UNIT 14: APPLICATIONS OF MASS MEDIA RESEARCH

UNIT STRUCTURE

14.1 Learning Objectives

14.2 Introduction

14.3 Research in Print Media

14.4 Research in Electronic Media

14.5 Research associated with Advertising and Public Relations

14.6 Online/Internet Research

14.7 Let us Sum up

14.8 Further Reading

14.9 Answers to Check your Progress

14.10 Model Questions

14.1 LEARNING OBJECTIVES

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

- explain the significance of mass media research
- discuss the role of research in different segments of media
- create understanding on the association of research with media activities

14.2 INTRODUCTION

In the previous units we tried to understand the various statistical elements required in research, especially in communication research. In this unit, we are going to discuss and conceptualize the understanding on research activity with various mass media segments. Each and every media outlet have their functioning pattern; and the research helps in underlying the core conceptual grounding. Let us now discuss them one by one.

14.3 RESEARCH IN PRINT MEDIA

The print media research is mainly qualitative in nature. Taking into the account from earlier academic journals, most prevalent form of study on print media research revolves on the survey of reader's interest in newspaper content. However, with the growth of publication industry, the advertisers got an opportunity to use newspapers platform for wider publicity and promotion. This lead to studies in applied research and different houses came out to sponsor their own readership survey.

In print media research there are different segments such as readership, circulation, management, readability, online media use etc. The readership research in print media provides a demographic summary of the readers. In readership research there are two segments lifestyle and psychographic. In psychographic segmentation the readers are provided multiple attitudinal statements and on lifestyle segmentation a series of questions are being asked related to the activities, habits, attitudes and interests. Both psychographic and lifestyle studies provide important scope on understanding editorial aims, circulation goals and target audience.

Magazine readership research comes under the sphere of print media research. There are two prominent techniques associated with magazine readership survey a. Survey Personal Interview b. Mail Survey. While carrying out personal interview, the researcher shows a copy of magazine to the respondent and asked him/her to rate it using a scale of four point. On other hand in mail survey, the media organization sends a copy of the magazine to the respondent and then the respondent marks his/her responses.

An **item selection study** - is another form of print media research. Under this method, the researcher uses two types of data collection methods a. Personal Interviews and b. Phone Interviews. The researcher uses aided recall method, whereby the researcher show a copy to the respondents and the respondents find out the story they remember.

Uses and Gratification Study - It is also a form of study carried out in print media research. Under this research, the researcher determines the motives that lead to the newspaper reading and the psychological rewards. The technique can be applied both for print and online media. There are some common statements used for this form of study.

a. I read the newspaper because it is worthwhile

b. I read the newspaper because it is interesting

c. I read the newspaper for time pass

d. I read the newspaper because it is entertaining

e. I read the newspaper to relive the tension

Journalist-Reader Comparisons - is regarded as the final area of newspaper readership research. A group of journalists asked about important topics and their responses are compared to the responses of the readers. The responses help in enumerating interests, reading habits and usefulness.

Reader-Nonreader Studies - This type of study can be conducted via online, mail interviews, Phono with minor change. The main purpose is to identify the non print-readers and attract them with online editions. Broader studies in this segment carry multiple variables that are beyond the control of newspapers.

Magazine readership research- This form of research is conducted by newspaper houses. Personal interview tool is being used in this form of research for data collection. Respondents are shown a copy of the magazine and they are asked to rate the magazine in four-point scale. Most of the consumer's magazine use audience data taken by Experian Simmons and MRI (Mediamark Research Inc.). For online magazines, the most recent trend is to use online reader panels. The online reader panels sample size is much wider than the traditional panel. The online panel is much cheaper than the traditional panel. More and more data can be generated by online survey panel. Two major agencies provide larger set of data for online readership are NielsenNetRatings and the Audit Bureau of Circulations(ABC).

Circulation Research - This type of research provides a clear picture of newspaper circulation. In current scenario there has been a sharp fall in the newspaper circulation. So most of the publisher comes up with multiple measures to maintain and gain the circulation. Circulation research also looks at the effect of the content variables on the circulation. To understand the reader behavior, circulation research looks at the individual reader as the unit of analysis to understand the effects of delivery aspects on individual behavior.

Readability Research - This form of research comes under the newspaper management research. Readability is the sum total of all elements that defines the success of printed material. The readability success depends upon the level of understanding readers derive from a piece of newspaper and magazine. There are different methods to measure readability among them the prominent one is Reading Ease Formula. Apart from reading ease formula, another form of readability is the 'Fog Index'. This index was developed by Gunning in year 1952. Taylor in 1953 developed another method for measuring readability, known as Cloze procedure.

