 BASIC CONCEPTS OF BROADCASTING:

Broadcasting means making audio or audio-visual programmes reach far and wide. Such programmes are in generated, processed, and stored in either analogue or digital form. The only problem here is that these cannot be transmitted in the analogue of digital form. For transmitting these programmes, we first have to convert them in to electro-magnetic waves. Here we shall discuss about some basic concepts related to transmission and broadcasting.

FACSIMILE AND FIDELITY:

Sounds from a speaker are merely a copy (i.e., representations) of their original form. This is called *facsimile*. For transmission purpose, attempt is made to make exact copies of the original sounds. *Fidelity* is the reproduction of any sound with nearly or exactly the original quality. *High-fidelity* audio, or "*hi-fi*" is a close approximation of the original sound it represents. In fact much of the technical development of radio and television has been in search for *high fidelity*, i.e., finding better ways to make facsimile of the original sound or images.

TRANSDUCTION:

Transduction may be defined as the process of changing one form of energy into another. Transducers are devices, which can convert one form of energy into another. For transmission, we need to convert audio or audio-visual signals in to electro-magnetic waves. For example, a microphone converts physical (sound) energy into electrical energy. Most of the sounds or pictures we are getting at are homes through electric media involve at least three or four transducers. Say when a speech is recorded by using a microphone. The microphone converts our speech into electrical signals. The electrical signal thus converted goes to the loud

speakers, which can convert the electrical signals back to sound. In between the microphone and the speakers the signal is processed through other transducers like the recorders. However, at each phase of transduction loss of fidelity is possible.

MODES OF TRANSDUCTION:

Broadcast transmission till 1980s used analogue signals. In this process, the broadcast information (audio or audio-visual signals) is converted from one form of energy to another. This means that to change the energy from physical to electrical impulses. To put it simply, the electrical impulses are analogous or very similar to that of the physical energy recorded.

These signals, known as analogue signals, tend to decay over time and space. This is because they merely represent the original signal and can never include all of the information present in the original sound. This problem is drastically reduced in *digital technology* in which each element of the audio and video signal is translated into its digital equivalent. Here each element of the audio or audio-visual signals is represented by a binary code. A binary code is one with only two values such as 0 and 1. This is called "*on-off*", "*Yes-No*" a "*open-shut*". The sound or pictures are transuded with the help of laser beams.

As the signal goes though many transducers, there is a possibility of losing some information. This is called *signal loss*. During multiple transductions, there is a possibility of addition of some unnecessary data, and unwanted interferences or noises. The *signal to noise (S/N) ratio* is a numerical representation of the amount of noise associated for any amount of signal recorded. Thus a signal-to-noise ratio of 55:1 means that for every 55dB of signal recorded 1dB of noise is present. *Decibel* or dB is the unit of measuring loudness of sound. Analogue recordings have very low S/N ratio whereas it is very high for digital technology and therefore better quality recordings.

SOUND WAVES:

We hear sounds as variations, fluctuations, or variations detected by our ears and interpreted our brain. Similarly, we see images as variations, fluctuations, or variations detected by our eyes and interpreted our brain.

The vibration of air produced by sound source and the vibration of light is known as *oscillation*. And through *oscillation* only, we hear sounds or see images. Oscillation means the signals are traveling in a waveform.

Frequency is the number of waves that pass a given point in a given time. *Frequency* is measured in *hertz (Hz)* after the radio pioneer *Heinrich Hertz*. This is also measured in *cycles per second*. The human voice is capable of producing sound of a range of about 10,000 *hertz*, from the lowest bass voices at less than 100 *hertz* to the highest all voice at a frequency approaching 10,000 *hertz*.

Amplitude, which characterizes to loudness of a sound, is the height of the sound waves. The use of the terms frequency and amplitude is important since AM (amplitude modulation) and FM (frequency modulation) are two modes of radio broadcasting.

Amplitude Modulation signals use the "surfboard" method. Here the signal is placed atop the rest of the wave. There's a lot of *going off course* and *crashing* (static). However, AM transmissions travel over considerable distances.

FM radio stations use frequency modulation in which the radio signal travels like a torpedo, just under the outer surface of the wave. In this case, the oscillations emanate powerfully, and in a straight line, in the form of an excellent noiseless sound in the receiver. FM signals, like in television, are a line of short signals and have relatively short range because of the earth's curvature. It also has remarkable clarity of tone. Edwin H. Armstrong developed FM.

4.2.2 SIGNAL PROCESSING:

The following steps are involved in the signal processing of radio broadcasting:

- *Signal generation*
- *Signal amplification*
- *Signal transmission, and*
- *Radio reception*

SIGNAL GENERATION:

This step involves the creation of the necessary oscillations of electrical energy, which corresponds to the frequencies of the original physical (sound) energy. It may be obtained by using phonographs or microphone.

In side the microphone, the spoken word, sound, or music is mechanically recreated to produce electrical signals. Microphones, based on the construction, can be of three types:

- *Dynamic or moving coil,*
- *Velocity or ribbon, and*
- *Condenser or capacitor*

In a *dynamic or moving coil microphone*, the *diaphragm* is suspended between two electromagnets. In the centre of the microphone is *voice coil.* This is a coil of electrical wire, which moves up and down between the magnetic poles as sound pressure vibrates the diaphragm. This results in an electrical pattern in the mike wire coil analogous to the frequency of the sound.

Like the voice coil in the dynamic microphone there is a *metal ribbon* in *velocity microphones*. There is no diaphragm in velocity mic. The electrical signals are produced by the oscillations of the ribbon suspended between the electromagnetic poles.

In *condenser microphones,* an electrical device called *capacitor* replaces diaphragm. The capacitor, which is an electrically charged plate, produces electronic equivalent of sound. The pattern of electricity in the plate varies in relation to its distance from its back plate.

TAPE RECORDER:

The transduction of sound signals into electrical oscillations takes place in the shape of grooves on a record. Vibration formation on a diaphragm or coil in a microphone is also a similar process. In recorders, the audiotape consists of metal fillings suspended inside a plastic covering. When the tape moves in the recorder, the metal fillings pass the electromagnetic tape head where a hole called the *head gap* is located. The electromagnetic energy sent by the microphone reaches this hole through a wire. The head now emits a signal that is a facsimile of the original sound and now it is in the form of a magnetic field. As the tape passes the gap, its microscopic metal fillings are charged and thus an analog signal is created.

Most tape recorders contain three different heads. First the tape passes the *erase head*, which returns the metal fillings to a noise free pattern. Erase head is an electromagnet charged with a neutral signal. Then the tape passes the *recording head*, which stores the new signal and finally passes the *playback head*, which "hears" the recorded signal by reversing the recording process.

The *playback head* sends a neutral signal through the gap, which is modulated by the signal on the tape. The electromagnetic patterns on the tape create oscillations in the gap and then they are sent for amplification in the form of electrical energy.

Professional audio facilities such as multi-track recorders are capable of handling *eight, twelve or even thirty-two separate sets of signals*. Radio stations use *open-reel machine*s (or *reel-to-reel machine*s), which employ two sets of *supply reels* and *the take-up reels*. Stations

also use *audiotape cartridge players* or "*carts*" with only one reel. The tape winds past the heads and back onto itself.

Digital audio discs (or compact discs, CD) use a different means of signal generation known as *pulse code modulation* (PCM). Here the message is in the form of a series of charges according to the number of time it occurs in one second, that is the frequency.

SIGNAL AMPLIFICATION:

The audio signals are transduced or converted from physical energy to electrical energy. This is an analogue or digital facsimile. This facsimile has lesser resolution than the original sound. Thus this needs to be intensified by the special process. This process is called *amplification*. Amplification is don by an amplifier, which is a device that boosts electrical signals. Typically in electrical circuitry, drawing on an external power source increases the voltage of the current of an input signal. Such sources include transformers that produce more powerful output signals. Vacuum tubes and modern transistors are other devices used for this purpose. Amplifiers perform functions beyond increasing the power of sound source.

An *equalizer* is a *frequency dependent amplifier*. This can work within a specified range of frequencies to adjust the amplification. *Equalization* enables a sound signal to be fine-turned for its best tonal quality. An equalizer can also be used to boost vocal sections out of the sound of an orchestrated passage. Equalizers can also be used to isolate and diminish, or remove poor sounding values of music. Simply put, unwanted noises in the high frequencies, such as whining from the equipment, can be filtered out through equalization so that they are not recorded. Of course, anything else at the frequency range will be filtered out, too. Therefore, equalization should not be used' to get rid of frequencies in the voice area while recording dialogues.

Automatic gain controls (AGCs) automatically adjust the *gain* in certain recorders so that the recording is neither too soft nor too loud. If the automatic gain control is not on, the operator should adjust the volume control manually to change the degree of loudness. The inherent noise or distortion in audio can be monitored and eliminated through volume unit meters, which indicate the changes in amplitude of the sound wave. The meter peaks or "pegs" at the point of highest amplitude.

Compressors, limiters, and expanders process the signal to allow for the maximum loudness possible without introducing noise or distortion. Compressors are used to decrease the sibilance (hissing sound). Limiters are utilized to record sound with very high but momentary

peak periods (like crashing cymbals). Expanders make loud signals softer and vice versa to allow for an acceptable mix.

Amplification circuitry also allows adding electronic special effects like reverberation. Special amplifiers can create all sorts of effects from echoes to "sing along" doubling or tripling or even artificial choruses and deep echo chambers.

Some other devices are available to amplify audio signals. Phasers manipulate frequencies to create the illusion of stereo from mono signals. Pitch changers can turn an out-of-time musician into an accomplished soloist, and tape recorder motors can be manipulated to record sounds backward and to speed up or slow down recordings.

MIXING CONSOLES:

The audio console or the audio board is the mixing board. It is the mixing link in audio production, which is the central nervous system of the audio facility. Various sound signals are input, selected, controlled, mixed, combined, and eliminated by the audio console.

To input a sound source is the first function of the audio console which usually consists of an even number of *sliding bars* called *inputs*. Common are eight, ten, twelve, twenty-four, and thirty-two input boards. Some inputs correspond to one and only one sound device. Others use select switches and patch-bays to allow for a single input to control as many as four or five different sound signals. A rotating dial controls each input. This dial is called a *pot* (short for *potentiometer*). A more commonly used control on an audio console is a *sliding bar* called a *fader*. More elaborate boards allow for equalization and special effects. Boards also allow for echo source to be measured and for the output of various signals to be amplified.

TRANSMISSION OF SIGNAL:

The electromagnetic spectrum consists of the electromagnetic radiation present throughout the universe. This spectrum has made possible the process of transmission of signals. And with the process of modulation the generated electrical signals are superimposed or attached "piggyback" on natural waves. The signal produced by a radio station on an assigned frequency is called a carrier wave. The radio signal is created by varying the carrier wave slightly, in correspondence with frequencies of the signals the station meant to transmit.

A tuner tuned to the precise middle of the carrier interpretes these oscillations and reproduces them as sounds in the speaker system. The radio waves, which are utilized for broadcasting and related transmissions is only a small part of the electromagnetic spectrum.

The electromagnetic spectrum consists of the *Radio waves* (up to 300, 000 MHz), the I*nfrared rays* (up to 10^7 MHz) the *visible light spectrum* (up to 10^{13} MHz), *Gamma rays* (10^{16} MHz) and Cosmic rays (10^{18} MHz).

In the beginning, radio broadcasting was done using the low end of the wave spectrum known as medium waves in an area ranging from 0.3 to 3 megahertz (1 megahertz, MHz is equal to one million Hz i.e. cycles per second). The frequencies raging from 3 to 30 megahertz are known as the high frequencies and are used for long-range military communications etc. Since high-frequency waves can be used to transmit signals over greater distances. International short wave stations such as BBC, the Voice of America and Radio Moscow have been using this part of the spectrum for many years.

The *very high frequency or VHF band* ranges from 30 to 300MHz and is utilized for telecommunications applications. The *ultra high frequency (UHF) band* is used for TV stations, weather satellites, etc. UHF band spans from 300 to 3000 megahertz. Microwave ovens which be used for to cook on food are modulated by UHF radiation.

Super high frequencies (SHF) band range from 3000 to 30,000 MHz and extremely high frequencies (EHF) range from 30,000 to 300,000 megahertz. Commercial satellites, news satellite, and many other new applications utilize these.

The use of the above waves must be policed or controlled for effective worldwide communication. This is because the spectrum is a physical entity that crosses national boundaries. Nations meet in international platforms to decide on the proper allocation of the spectrum space. The International Telecommunication Union (ITU) lays down radio regulations as well as technical and operating standards. In 1959, the World Administrative Radio Conference (WARC-59) in Geneva evolved a detailed procedure for coordination of frequencies in the high frequency brands for broadcasting. However, with the increase in the number of high power transmitters, coordination of medium frequencies has become rather complicated.

In India, sound broadcasting and related transmission are carried out in a low frequency range of 150 to 280 MHz (kilohertz); medium frequency of 525 to 1605 MHz; high frequency of 3 to 30 MHz and 98 to 102 MHz and 106 to 108 MHz.

Electromagnetic spectrum:

	Spectrum	Megahertz
1.	Radio waves	300,000
	EHF	
	SHF	
	UHF	
	VHF	
	Short	

Medium
Long

2. Infrared range 10^7
3. Visible light 10^8
   Violet
   Indigo
   Blue
   Green
   Yellow
   Orange
   Red
4. Ultraviolet rays 10^9-10"
5. X-ray 10^{13}
6. Gamma rays 10^{16}
7. Cosmic ray 10^{18}

Radio waves:

	Radio wave	Megahertz
1.	Very low	0.03
	Very long range	
	Military communication	
2.	Low	0.3
	Navigation signals	
	Long wave	
3.	Medium	3
	AM channels	
	Ham radio	
4.	High	30
	Short-wave	
	Ham radio	
5.	Very high	300
	FM channels	
	VHF television	
	Air navigation	
6.	Ultra high	3,000
	UHF television	
	Radar	
	Weather satellite	
7.	Super high	30,000
	Radar	
	Ku and CL and communication satellites	
	Air navigation	
8.	Extremely high	300,000
	Military communication	
	Developing technologies	

Radio transmitters can generate three types of waves:

- *Sky waves*
- *Ground waves, and*
- *Direct waves*

Sky waves radiate upward from the transmitter and either go into space or bounce off a part of the *ionosphere* (the *Kennelly-Heaviside* layer-which is a part of the atmosphere) to a distant spot on the Earth, a process called *skipping*.

Ground waves are conducted by soil and water and follow the curvature of the Earth until they dissipate, or attenuate.

Direct waves travel in a line of sight from the transmitter to the receiver. Their range is limited by the straight-line formed form the top of the autumnal to the horizon, which can be interrupted by tall buildings, mountains, etc.

Certain propagation methods work better in different portions of the electromagnetic spectrum, enabling stations to vary their power and antenna angles for maximum coverage with minimum interference.

The medium-wave band is particular suited to ground and sky wave propagation. AM stations have generally located their transmitters in low land area. They bury part of their transmitters in the ground to use the conductivity of the ground wave, and may use three or four antennas arranged in a geometrical grid pattern to make sure the signal radiates throughout their coverage area. AM stations also beam a signal upward to make use of the sky wave. That is why some AM stations can be heard over great distances at night.

The primary coverage area of AM station is the range of that station's ground wave. The secondary coverage area is the limits of an acceptable sky wave. Wet soil, more power, etc, allows greater coverage for AM stations.

High frequency response and *high signal-to-noise ratio* are the advantages of FM stations. However, they require more bandwidth, higher power, and taller towers to perform their noise-free magic. But the higher bandwidth of FM allows the FM stations to transmit more than one signal through their channel. Such signals use the area above and below the stations carrier frequency, known as *sideband*. It is called *multiplexing. Multiplexing* is one of the most common use of FM which is use to disseminate separate signals for the left and right channel to broadcast in stereo.

RECEPTION OF RADIO WAVE:

The reception of the audio signal is the step after transmission. During reception, the radio waves are picked up by the radio sets and transduced by the speaker into sound waves. The characteristics of the electromagnetic spectrum and the different modulation techniques have led to the development of different types of radio receivers. The various types of receivers may be classified as:

- *AM receivers*
- *FM receivers*
- *Multi-band receivers*

AM Receivers:

- Tall and telescopic antennas are not required due to the effectiveness of the ground waves.
- Good signal may be received even when the radio is in motion.
- The phenomenon of the sky wave enables listening over long distances.

However AM receiver are not free from limitations.

- AM radio is prone to interference and noise.
- There is limited frequency response.

FM Receivers:

- The noise free dynamic range of FM makes it a natural choice for the hi-fi enthusiasts.
- FM receivers do not have amplifiers or speakers attached to them; there are separate tuners, which need to be plugged into the hi-fi system.