14.4 RESEARCH IN ELECTRONIC MEDIA

Electronic media research has its root from the year 1920s. In its early period, the broadcasters were busy in assessing the signal which are being sent and received. During the period of World War II radio became a popular medium and started attracting larger audiences across the globe. But the major issue associated with the popularity of radio was government financing. Advertisement became better choice than government financing. The significance of advertisement for radio functioning is the major step for electronic media research.Advertisers are the major player for the initiation of electronic media research. They want clear data or the information about the characteristics of the audiences.

Under the segment of electronic media, the advertisers became interested in knowing the behavior of viewers. This led to the development of new form of research called Psychographics. Such information is valuable

in designing various ad campaigns. Electronic media comes under two broad categories: ratings and non-ratings.

Ratings Research - With the growth of radio the advertisers became more concentrated to grab attention of the customers. The print media has a separate mechanism to assess the circulation pattern. On other hand the radio has a problem in acquiring data. The early attempts of audience measurement failed to provide adequate data. In 1930 a group known as Cooperative Analysis of Broadcasting conducted the first audience surveys for radio.

There are some major agencies associated with ratings measurement worldwide:

a. Nielsen

Nielsen media research is located in Illinois and it is a subsidiary of Nielsen Company. This company was founded in 1945 and has a significant name in the market research.Nielsen media research uses two types of data collection methods: diaries and electronic meters. Meters and Diaries Nielsen uses two types of meters the Set meters and People Meters. The Set meters capture what channel is being viewed and People meters provide information about who is watching.

b. Arbitron

It was founded in year 1949 as the American Research Bureau (ARB). The company name was changed Arbitron Company in 1989. Till 1995 Arbitron provided ratings for local television but currently it focuses on Radio by using Dairies and Portable People Meter (PPM). Arbitron continually monitors the larger markets in the United States (US). It also conducts online radio listening surveys with its online Radio Services Product.

The best known process for data collection is electronic ratings gathering instruments. The People Meter was introduced as the audimeter in 1936. After gradual change and with new innovative technology in 1973 the *audimeter* changed to a new technology called the storage Instantaneous *audimeter* (SIA).

In India three most common methods used for audience research are: the consumer panel, recall method, people meters. The people meter method comprises three technologies: a meter-display unit (MDU), remote-control and Central Data Storage Unit (CDSU). With the growth of Cable TV technology in 1995 the meter data usage was started. Indian Market Research Bureau (IMRB) and ORG-MARG pioneered the use of 'people meters'. The IMRB system was called TAM (Television Audience Measurement) and the ORG-MARG was called IMTAM. In 2007, a second rating agency called aMap started its service. It is able to provide ratings and demographics online to its subscribers. Doordarshan uses Doordarshan Audience Research Television (DART) method for data collection.

14.5 RESEARCH ASSOCIATED WITH ADVERTISING AND PUBLIC RELATIONS

The research in advertisingis generally applied in nature and it is more concerned with specific issue and not associated with theorizing and generalizing to other situations. Advertising research constitutes different research methods such as survey, filed research, focus group and content analysis. Most of the techniques associated with advertising research are industry driven. The data which is generated through this research are used by agencies for evolving multiple strategies. The significant portions of this form of study are market studies and conducted by commercial research firms. Three main functional areas associated with advertising research are copy research, media research and campaign assessment research.

Copy testing is a research technique adopted in advertising research to understand the effectiveness of advertisements and to determine which of the technique is effective. This technique is used in every stage of the advertisement process. In television medium the rough cut of an ad film is screened and the expert associated with the production, design, copy testing etc. provides their opinion to improve the copy. There are different techniques associated with copy testing. Leckenby and Wedding (1982)

suggests a linear process which constitutes which is associated with the cognitive dimension and deals with three important factors of knowing, feeling and doing. In the cognitive dimension the researcher look forwards for important variables such as exposure, attention, awareness, recognition and comprehension.In cognitive dimension a Tachistoscope (T-Scope) measure is used for the recognition of an advertisement.T-Scope method is also used to understand how long subjects take to comprehend the theme of a subject.In the affective dimension important dependent variables are attitude change, liking/disliking and involvement. In affective dimension there are different techniques such as rating scale, projective tests, theater testing, physiological measures and semantic differential scales. The conative dimension revolves around the actual consumer behavior and it is the most important of all dependent variables. Two main categories associated with behavior are actual purchasing behavior and buying predisposition.

Public relations research uses various techniques of quantitative and qualitative research methods. There are three different types of public relations research applied, basic and introspective. Applied research deals with specific practical issues and used to develop public relations campaigns and programs. A branch of applied research is the strategic research that is used to develop public relations campaigns and programs. Another branch is called evaluation research that is used to assess the effectiveness of public relations campaigns. Basic research in public relations is more theory driven and it is more associated with understanding public relations processes. Another form of research associated with public relations is introspective research. There are four step model associated with public relations:



Sedition: Actions or speech urging rebellion against the authority of a state or ruler.

a. Planning public relations programme

b. Defining public relations problem

c. Implementing the public relations programs through actions and communications

d. Finally evaluating the programme

There are qualitative methods in public relations research technique: critical incident technique and discourse analysis. The critical incident technique involves two methods which are in-depth interviewing technique and the case study approach. On other hand the discourse analysis is more advanced technique that examines public relations technique in a more significant manner. The discourse analysis helps in understanding the organization of language at a different level of analysis which is beyond the corridors of sentence and clause.

14.6 ONLINE/ INTERNET RESEARCH

Online Research Methods (ORM) is the process of collecting data from the platform of Internet. It is also known as Internet Research. This field is relatively new and with the growth of social media segments there has been a major advancement in the platform of online research. There are multiple agencies associated with online research. The user generated data are primarily used by multiple organizations to create strategy that helps in their growth. There are popular methods data collection and processing methods such as Cyber-ethnography, online interviews, online content analysis, online focus group selection, social network analysis and web-based experiments. In online research the keywords plays a significant role, through the help of web based search process multiple pages and the information can be traced.

The popular search tools associated with online research process are web search engines, web directories, meta-search engines etc. Through the help of web search engine the web crawler traces hyperlinks that connects the pages on the World Wide Web (WWW). Due to the legal restriction the flagship search engine Google is not linked with Metasearch engine. In current scenario most of the media organizations have their online or internet visibility. To understand the popular and the modern media scenario it is pertinent to understand the internet in a more research oriented manner.

The online research is pertinent for carrying out effective digital strategy for various clients. There are some important questions while forming new online strategy:

a. Key influencers associated with the topic

b. Terminologies your audience are acquainted

c. Kinds of messages circulated within the spaces

Online research is much more impactful than the traditional means of research. The response rate in online research is much quicker than the traditional means. Generally the online research can be carried by using product testing, database mining, and audience targeting.

For carrying out effective online research process there are different methods such as online focus group, online interview, online qualitative research, online text analysis and social networking analysis.



CHECK YOUR PROGRESS

Q.1: What is Uses and Gratification study?

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Q.2: Name some major agencies associated with ratings measurement worldwide.

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Q.3: What is Copy testing?

.....



14.7 LET US SUM UP

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

- For carrying out effective online research process there are different methods such as online focus group, online interview, online qualitative research, online text analysis and social networking analysis.
- Online Research Methods (ORM) is the process of collecting data from the platform of Internet. It is also known as Internet Research.
- There are qualitative methods in public relations research technique: critical incident technique and discourse analysis. The critical incident

technique involves two methods which are in-depth interviewing technique and the case study approach. On other hand the discourse analysis is more advanced technique that examines public relations technique in a more significant manner.

- The people meter method comprises three technologies: a meter-display unit (MDU), remote-control and Central Data Storage Unit (CDSU). With the growth of Cable TV technology in 1995 the meter data usage was started.
- The best known process for data collection is electronic ratings gathering instruments. The People Meter was introduced as the *audimeter* in 1936.
- There are two prominent techniques associated with magazine readership survey a. Survey Personal Interview b. Mail Survey.
- Both Psychographic and Lifestyle studies provide important scope on understanding editorial aims, circulation goals and target audience.



14.8 FURTHER READING

1. Hasan, Seema (2013). *Mass Communication: Principles and Concepts*, 2nd edition. CBS Publishers
2. Kumar, Keval (1998). *Mass Communication in India*, 4th edition. Jiaco Publishing House
3. Khandekar, Vanita (2017). *The India Media Business*, 4th edition: Sage India
4. Singhal, A. and Rogers, E. (2000). *India's Communication Revolution: from Bullock Carts to Cyber Marts*, 1st. edition: Sage India.



14.9 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1: It is a form of study carried out in print media research. Under this research, the researcher determines the motives that lead to the newspaper reading and the psychological rewards.

Ans. to Q. No. 2: Nielson and Arbitron

Ans. to Q. No. 3: Copy testing is a research technique adopted in advertising research to understand the effectiveness of advertisements and to determine which of the technique is effective. This technique is used in every stage of the advertisement process.