FM receivers are limited by:

- The FM signal requires a clear path or *line of sight* from the transmitter to the receiver.
- Requires a long antenna.
- FM signals tend to be blocked by buildings, mountains and moving objects.

Multi-band Receivers:

Today most radio receivers have both AM and FM bands. In addition, many radios offer access to a range of other bandwidths that provide various radio services. More popular are *Radio with TV*. Sound digital tuner is an exciting and useful feature of many radio receivers. Digital tuners display a stations frequency in real numbers. The numbers may be presented on a *liquid crystal display* (LCD) or on a *light emitting diode*. Digital tuners perform impressive functions. When

equipped with a numeric keypad, they enable the listener to programme specific frequencies. They enable clock radios and radio-tape recorder combinations to operate with up to the minute accuracy.

SIGNAL STORAGE:

This stage is the concluding or final stage. The audio signals that were generated, transduced, modulated and transmitted are stored for playback or rebroadcast by sound studios, radio stations, and the public.

There are many storage devices. Most of these are recorders. *Wire recorders*, which are similar in design and look to tape recorders, store signal on a length of special wire. *Magnetic tapes* are suitable for quality broadcast and are easy to edit.

The three most common tapes in use today are *open reel (reel-to-reel), cassette and cartridge*. *Phonograph recording* has been around since the turn of the century with various record formats including 33-1/3 rpm (revolution-per-minute) and 45 rpm 7-inch "donuts".

Compact Disc (CD) recording has become a common phenomenon today. Digital audiotapes (DAT) are also used in professional audio facilities. In the coming years DAT will play an increasing role in radio and other audio programmes.

4.3 SUMMARY:

- Radio and TV programmes are in generated, processed, and stored in either analogue or digital form. However, these cannot be transmitted in the analogue of digital form. For transmission these programmes need to be converted in to electro-magnetic waves.
- *Frequency* is the number of waves that pass a given point in a given time. *Frequency* is measured in *hertz (Hz)* after the radio pioneer *Heinrich Hertz*. This is also measured in *cycles per second*. The human voice is capable of producing sound of a range of about 10,000 *hertz*, from the lowest bass voices at less than 100 *hertz* to the highest all voice at a frequency approaching 10,000 *hertz*.
- *Amplitude* characterizes to loudness of a sound. This is the height of the sound waves. The use of the terms frequency and amplitude is important since AM (amplitude modulation) and FM (frequency modulation) are two modes of radio broadcasting.
- Amplitude Modulation signals use the "surfboard" method. Here the signal is placed atop the rest of the wave. There's a lot of *going off course* and *crashing* (static). However, AM transmissions travel over considerable distances.

- FM radio stations use frequency modulation in which the radio signal travels like a torpedo, just under the outer surface of the wave. In this case, the oscillations emanate powerfully, and in a straight line, in the form of an excellent noiseless sound in the receiver.
- The steps involved in the signal processing of radio broadcasting are: signal generation, signal amplification, signal transmission, and radio reception.

4.4 KEY WORDS:

Facsimile and Fidelity: Sounds from a speaker are merely a copy (i.e., representations) of their original form. This is called *facsimile*. For transmission purpose, attempt is made to make exact copies of the original sounds. *Fidelity* is the reproduction of any sound with nearly or exactly the original quality.

Transduction: Transduction is the process of changing one form of energy into another. Transducers are devices, which can convert one form of energy into another. For transmission, we need to convert audio or audio-visual signals in to electro-magnetic waves. For example, a microphone converts physical (sound) energy into electrical energy. Most of the sounds or pictures we are getting at are homes through electric media involve at least three or four transducers.

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Amplitude Modulation: Here signals use the "surfboard" method. Here the signal is placed atop the rest of the wave. There's a lot of *going off course* and *crashing* (static). However, AM transmissions travel over considerable distances.

Frequency Modulation: FM radio stations use frequency modulation in which the radio signal travels like a torpedo, just under the outer surface of the wave. In this case, the oscillations emanate powerfully, and in a straight line, in the form of an excellent noiseless sound in the receiver. Edwin H. Armstrong developed FM.

Stages of Signal Processing: The steps involved in the signal processing of radio broadcasting are: *signal generation, signal amplification, signal transmission, and radio reception.*

Dynamic or Moving Coil Microphones: Here the *diaphragm* is suspended between two electromagnets. In the centre of the microphone is *voice coil.* This is a coil of electrical wire, which moves up and down between the magnetic poles as sound pressure vibrates the diaphragm. This results in an electrical pattern in the mike wire coil analogous to the frequency of the sound.

Velocity Microphones: There is a *metal ribbon* in *velocity microphones*. There is no diaphragm in velocity mic. The electrical signals are produced by the oscillations of the ribbon suspended between the electromagnetic poles.

Condenser Microphones: Here an electrical device called *capacitor* replaces diaphragm. The capacitor, which is an electrically charged plate, produces electronic equivalent of sound. The pattern of electricity in the plate varies in relation to its distance from its back plate.

4.5 SELF-ASSESSMENT QUESTIONS (SAQs):

1. Write a detailed note on the basics of broadcasting.
2. Describe in detail how signals are processed?
3. Write a detailed note on amplitude modulation and frequency modulation.

4.6 REFERENCES / SUGGESTED READINGS:

- Keith, Michael C & Krause, Joseph M. (1989) — **"The Radio Station".**
- Chatterji, P.C. (1993) — **" Indian Broadcasting".**
- Dilliard (1990) — **"Television Journalism and Broadcasting".**
- Bhatt, S.C. (1995) — **"Broadcast Journalism".**

Annexure 1

When India attained Independence in 1947, AIR had a network of six stations and a complement of 18 transmitters. The coverage was 2.5% of the area and just 11% of the population. Rapid expansion of the network took place post Independence.

AIR today has a network of 223 broadcasting centres with 143 medium frequency (MW), 54 high frequency (SW) and 161 FM transmitters. The coverage is 91.42% of the area , serving

99.13% of the people in the largest democracy of the world. AIR covers 24 Languages and 146 dialects in home services. In External Services, it covers 27 languages; 17 national and 10 foreign languages.

Radio & TV - Broadcasting Facilities

All India Radio

Broadcast Centres: 207

Transmitters: 321

External Services Transmitting Centres:19

Studios: 193

Studio to Transmitter Links: 122

Satellite Up-linking Captive Earth Stations: 20

Receive Radio/TV Networking terminals: 350

Doordarshan

Programme Production Centre: 49

Transmitters: 1223

Satellite uplink stations Mobile uplink and News Gathering Vans: 21

M. A. Mass Communication (2nd year)
MEDIA PRODUCTION MMC 202 Lesson: 5

ELECTRONIC MEDIA PRODUCTION

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LESSON STRUCTURE:

In this lesson, we shall discuss the basics of radio production. We shall start with radio production formats. Then we shall focus on basic equipments for radio production, stages of radio programme production, and the different types of radio programmes. We shall also briefly discuss about writing for radio.

In the second part, we shall discuss the basics of television programme production. We shall start with an introduction to television programme production. Then we shall focus on the stages of television programme production, and the different types of video formats. We shall also discuss about the terminology used in television production. The lesson structure shall be as follows:

5.0 OBJECTIVES:

The objectives of this lesson are as follows:

- *To study about the various radio production formats*
- *To study about equipments for radio production,*
- *To study about stages of radio programme production,*
- *To study about types of radio programmes,*
- *To study about writing for radio,*
- *To get an Introduction to Television Production,*
- *To study about the Phases of Television Production,*
- *To study about the Pre Production Stage,*
- *To study about the Production Stage,*
- *To study about the Postproduction Stage,*
- *To know about some Video Formats, and*
- *To Know Some Terminology Used in Television Production.*

5.1 INTRODUCTION:

Electronic media of communication bring into our homes audio and video signals in the form of various programmes. These programmes, which come on air as sound or both picture and sound, are either live or are already recorded or shot, processed, and transmitted. Electronic media viz. television, radio, and film (or motion picture) share the following attributes:

- *Immediacy:* These media can present topical, contemporary material live to the audience immediately.
- *Impermanence*: Programmes brought by these media are perishable images and sounds.
- *Diversity*: They bring a variety of programme material, which appeals a wide range of audiences.
- *Flexibility*: Material can be recorded edited, and duplicated for multiple playbacks.

In this lesson, we shall discuss about the basic aspects of radio and television programme production.

5.2 PRESENTATION OF CONTENT:

The content of this lesson shall be presented as follows:

- *Radio production formats*

- *Equipments for radio production*
- *Stages of radio programme production*
- *Types of radio programmes*
- *Writing for radio*
- *Television Production: An Introduction*
- *Phases of Television Production,*
- *Pre Production Stage,*
- *Production Stage,*
- *Postproduction Stage,*
- *Video Formats, and*
- *Terminology Used in Television Production*

5.2.1 RADIO PRODUCTION FORMATS:

Many radio programmes are live. Some programmes on radio are recorded first and broadcast later. Some programmes are studio based, while others are recorded on outside locations. Here we shall discuss about a few different varieties of radio production formats:

LIVE OR RECORDED RADIO PROGRAMMES: The programmes on radio and television can be live, pre-recorded or a combination of both. The nature of production calls for whether a programme will be produced live or recorded in advance and used later.

Live production involves the risk of production errors, as there are no "second chances". It has to be right the first time, which is the only time. However, live production is cheaper than recorded production techniques and sometimes easier and quicker.

Recorded productions allow supervision and control over quality. In this method, first recording of programmes is done. Editing and postproduction are done at a later time. This is an attempt at enhancement to further refine production value and quality while shooting. This can also combine with live production method. Portions or segments of a programme can be recorded, edited, and processed in advance and incorporated into a studio production using live talent.

STUDIO OR REMOTE (OUTSIDE ON LOCATION): Programmes can be produced with in the controlled environment of an indoor studio, which offers the required settings of a programme. Studio settings offer personnel control, light control, temperature

control, sufficient power supply, and access to supplementary production personnel, equipment accessories and spare parts, and even telephones and change rooms.

Production can also be done at a temporary remote location. A unique setting can be achieved by thoughtful selection, planning and full use of a remote outside location. The realism and detail required for the quality and success of a production can also be obtained. However, in such a situation some production requirements, such as extensive lighting or elaborate sets are eliminated.

A combination of studio and remote production is also possible. Most newscasts combine anchors in the studio with reporters in the field. The anchor introduces a story from the studio and the reporter provides the details from the field.

OTHER PRODUCTION FORMATS:

Audio production can be carried out in many ways depending on the types and source of programmes. *Local live* production employs station's own announcers or newscasters locally and play records and tapes, which they themselves own. *Live-assist* production is one way where stations retain local announcers and disc jockeys as the backbone of the programme and uses syndicated programming, such as reels of taped (prerecorded) music and satellite delivered music services.

In *semi automation* production a local radio station relies on the services of the syndicated programme producer. The music is typically played on large tape machines. When a break point for a programme announcement is reached, smaller cartridge tape machines are triggered to play by a sub audible cue tone on the master tape.

Turnkey automation refers to fully automated radio stations, which consists largely of a satellite dish and a control board. The satellite disk downlinks radio programmes. The services may also be localized such that new information is telephoned to the programme producer in time for the announcers many miles away to prepare the inserts.

5.2.2 EQUIPMENT FOR RADIO PROGRAMME PRODUCTION:

The basic equipment to produce audio programme include the following:

- *The studio desk (mixer console or control board or control panel)*
- *Microphones*

- *Turntable*
- *Compact Discs and Records*
- *Audiotapes*
- *Music and Sound effects.*

THE CONSOLE: The control board or console processes the sounds and voices during recording, editing, and dubbing. This mixes together the various programme sources to form the broadcast output. This is located in the central control point or control room. Three types of circuit functions are operated.

Programme circuits: A series of channels, their individual volume levels controlled by separate rotary faders.

Monitoring circuits: Visual (meter) and aural (headphone) means of measuring the individual sources or channels as well as the final mixed output.

Control circuits: Provision of communication with studio or outside by means of "talk back" or telephone line.

MICROPHONE: A microphone (mics, pronounced *myke*) is a transducer, which converts acoustic energy into electrical energy. Several types of microphones are available with audio pickup pattern characteristics designed to meet various recording requirements and situations. The directional property of microphones, which is also called the pickup pattern, is important for selecting the right kind of microphone. According to the pickup patterns, microphones can be classified as:

- Unidirectional microphones are appropriate for one or two people speaking side by side. Background noise is undesirable. These are also called cardioid mics because of their heart-shaped pick-up pattern.
- Bi-directional microphones are used when two people directly facing each other.
- *Omni-directional microphones are used for picking up a large number of people and are excellent for gathering background noise.*

Stereo recording requires specially designed stereo microphones. It can also be achieved by using at least two microphones. One such approach is *M-S (mid-side)* miking. A bi-directional microphone picks up sound to the left and right and a super cardioid microphone picks up sound to the front. The output of both microphones is fed through a complicated circuit. *X-Y miking* is another method of stereo recording.

Two cardioid microphones are placed next to each other. One angles to the left at a 45-degree angle and other to the right at 45 degree. This way both the microphones pick up sound from the center.

TURNTABLE: A turntable picks up information recorded on a disc or record and sends this information to the console for amplification, mixing, processing, and integration with other sound elements.

COMPACT DISCS AND RECORDS: Vinyl records or LPs are being replaced by high quality digital recordings made on compact disc. In playing a disc, most control desks have a "pre-fade", "pre-hear" or "audition" facility which enables the operator to listen to the track and adjust its volume before setting it up to play on the air. With a record, a glance at the grooves will often be sufficient to indicate whether there is a wide variation in dynamic range.

AUDIOTAPE: Sounds can be recorded in the field or in the studio onto audiotape at standard speeds. The audiotape used in studio may be in the form of continuous loop cartridges, or *carts,* or materials may be recorded on reel-to-reel audiotape machines. Digital Audio Tapes (DAT) record the signal in digital form in which the original electrical variations are represented by a series of pulses or bits of information.

MUSIC AND SOUND EFFECTS: Music and sound effects may be produced and recorded in CD or audio tape and may also be prerecorded on disc or audio tape and integrated into the programme material using the console or control board.

Voice Terms: The terminology used for production describes the placement 9place of origin of voice) and quality of voices. The voices are indicated using easily understood designations, for instance, *Voice 1, character's name* or *Announcer # 1.*

- *On mic* (*on mike*): A voice or character is heard at a normal distance from a microphone.
- *Off Mic*: When we want the voice to be heard as though coming from a distance or from the back of a room we use this term.
- *Fading on or fades on*: We write this when we want the voice to sound as though is approaching the centre of action in the minds eye of the listener. Fade off or

fading off could indicate the reverse process, where the voice starts at a normal distance from the microphone and then slowly moves away.

- *Reverb*: is written to create suspense or heighten a mysterious mood when we want the voice to be heard with a slight echo or reverberation. It is normally written after the talents designation. To create the illusion of a telephone conversation, the notations "filtered a "behind barrier" can be used, or simply indicated as heard through a telephone,
- *SFX:* The common abbreviation for sound effects is "SFX". For sound effects indicate both the source and the nature of the material, for instances "CART: MUSIC UP FULL FOR FIVE SECONDS AND THEN UNDER". *Music under* or *sneak under* is used when the music or the sound effect is heard in the "background" (bg.) and then is heard at full volume after a character finishes a particular word.
- *Segue:* We write, "segue" where one selection ends and the next selection begins immediately. We write "Cross fade" when one selection gradually fades out and the next selection gradually fades in.
- *Ad lib:* Sometimes audio scripts include "ad lib", which allows character or voices momentarily to create their own words keeping with the general tune, mood and purpose of the script.

5.2.3 STAGES OF RADIO PROGRAMME PRODUCTION:

Radio productions are planned in three stages.

PRE-PRODUCTION:

This is the planning and development stage. This begins with the generation of a script. Unless a script is developed it is difficult and there will be confusion on what type of programme you are producing. The script contains instructions and guidelines for the production of the programme.

PRODUCTION: The second stage is *production*. All the material for the programme is recorded or organized at this stage. Selecting and positioning of the microphones, the type of tapes to be used, and selection of various sources of sound through the mixer are all part of this stage.

POSTPRODUCTION: This stage generally includes editing. Sounds recorded during production and dubbing if required, are the principal focus of postproduction. Putting

together the previously recorded sound and selection of sound are important. The purpose of editing can be summarized as:

- To arrange recorded material into a more logical sequence.
- To remove the uninteresting, repetitive, or technically acceptable portion.
- To compress the material in time.
- For creative effect to produce new juxtaposition of speech, music, sound and even silence.

5.2.4 WRITING FOR RADIO:

We know that script is the backbone of production. So writing is an essential part of it. We write what type of sound would be required at a given situation and what would follow. Sound is the entire means of communication in radio. Sounds help create and enhance mental images.

Sounds have the unique capability of creating an environment for the listener. Through the creative use of various writing and production techniques, entire worlds can be created in the human mind. Many techniques are availed to create an environment with sound.