14.10 MODEL QUESTIONS

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

Q. 1: What are Nielsor Net Ratings and ABC?

Q. 2: When the People Meter was introduced as Audimeter in India?

Q. 3: Doordarshan uses which method for data collection?

Q. 4: What are the common methods used for Audience Research?

Q. 5: What is readability research?

Q. 6: Write a short note on the process of Copy testing.

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

Q. 1: Explain the process associated with electronic media research.

Q. 2: What are common research methods adopted by print media to assess the circulation pattern? Explain detail the function of ORM methods in assessing the effectiveness of online media users.

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UNIT 15: ROLE OF COMPUTER IN RESEARCH

UNIT STRUCTURE

15.1 Learning Objectives

15.2 Introduction

15.3 Important characteristics of Computer

15.4 Application of computers in the field of research

15.5 Computer Monitored Data

15.6 Limitations of computer-based analysis

15.7 Loss of data due to malware

15.8 Let us Sum Up

15.9 Further Readings

15.10 Answers to Check your Progress

15.11 Model Questions

15.1 LEARNING OBJECTIVES

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

- describe the basic functioning of a computer
- explain its usefulness
- discuss its uses in the research study
- list its limitations
- clarify Computer-based monitoring, and
- analyse the causes of data loss

15.2 INTRODUCTION

In today's world, we use computers for almost all our tasks. Our day-to-day activities: paying bills, buying groceries, using social media, seeking entertainment, working from home, communicating with a friend, calculations for research, etc., can all be done using a computer. So, it is important not only to know how to use a computer but also to understand the components of a computer and their functioning.

A computer is a sophisticated electronic machine that accepts input information, processes the information according to stored instructions and finally produces the resulting output information. Based on the functions performed by the computer, the components of a digital computer are:

- **the input unit** (it takes information),
- **the processing unit** (it processes information),
- **the memory unit** (it stores information) and
- **the output unit** (it outputs or gives the result of data).

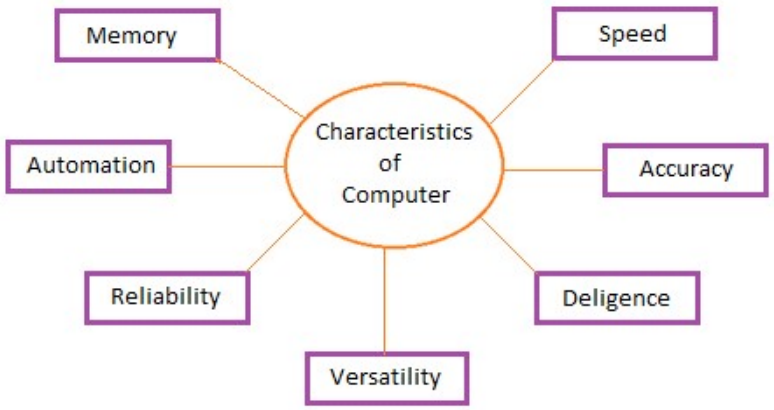
The data part is the path through which your information flows. ***The Arithmetic and Logical Unit*** called the **ALU** includes functional units like adders, subtractors, multipliers, shifters etc and you also have registers which are used as storage media within the processor because the data has to be stored somewhere for processing. These registers are inbuilt storage mechanisms available within the processor and the **ALU** is used for performing all arithmetic and logical operations. The Central Processing Unit or CPU is the control path of a computer which coordinates the activities of the various units. The data storage consists of the memory unit which stores all the information that is required for processing the data as well as the programme.

The programme in a computer is a list of instructions which is stored in memory. An **operating system** (lists of instructions) is the software that controls the system's hardware and interacts with user and application software.In short, an operating system is a computer's chief control programme.

The data we use in the computer could be decimal numbers, binary numbers or octal numbers, or encoded characters. The memory unit stores instructions as well as data as a sequence of bits. Such groups of bits stored or retrieved at a time and processed normally arecalled a word. The word length of the processor depends upon the processor that you're looking at, if it is an 8-bit processor, the word length is eight. If it's a 64-bit processor, you talk about a word length of 64. When you talk about a processor which has a word length of, say, 64-bits, it means typically the processor operates on 64 bits of data.

15.3 IMPORTANT CHARACTERISTICS OF A COMPUTER

The computer has always helped in serving the difficulties faced by human beings. By the passing of time, computers have been reduced in size for convenience. A computer performs many functions and does a variety of jobs with speed and accuracy. Today, life has become impossible to imagine without computers. They are used in schools and colleges and have become an indispensable part of every business or profession. Research is also an area where a computer is playing a major role. A computer can be characterized by the following terms -



Speed

A computer works with much higher speed and accuracy compared to humans while performing mathematical calculations. Computers can process millions of instructions per second.

Accuracy

Computers perform calculations with 100% accuracy. Errors may occur due to data inconsistency or inaccuracy on the part of the operator. Computers rarely commit errors and do all types of tasks precisely.

Diligence

A computer can perform millions of tasks or calculations with the same consistency and accuracy. It doesn't feel any fatigue. Its memory also makes it superior to that of human beings.

Versatility

Versatility refers to the capability of a computer to perform different kinds of work with the same accuracy and efficiency.

Reliability

A computer is reliable as it gives consistent results for a similar set of data i.e., if we give the same set of input any number of times, we will get the same result.Sometimes there can be failures of a computer system due to internal and external reasons.This is why a backup facility is required.

Automation

A computer performs all the tasks automatically i.e. it can perform tasks without manual intervention.

Memory

A computer has built-in memory called primary memory where it stores data. Secondary storage is removable devices such as CDs, pen drives, etc., which are also used to store data. Apart from this physical storage, there is another virtual storage unit like the cloud too, where millions of data can be stored.

15.4 APPLICATION OF COMPUTER IN THE FIELD OF RESEARCH

Computers are used in scientific research immensely and it is an important tool especially when a large number of samples is used. There are various steps necessary to effectively carry out research and computer can be used to carry out different phases of the research process.

A research process has five major phases: conceptual phase, design and planning phase, empirical phase, and data analysis phase. Computer is used in all these phases of research.

a. Conceptual Phase

In this phase, we have to formulate the research problem, do review of literature, create theoretical framework and formulate hypothesis. Here, a computer can help us in searching the existing literature; like finding

the relevant existing research papers so that researcher can find out the gap in the existing literature. Researchers can do a 'text search' to find, count and retrieve necessary literature which is relevant to the study.

Bibliographic references can also be stored through the World Wide Web or in Microsoft Word. We can give commands on the computer that can help us write references, which can be written automatically in different styles like for any kind of research journal (National/International), book etc. This eventually saves a lot of time for the researcher. Because of the computer, the researcher need not visit all the libraries many libraries of the world have online access system. By taking the membership of a library or by buying a journal provider system, a researcher can work from home. It helps researchers to know how a theoretical framework can be built.

b. Design and Planning Phase

Computers can be used for many things like deciding population (numbers),samples, questionnaire designing and data collection. Various internet sites are available that help one to design a questionnaire (example: Google Form). Several software (based on the type of study, this software can be of different types that give different instructions/ commands to analyse) can be used to calculate the sample size as well.

A computer makes a pilot study of the research possible. In the pilot study, sample size calculation and standard deviations are required where a computer can provide all the help we need. Today, a researcher can also use extensive online -interactive apps or sites for designing the research and for conducting academic discussions.

c. Empirical Phase

The computer helps in both collecting data and data analysis. After collecting data, it is stored on computers in word files or Excel sheets or in other formats (based on the analysis/software we use). The important applications used in scientific research are data storage, data analysis, scientific simulations, instrumentation control and knowledge sharing. Necessary corrections are made or edited whenever it is required. Otherwise, it will be a time-consuming process.

The process of coding- which is common for data analysis in social science has become easier due to computer applications.Computers help in referring, editing and managing data. The computer allows for greater flexibility in recording the data and made the analysis easier. In research, preparation and inputting data are the most labour-intensive. It consumes a lot of time. Data is being converted into a form which is suitable for the computer. It can be coded on the excel sheet. These excel spreadsheets can be directly opened with the statistics software for analysis.This journey took a huge time during the days of typewriting.

d. Data Analysis

Data analysis and interpretation can be done with the help of computers. For data analysis, manysoftwares are available. These softwares help in using techniques for analysis like average, percentage, standard deviation, correlation, chi-square test etc. The software used is different, depending on the calculations we do (business, industry, scientific, statistical, technological and so on). Some very sophisticated instrumental data calculations(example: SPSS) can be done easily with the help of a computer. They can also be used for checking the reliability and validity of data, establishing and testing hypotheses, etc.

Computers are used in interpretation as well. It can check the accuracy and authenticity of data. It helps in the preparation of tables by which a researcher can interpret the results easily.