- *Language:* The primary goal of language is to communicate ideas and information to be easily understood. The selection and using words and the combining of words into meaningful sentences are important for good production.
- *Words:* Words are the primary tools for the expression of thoughts, ideas, and emotions, regardless of the medium. Words have meaning and power. Words need to be selected carefully. Use words that comes close to reality. Informal, rather than formal words are preferred.
- *Sentences:* Sentences are the principal units of organised thought. The keys to construct effective sentences are clarity, simplicity, conversational style and conciseness.

5.2.5 DIFFERENT RADIO PROGRAMMES:

NEWS AND SPORTS:

Newscasts and sportscasts represent a station or network's largest daily commitment of time, effort, personnel and facilities. Several steps are followed to develop news stories.

- The idea for a story is suggested by a reporter,

- The idea in evaluated.
- The logistics governing the story are identified and finalized.
- The story is produced into finished form.

The process of writing and structuring the first version of story should include the following:

- Reading the source material carefully and thoughtfully. What is newsworthy? What is the essence of the story? What impact it might have on the audience?
- Highlighting the main points on the original source material.
- Tell the story informally to a friend or a fellow newsroom reporter
- Determine how the story can best be told.
- Write the first draft.
- Arrange the structure, lead, sentence pattern, ending, etc.
- Check your copy against the original source.
- Revise the copy

DOCUMENTARIES AND FEATURES:

A documentary presents, facts, based on documentary evidence about a relevant subject from real events, persons or places to reflect, interrelate, creatively interpret or comment on current concerns and realities. The feature programme on the other hand need not be wholly true in the factual sense. It may include folk song, poetry & fictional drama to help illustrate its theme.

Reality is the basic requirement for a documentary. Documentaries may be classified as information, interpretation, or persuasion according to the ultimate objective. They may also be combined.

To develop a subject (idea) of a documentary the following process is normally followed:

Information
to
Knowledge
to
Understanding
to
Expression.

Some suggestions are given for the production of documentaries.

- Prepare as detailed an advance script as possible.

- Divide programme elements into those that are under your control and those that are not.
- Write narration involving the audience.
- Provide narration that sounds natural and conversational.
- Avoid long lists, unnecessary statistics, complex terms and jargons and hackneyed expressions.
- Make narration clear, precise, and easy to understand.
- Do not inundate the programme with too much narration.
- Do not use narration when a sound will communicate the information or mood more meaningfully.

TALK PROGRAMMES (INTERVIEWS):

The general programme category of public affairs includes the *talk programmes, interviews, newspaper programmes, and discussions*. When regular broadcasting began in the 1920s, among the first types of programmes to appear on radio networks were those of featured interviews. The aim of an interview is to provide facts, reasons, opinions in a particular topic in the interviewee's own words, so that the listener can form a conclusion as to the validity of what the interviewee is saying.

Electronic media interviews are done under a variety of circumstances - live or recorded and edited for later use, in the studio, on the telephone, or on a remote location in the field. Interviews can be divided into three types the information interview, the opinion interview, and the personality interview.

What ever is the type of interview; the following methods of approaching the task can be used.

- *The style of the interview*
- *The wishes and comfort of the guest.*
- *The time available for preparation.*
- *The nature of the topic.*
- *The interview policies of the station - some prefer the spontaneous, unrehearsed method while other prefer more structural and predictable interview situation.*

5.2.6 TELEVISION PRODUCTION- AN INTRODUCTION:

The word *television* means "to a see at a distance". In TV broadcasting system, the visual information is recorded and converted in to an electric signal, which is transmitted to the receiver. At the receiving end, the video signal is converted back in to the images on the screen of the picture tube (TV set).

Much similar to radio broadcasting, television originally was conceived as another method of broadcasting entertainment and news programmes but with pictures. Commercial broadcasting turned out to be the largest field in the application of television.

The ability to reproduce pictures, text material, graphics, and visual information has become so useful that we can watch a programme from a foreign country relayed by satellite or play back a video cassette recorder (VCR), or a video game can be connected to the TV receiver.

5.2.7 STAGES OF TELEVISION PROGRAMME PRODUCTION:

Essentially the production of television programmes encompasses three basic stages or phases. These are:

- *Pre-production,*
- *Production, and*
- *Post production.*

These phases may also be called as: planning, shooting or recording, and editing.

Pre-production is the stage of development and planning that is executed before the actual shooting phase of production. Pre-production begins with the generation of a script without which developing a budget, hiring the crew, planning a shooting schedule, selecting locations are almost impossible.

All the material for the programme is shot in the production stage. Shooting is done as envisaged in the production script. The scenes and shots required for the programme are recorded or obtained at this stage. The various shots are joined in a logical, pleasing and meaningful order during postproduction. Each phase is crucial to the phase that follows. Inadequate pre production almost guarantees a poor production, and a poor production is seldom "saved" or improved upon in the postproduction.

The principal focus of postproduction is editing the images and sounds recorded during production. The phase involves giving finishing touches to the

images, sound and special effects. Dialogue that may have been poorly recorded during production may need to be rerecorded or dubbed. If the script calls for voice-over narration or stock footage to complete a particular sequence, these are handled during postproduction.

Eventually, a version of the programme that contains picture, dialogue, music, sound, special effects, and any other necessary elements is put into the final form, which can now be submitted for transmission.

Each of these phases is explained in detail in this lesson.

5.2.8 PREPRODUCTION STAGE:

SCRIPT WRITING:

The Concept: *Also* called the idea, premise, or synopsis, a script is a written account describing the basic idea of the programme story. It presents a thumbnail sketch of the story and is often used to provide the producer or the director with a quick means of evaluating the overall scope of the programme story. The argument for beginning the productions with a brief story idea is that if a short concept can't catch interest, it hardly makes sense to develop that idea into a full-length script.

Example of concept (TV serial Hum Log)

> The average lower middle class family is under grate strain of the forces of modernization. Parents and children live under profound generation gap. The society needs to be shown a mirror, thereby making these people aware and conscious of certain problems. At the same time there has to be an attempt to provide options for behaviour and resolution of conflicts. People need some guidelines and what can be better than telecasting an entertaining serial on television.

The Scene Outline: *The* scene outline is a list in numerical order of all the scenes without dialogues or elaborate descriptions. It is an excellent tool for listing the plot, which is not necessarily the same thing as the story.

The Treatment: The treatment is a prose description of the story. It reads like a story, describing the action in detail and provides the kind of visual imagery. It gives the first indications of where dialogues will be needed and builds on and amplifies the characters, action and motivation suggested in the outline. The treatment is one of the most important stages in script writing.

The Master Scene Script: *The* master scene script is the translation of the treatment into script form. Using the treatment as a guide, a master scene script creates a heading for each scene (for examples, INTERIOR OF THE CENTRAL HALL - AFTERNOON).

The Shooting Script: The shooting script is the final stage of script writing. The shooting script is usually the director's responsibility. The shots in the shooting script are numbered consecutively. In addition to the scene headings, descriptive material, and dialogue from the master scene script, the shooting script provides specific instructions about camera angles, positions, and movements. The shooting script also contains information about the transitions between shots or scenes.

Some directors supplement the shooting script with drawings called *storyboards.* These are diagrams of the main scenes and tell the entire story in a visual format on paper. Storyboards depict the scenes and also indicate the camera positions.

The Budget: Within the professional world the budget is the governing force of all productions. Estimations of what the programme will cost must be accurate. Although the size of the budget can affect the script, the usual procedure is for the budget to be derived from the script.

5.2.9 PRODUCTION STAGE:

PRODUCTION PERSONNEL:

Producer: The producer assumes responsibility for the entire television production. Depending on the type of production and facility involved, these responsibilities are combined with those of the director, the writer, or both.

The Director: The director coordinates the efforts of the technical crewmembers and the performance of the television talent. The director executes the production designed by the producer and conceptualized by the writer.

The Writer: Basically, the writer conceptualizes and formulates the essential television elements into proper script to accomplish specific objectives.

5.2.10 POST PRODUCTION STAGE:

The need for editing was apparent, even in the early days of the movie image. At first it was done by turning the camera off after one shot, then repositioning and

turning it back on for the next shot. The film was processed and then projected with all the scenes in the same order in which they had been shot. Real editing began when they turned the camera off and on several times in one reel, processed the film, and then cut the shots apart and glued material back together in a shorter form or different order. Then video editing started. It too began with physical cutting and splicing of tape.

On-line and Off-line Editing: On-line editing is analogous to cutting the film negative whereas off-line editing has been akin to film editing that uses work prints.

Right after tapes are shot, they are dubbed to work print tapes that are then used to make all the editing decision. The work prints are viewed in order to determine the edit-in point and edit-out point. When the points are marked, their time code numbers will be stored in the computer which keeps track of all the changes in what is called an edit decision list (EDL).

Linear and Nonlinear Editing: Originally, all video editing consisted of recording shots one after another from the beginning of the programme to the end in a linear fashion. If someone finished editing an entire production and then decided that the second edit should be two seconds shorter, there was no easy way to fix the problem. This process also suffers from *generation loss* because signal information is lost or contaminated when material is dubbed from one analog tape to another.

Computer based *nonlinear* electronic editing was developed in the mid 1980s. It is also known as *random access* editing. On a computer if your decide to more a paragraph from page 2 to page 152 from a word processing programme, a few key strokes will accomplish the task. Similarly, in nonlinear editing scenes can be trimmed and moved quickly and easily.

Cuts only Linear Editing: A cut only system is the most basic and the simplest editing system, which can butt one video image and its dialogue against another. It cannot execute *wipes* and dissolves since it cannot show two pictures at a time.

Control Track Editing: This process involves using the video control track. An operator uses the controller to mark the *edit-in* and *the edit-out points* on the tape. Then the controller backs up both machines an equal amount so that they run at same speeds, running frames in sync, counts control pulses to the edit-in points, and then starts the edit.

Time Code Editing: Time code is a digital numerical address that includes the hour, minute, second and also the number for each frame. Time code can be recorded on a *linear audio* track, which is referred to a s *longitudinal time code (LTC)*. The item code can also be placed in the vertical interval, which is referred to as *vertical interval time code* (VITC).

This is the retrace area where the scanning stops at the bottom of the frame and returns to the top of the frame. Drop-frame time code is a more advanced system and corrects the error accumulated in LTC and VITC. This system corrects the time code frame counter by systematically dropping just enough frames to match the clock time and the time code address numbers.

EDITING EQUIPMENT:

Cuts-only video editing involves two video tape recorders, one or two monitors, and an edit controller. One videotape recorder, called the source deck, contains the original camera footage that is to be rerecorded. The other recorder, called the edit deck, is the machine an to which selected materials from the source deck are edited. One monitor shows the output of the source deck; the other shows the output of the edit deck. The edit controller is used to mark the editing points and cue the decks to execute the editing decisions.

Advanced editing can be achieved by incorporating other equipment like the *switcher, which* can generate transitions. The *A-B roll* uses two sources to supply one edit machine, *special effects generator* (SEG), and *character generator* (CG), which can generate graphics.

Desktop computer assisted editing has changed the world of editing. One advantage of using desktop computer for editing is that the same computer can be used for graphic programmes, special effects, audio, shot logging and other production process. This makes postproduction more of a "one stop" process that is less time consuming than postproduction has been in the past.

5.2.11 VIDEO FORMATS:

The production begins with the video camera and recorder. Here you need to know the video camera and recorder (or camcorder), camera mounting equipment and lenses. Different video formats are also studied.

FORMATS: Ampex, in 1950s, used a tape that was 2 inches wide. Portable configurations came only in the 1970s with the introduction of U-matic, which consisted of a camera and separate videocassette recorder that used a 3/4-inch tape.

Two 1/2 inch formats introduced two years later by Sony's Betamax and JVC's VHS were not compatible with U-matic due to the difference in tape size; they also were not compatible to each other because the way the tape wound around the recording heads, and the speeds were different.

In the early 1980's came camcorder system-a combination of the camera and the video tape recorder. Sony's Beta-cam and JVC's and Panasonic's M-format though used 1/2 inch tapes were not compatible again. Video-8 introduced by Sony used a tape that was 8 mm wide (about 1/4 inch) became the most portable format.

The formats that came in the 1980s were improved and yielded to new equipment: U-matic SP, Super VHS ((S-VHS), Beta-cam SP, MH-II and Hi-8.

All the formats mentioned above are designed on the analog technology. The latest developments are digital video recorders which give much better results.

LENSES: Lenses gather light reflected by a subject and concentrate it on the imaging device. Most lenses on TV cameras and camcorders are zoom lenses (more properly called variable focal length lenses). Other lenses, called fixed lenses (or prime lenses) are capable of capturing visuals only one distance. Lenses, which show shots that appear to be magnified, are called telephoto lenses. Those that show views roughly as the eye sees them a normal lenses. Those with a view wider than the human eyes are called wide-angle lenses.

DEPTH OF FIELD: Viewers' attention within the frame can be directed by manipulating the depth of field. A shallow depth of field (a shallow focus) isolates a subject in one plane and throws all other out of focus. A large depth of field allows the viewers eyes to roam throughout every plane of action.

LIGHT AND FILTERS: Light is the key to recording an image on videotape. To obtain the correct exposure the amount of light reaching the electronic imaging device is controlled; too much light will result in an overexposed image; too little light to an under exposed image. A light meter is used to measure the amount of light falling on or reflected by the subject.

Light meters may be 'incident light meters' that measure the amount of light falling in a particular talent or area of the set; 'reflected light meters' measure the amount of light reflected by the subject, providing on overall light reading for the entire scene. Best feature of light can be obtained by using a combination of both reflected and incident light meters.

THE COLOUR OF LIGHT: In making quality images you need to know the colour of light. Electromagnetic energy is measured according to wavelengths. Our eyes see different wavelengths as different colours. A colour temperature scale was developed to provide a precise and accurate measurement of different colours of light. The scale in measured in degree Kelvin (K). Human eyes have the ability to compromise for large changes in the colour of light and still see quite realistically. However, film and video cameras cannot do this. Therefore colour correction filters are used for good colour quality of the production.

FILTER: Among the most common filters are neutral density filters which reduce the intensity of the light reaching the imaging system without altering the colour of the light in any way. A haze filter is useful for eliminating the bluish cast. The ultraviolet (UV) filter eliminates the ultra violet rays. Diffusion filters have a rippled surface or an extremely fine, netlike pattern that scatters (diffuses) the light and creates a softer, less detailed image.

Fog filters break up the light like diffusion filters but scatter that light from the bright picture areas into the shadow areas. Double fog filters produce a fog effect but without reducing sharpness.

Basic lighting instruments: Shooting cannot be done in natural sunlight all the time. So artificial lights are needed. Lighting instruments are classified by the quality of the light they produce and how the light can be shaped and controlled by the lighting instrument itself. A hard light has a narrow angle of illumination and produce sharp, clearly defined shadows, whereas a soft light scatters the light to create much wider angle of gentle diffused illumination.

Lights are also classified as spotlights or flood lights; spotlights illuminate small concentrated areas while floodlights cast a diffused and even beam of light over a fairly large area.

LIGHTING APPROACH: The basic three-point lighting uses a key light, fill light and back light. The primary source is the key light, It illuminates the subject. Then there is the fill light. It fills in the

shadows created by the key light. Backlight is placed above and behind the subject at enough of an angle to keep the light from coming directly into the camera lens. The backlight helps to outline the subject and separate it from the background.

Additional lights sometimes referred to as separation lights amplify or enhance the three-point lighting. They are: *eye light* which is placed near the camera to add sparkle to a persons eyes, a *background light* that illuminates the background.

SOUND IN TV PRODUCTION: Sound is also an essential element and should be given much thought and care. Sound has a number of characteristics that are important to understand in order to select the right audio equipment and record properly.

PITCH AND FREQUENCY: Sound waves travel in well-defined cycles. Frequency is the number of times per second that the wave travels from the beginning of one cycle to the beginning of the next, and is measured in hertz (Hz). The sound made by differing frequencies is the *pitch*. Each microphone and tape recorder has its own *frequency response,* the range of the frequencies that it will pick up. Microphones and recorders may not pickup all frequencies equally well. As a result equipment of varying ability to pickup various frequencies with a graph called a *frequency curve* are used.

LOUDNESS AND AMPLITUDE: Amplitude is related to loudness. As the amplitude increases, the sound will appear to become louder. Loudness is measured in decibels (dB). A whisper is about 20dB, conversation about 55dB, and a rock concert can get well above 100 dB. The *threshold of pain* starts at about 120dB. The range of quietness to loudness is called *dynamic range*. If something is recorded louder the system can handle, the result is distortion.

SIGNAL TO NOISE RATIO (S/N): Most electronic equipment has inherent noise built into it that comes from the various electronic components. One of the specifications provided for equipment is its signal to noise ratio, usually something like 55:1, which means that for every 55 dB of signal recorded 1 dB of noise is present.