Computers are nowadays used to simulate and study complex systems by applications of mathematics, physics and computer science. This process is called computational modelling. You may have heard about the use of Computer simulation models in business, weather forecasting, flight simulations, crash modelling, health sector etc. Likewise, computer modelling can be used in research to predict what will happen to a system. Computer modelling can be considered as a prototype or visual representation of either the whole system or part of the information system that allows scientists to conduct simulated experiments. Before establishing a computer model for acceptance, a researcher needs to do

thousands of experiments from the existing data for reliability and validity. Computer models are beneficial for making quick alterations in the method of data processing and to see the outcomes or predict any dangerous outcome.

e. Research Writing and Dissemination

After interpretation, a computer helps in using the results in preparing a research article or report/dissertation which can be published. Today, regional languages have been incorporated in to the writing and presentation process through various software or apps by many institutions. After completion, the report can be stored in a memory **storage device** or in a **cloud system**; which is been developed to store files without any fear of losing them. Some software can help you to check the language of your writing. While free versions are available, some others may require payments for use.

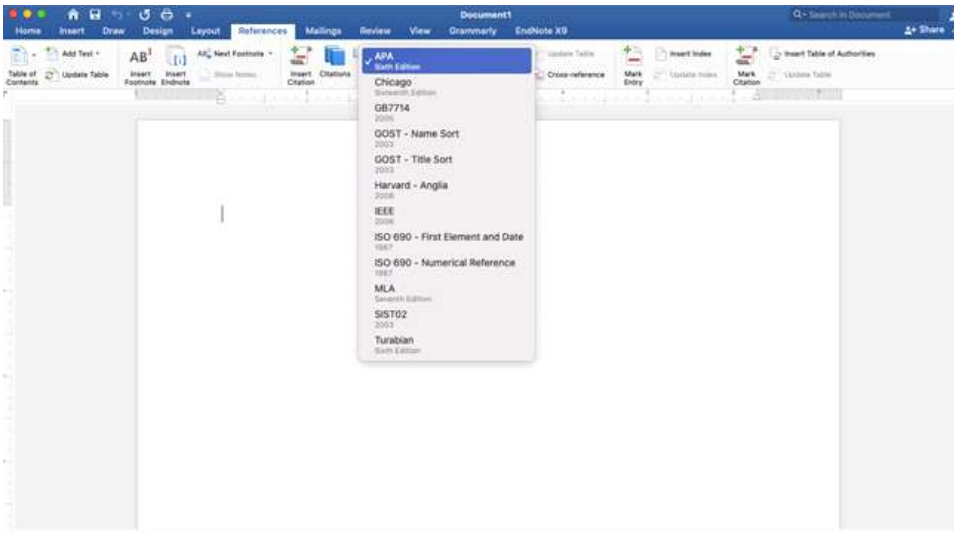
These days, dissemination of research is done by the extensive use of a computer. Email is a convenient mode for communication of your research with your supervisor as well as for publication.

During Covid 19 pandemic, increasing online modes of discussion have accelerated the use of computers in academic discourse.

f. References Writing

A researcher needs to present the sources of the literature studied and discussed in the references section so that the reader can understand the basics of the work and the advancement made through the present study. Here also computers lend you a helping hand in preparing references. The references can be written in different styles depending on the format you want; like in APA, MLA, Chicago Manual or Harvard format etc. All the details of authors, journals, publication volume,and book name can be filled in these options "reference" given on the computer and it automatically changes the information into the required style. Some softwares like Medley and Endnote are used to manage the references. A researcher need not worry about remembering all the articles from where literature is taken, it can be easily managed with the help of this softwares.

Microsoft Word can also be used as a reference tool. You will find the reference icon in the bar of a page.



A reviewer can also check and suggest modifications to your work through your computer.

15.5 COMPUTER MONITORED DATA

Computer monitoring is an automatic logging process of the type, content or time of transactions made by a user from a terminal with the system. Most monitoring studies involved two systems: (i) an Information retrieval system (IR) or (ii) a Computer-based communication system (CBC).

Discussing the use of computer-monitored data in Information science and communication research, Ronald E Rice and Christine L Borgman reveal that computer-monitored data from IR and CBC systems are useful in evaluation and impact research.

In an IR system, users can directly access and interrogate machine-readable databases and documents. It may be either a bibliographic database (example: literature such as journal articles or books) or a *nonbibliographic* database (anything other than a bibliographic database, such as statistical files, company records, stock exchange activity etc.) 'Online catalogue' used by many libraries is an example of IR system. Monitoring studies of IR systems are not used to study user behaviour.

With the help of the CBC system, a researcher can 'send a text (data, memories, letters, reports etc.) to one another (to several individuals or groups) or may share files (conference comments, working drafts, co-authored papers, programmes etc.) while communicating (usually not at the same time) via geographically dispersed terminals i.e. video or hard copy using a shared host computer ad telecommunication lines (national networks, cable etc.)' (p 248). Behaviour study can be done in CBC system. An electronic journal is an extension of the CBC system.

A computer monitoring system produces large datasets. The researcher can collect some of the following sensitive data points from both IR and CBC systems:

i. Terminal and user identification numbers (All organisations have different user numbers)

ii. Various commands used by a system

iii. Complete content or text including use of keywords, topic, code, message received and communicated, start and end time, total period etc.

iv. Audience categorisation as per the use along with frequency database

v. Errors and bad entries (for example illegal commands) etc.

Computer monitored data can thus help you to explore and discuss patterns of system usage, error and time analysis. A combination of all these analyses can lead to a helpful model of IR/ CBC behaviour user patterns. Monitor data can provide

(i) Direct and immediate diagnostic aid to the users

(ii) Group or individual user evaluation (i.e. user preferences, success/ satisfaction etc.)

(iii) System protection (e.g.) diagnosis of attempts of unauthorised system access and System Evaluation

15.6 LIMITATIONS OF COMPUTER BASED ANALYSIS

Our world has become computer-dependent. The recent inclusion of Artificial Intelligent has opened up many possibilities in the research field too. Yet, computers have some limitations in the field of research:

Computers are only ‘dumb’ machines that work according to the instructions which are provided. As such, there might be chances of error in analysis. Moreover, as a computer has no decision making power, the researcher needs to be cautious enough for choosing the right programme or software suitable for the research computation and analysis. Apart from these, there are some other limitations as mentioned below:

(a) Unavailable resources

While database systems help the researcher to find resources easily, it is not easy all the time to access and have required data due to unavailable resources. Such data are available in non-digital format.

(b) Unintentional plagiarism

Sometimes, similarities in content, idea, diagram or writing can happen unintentionally which is marked by software as plagiarism.

(c) Deceptive websites

Due to abundant sources of information on websites, a researcher has to check a website for the authenticity of the information.

(d) Time-dependent behaviour

The biggest drawback of a computer is that it needs a constant update in software. Moreover, new versions of a system or software demand a researcher to be updated with this time-dependent behaviour of the computer

15.7 LOSS OF DATA DUE TO MALWARE

a. What is data loss

You might have heard the word 'Data loss'. It occurs when valuable information on a computer is compromised due to theft, human error (accidental deletion or overwriting of files, spilt liquids), viruses, malware,

or power failure. It may also occur due to physical damage or mechanical failure or equipment of an edifice.

b. Malware attack on computer

Malware attack is a common word for computer users. Malware is software which is designed to cause harm to a computer or computer system. You might have heard about 'data leakage', and 'unauthorised access to a system'. These are also caused by malware. You should know thatnot all malware poses a direct threat to data though these might be destructive in other ways.There are numerous other forms of cyberattacks that do put your data at risk.

Data exposure malware: 'Data exposure' involves taking sensitive, privately stored data and putting it in a publicly viewable location. It was considered one of the worst kinds of cybersecurity breaches in 2018.

Denial of Service (DoS): It is a kind of cyber attack. DoS attacks on websites happen when attackers flood a page with so much traffic that it crashes the site and thus makes the network resource unavailable/ inaccessible to the users.

Data deletion and modification: Some malware, like Trojans or the W32.Narilam worms are designed to delete or modify sets of data from a computer or a database.

Data theft: Aside from simply destroying or encrypting data, sophisticated hackers or data thieves are using malware to steal sensitive information. The hackers then sell the data for money or other interests, especially if it's users' passwords.

Hijackers: Hijacking on the computer means unauthorised control of network security by malware. Hijackers in general, redirect users' browsers to unwanted ads or websites.

Technical writer Ben Lutkevich talks about various kinds of malware like :

Virus: It infects programmes or files.

Worm: It can self-replicate without a host programme

Trojan horse: It is designed to appear as a legitimate software programme but once activated, it can execute malicious functions.

Spyware: It collects information and data without the knowledge of the user.

Ransomware: It encrypts important data and throws away the key. Cyber attackers then demand money to decrypt the information. Ransomware has been around for years, but it caught attention worldwide in 2017 after WannaCry and NotPetya disabled thousands of computers across the globe. While recent trends suggest that ransomware is declining, the attacks are getting more sophisticated. Most attacks occur when users inadvertently open infected emails, but WannaCry and NotPetya both exploited known vulnerabilities in Windows.

Rootkit: It obtains administrator-level access -level access. If installed, the programme allows the attackers to access the system.