TIMBRE: Timbre deals with such characteristics as mellowness, fullness, sharpness and resonance. *Harmonics* and *overtones* contribute to the production of timbre. A sound has one particular pitch, called a *fundamental*, but it has other pitches that are exact multiples of the fundamental frequency (harmonics) and pitches that may or may not be exact multiples (overtones). Timbre can vary for different mics.

DURATION: Duration is the length of time a particular sound lasts. Duration has three parts: attack, sustain and decay. *Attack* is the amount of time it takes a sound to get from silence to full volume; *sustain* is the amount of time the sound is at full volume; *decay* is the amount of time it takes sound to go from full loudness to silence.

VELOCITY: Velocity refers to the speed of sound. This speed is 750 miles per four, which is relatively slow. This can cause *phase* problems. If two microphones pick up the same sound at slightly different times, they can create a signal that is out of phase; one of the mics is receiving the sound when the wave is going up and the other is receiving the sound when the wave is going down. The result is that some or whole of the sound is cancelled, and little or nothing is heard. One way to avoid this problem is the *three to one rule*. No two microphones should be closer together than three times the distance between them and the subject.

MICROPHONES: Microphones are the instruments that collect the sound and convert it in to electrical energy. In addition to differing in frequency response, dynamic range and timbre producing qualities, microphones have particular characteristics that relate to their directionality, construction, and positioning, etc.

DIRECTIONALITY: Directionality in a microphone involves its *pickup pattern*. A unidirectional mic is appropriate for one or two people speaking and the background noise is undesirable. It is also called *cardioid mic* because of its heart shaped pickup pattern. Other unidirectional mics in use are: *super-cardioid, hyper-cardioid* and *ultra-cardioid* whose patterns are longer and narrower than those of regular cardioid. *Bi-directional mics* are used when two people facing each other directly. The sound is carried from both directions. *Omni-directional* mics are best for picking up a large number of people and are excellent for gathering background noise from all directions.

Stereo recording requires at least two mics or specially designed stereo mics that have several different pickup elements within them. One approach to stereo recording is M-S (mid-side) miking. This uses bi-directional and super-cardioid mics; the bi-directional mic picks sound to the left and the right and the super-cardioid mic picks up sound to the front. The output of both mics is fed through a complicated circuit that makes use of their phase differences to produce left and right channels.

Two cardioid mics are used placing next to each other in another method called *X-Y miking.* One angles 45 degree to the left and the other angles to right at

45 degrees. This way both mics pick up sound from the centre, and primarily one mic or the other picks up sounds for each side. When the recording is played back through stereo speakers, it yields left and right channels.

CONSTRUCTION: Based on construction, mics can be divided in two types. A *dynamic mic* uses a diaphragm magnet and coils of wire wrapped around a magnet. The diaphragm moves in response to the pressure of sound and creates a disturbance in the magnetic field that induces a small electrical current in the coils of wire.

A *condenser mic* has an electronic component called a capacitor that responds to sound. A diaphragm moving in response to sound waves changes the capacitance at the back plate, which then creates a small electrical change.

POSITIONING OF MIKES: *Boom* is a device with a long pole with the mic on the end of it that positions the mic above the talents and is moved as each person speaks. Sometimes they consist of a simple pole (called a fish pole), which have a *shock-mount* on the end to isolate the mic from vibrations.

Stands like *floor stand* and *table stands* are also used to hold mics. *Hidden* mics are not desirable if people in the scene move a great deal. Cameras also have in built mics which are not appropriate as they are usually too far from the talent to pick up their sound well. Very small microphones called *lavalieres* attach to clothing.

Some microphones be they lavaliere or stand mics do not have cables. They are called *wireless mics. Shotgun mic* has very long but narrow pick up pattern, usually super, hyper, or ultra-cardioid. They are almost always covered with windscreen.

RECORDERS: Sound travels from a microphone through cable and connectors to recording equipment, which stores it on either audio tape a videotape. The videotape recorders and the audiotape recorder have the same function control as most recorders-play, record, stop, pause, fast forward, rewind.

Most recorders have three audio heads erase, record and play. The erase headlines up the iron particles in a straight manners that contain no audio impulses. The record head rearranges the particles to form representation of the sound. The play head picks up the sound recorded by the record head and reproduces it.

High quality tape recorders have a VU (volume unit) meter, a devices that shows how loudly the sound is being recorded. *Equalization* function enables you to cut out or emphasize certain frequencies such as bass or treble. Some recorders

have automatic gain control (AGCs) in which the gain is automatically adjusted so that recording is neither too soft nor too loud.

5.2.12 VISUAL TERMINOLOGY:

Several terms describe what the camera sees and the perspective of the scene offered to the viewer. The descriptions of the composition of a shot involves such elements as the distance between the camera and the subject, the amount of the subject shown, and the position or angle of the camera in relation to the subject. But first we should know the following terms:

Shot: A shot begins when the camera starts running and ends when it stops. It may be short or long, require a complex camera movement, or be totally static. A shot begins as the Director says **roll camera and action** and ends with the word **cut**.

Scene: A scene is usually defined as any unified action occurring in a single time and place. It may be composed of a single shot but normally is made up of a group of shots.

Sequence: A sequence is somewhat an arbitrary concept. It consists of a group of scenes linked together or unified by some common theme, time, idea, location or action. A sequence conveys a message.

The basic shots: *Establishing shot (ES) / full shot (FS) / cover shot (CS*): The major area of action is to be seen. This type of shot helps establish or re-establish the setting. Ex. the long shot of a building, play ground, the sea with high tides, dark lane with no traffic.

Long shot (S): The widest possible view of the scene is to be shown. Defining long shot cannot be precise since a long shot may mean different things to different directors, for example LS of a building may include all the building and its surroundings or only a portion of the building. Showing the full height of the talent with surroundings is a long shot.

Medium shot (MS): A smaller portion of the scene is to be shown than in a LS. In effect, a long shot comprises several medium shots. Showing the talent from head to thigh is a medium shot.

Close-up (CU) / tight shot (TS): Generally a close-up isolates the subject such as a talent from the surroundings. A smaller portion of the scene is to be shown than might be in a MS. Several close-ups make up a medium shot. Showing the bust i.e.,

the head and part of the chest is a close up. But showing only the face is a tight shot.

Some other terms are also used to indicate intermediate designations. Common examples are '*medium long shot'* (MLS), a camera shot showing more than a MS but less than a LS; *medium-close-up* (MCU), an *extremely-close-up shot* (ECU) shows only a small portion of a talent or object like the eyes of a girl or the face of a watch.

A composition is also described according to the number of people in the shot. A "two-shot" indicates that there are two people or items, a "three-shot" includes three people or items, and so on. For example, you can write, "two-shot of Rama and Hanuman".

Some subjective camera terms are also used in scripts.

Point of view (POV): The camera shows the viewer the scene from the subject's viewpoint. For example, write "POV" when you want the viewer to see out of a car window, from the driver's perspective.

Over the shoulder (OS): The camera is placed behind the shoulder of one of the talents to show what or whom that talent sees.

Canted shot: Such a shot shows a scene or talent out of the normal horizontal and vertical orientation. This is done to emphasize distortion, disorientation, and unreality. The canted shot can illustrate the effect of drunkenness, drug use or severe head injury.

High angle / low angle: Here size and dimension can be emphasized. The camera could look down from a high angle on a person to stress his or her diminutive size; you could write "high angle on Gulliver", which would show Gulliver looking up into the camera lens, emphasizing his short stature. The low-angle could be used in a reversed way. Thus "low angle on Shaktiman" would indicated that he would be shown from a low angle, emphasizing his size and height, as a small subject, like a child, would see her.

CAMERA MOVEMENTS:

Some camera movements can be used not only to follow moving people or objects but also to provide different psychological effects.

Follow: The camera follows the character's actions while maintaining approximately the same image size and perspective.

Zoom in / Zoom out: In a zoom the elements of the lens move, magnifying (zoom in) or reducing (zoom out) objects in a way that the human eye cannot. It can present shots ranging from a CU to a LS and any composition in between.

Dolly in / Dolly out: An effect similar to zoom in/out can be achieved by having the entire camera move toward (dolly in) or away from (dolly out) the talent or the scene.

Pan right / Pan left: The panoramic view of the scene can be shown by having the camera mount remain stationary but pointing the lens of the camera to cover the scene. "Pan right" indicates that the camera is to cover or show the scene beginning at the left and continuing to the right. "Pan left" provides the opposite perspective.

Tilt up / Tilt down: The camera can show or setting a talent going from a low to a high angle (tilt up) and from high angle to low angle(tilt down).

Truck right / Truck left: The term "truck" is used when you want to follow the panoramic action but maintain the same distance between the camera and the action on the talent. In this case the camera is mounted on a trolley that moves on rails.

Pedestal / Boom / Crane-up or down: Here the camera is placed on a crane. The scene can be obtained as in case of tilt, but it provides extra visual perspective for the viewer. The camera shot would be continuous from a normal angle to a unusually high or low angle.

VISUAL TRANSITION:

Moving from one shot to another shot is called *transition.* The following terms are used to describe transitions or the visual adjustments between composed shots.

Fade in / Fade out: At the beginning or end of a scene or an act, or a major division of production. Gradual appearance of the visual on the screen is fade-in and gradual disappearance is fade-out. Both fade-in and fade-out can be quick or slow depending upon the requirement. There is no overlapping of scenes.

Cut: This is an instantaneous change from one shot to another. Since this is the most common visual transition between shots, it is not written in the scripts.

Dissolve: A shot gradually fades out as another gradually fades in. The two images overlap. It can be a "quick dissolve", or a "slow dissolve". The image obtained by stopping a dissolve midway is known as *super*. A "match dissolve" is made from one shot to another that is closely related in picture size and appearance.

Key: It essentially means placing one image into the background picture of another. A "*chroma key*" is an electronic effect that eliminates a specific colour in a picture and replaces that colour with another visual.

Wipe: A "Wipe" is a visual transition made by gradually replacing portions of one picture with the corresponding portions of a new picture. During a wipe, a new picture moves the current picture of the screen vertically, horizontally, in a circular pattern or from any corner of the picture. Many patterns for wipe are available.

5.3 SUMMARY:

- Radio programmes can be live, pre-recorded or a combination of both. Live production involves the risk of production errors, as there are no "second chances". It has to be right the first which is the only time. However, live production is cheaper than recorded production techniques and sometimes easier and quicker. Recorded productions allow supervision and control over quality. In this method, first recording of programmes is done.
- Studio settings offer personnel control, light control, temperature control, sufficient power supply, and access to supplementary production personnel, equipment accessories and spare parts, and even telephones and change rooms. Production can also be done at a temporary remote location. A unique setting can be achieved by thoughtful selection, planning and full use of a remote outside location.
- The Console is the central control board that processes the sounds and voices during recording, editing, and dubbing. This mixes together the various programme sources to form the broadcast output. This is located in the production control room.
- A microphone converts acoustic energy into electrical energy. Several types of microphones are available with different audio pickup patterns. According to the pickup patterns, microphones can be classified as: Unidirectional, Bi-directional, and Omni-directional.
- Television has the following characteristics: Production costs are higher than in most other media. The profile and size of the audience are relatively unstable. It is a friendly, personal medium. It does not respect territorial limits.

- Television programmes are produced in three basic stages or phases. These are: Pre-production, Production, and Postproduction (also be called as: planning, shooting or recording, and editing).
- The shooting script is the final stage of script writing. The shooting script is usually the director's responsibility. The shots in the shooting script are numbered consecutively. In addition to the scene headings, descriptive material, and dialogue from the master scene script, the shooting script provides specific instructions about camera angles, positions, and movements. The shooting script also contains information about the transitions between shots or scenes.

5.4 KEY WORDS:

Live or Recorded Radio Programmes: Radio programmes can be live, pre-recorded or a combination of both. Live production involves the risk of production errors, as there are no "second chances". It has to be right the first which is the only time. However, live production is cheaper than recorded production techniques and sometimes easier and quicker. Recorded productions allow supervision and control over quality. In this method, first recording of programmes is done. Editing and postproduction are done at a later time.

Studio or Remote (outside on location): Studio settings offer personnel control, light control, temperature control, sufficient power supply, and access to supplementary production personnel, equipment accessories and spare parts, and even telephones and change rooms. Production can also be done at a temporary remote location. A unique setting can be achieved by thoughtful selection, planning and full use of a remote outside location.

Basic Equipment Audio Programme Production: The basic equipment to produce audio programme include: *The studio desk (mixer console or control board or control panel), Microphones, Turntable, Compact Discs and Records, and Audiotapes.*

The Console: This is the central control board that processes the sounds and voices during recording, editing, and dubbing. This mixes together the various programme sources to form the broadcast output. This is located in the production control room.

Microphone: A microphone converts acoustic energy into electrical energy. Several types of microphones are available with different audio pickup patterns.

Unidirectional Microphones: *These are appropriate for one or two people speaking side by side. Background noise is undesirable. These are also called cardioids microphones because of their heart-shaped pick-up pattern.*

Bi-directional Microphones: *These are used when two people directly facing each other.*

Omni-directional Microphones: These are used for picking up a large number of people and are excellent for gathering background noise.

Characteristics of Television: The characteristics of TV include: higher production costs, relatively unstable profile and size of the audience, a friendly, personal medium, no territorial limits, etc.

Stages of Television Production: Essentially the production of television programmes encompasses three basic stages or phases. These are: Pre-production, Production, and Postproduction. These phases may also be called as: planning, shooting or recording, and editing.

On-line and Off-line Editing: On-line editing is analogous to cutting the film negative whereas off-line editing has been akin to film editing that uses work prints.

Right after tapes are shot, they are dubbed to work print tapes that are then used to make all the editing decision. The work prints are viewed in order to determine the edit-in point and edit-out point.

Linear and Nonlinear Editing: Originally, all video editing consisted of recording shots one after another from the beginning of the programme to the end in a linear fashion. If someone finished editing an entire production and then decided that the second edit should be two seconds shorter, there was no easy way to fix the problem. This process also suffers from *generation loss* because signal information is lost or contaminated when material is dubbed from one analog tape to another.

Cuts only Linear Editing: A cut only system is the most basic and the simplest editing system, which can butt one video image and its dialogue against another. It cannot execute *wipes* and dissolves since it cannot show two pictures at a time.

Control Track Editing: This process involves using the video control track. An operator uses the controller to mark the *edit-in* and *the edit-out points* on the tape. Then the controller backs up both machines an equal amount so that they run at same speeds, running frames in sync, counts control pulses to the edit-in points, and then starts the edit.

Time Code Editing: Time code is a digital numerical address that includes the hour, minute, second and also the number for each frame. Time code can be recorded on a *linear audio* track, which is referred to a s *longitudinal time code (LTC)*. The item code can also be placed in the vertical interval, which is referred to as *vertical interval time code* (VITC).

5.5 SELF-ASSESSMENT QUESTIONS (SAQs):

1. Write a detailed note on radio programme production.
2. Discuss the equipment used for radio programme production.
3. What are the various formats of radio programme production? Discuss in detail.
4. Write a detailed note on the various stages of TV programme production.
5. Discuss the process of television programme editing in detail.
6. Write a detailed note on the pre production stage of TV programme production.
7. Write a detailed note on the postproduction stage TV programme production.

5.6 REFERENCES / SUGGESTED READINGS:

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M. A. Mass Communication (2nd year)
MEDIA PRODUCTIONS MMC 202 Lesson: 6

EDITING FOR RADIO AND TELEVISION:

AN INTRODUCTION

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LESSON STRUCTURE:

In this lesson, we shall discuss the basics of radio and television editing. We shall start with an introduction to editing of radio and television programmes. Then we shall focus on the stages of television programme production, and the different types of video formats. We shall also discuss about the terminology used in television production. The lesson structure shall be as follows:

6.0 OBJECTIVES:

Editing is an essential step in any kind of media production. The aim of this lesson is to familiarize you with the process of editing both for radio and television programmes. After going through this lesson carefully, you should be able:

- *To get familiar with the Process of Electronic Editing*
- *To Know about the Editing Equipment and Software*

6.1 INTRODUCTION:

In all kinds of media production, whether for radio or television or film or even for computer, *editing* is considered to be an integral part. Essentially, it is the process of assembling and rearranging already recorded audio-video materials in it a continuous and meaningful story.

These days, most radio and television are often recorded in film style with little regard for sequential order of audio sequence or video shots at the recording on production stage.

Editing process enables the producer to physically assemble these audio/video fragments into a coherent message on audio or videotape.

Since the editing process takes place after (post) production (and not during production as it happens in the case of live/studio production), it is also called “Post-Production Editing”.

Post-production editing provides the producer an opportunity to look at and manipulate the prerecorded audio or video materials in a more careful and patient way. Of course, it may sometimes take even more time than actual recording.