Adware: It is more advanced. Adware can trace the history of browsing by the user 'with an intent to display pop-ups' or banner advertisements' so that users are lured for purchasing.

Keyloggers: Keyloggers can monitor or track almost everything that a user does on a computer including email, webpages, programmes etc.

Various statistics show thatmalware is the third most common cause of data loss and system malfunction in the world. To protect computers from data loss you should: (i) back up everything in a different storage device or email yourself, every time you update your files, Use paid versions ofanti-malware& antivirus solutions and update your system constantly.



CHECK YOUR PROGRESS

Q.1: What is ALU?

.....

Q.2: What is CPU?

.....

Q.3: What is Computer monitoring?

.....

Q.4: What is the meaning of hijacking on computer?

.....



15.8 LET US SUM UP

- Our world has become computer-dependent. The inclusion of Artificial Intelligent has opened up many possibilities in the research field too.
- A computer is characterised by some characteristicslike its high speed, reliability, versatility, automated function mode, accuracy etc.
- Computers are used in scientific research immensely and it is an important tool especially when a large no. of samples is used. The research process has five major phases (conceptual phase, design and planning phase, empirical phase, and data analysis).
- Computers are also used in research writing, dissemination of research materials and presentation of research works.
- Computer-monitored data can be broadly divided into two groups: (i) Information retrieval system (IR) or (ii) Computer-based communication system (CBC). Such data have made research easier these days.
- Although the computer is a great assistant for a research scholar it has many limitations as well. Therefore, a researcher should take proper precautions to save and store the data



15.9 FURTHER READING

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15.10 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1: The Arithmetic and Logical Unit called the ALU includes functional units like adders, subtractors, multipliers, shifters etc and you also have registers which are used as storage media within the processor because the data has to be stored somewhere for processing.

Ans. to Q. No. 2: The Central Processing Unit or CPU is the control path of a computer which coordinates the activities of the various units.

Ans. to Q. No. 3: Computer monitoring is an automatic logging process of the type, content or time of transactions made by a user from a terminal with the system.

Ans. to Q. No. 4: Hijacking on the computer means unauthorised control of network security by malware. Hijackers in general, redirect users' browsers to unwanted ads or websites.



15.11 MODEL QUESTIONS

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

Q. 1: What is coding?

Q. 2: Name one software used in data calculation.

Q. 3: What is computational modelling?

Q. 4: Name two reference systems used in reference writing.

Q. 5: What do you mean by 'text search?

Q. 6: Name the two systems of computer-monitored data

Q. 7: What are the characteristics of a computer?

Q. 8: State the components of the computer.

Q. 9: Write about the significance of computational modeling.

Q. 10: Write a note on

(a) Use of computer in reference writing

(b) Limitations of computers in research

(c) Computer 'data loss'

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

Q. 1: Explain how a computer can be used in research.

Q. 2: What do you mean by a Malware attack on a computer? Explain.

Q. 3: Briefly discuss the need and significance of computer-monitored data

*** ***** ***



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Name of the Paper: Course Code:

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Learner's Feedback on Course

Dear Learner,

Regarding the course as mentioned above, we would like to know your opinions and comments so as to improve the quality of self learning materials in future. Please respond to the following statements by ticking the number you feel most reflect your opinion. After completion of the additional comments, please detach the page and send/mail the same to us at the address given below.

The Director, Centre for Internal Quality Assurance, KKHandiqui State Open University
Housefed Complex, Dispur, Guwahati- 781006
(E-mail id: ciqa@kkhsou.in)

1. Approximately how many hours did you spend for studying the units in the course? | | | |
2. Please give your opinions (by √ mark) to the following items based on your reading of the block:

Sl. No.	Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I.	The SLMs of the course fulfil the learning objectives set out in the beginning of each unit					
II.	The units of the SLM could satisfy my academic needs and expectations					
III.	The Unit writers have excellent knowledge about the course contents					
IV.	Language and contents of the units were presented at a level which I could readily understand					
V.	Ample opportunity for participation in the activities provided in the units					
VI.	Used enough Illustrations (Diagrams, tables etc.) for conceptual clarity					
VII.	Quality of content is engaging, relevant, and up-to-date					
VIII.	The self check questions are very helpful					
IX.	The Possible/model questions and the answers to check my progress have benefited me a lot					

Additional Comments: *(Please feel free to provide your open comments)*

1. Which aspects of the SLM, according to you, worked well?

   ---

2. What sort of changes/improvements do you feel KKHSOU could implement to improve the overall quality of the SLM?

Thank you for taking the time to complete this form.

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