6.2 PRESENTATION OF CONTENT:

The content of this lesson shall be presented as follows:

- *To get familiar with the Process of Electronic Editing*
- *To Know about the Editing Equipment and Software*

6.2.1 PROCESS OF AUDIO-VISUAL EDITING:

The basic purpose of editing is to put an audio or video programme together with clarity, continuity and impact, and is an interesting manner. To achieve this end, the following suggestions may be useful:

- Preview your prerecorded audio or video materials carefully and patiently once, twice and even more if you have time.
- Make a proper log sheet an note down all important points and precise details that come to your mind.
- Take some time to ponder over recorded materials and re-clarify your ideas about the overall shape of the programme - its central theme, its objectives, style, music, pace, its organization, its beginning and end etc.
- Take a decision about what is important and relevant to the purpose of your programme and what is not.
- Discard all such portion or footage, however beautiful, as does not contribute to the theme of your programme. Select only most effective and good quality sequences and shots for your final version.
- Look for any missing gaps and re-record or re-shoot some more essential material, if it can fill the gaps and can add to the quality and purpose of your programme.

- Now, have a clear idea about the final shape or overall story of your programme and develop the final edit-script. That is: the precise order and continuity of audio bits, video shots, of sound and music, use of transitions, cut-aways and reaction shots that can achieve a smooth flow and desired effect.
- You are now ready to edit actually. Estimate how much time you need for editing. Try to finish it in one go. While editing, stick to your final editing-script as far as possible. Avoid abrupt cuts, and remember the basic rule of progression of shots: LS, MS, then CU. Make good use of cut-aways and reaction shots for television programme.

These are only some guidelines to enable you to follow a smooth procedure. In fact, there are many more things that you will learn when you get an opportunity to edit an audio or video programme either independently or with the help of a professional audio or video editor.

STAGES OF EDITING:

The editing process takes place in several steps or phases ball for radio and television. These are:

- *Recording or shooting phases.*
- *Review (Listening and Viewing) Phase*
- *Decision - Making Phase*
- *Final or Operational Stage (Post Production)*

RECORDING OR SHOOTING STAGE: In a way, the bulk of audio or video editing is largely predetermined by the way the material is recorded or shot. For example, to allow for convenient edits at the post-production stage, it is advisable to let an audio or video shot to continue silent for just a few seconds.

This will facilitate to bring in a designed transition and proper audio/video continuity while joining it to the next shot or sequence.

It is always wise to get some cut aways on the video-tape and/or to record wild track both for audio and video and video clipping a reaction shot or a cut aways in very useful in providing between two shots and helps you to avoid a jump cut.

Similarly, some additional shots of the location must be recorded such as crowd shots, wide shots of streets, traffic, etc. These will provide excellent editing facility and good transition, if and whenever required. Recording ambient sound on the audio track is also very important to provide continuity and transitions.

REVIEW PHASE: This phase is essentially concerned with the listening and viewing of the prerecorded audio/video materials for their quality and suitability. In this phase the producer is required to listen, view and time the audio or video programme from beginning to end and prepare a detailed 'LOG SHEET', giving a brief description of end shot or portion and marking 'Good' or 'NG' (No Good). The review of intervals automatically leads you to the next phase i.e. the decision making phase.

DECISION-MAKING PHASE: At this stage, the whole programme story lies bare before you of course in disconnected sequences. Now you have a little more time to think and contemplate on the course of your editing in a rather patient way. Often you are forced to look at the log sheet or review the raw materials again and again to make your final editing decisions.

Studying, listening and viewing the raw materials-individual shots and sequence-you begin to decide on the final shot sequence. It is at this stage that you re-clarify your ideas about the programme. Discard all that is not required or does not contribute to your story, look for missing gaps and re-record or re-shoot, if necessary.

Finally prepare an 'EDIT SCRIPT' - indicating the order and continuity of shots, mixing of sound and music, use of transition - cut aways, reaction shots to ensure smooth flow. With a complete edit script; you are now ready for the final editing.

FINAL OPERATIONAL STAGE: The operational phase refers to the process in which the planned edits are actually performed using the edit script as a reference. Editing audio or video - can be best learnt during the actual process with hands on the materials and the machines. Today, a variety of models and types of editing equipment, including computerized and digital control units are available.

These modern machines can perform the editing job with great speed, accuracy and precision. It is difficult to prescribe standard operation for all types of machines, because actual editing operation slightly varies from machine to machine.

Depending on the particular editing technique followed, some of the steps shown here can be skipped. For example, if edit preview is not required, step 4 and 5 can be skipped. Remember that the initial portion of about 10 seconds of the tape is left blank.

In actual editing phase, it is always important to estimate your editing time in advance. Book for all facilities and machines you need and all tapes, log sheets and edit scripts must kept

ready by your side. Ideally, the editing task for a programme must be so planned that it can be accomplished in one go, without interruption.

Editing should not be noticeable. When final editing, the programme must appear to be quite natural preserving its rhythm, continuity, flow and flavour.

VIDEO EDITING PROCEDURE

PLAY (ER) MACHINE	RECORD (ER) MACHINE
* Turn on Power for Player.	* Turn on Power for Recorder.
* Turn Monitor Power On.	* Turn Monitor Power On.
* Insert MASTER TAPE in the player and set counter after FFD/RWD and CUE.	* Insert BLANK TAPE (Edit Tape) in the recorder and CUE.
* Check audio level.	* Check audio level.
* Reset counter before editing.	* Reset counter before editing.

FOR COPYING

* Cue both tapes and PLAY

FOR ASSEBMLE EDIT

* Cue both tapes at the desired IN and OUT points
* Press REVIEW and observe for correctness
* Press EDIT and STOP after required edit is recorded
* Review EDIT and proceed to next EDIT

FOR INSERT EDIT

* Cue both tapes at the desired IN and OUT points and press VIDEO, AUDIO- I or AUDIO- II, etc
* Press EDIT and stop after required edit is recorded
* Review EDIT and proceed to next EDIT

6.2.2 EDITING EQUIPMENT & SOFTWARE:

Cuts-only video editing involves two video tape recorders, one or two monitors, and an edit controller. One videotape recorder, called the source deck, contains the original camera footage that is to be rerecorded. The other recorder, called the edit deck, is the machine on to which

selected materials from the source deck are edited. One monitor shows the output of the source deck; the other shows the output of the edit deck. The edit controller is used to mark the editing points and cue the decks to execute the editing decisions.

Advanced editing can be achieved by incorporating other equipment like the switcher, which can generate transitions. The A-B roll uses two sources to supply one edit machine, special effects generator (SEG), and character generator (CG), which can generate graphics.

Computer assisted editing has changed the world of editing. One advantage of using desktop computer for editing is that the same computer can be used for graphic programmes, special effects, audio, shot logging and other production process. This makes postproduction more of a "one stop" process that is less time consuming than postproduction has been in the past.

VIDEO EDITING SOFTWARE:

Video editing software handles the editing of video sequences on a computer. It has the ability to import and export video, cut and paste sections of a video clip, add special effects and transitions.

Lightworks, **Avid** and more recently, **Apple**'s *Final Cut Pro* are pioneers in video editing software and have a great influence on how films and TV programmes are edited. These systems use custom hardware for video processing (video editing).

With the availability of video processing hardware, specialist video editing cards, and computers designed specifically for non-linear video editing, many software packages are now available to work with them. Some other video editing software are **Velocity** and **Adobe**'s *Premier Pro*.

6.3 SUMMARY:

- Editing is the process that enables us to convert the raw audio and video material into finished programmes. It includes assembling and rearranging material-both while it is being recorded or already recorded material - in a continuous and meaningful flow. Good editing needs a lot of advance planning and sometimes takes more time than actual shooting or recording.
- Both for radio and television the editing process takes place in several steps - recording or shooting stage, review stage, decision-making stage, and the final operational stage. These days very sophisticated computerized and digital editing machines are available. These

machines make the editing task easy, sleek, and precise. The basic purpose of editing is to put a radio or television programme in a proper shape with clarity and continuity.

- Lightworks, Avid and more recently, Apple's *Final Cut Pro* are pioneers in video editing software and have a great influence on how films and TV programmes are edited. These systems use custom hardware for video processing (video editing). Some other video editing software are Velocity and Adobe's *Premier Pro*.
- The purposes of editing are: to arrange recorded material into a more logical sequence; to remove the uninteresting, repetitive, or technically acceptable portion; for creative effect to produce new juxtaposition of speech, music, sound and even silence.
- Simply speaking, video editing involves two video tape recorders, one or two monitors, and an edit controller. One videotape recorder, called the source deck, contains the original camera footage that is to be rerecorded. The other recorder, called the edit deck, is the machine on to which selected materials from the source deck are edited. Advanced editing can be achieved by incorporating other equipment like the switcher, which can generate transitions. Computer assisted editing has changed the world of editing. One advantage of using desktop computer for editing is that the same computer can be used for graphic programmes, special effects, audio, shot logging and other production process.
- Video editing software generally also allows for some limited editing of the audio clips that accompany the video or, at least, the ability to sync the audio with the video.
- Lightworks, Avid and Apple's *Final Cut Pro* are pioneers in video editing software. These systems use custom hardware for video processing (video editing). With video processing hardware, specialist video editing cards, and computers designed specifically for non-linear video editing, many editing software packages are now available. Some other video editing software are Velocity and Adobe's *Premier Pro*.

6.4 KEY WORDS:

Editing: Editing is the process that converts recorded audio and video material into finished programmes. It includes assembling and rearranging material-both while it is being recorded or already recorded material - in a continuous and meaningful flow. The basic purpose of editing is to put a radio or television programme in a proper shape with clarity and continuity.

Editing Process: Both for radio and television the editing process takes place in several steps - recording or shooting stage, review stage, decision-making stage, and the final operational stage. These days very sophisticated computerized and digital editing machines are available.

Purposes of Editing: The purposes of editing are: To arrange recorded material into a more logical sequence; To remove the uninteresting, repetitive, or technically acceptable portion; To compress the material in time, and For creative effect to produce new juxtaposition of speech, music, sound and even silence.

Stages of Editing: The editing process takes place in several steps or phases both for radio and television programmes. These are: *Recording or shooting phase, Preview (Listening and Viewing) Phase, Decision - Making Phase, and Final or Operational Stage (Post Production Editing)*

Recording or Shooting Stage: Majority of audio or video editing related decisions are largely predetermined. These decisions are reflected in the way the material is recorded or shot. For example, to allow for convenient editing at the post-production stage, audio or video shots are recorded for just a few seconds longer than required. This helps in facilitating a desired transition and proper audio/video continuity while joining one shot to the next shot.

Preview Phase: This phase is essentially concerned with the listening and viewing of the prerecorded audio/video materials for their quality and suitability. In this phase the producer prepares a detailed ‘log sheet’. A log sheet provides brief description of the shots and these are marked ‘Good’ or ‘NG’ (No Good).

Decision-making Phase: Studying, listening and viewing the raw materials including the individual shots and sequences, the editor decides on the final shot sequence. Editors take such decisions in consultation with the director. Finally an *edit script* is prepared. This indicates the order and continuity of shots, mixing of sound and music, use of transition - cut aways, reaction shots to ensure smooth flow. With a complete edit script; you are now ready for the final editing.

Final Operational Stage: The operational phase refers to the process in which the planned edits are actually executed using the edit script as a reference. Today, a variety of models and types of editing equipment, including computerized and digital control units are available. These modern machines can perform the editing task with great speed, accuracy and precision.

Editing Equipment: Cuts-only video editing involves two video tape recorders, one or two monitors, and an edit controller. One videotape recorder, called the source deck, contains the original camera footage that is to be rerecorded. The other recorder, called the edit deck, is the machine on to which selected materials from the source deck are edited. Advanced editing can be achieved by incorporating other equipment like the switcher, which can generate transitions. Computer assisted editing has changed the world of editing.

Video-Editing Software: Video editing software generally also allows for some limited editing of the audio clips that accompany the video or, at least, the ability to sync the audio with the video. **Lightworks**, **Avid** and more recently, **Apple**'s *Final Cut Pro* are pioneers in video editing software and have a great influence on how films and TV programmes are edited. Some other video editing software are **Velocity** and **Adobe**'s *Premier Pro*.

4.5 SELF-ASSESSMENT QUESTIONS (SAQs):

1. What are the basic equipment for editing? Discuss in detail.
2. What kind of preparation is required for editing? Discuss in detail.
3. What are the stages of editing? Discuss in detail.

6.6 REFERENCES / SUGGESTED READINGS:

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M. A. Mass Communication (2nd year)
MEDIA PRODUCTIONS MMC 202 Lesson: 7

BUDGETING FOR INFORMATION CAMPAIGNS

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LESSON STRUCTURE

Information forms the soul of advertising campaigns. PR campaigns depend on information. Political campaigns also depend on information. All these campaigns are called information campaigns. To be effective, these campaigns need to be highly creative. To be effective, these campaigns try to their audiences through various media. Both these processes require huge finances. Proper planning of the related expenses in information campaigns is called budgeting. We shall discuss about the various facets of budgeting for information campaigns in this lesson. The lesson structure shall be as follows:

7.0 OBJECTIVES:

Newspapers and magazines of today are well designed and well packaged. With changing audience tastes and availability of technology, style of presentation or page make up has

become as important as the substance or content of these printed media. In this lesson are shall discuss the following:

- *To Have an Overview of Advertising Campaign Budgeting,*
- *To Have an Overview of PR Campaign Budgeting*.

7.1 INTRODUCTION:

Marshal McLuhan had coined the phrase "*Medium is the Message*". This still holds true. But a new phrase has been coined for the present times, "*Image is the message*". So *TATA* has the image of being quality conscious. *The Hindu* and the *Statesman* are serious and sober newspapers. "*Hero Honda* is a no problem bike". "*Luna* is a no tension moped". "*TATA* also makes steel" and "There is little bit of *SAIL* in every body's life."

This image is created and sustained through information campaigns. Whether it is an advertising campaign or a PR campaign, it involves meticulous planning. And among other things, the success or failure of a campaign depends on how much money is spent on the camping. Deciding *how much* money to spend on a campaign and *how, when* and *where* to spend this money is called budgeting.

In this lesson, we shall discuss budgeting for advertising campaigns and PR campaigns.

7.2 PRESENTATION OF CONTENT:

The content of this lesson shall be presented as follows:

- *Advertising Campaign Budgeting- An Introduction*
- *PR Campaign Budgeting- An Introduction*

7.2.1 ADVERTISING CAMPAIGN BUDGETING- AN INTRODUCTION:

Advertising is a big money business. A 30-second commercial on Doordarshan could cost you to the tune of Rs. 2.70 lakhs. A full-page colour advertisement on the back page of a national newspaper could cost a few lakhs of rupees. Even a small ear panel on a local newspaper could cost you a few thousand rupees.

The cost (rent) of putting a hoarding for one year at a prominent place like a flyover in a metropolitan city could cost for up to one lakh rupees or more. In addition to the ever-increasing media costs, there is expenditure on preparing and producing the ads. For example, hiring somebody like Shahrukh Khan, Amitabh Bachchan or Sachin Tendulkar to model for a brand could cost in crores. Even printing very small sized pamphlets could cost you thousands of rupees.

So advertisers and advertising agencies spend a lot of time and efforts to finalize how much to spend on an advertising campaign. Here let us make one thing very clear. Budgeting or the amount estimated to be spend on advertising is not determined by a fixed formula.

Budgeting is not a singular act. Budgeting is a process. Also setting the budget is not an academic exercise. It requires a practical approach. Again budgeting for different campaigns require different approaches. So situational sensitivity is also a necessity to budgeting.

Budgeting for an advertising campaign is not like budgeting for procurement of raw material, machinery or other such expenditures. This is because while other expenditure- investments as they are called- can be justified easily, it is not easy to justify advertising expenses. This is because the results of advertising are never in tangible terms and cannot be quantified. This is reflected in the famous saying about advertising expenditures: "*Half the money spent on advertising is wasted*".

However, the amount spent on advertising is not to be counted as an expenditure. It, in fact, is an investment. Only the results of advertising are not always immediate and often delayed. Also there is no precise method of measuring advertising effectiveness.

While advertising may not bring about any immediate increase in the sale of a brand or in the adoption of a service, it has long-term benefits. In addition to creating an image, reinforcing it and sustaining it in the minds of the potential customers, advertising also affects the trade channels - whole sellers, stockists, dealers, and retailers.

Good advertising not only informs and creates an image for a brand; it also adds value to the brand. This value addition helps other promotional and marketing activities.

Other factors that advertising personnel should consider before deciding the budgets are that budgets cannot be set in isolation. One needs to know what kind of a *competitive market situation* a brand is operating in. Also important is the *brand history* and which *stage of product life cycle* it is in (introductory phase, growth phase, maturity stage, or decline stage). The *product category* and the *nature of the product* also are determining factors in setting a brands budget.

For example, a consumer good would require more budget spending and elaborate budget planning, while the total ad-spend for an industrial good would be much lesser and the planning less elaborate. Again fast moving consumer goods like soft drinks, toothpastes, soaps, etc. require different kind of budgeting than slow moving consumer goods like cars, refrigerators, washing machines, television sets etc.

Setting the budget also depends to a great extent on the *objectives of the campaign* whether it simply wants *to inform, create brand image, cultivate brand preference or brand loyalty,* whether it is *to reinforce or change an existing image,* whether it is *to clarify some confusion,* or whether the campaign tries *to create and sustain a corporate image*.

Now here is some startling information. We all know that the amount of money spent on advertising varies widely among companies in different product categories. But the ad-spend of companies in some industry also varies widely. For example, at the global level, *Proctor and Gamble* spends about 12 per cent of its sales amount on advertising, while *Lever Brothers* spends only about 8 percent. Another company in the same industry- *Colgate Palomlive* spends almost 14 percent of its total sales amount on advertising. Also companies often change their ad spends radically from year to year.

From this discussion many questions arise. Why there is wide variation in ad spends among companies within the same industry and over time for the same company? How do companies set their advertising budgets? What methods are employed in setting advertising budgets?

Let us try and find out answers to these questions. Before going further let us understand a few terms. The total amount of money spent on an advertising campaign is known as the *ad spend* or *appropriation*. Finding out this total ad-spend is not budgeting. It is just one part of budgeting. *A budget is a financial plan, which includes details of how much money will be spent and how the money will be spent.*

We know that advertising is a part of the total *marketing communication* or *promotional* activities for a product, which in turn is part of the marketing process. This way the advertising budget is part of the total promotional budget, which is part of the marketing budget. As different promotion mixes (combination of promotional

activities like sales promotion, personal selling, public relations and advertising) are used for different brands, the advertising budgets also vary accordingly.

Advertising budget consists of media budget, creative and production budget and research budget.

Now let us find out answers to the big question: How much to spend? So let us start by discussing the various methods of determining the ad-spend or ad appropriation.

METHODS OF DETERMINING ADVERTISING APPROPRIATION:

Long back in 1967, the Association of National Advertisers of the United Kingdom opined that: "*There is no formula for determining the ideal advertising appropriation*". However, advertisers all over the world make use of certain methods to workout the total ad appropriation. Some major methods are discussed below:

Advertising-to-Sales Ratio (A/S) or Percentage of Sales Method:

The advertising to sales ratio is one of the widely used methods of determining the appropriation. Here the total sales revenue for the brand for the next year is estimated and a fixed portion of this is allocated for advertising. Some times the total sales revenue for the past or the current year is also used. Often advertisers combine the past sales and estimated sales revenues to workout the proportion to be allocated for advertising.

Deciding this proportion often involves guesswork, intuition and past experience.

However, this method is easy to practice once the proportion is decided. Brands with high sales get more ad budget. Also this method tries to establish a relationship between the sales and the ad-spend.

On the negative side, this method needs to be reviewed and updated every year as sales revenues keep changing every year. This method determines ad spend on the basis of the sales. Whereas it should be the other way round as advertising promotes or helps increase sales. Again decreasing sales may led to decreased ad-spend while in such a case a brand may need more advertising to boost sales.

As a variation of the percentage of sales method, the Advertising to Margin method is also used. Here the total gross margin for the brand is estimated and a fixed proportion of this is allocated as the ad-spend.

Per Case Allowance or the Unit Price Method:

This method is mostly used for slow moving consumer goods or for those goods, which are sold in 'cases'. The total number of units or cases to be sold the next year is estimated and a fixed sum per unit is allocated for advertising. From this the total ad spend is calculated.

For example, if a car manufacture plans to sell 10,000 cars in the next year and decides to spend Rs. 1,000 on each car, then the total ad spend for the brand will be Rs. 1,00,00,000.

This method is easy to follow once the fixed amount is set. This method provides support for successful brands with high sales.

However, this method again poses the problem about fixing the sum per unit. This method requires constant reviewing every year for updating the fixed sum per unit. This method, like the previous method, ignores the effect of advertising on sales. A variation of this method is the *Other Allowances Method* where instead of units or cases, a fixed sum is allowed to a particular territory, region, state or country.

Inertia Method:

This is the most traditional method. Here the advertiser uses the previous year's budget without changing or only minor changes are brought about. The philosophy behind this method is that if a budget was successful the year before there is no reason why it should not be successful this year. *Winning teams are rarely changed*. Practitioners of this method also believe in not changing a successful budget.

One big advantage of this method is simplicity. This method is used if advertising is only a small part of the total promotion mix. However, practitioners of this method believe that everything will be the same in the next year and ignore changes that are likely to take place like in the objectives of the campaign, the competitive situation, the media costs, the effect of advertising, etc.

Media Inflation Multiplier Method:

This method is rarely used singly. It is mostly used with some other method. Often it is used with the Inertia method. Here first the budget is agreed upon. Say for example, it is decided that the total ad spend will be the same as that of the last year. To this the estimated increase in media costs is added.

In this method only the change in media costs are included. It, however, ignores all other changes that are likely to take place.

Competitive Parity Method:

This method is adopted when there is strong competition. Here an advertiser may try to match his advertising with the advertising of the competitor(s) in terms of the total amount to be spend, the total number of exposures, etc. This is an attractive option as it is easy to follow and helps maintain parity with the competition.

This method is easy to defend by citing the reason of matching the competition. Also this method takes into consideration the competitor's advertising.

But this method assumes that competition is spending the right amount. As with the previous methods, the effect of advertising is also ignored.

Affordable or Residual Method:

Here the advertiser decides what amount is affordable to be spent on advertising. The effect of advertising is ignored along with competitive advertising. This method may lead to an unrealistically small or proportionately very large amount being allocated to be spent on advertising.

All these methods discussed are called *breakdown methods*. There methods involve deciding the total ad-spend first and then deciding how much to be spend on which specific activities. All these methods ignore the effect of advertising on the sale of brands. Also these methods ignore many other important factors. However, one breakdown method that takes many factors into account is the brand history review method.

Brand History Review Method:

Here the brand's recent history is analyzed. It is compared with similar and competing brands. This comparison is done on the basis of total sales volume, the

market share, the sales revenue, prices, advertising activities, and other promotional and marketing activities. Also included in the comparison are product changes, new packaging, new positioning, distribution channels, etc.

From this comparison averages, trends and associations emerge which help decide the total ad-spend.

On the plus side, this method provides a realistic understanding of what has happened. This helps correct false expectations about future plans. On the negative side, the information about brand history - particularly those of competing brands - may not be available. If available, these may not be always reliable. Also like other breakdown methods, this method involves determining the budget more as a matter of adjustment.

So far we discussed methods that involve determining the ad appropriation first and then making apportions or allocations for specific activities. These break down methods are not realistic and may not prove reliable as these are mostly based on inituition or experience.

So advertisers use a different method. This is called the *build up method*. Here the ad appropriation is not decided first. Rather the various advertising activities are identified and listed. These activities are allocated specific amounts. Adding all these allocations we get the total ad appropriation. This method is called the *task method* or the *objective and task method*.

Objectives and Task Method:

This method of setting advertising budget or *budgeting by objectives* starts with the advertising objectives. Then the activities required to achieve these objectives are identified and listed. Each activity is allocated a particular amount on the basis of its role and importance. The total allocation, calculated by adding allotments for individual activities, forms the ad-spend or appropriation.

This method can be adopted only when clear-cut advertising objectives are identified. Here money is allocated for specific (and hopefully measurable) activities. This method recognizes the effects of advertising. In fact, advertising is seen as an activity that produces results.

Here the budget is more goal-oriented being derived from the objectives. Also accountability of advertising is taken into consideration. The allocation for each advertising activity is checked for affordability.

This method takes into account the changing market scenario, the competitors' activities including their advertising strategies.

This method has a few disadvantages too. Like the total ad-spend determined by this method may be very large. It may also lay undue emphasis on the effectiveness of advertising at the cost of other promotional activities. The question of *how much advertising is enough* may not be satisfactory answered. This method is also called Zero Based budgeting as the budgeting process starts from zero.

So far we have discussed about determining the ad-spend or how much to be spend. Now let us discuss how this money should be spent. Advertising money is basically spent in three areas - research, creative work and production, and media.

Many a times, there is no or negligible expenditure on research. The creative and production costs are mostly not charged separately by agencies that recover this money through the commission they get on media rates. The major part of advertising expenditure is the media costs. In fact, in most cases the total ad appropriation is spent on media costs only.

The major decisions in media spending include *which media to use*. Four media factors are considered for this. These are:

Media Class: Type of medium such as newspapers magazines, television, radio, outdoor media like hoardings, banners, direct mail, etc.

Media Vehicles: Within a media class there are many vehicles. For example, in case of newspapers, there are individual vehicles like the Times of India, The Tribune, The Indian Express, the Punjab Keshari, Dainik Tribune, etc. In case of television there are thousands of programmes on the 40 odd different channels like *Chitrahaar* on DD1, *Antakshari* on Zee TV, *Boogie Boogie* on Sony, etc. In case of magazines, there are thousands of different magazines in different languages covering a wide range of subjects and catering to highly specific audiences.

Media Options: This includes specific characteristics of advertisements (other than copy and illustrations). It specifies the *size* (full page, half page, quarter page, bottom spread, side-strip, etc.), *length* (15 seconds, 30 seconds or 60 seconds), *colour* or *black and white*, *location* (front page, back cover, inside covers, inside pages in case of newspapers and magazines and before, after or during a programme on radio and TV).

Scheduling: This is about how advertisements are scheduled. The scheduling alternatives are:

Fighting: alternating periods of advertising followed by periods of inactivity or no advertising;

Continuous: advertising evenly through out; and

Pulsing: continuous advertising supported by periodic bursts of heavy advertising.

The selection of the type of medium, such as television, newspaper, radio, magazine depends on the number and type of people in the target audience the medium can reach. For example, television reaches general public, while newspapers reach only the reading public. Internet advertising, on the other hand reaches only the users of Internet.

It also depends on the nature of advertisements. For example, an ad that has to show some demonstration cannot be placed in radio. For such ads television is the best medium. Again television is the best medium for ads of high emotional content, while newspapers and magazines are better suited for rational ads.

A major factor in determining a specific media vehicle or option is the *cost per thousand* (CPM) for print media and the *gross rating points* (GRP) for radio & TV programmes. Both the CPT and GRP are measures of the cost of the total exposures.

Also considered for this are the *reach* (number of people reached at least once) and *average frequency* (the average number of exposures per exposed persons).

Budgeting for advertising campaigns is done following any of the methods of determining the appropriation. While none of the method is full proof, the choice of the method requires situational sensitivity and practical selectivity.

7.2.2 BUDGETING FOR PR CAMPAIGNS

Public relations differs from advertising in many ways. While advertising is much more direct, PR is very subtle. Advertising is highly visible. Public relations does not enjoy high visibility. Also public relations is much more complex as it deals with a

wide variety of publics at the same time. Although PR is highly complex and PR activities are difficult to plan, it is the most cost effective means of promotion and publicity.

PR does not involve huge investments as in case of advertising. Also PR does not depend upon volume and visibility to be effective. Successful PR can be practiced with the help of a wide range of highly cost effective tools and media.

This does not mean that PR campaigns do not involve financial planning or budgeting. In fact, PR needs highly elaborate planning. This planning is done in the selection of cost effective tools and media and deployment of resources.

Unfortunately there is no consensus on what is a reasonable or adequate amount to be allocated for a public relations campaign. In case of advertising budgeting there are fixed figures like the total sales, market volume, marketplaces, or percentage of the total turnover or profits. But PR does not use such fixed figures or percentages to determine the total expenditure or appropriation.

PR is a uniquely flexible tool for any management, which has the capability of adapting itself to the needs of the organization.

For example, a big industrial good marketer with a few hundred customers will have different needs than a consumer goods marketer with crores of consumers- even though both companies have similar turnovers. A company, which innovates and expands constantly, will have different needs than a stable company in the maturity phase - even though both companies are part of the same industry.

While advertising is purely driven by promotional needs, the case of PR is totally different. PR is all about creating goodwill*, a positive image* and the *ability to face a crisis* - be it an accident, a dispute, a takeover bid, or a controversial issue.

For example, the manufactures of DHARA brand of mustard oil faced little problem when the *argemone* adulteration became a big issue. This was because of the existing good will and positive image and its preparedness to face the situation. In fact, the makers of DHARA used this adulteration case and earned a lot of good will by issuing full page ads about withdrawal of DHARA mustard oil packs from the market.

This *proactiveness* through *man management, relationship management* and *handling of issues* makes budgeting for PR different from budgeting for advertising.

One thing that affects PR budgeting is the higher consultancy fee charged by PR consultancies. These consultancies vary widely in both the quality of their work and the fees charged. Often there is no relationship between the service provided and the fee charged.

Reputation and *success rate* of consultancies are the guiding factors in setting PR consultancy fees. Financial PR consultancies are the most expensive. Again larger consultancy firms are also very expensive. Some PR consultancies reduce their retainer but charge heavy handling fees. Others charge a higher consultancy fee that covers all handling charges. Some big consultancies charge higher retainer and heavy handling fees.

Structure of a PR Budget:

Planning the PR budget starts with an assessment of the PR campaign and its objectives. Also the accounting practices of the company need to be considered as these vary widely from company to company. For example, the following points about accounting need to be clarified before planning the PR campaign or the PR campaign budget.

- Who (which division) will bear the costs of providing accommodation to visiting journalists and other visitors? Will the PR department be charged?
- Who will bear the cost of free tickets provided to journalists or the free samples distributed?
- Who will bear the cost of luncheon, etc. hosted for journalists and other media personnel?
- Who pays for the gifts?

In all these cases, it is safe to find out whether the PR department will be charged for these and other expenses so that these can be included in the budget. This is because in some companies all these costs are charged to other departments while in some other companies all these expenses are included in the PR budget.

The other considerations that need to be taken into account before planning the PR budget are:

- The amount of time or the number of people likely to be involved;
- Expenses on accommodation, transportation, food, etc.;

- Expenses on stationery, postage, telephone, etc.;
- Expenses on photography and videography, etc.;
- Expenses on entertaining;
- Cost for producing material for employee communications;
- The cost of producing material for external relations;
- The cost of subscribing newspapers, magazines and journals, etc.;
- The cost of media monitoring and maintaining press clippings, etc.

Public relations is full of glorious uncertainties. While one can anticipate trends and certain other things like an imminent strike there is no way one can predict about disputes, accidents, and controversies. In the face of such uncertainties, PR campaign budgets need to be highly flexible. Keeping aside a large amount as *contingency* for unforeseen happenings is a common practice in PR budgeting.

Then there is the question of measuring the effectiveness of PR campaigns or activities. Unlike in case of advertising, methods of measuring PR effectiveness are not so well developed. Also there is rarely any tangible or measurable results of PR. Infact, many PR practitioners consider measurement in PR to be an imperfect act. Thus many PR campaigns exceed planned budget targets.

However, like any other business activity, PR campaigns must be based on sound budgeting. After identifying the *objectives* and the *strategies*, the public relations professional make a detailed list of the particular *tactics* that will help achieve these objectives.

No organization can spend indiscriminately. And without a realistic budget, no organization will succeed. Likewise, public relations campaigns must be disciplined by budgeting realities. The key to PR budgeting lies in performing two steps:

- Estimating the extent of the required resources - personnel to be hired and material to be purchased - to accomplish each activity of the PR campaign, and
- Estimating the cost and availability of these resources.

As we have discussed earlier, a contingency amount is added to this to make the budget appropriation more flexible. The PR budget is then prepared.

Mostly organizations create a PR budget head. The PR department is provided money on a *monthly basis* or *as and when needed basis*. Such a system helps control and audits the PR budget on a routine periodical basis. This also provides flexibility to make adjustments well in advance for crisis situation.

Most PR campaigns operate on limited budgets. Therefore, whenever possible, adaptable and flexible systems and programmes are planned. Such programmes can be recycled and redesigned to meet changing needs.

For example, advertising on newspapers, magazines and television is too expensive for PR budgets. But special events, exhibitions, personalized publicity literature, direct mail, personal contacts, and promotional displays are inexpensive communication tools. Also these can be used a number of times also.

Some organizations follow the practices of advertising budgeting for preparing their PR budget and use either the *percentage of sales* or the *objective and task method* to decide the budget appropriation.

Here is a list of different headings under which PR expenses are incurred.

Accommodation; Remuneration to hired personnel; Transportation; Food and Beverages etc.; Telephone, Postage; Entertainment; Material to be purchased like Photographic material, Films, Visual aids, Stationery, Gifts etc; Production costs for Printing, Production of Audio-visual aids, Films etc; Outside services like Consultancy, Creative work (copy, art work, photographic work, etc.); Research; Advertising; Expenses on arranging Conferences, Tours, Visits, Special Events, Exhibitions, etc.

As we have discussed earlier, public relations is a very flexible tool of promotion. Thus the PR budget also needs to be flexible. However, PR budgets cannot be prepared haphazardly or without proper planning. In fact, like PR campaigns, PR budgets should also be carefully planned to achieve the predetermined objectives. Thus the PR budgets vary with objectives, the size of the campaigns and the tools and methods used.

Here is an example of the various headings on which expenses will be incurred for conducting a special event. This will primarily depend on the estimated attendance.

Refreshment, catering service, supplies, decoration, cost of hiring hall, transportation, printing of publicity material to be distributed, of identification ribbons, pins or cards, souvenirs, gifts or prizes, mailing expenses, postage.

Here is a small exercise for you. Prepare an exhaustive checklist for the Annual Meeting of a big company. Identify the headings for which expenses will be incurred. Also assume that this annual meeting will be held in the city of Hisar. Now do a rough estimate of the totally expenses likely to be incurred for this annual meeting.

7.3 SUMMARY:

An advertising campaign or a PR campaign, it involves meticulous planning. And among other things, the success or failure of a campaign depends on how much money is spent on the camping. Deciding *how much* money to spend on a campaign and *how, when* and *where* to spend this money is called budgeting.

Setting the budget depends to a great extent on the *objectives of the campaign* whether it simply wants to inform, create brand image, cultivate brand preference or brand loyalty, whether it is to reinforce or change an existing image, whether it is to clarify some confusion, or whether the campaign tries to create and sustain a corporate image.

Proctor and Gamble spends about 12 per cent of its sales amount on advertising, while *Lever Brothers* spends only about 8 percent. Another company in the same industry- *Colgate Palomlive* spends almost 14 percent of its total sales amount on advertising. Also companies often change their ad spends radically from year to year.

Advertising is a part of the total *marketing communication* or *promotional* activities for a product, which in turn is part of the marketing process. Advertising budgets vary according to the requirements. Advertising budget consists of media budget, creative and production budget and research budget.

While advertising is much more direct, PR is very subtle. Advertising is highly visible. Public relations does not enjoy high visibility. Also public relations is much more complex as it deals with a wide variety of publics at the same time. Successful PR can be practiced with the help of a wide range of highly cost effective tools and media. But PR campaigns often involve huge financial investments. PR campaigns

need highly elaborate planning. This planning is done in the selection of cost effective tools and media and deployment of resources.

7.4 KEY WORDS:

Information Campaign Budget: Budgeting or the amount estimated to be spend on an information campaign is not determined by a fixed formula. Budgeting is not a singular act. Budgeting is a process. It requires a practical approach. Again budgeting for different campaigns require different approaches. *Situational sensitivity* is a necessity to budgeting.

Advertising Budget: Advertising is a part of the total *marketing communication* or *promotional* activities for a product, which in turn is part of the marketing process. This way the advertising budget is part of the total promotional budget, which is part of the marketing budget. As different promotion mixes (combination of promotional activities like sales promotion, personal selling, public relations and advertising) are used for different brands, the advertising budgets also vary accordingly. Advertising budget consists of media budget, creative and production budget and research budget.

Advertising Appropriation: This is the total amount to be spend on an ad campaign. It is also called the ad-spend or advertising expenditure.

Advertising-to-Sales Ratio (A/S) or Percentage of Sales Method: This is one of the widely used methods of determining the appropriation. Here the total sales revenue for the brand for the next year is estimated and a fixed portion of this is allocated for advertising. Some times the total sales revenue for the past or the current year is also used. This method involves guesswork, intuition and past experience.

Per Case Allowance or the Unit Price Method: This method is mostly used for slow moving consumer goods or for those goods, which are sold in 'cases'. The total number of units or cases to be sold the next year is estimated and a fixed sum per unit is allocated for advertising. From this the total ad spend is calculated.

Inertia Method: This is the most traditional method. Here the advertiser uses the previous year's budget without changing or only minor changes are brought about. The philosophy behind this method is that if a budget was successful the year before there is no reason why it should not be successful this year. *Winning teams*

are rarely changed. Practitioners of this method also believe in not changing a successful budget.

Media Inflation Multiplier Method: This method is rarely used singly. It is mostly used with some other method. Often it is used with the Inertia method. Here first the budget is agreed upon. Say for example, it is decided that the total ad spend will be the same as that of the last year. To this the estimated increase in media costs is added.

Competitive Parity Method: This method is adopted when there is strong competition. Here an advertiser may try to match his advertising with the advertising of the competitor(s) in terms of the total amount to be spend, the total number of exposures, etc. This is an attractive option as it is easy to follow and helps maintain parity with the competition.

Affordable or Residual Method: Here the advertiser decides what amount is affordable to be spent on advertising. The effect of advertising is ignored along with competitive advertising. This method may lead to an unrealistically small or proportionately very large amount being allocated to be spent on advertising.

Brand History Review Method: Here the brand's recent history is analyzed. It is compared with similar and competing brands. This comparison is done on the basis of total sales volume, the market share, the sales revenue, prices, advertising activities, and other promotional and marketing activities. Also included in the comparison are product changes, new packaging, new positioning, distribution channels, etc.

Build up Approach: Here the ad appropriation is not decided first. Rather the various advertising activities are identified and listed. These activities are allocated specific amounts. Adding all these allocations we get the total ad appropriation. This method that uses this approach is called the *task method* or the *objective and task method*.

Objectives and Task Method: This method of setting advertising budget or *budgeting by objectives* starts with the advertising objectives. Then the activities required to achieve these objectives are identified and listed. Each activity is allocated a particular amount on the basis of its role and importance. The total allocation, calculated by adding allotments for individual activities, forms the ad-spend or appropriation.

PR Budget: Public relations is much more complex as it deals with a wide variety of publics at the same time. PR does involve huge investments as in case of advertising. PR needs highly elaborate planning.

7.5 SELF-ASSESSMENT QUESTIONS (SAQs):

1. Write a detailed note on budgeting for information campaigns.
2. Discuss in detail the various methods of deciding advertising appropriation.
3. Write a detailed note on budgeting for PR campaigns.

7.6 REFERENCES / SUGGESTED READINGS:

- ***Making PR Work*** *(Sushil Bahl).*
- ***Advertising and Public Relations*** *(B. N. Ahuja and S.S. Chhabra).*
- ***Lesly's Hand Book of PR and Communication*** *(Edited by Philip Lesly).*
- ***Public Relations: Principles, Cases, and Problems*** *(More and Kalupa)*
- ***The Practice of Public Relations*** *(Fraser P. Seitel)*

Master of Mass Communication (2nd year)
MEDIA PRODUCTIONS MMC 202 Lesson: 9

ADVERTISING CAMPAIGNS

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LESSON STRUCTURE:

There is a saying in the field of advertising; '*doing business without advertising is like winking at a girl in a dark room'*. This saying tells a lot about the importance of advertising. The importance of advertising can also be judged from the fact that there is hardly any kind of organization that does not use advertising.

Advertising has emerged as a major tool of marketing communication. It informs people about the advertised products, it creates positive images; and it persuades. In this lesson, we shall discuss about advertising campaigns. We shall also focus on the stages of advertising campaigns. Finally, we shall discuss media planning and creative planning. This lesson shall be structured as follows:

9.0 OBJECTIVES:

The objectives of this lesson are as follows:

- *To understand the Structure of Advertising Campaigns,*
- *To study Situational Appraisal,*
- *To understand Situational Analysis,*
- *To understand Strategic Planning,*
- *To understand Creative Planning,*
- *To understand Media Planning,*
- *To understand Implementation or Execution,*
- *To understand Coordination,*
- *To understand Evaluation.*

9.1 INTRODUCTION:

Advertising reaches large number of people with information. It tries to create positive and concrete images. This cannot be achieved with single or sporadically appearing advertisements. Considering the high costs of creating advertisements and the high media costs, advertising requires proper planning. Just as in case of military operations.

This is the reason why advertising rarely consists of a single isolated advertisement. Almost always, a series of related ads are used over a period of time in the form of a campaign.

All the ads in a campaign appearing in different media are self contained and independent in nature. However, they have a single theme and resemble each other in terms of visual and verbal similarity. The singular theme provides psychological continuity while the visual and verbal similarity provides physical continuity. This way all the ads in a campaign work towards a single goal of informing and persuading.

In this lesson, we shall discuss the various aspects of advertising campaigns including the stages of ad campaigns.

9.2 PRESENTATION OF CONTENT:

In this lesson, the content shall be presented as follows:

- *Structure of Advertising Campaigns,*
- *Situational Appraisal in Advertising Campaigns,*
- *Situational Analysis in Advertising Campaigns,*
- *Strategic Planning in Advertising Campaigns,*
- *Creative Planning in Advertising Campaigns,*

- *Media Planning in Advertising Campaigns,*
- *Coordination in Advertising Campaigns,*
- *Evaluation in Advertising Campaigns.*

9.2.1 WHY AD CAMPAIGNS?

The term campaign comes from the military. The Webster Dictionary defines a campaign as 'a series of planned actions'. In military maneuvers, a campaign means "a series of planned activities executed in a specific time period, over a specific area to achieve specific goals".

An advertising campaign means an organized series of related advertisements prepared and placed in various media over a specific period of time to achieve specific advertising objectives."

Like in military operations, which are based on intelligence, advertising campaigns require information. This is collected through research. This information forms the basis for setting the objectives and planning. Ad campaigns, to be effective, also require proper timing and execution.

In military maneuvers, a series of operations are required to overcome obstacles and barriers. In advertising, a series of ads are required to reach the target audience, keep reminding them, reinforce the message, and finally reassure them. While doing all these, an ad campaign tries to persuade the people to act the way the advertisers want.

There are two ways of doing advertising. An advertiser can advertise in an erratic, irregular and unplanned manner. This would lead him nowhere and all the efforts and money spent on advertising would bear no fruit. Or an advertiser can plan a concrete, detailed and sound advertising programme and create a series of related ads to be placed in the media in the form of a campaign.

An advertising campaign has far greater chances of succeeding because of coordination, balance, proper timing and continuity.

9.2.2 STRUCTURE OF AN AD CAMPAIGN:

An ad campaign determines what the advertiser wants to say. It also determines how, when, where and to whom the advertiser wants to say it. It also answers the big question - how much to spend?

These simple questions like 'what', and 'who' etc. have different names in advertising terminology. The '**Who**' in advertising is the 'target market or audience'? The '**How**' is the creative strategy and '**What**' is the message. '**Where**' is the media strategy, '**When**' is the

‘timing’ or scheduling and ‘**How much**’ is the advertising budget. The above-mentioned ‘questions’ are answered during the campaign planning process.

This planning process includes the following activities:

1. SITUATION APPRAISAL
    i. Consumer research and market research.
    ii. Company and product research.
    iii. Competitive research.
2. SITUATION ANALYSIS
    i. SWOT Analysis (Strengths, Weaknesses, Opportunities and Threats)
    ii. Analyzing key problems.
    iii. Finding the competitive advantage.
3. STRUCTURAL or STRATEGIC PLANNING
    i. Setting objectives
    ii. Targeting
    iii. Positioning
    iv. Determining the length or duration of the campaign.
    v. Budgeting
4. CREATIVE PLANNING
    i. Finding the theme
    ii. Finding the creative strategy
5. MEDIA PLANNING
    i. Deciding the media, the vehicles and the options
    ii. Media Scheduling
    iii. Media booking
6. IMPLEMENTATION OR EXECUTION
    i. Writing & designing all promotional material
    ii. Producing all promotional material
7. COORDINATION
    i. Coordination with other promotional activities
    ii. Overseeing all promotional activities in a holistic manner
8. EVALUATION
    i. Pre-testing
    ii. Concurrent testing

iii. Post-testing

9.2.2.1 SITUATION APPRAISAL:

Before planning any activity, one requires relevant information regarding the situation. For planning an ad campaign we require information about three things:

* *The target market or the consumer,*
* *The company or product, and*
* *The competition.*

Information is collected using primary and secondary research techniques. The three important research areas are:

* *Consumer Research and Market Research.*
* *Product and Company Research*
* *Competitive Research*

Consumer Research and Market Research: Who buys the product? When do they buy it? How frequently do they buy? How do they use the product? What are their attitudes and perceptions about the product? Who takes the decision to buy? Who influences them to buy? What decision process do they go through before buying?

Consumer Research and Market Research find answers to the above mentioned and other related questions. The target market has to be described geographically, demographically and psycho-graphically.

Product and Company Research: Product research covers the quality of the product, its uses, distinctive features, packaging, price, unit of sale, brand image, distribution, positioning and its product life cycle, etc. Company research includes the image of the company, its reputation, the resources, its philosophies, etc.

Competitive Situation Research: This involves finding the activities of the competitors, both direct and indirect - with respect to market share, product range, product features, positioning and targeting strategies, distribution network, prices, etc. This also covers the competitors' current and past of advertising strategies, media expenditures and advertising schedules.

9.2.2.2 SITUATION ANALYSIS:

Research conducted to collect information about the target market, the product and competition needs to be analyzed to find out relevant and significant facts. These facts help in developing strategies. The following things are done after collection of information.

* SWOT Analysis
* Key problem analysis
* Competitive Advantage analysis.

SWOT Analysis: SWOT stands for strengths, weaknesses, opportunities and threats. From all the information collected, campaign planners find out the strengths of the product. These strengths could be in any area. For example, it could be a new or better product feature, better servicing or distribution network, lesser price, durability, etc. The strength often leads to new opportunities to be explored.

SWOT analysis also reveals the weakness of the product in comparison to its competitors. Weaknesses make the product vulnerable to threats from others. For example if a product is priced high, the competitors could start offering their products at a lower price. If the servicing network is poor, then competitors could exploit this. So all the weak areas need to be guarded.

Key Problem Analysis: From SWOT analysis, the campaign planners find communication problems that need to be addressed through the campaign. Key communication problems include:

* Informing the consumers,
* Increasing their awareness level,
* Changing a negative attitude,
* To reinforce a message or image,
* To reassure the consumers,
* To change an image,
* To create a new image,
* To create broad differentiation in the minds of the consumers, and
* To bring about acceptance of goods or ideas, etc.

Finding the Competitive Advantage: This particular analysis focuses on finding how and in what respects the product is better than its competitors. This analysis tries to find out an area

that is important to consumers and if the product has any advantage over its competitors in that area.

9.2.2.3 STRATEGIC PLANNING:

We all know that advertising is both an art and a science. While the art comes from writing, designing and producing exciting advertisements, the science comes from scientific methods of research and strategic planning. Advertising is a disciplined art. The discipline comes from well-formulated strategies, which are developed to accomplish specific objectives.

Strategic planning is the process of making intelligent decisions. It starts with finding out what to do (setting objectives), deciding how to accomplish the objectives (determining strategies). It also decides whom to address (the target audience), how to distinguish the product (positioning), how much to spend (budgeting) and for how long to run the campaign (duration).

Setting the objectives: Advertising objectives are determined directly from the key problems analysed earlier. These objectives are usually answers to such questions as what does this campaign need to accomplish or what effect should it have on the target audience? As far as the first question goes, advertising objectives could be :

* To inform about a new product.
* To change or reinforce consumer attitudes and perspectives.
* To persuade consumers to try a new product or to buy more of it.
* To persuade consumers to switch brands.
* To create a new image or personality for the product.
* To create a unique position for it.
* To sustain an image.

Others set advertising objectives on the basis of the impact or effect they create on the consumers. One classic approach is John D. Leckenby's *AIDA model (Attention, Interest, Desire and Action)*.

Russell Colley developed a slightly different model called the *DAGMAR (Defining Advertising Goals for Measured Advertising Results)*. This model begins with awareness, moves on to comprehension, then conviction, and ends with action.

Michael L. Ray developed the *think-feel-do* model. Here think stands for awareness and knowledge, feel stands for liking and preference and do stands for acceptance and purchase.

Advertising objectives are used to guide the development of the campaign strategy. Also these are used to measure the result of the campaign at the end of the campaign. Some additional objectives are listed below:

* To boost immediate sale.
* To build a brand image.
* To contribute to increased sale.
* To build consumer satisfaction.
* To help the trade channels.
* To project a corporate image.

Targeting: The next step is to identify the present and the potential buyers. They are called the target market or the target audience. Advertising people finalize the target audience, find their characteristics (geographic, demographic and psycho-graphic). These characteristics help determine the media to be used to reach the target audience and also to create effective advertising messages.

Target market or the target audience (the first is a marketing term and the second is an advertising term) includes present and potential customers. It also includes those people who influence the buying decision. For example, in case of many products kids influence the buying of certain household products. Doctors influence buying of medicines by way of prescribing. So do pharmacists. Similarly architects and designers influence the purchase of materials used for building and decorating houses.

In addition to geographic, demographic and psycho-graphic features, the target audience is also profiled in terms of personality and lifestyle of the typical audience member.

Positioning: Positioning is a marketing strategy. It is however created through advertising. Positioning is the perception about a product in the minds of the consumers in relation to the competitors. For example ‘Luna’ is the ‘no tension moped’. ‘Maggie noodles’ is a ‘two minutes snack’. ‘Marlboro’ is a ‘macho cigarette’.

Establishing as well as changing ‘positions’ requires tremendous advertising efforts and a lot of research. This basically involves product feature analysis. The most important and relevant features of the product are then compared with features of competing brands.

Some people also use a technique called perceptual mapping. This technique helps find the present positioning and determining a new positioning, if required).

Duration of the Campaign: Advertising campaigns vary in length i.e., duration. Some run for a few days, some for weeks. Some campaigns run for months and some others run for years together. Some advertisers run more than one campaign in a year. Some others run campaigns seasonally - say during the summer or winter or during festive seasons.

Factors that determine the duration of a campaign are the competitors media strategies, the market situation, the seasonal sales curve of the product, the life cycle of the product, the advertising fund, campaign objectives and the nature of the advertisers marketing programme.

Budgeting:

The client finalizes the advertising budget. This is usually taken out of the overall 'marketing communication' or promotional budget, which in turn is part of the marketing budget. In other words a certain portion of the marketing budget is allocated for marketing communication (i.e. all the promotional activities like sales promotion, personnel selling, Public Relations and of course, advertising). And part of this budget for marketing communication is allocated to advertising.

Budgeting is finding out how much is going to be spending for the campaign before one starts planning the campaign. Client companies usually finalize an exact amount and ask the agency to fit the campaign expenditure with in that amount. Or they give an approximate idea and ask the agency to finalize the budget amount or the advertising appropriation or advertising expenditure. There are different ways of arriving at the advertising appropriation. These include:

Percentage of Sales Method: This method is based on the fact that there is a direct relationship between the advertising expenditure and the total sales. This method compares the total sales with the total advertising budget during the previous year or the average of several years to finalize a percentage.

Here the past advertising expenditure is divided by the total past sales to arrive at a percentage. This percentage is than multiplied by the next year's sales forecast to arrive at the new advertising appropriation.

Unit Price Method: This method is often applied for slow moving consumer goods (SMCG's). A particular amount per unit to fixed and the number of units to be sold in a year is finalized. When

you multiply the ad spend per unit by the number units to be sold, then you get the total ad spend or ad appropriation.

Competitive method: Budgeting and particularly finalizing the total ad spend often taken into account the competitive situation into account. In highly competitive situations, clients try to spend at least as much the competitor is spending. This method has no scientific basis.

Go-for-Broke Method: This is even a more unscientific method of determining the advertising expenditure. Here the client tries to not only out-spend its competitors but goes to extreme extents with regard to advertising expenditure. This occurs only in extremely competitive situations.

The four methods discussed above help finalize the advertising appropriation without considering the various aspects of the campaign. These methods do not consider the campaign objectives, the strategies and tactics decided to achieve the objectives.

In the above-mentioned methods, the total appropriation is finalized first and then it is apportioned or allocated to various heads or activities devised as part of the campaign. This is why all these methods are called *breakdown methods* as they breakdown the total ad spend into small heads as print spend, TV spend, outdoors spend, etc.

Task and Objective Method: This method is different from the above-mentioned methods. Here consideration is given to the objectives decided and activities planned to accomplish them. In other words it builds up the budget by determining what it will cost to accomplish the objectives of the campaign. All these amounts added together becomes the final ad spend. This method is called zero-base budgeting as it starts from zero and finally determines the total ad spend. The task objective method is also known as the build up method.

9.2.2.4 CREATIVE PLANNING:

So far we have discussed campaign planning from the strategic point of view. Now let’s shift to the creative side of advertising planning. Some call it creative strategy. Others call it copy platform. Some others call it the creative work plan or the creative blue print.

Whatever name it is given, the creative planning is simply a way to analyze the communication problem and find ways how to solve it. This kind of plan also helps as a guideline for all the people involved in the creative development work in one direction. Creative

planning includes developing a theme, the creative strategy and finally deciding the creative tactics.

Developing a Theme: A campaign is a series of ads built around one central theme. This is also called the big idea. This theme or creative concept is part of all the different ads of the campaign that are prepared for different media, situations, audiences and different time of the year. The theme thus needs to be a strong concept to be able to hold all there different and diverse ads together.

For example, for more than four decades Marlboro has been using the ‘macho man smoke Marlboro’ theme. Pepsi has been using the ‘Pepsi Generation’ theme for decades. Thums-Up used the ‘thunderous taste’ theme for a very long time. Lux has been using the ‘beauty soap of film stars’ theme, for over five decades now.

A powerful theme brings about what is called synergy to the campaign. Synergy works as a ‘binding factor’ that intensifies the impact of the campaign through the repetition. The repeat value is gained not only through multiple insertions of ads in the same medium but though the variations of the same theme in the different advertisements in different media.

Also the theme provides a psychological continuity or link among all the ads of the campaign. For example, using the same slogan in ads for different media creates this continuity.

Another benefit of a central theme is the concept of image transfer. While receiving the ad message from ads in one medium the audience members think about similar presentation style of ads on other media. Usually clients show ads on TV in the beginning and when these ads become popular, then the clients switch to less expensive media like radio, outdoor, etc. Ads on these cheaper media keep reminding the audience about the TV ads.

A campaign theme is the gist of the advertiser’s message, a summary of the client’s story or a point of focus. In fact, it is the most important part of the client’s message. A theme needs to be interesting, desirable as it has to motivate the consumers.

A theme must always relate to and reflect the campaign objectives. Also a theme should be tied to the needs, wants and problems of buyers and to the advertiser’s product as the answer to these problems and wants. Effective themes are true, believable, and convincing. And finally it should be distinct and unique to be able to establish competitive superiority.

Creative Strategy: Creative strategy decides the type of message. It flows from the communication problem and the objectives. The creative strategy outlines the impressions the campaign wants to create. Some of the common creative strategies are:

Generic Strategy: Market leaders who ignore the presence of competitors use this strategy.

Pre-emptive claim strategy: Here the brand is the first to pick up a particular feature. In the minds of the people, it becomes associated with that brand. For example, every body associates PUF with Godrej refrigerators while it is present in all fridges.

Unique selling proposition (USP) strategy: Here the campaign talks about some feature, which is unique to that advertised brand and is not available in others.

Brand image strategy: When there are no strong differentiating features among the competitors, then brands try and create images. For example, Pepsi in the 'new generation drink', Maggi Hot and Sweet tomato sauce is 'different', etc.

Product positioning: Some times products or brands are positioned different from competing brands. For example Maggi noodle is a "two minute snack".

All the above creative-strategies or message-strategies try to set the brand apart from its competitors. Here one can take an informative approach where one gives straightforward facts. This approach is suitable for high-involvement products like slow moving consumer goods (Cars, TV, fridge, washing machines, etc.) where consumers are looking for information to make the purchase decision.

The other approach is the *associational or emotional approach*. This approach is adopted for low-involvement goods like fast moving consumer goods (chocolates, toothpaste, cigarette, toilet soaps, etc.) where consumers do not need much information to take decisions. Here advertising tries to establish images or touch emotions.

CREATIVE TACTICS AND IMPLEMENTATION:

Now that we have developed a theme and decided on creative strategy, it is time for executing them. Creative execution translates the strategy into advertising messages. It dramatizes strategy to capture the attention of the audience, make it memorable and effective.

An advertisement is called creative when it is original or novel and has features to stand out. To be effective, an ad has to be relevant and connect the audience which the product.

Creative tactics or implementation (execution) includes copy writing, deciding the visuals and layout in case of print advertisement. In case of radio and TV ads, it includes writing the script, recording, editing, and giving music and other special effects.

9.2.2.5 MEDIA PLANNING:

The ultimate goal of advertising is to reach the target audience with the advertising message. So far we have discussed about creating the advertising message. Now let us discuss about how to reach the target audience. The major decisions that need to be taken are:

* Which media to be used?
* Where to advertise (geographic region)?
* When to advertise (timing and scheduling)?
* How intense the exposure should be (frequency)?

Media planning is a 'behind the scene' part of advertising. It plays an integral role in merging the science of marketing with the art of advertising.

A media planner has to find out about the availability of various media, the media rates, their reaches and also analyzing the effectiveness of the various media. Then the media planner has to choose such media, which would reach the target audience effectively - both impact and cost wise.

Deciding the Media:

From newspapers, magazines, radio, TV and films to pamphlets, leaflets, brochures and posters to outdoor and transit media, advertising uses many means to reach the target audience. All these media have different reaches, different rates, different characteristics and they also differ in terms of popularity.

A media planner has to select and choose the medium or media-mix depending on the above-mentioned things as well as the target audience and the advertising objectives. One important consideration here is how much money is available for media buying in the ad budget.

Once the media planner chooses the medium or media-mix, the next step is to choose the vehicles with in these media. For example, if the medium chosen is newspaper, then there are many vehicles available - like national, regional or local newspapers, various language newspapers, general newspapers or special newspapers like economic and business newspapers. For television there are so many channels available.

The next step is to finalize the various options with in the vehicles. In case of a newspaper, the available options are any specific days of the week, the main newspaper or supplement, any specific page and in that page any specific place. In case of a TV channel, the available options are to run ads as spots or to sponsor particular programmes, to run the ads before, during or after specific programmes.

Other options available are to sponsor specific parts of a programme like a song in a feature film and sponsor replays during cricket matches etc.

The medium or media chosen along with the vehicles and options should match the audience in terms of geographic spread, accessibility and also psycho-graphically (in terms of liking, popularity and rating, etc.). Also these have to be most effective in term of costs.

Media Scheduling:

So far we have answer two questions through the selection of media - whom to reach and where to reach. Now is the time to answer the questions - when to run the campaign and for how long to run it. This is basically called media scheduling or finalizing the day, time and other specifications about the placement of the ads.

One important aspect of scheduling is the frequency or the number of times an advertisement message is delivered (published or broadcast) within a given period of time (usually a week or month). Frequency is important as it is directly related to the impact of the ad message. More the frequency more is the recognition of the product advertised, more the recall of the message, and consequently more the success of the ad in term of sales or acceptability.

Another important aspect is timing pattern. Some common patterns are:

* *Seasonal:* This pattern is used for products which sale seasonally like sun screen lotions, air coolers and refrigerator in summer; cold creams, water heaters, room heaters, woolens in winter.

* *Steady Pattern:* This pattern is used for products that sale uniformly through out the year like soaps, shampoos, tooth paste etc.

* *Pulsing:* This is also called flighting. Pulsing involves short bursts of advertising in a few markets for a short duration rather than going for a steady pattern. It increases the awareness level of consumers to a much higher level that continues while the product is not being advertising.

Media Booking:

After the planning is over, then the media buyers contact the various media and book the space and time according to the media plan devised. Big agencies with media buying wings do it on

their own. Many agencies, however, leave media booking and media buying to specialized media buying organizations.

9.2.2.6 IMPLEMENTATION OR EXECUTION:

This involves creating and producing the ads. This also happens to be to most important and most exciting stage in the campaign process. All that has been planned so far are now implemented. For print ads, implementation involves writing the copy, coming up with the illustrations, designing and giving the finishing touches. For radio and TV commercials, it involves script writing, (story board preparation for TV), planning the production, recording, editing, and dubbing and adding the special effects. This also involves finalizing cast and crew, selecting studio and location, arranging the equipment, rehearsal, etc.

9.2.2.7 COORDINATION:

Advertising is often thought to be the only means of reaching prospective consumers with the selling message. In reality, it is only a part of marketing communication or promotion. Personal selling, sales promotion, Public Relations are the other means of reaching the target audience.

Advertising, depending upon the product and the situation, may play a dominant role with other activities supporting it. It may also play a supplementary role to other promotional activities. All these promotional activities have the same goal - of achieving increased sales or acceptance. Thus there is a need for proper coordination among all these promotional activities. The people planning ad campaigns should be fully aware of the other promotional activities and plan the campaign accordingly.

9.2.2.8 EVALUATION:

Constant and periodic evaluation of the ad campaign at various stages is required to judge the effectiveness of the campaign. Some advertisers do not pay much attention to this aspect and get the evaluation conducted informally. However, there is a greater need to conduct evaluation by way of formal and proper research.

Evaluation of an advertising campaign is conducted at three stages:

* *Pre-evaluation (pre-testing)*
* *Concurrent evaluation*
* *Post evaluation (post-testing)*

Pre-Evaluation: This is conducted after the creative execution is over and before the advertisements are placed in the media. By this time the expenditure incurred is not much as the maximum expenditure is for media time and space. The prepared ads are shown to a cross

section of the target audience. If they like the ads then they are released, and placed in the various media. Otherwise the ads are changed accordingly.

Concurrent Evaluation: This is done while the campaign is running i.e., when the ads have been placed in the media. By now the ads have reached the target audience. The reaction of the target audience to the ads (including the recognition, recall, etc.) is collected though research. If the ads are being liked by the target audience and doing well in terms of increasing sale, then no changes are required. Otherwise, the necessary changes are brought about to make the ads more attractive, appealing and acceptable.

Post-evaluation (Post Testing): This is done after the campaign is over i.e., after the ads have been published, aired or broadcast for the duration decided. The results are matched with the original objectives (both advertising and marketing objectives).

The main purpose of post-testing is to evaluate the effectiveness of the campaign and to learn lessons for future campaigns. This way one can repeat effective and successful practices and avoid or change ineffective practices.

7.2 SUMMARY:

- Most of the ads in a campaign appearing in different media are self contained and independent in nature. However, they have a single theme and resemble each other in terms of visual and verbal similarity. The singular theme provides psychological continuity while the visual and verbal similarity provides physical continuity. This way all the ads in a campaign work towards a single goal of informing and persuading.
- An advertising campaign means an organized series of related advertisements prepared and placed in various media over a specific period of time to achieve specific advertising objectives."
- An ad campaign determines what the advertiser wants to say. It also determines how, when, where and to whom the advertiser wants to say it. It also answers the big question - how much to spend? The 'Who' in advertising is the 'target market or audience'? The 'How' is the creative strategy and 'What' is the message. 'Where' is the media strategy, 'When' is the 'timing' or scheduling and 'How much' is the advertising budget.
- Key communication problems (campaign objectives) include: *Informing the consumers, Increasing their awareness level, Changing a negative attitude, To reinforce a message or*

image, To reassure the consumers, To change an image, To create a new image, To create broad differentiation in the minds of the consumers, and To bring about acceptance of goods or ideas, etc.

7.3 KEY WORDS:

Campaign: The term campaign comes from the military. The Webster Dictionary defines a campaign as 'a series of planned actions'. In military maneuvers, a campaign means "a series of planned activities executed in a specific time period, over a specific area to achieve specific goals".

Advertising Campaign: An advertising campaign means an organized series of related advertisements prepared and placed in various media over a specific period of time to achieve specific advertising objectives." An advertising campaign has far greater chances of succeeding because of coordination, balance, proper timing and continuity.

Functions of an Ad Campaign: An ad campaign determines what the advertiser wants to say. It also determines how, when, where and to whom the advertiser wants to say it. It also answers the big question - how much to spend?

Situation Analysis an Ad Campaign: For planning an ad campaign we require information about three things: *The target market or the consumer, The company or product, and The competition.* Information is collected using primary and secondary research techniques. The three important research areas are: *Consumer Research, Product and Company Research, Competitive Research.*

Key Communication Problems: The major communication problems are *Informing the consumers, Increasing their awareness level, Changing a negative attitude, To reinforce a message or image, To reassure the consumers, To change an image, To create a new image, To create broad differentiation in the minds of the consumers, and To bring about acceptance of goods or ideas,* etc.

Competitive Advantage: This involves finding how and in what respects the product is better than its competitors. This analysis tries to find out an area that is important to consumers and if the product has any advantage over its competitors in that area.

7.5 SELF-ASSESSMENT QUESTIONS (SAQs)

1. What is an advertising campaign? Discuss the various steps involved in an advertising campaign.
2. Why should advertising be done in the campaign format? Discuss the benefits of an advertising campaign.
3. Write a detailed note on the planning involved in an ad campaign.
4. Discuss how budgeting is done for an advertising campaign.

5. Write a detailed note on the creative planning in an advertising campaign.

7.6 REFERENCES / SUGGESTED READING:

- ***Advertising* (4th Edition)**; by Jefkins, Pearson Education, Delhi, India; 2006
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- ***Advertising and the Mind of the Consumer***: What Works, What Does Not and Why; Max Sutherland and Alice K. Sylvester; Kogan Page, London; 2000
- ***Advertising: Principles and Practices***; William Wells, John Burnett, and Sandra Moriarty; Prentice Hall, New Jersey;1999