

Professional English

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Preface

Communication, the most important soft skill, is the cornerstone of our personal, academic, and professional success. Clear, efficient, and accurate professional communication—both oral and written—can exert a positive impact on any organization’s credibility. From sharing all kinds of information through various forms of organizational communication, namely, meetings, presentations, discussions, and emails to preparing different kinds of technical documents such as reports, proposals, and instruction manuals, professional communication plays a major role in any organizational set-up.

As you are aware, language is the key to effective communication. Considering the pervasive use of English language across the globe, one needs to enhance their English proficiency in order to communicate effectively in today’s global environment. Strengthening one’s skills in Listening, Speaking, Reading, and Writing (LSRW)—the four basic language skills—can enable an individual to climb the ladder of success with élan and confidence. This book aims at enhancing one’s understanding of the nuances of professional and technical English used to carry out the various communication activities at workplaces, thereby enabling students to sharpen their communication skills in English.

About the Book

The textbook has been developed as per the latest syllabus of Professional English. The five modules of the syllabus are completely covered in Chapters 3 to 7 of the book. In addition, the book includes two introductory chapters along with two additional readings. The content has been organized keeping in mind the role of different types of technical communication skills in the academia and workplaces. In alignment with the university course, various kinds of chapter-end exercises have been included in the text with a view to help you acquire the necessary linguistic and soft skills.

Key Features

- Covers the syllabus completely
- Includes model test papers based on the latest syllabus

Coverage and Structure

The text has been divided into five modules comprising seven chapters.

*Introductory chapters 1 and 2, **Basics of Technical Communication** and **Barriers to Communication**,* provide an introduction to technical communication, barriers usually found in the process of communication, and ways to tackle them.

*Chapter 3, **Basics of Technical English** (Module 1),* discusses the nature of technical English and the different approaches to technical communication; listening, reading, writing, and thinking strategies; and modes of speech delivery.

*Chapter 4, **Components of Technical Writing*** (Module 2), includes discussions on vocabulary building, word formation, technical words, root words from foreign language and their usage, and requisites of forming a sentence.

*Chapter 5, **Basic Technical Writing Skills*** (Module 3), covers business and official writing, sentence patterns and the salient points of sentence construction, essential components of a paragraph, and techniques of good technical writing.

*Chapter 6, **Common Grammatical Errors and Technical Style*** (Module 4), includes usage of important parts of speech, role of subject–verb agreement in sentences, and ways to avoid clichés and redundancies in writing. Types of modifiers and paragraphs are discussed at length too.

*Chapter 7, **Presentation Strategies and Oral Communications*** (Module 5), discusses important factors to be considered while planning a presentation, significance of kinesics in face-to-face communication, various paralinguistic features of human voice, and barriers to organizational communication.

Additional Readings on Interviews and Technical Proposals are provided at the end of the book.

Acknowledgements

First and foremost, we thank our colleagues and family for their support and cooperation. We would also like to thank Sakshi Sharma for suggesting students' perspectives on various topics, and Prof. Aeda Abidi, Assistant Professor, Inderprastha Engineering College, Ghaziabad for developing the model test papers.

We would like to place on record our appreciation to the editorial team of Oxford University Press India for their meticulous planning and execution of this project.

We hope that this book meets the expectations of students and faculty who wish to enhance their communication skills and English proficiency. Any suggestions and comments to improve the text are welcome. You can reach us at raman.mee@gmail.com and 38.sangeeta@gmail.com.

Meenakshi Raman
Sangeeta Sharma

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1

Basics of Technical Communication

After going through the chapter, you will be able to understand

- the importance of technical communication
- how general-purpose communication is different from technical communication
- the objectives and characteristics of technical communication
- the constituents of the communication process
- the different levels of communication
- how and why visual aids are used in technical communication

INTRODUCTION

Technical communication plays a pivotal role in any set-up, whether it is a business enterprise, an industry as a whole, or an academic institution. All managerial or administrative activities involve communication, be it planning, organizing, recruiting, coordinating, or decision-making. When you write reports, give instructions, or read brochures and manuals, you are involved in the process of communication. Communication serves as an instrument to measure the success or growth of an organization. For example, papers published by R&D organizations bring to light their progress. When the chief executive officer (CEO) of an organization presents his/her company's achievements in a meeting, each of the participants comes to know of these milestones. The higher one's position is, the greater is their need to communicate. A labourer, for example, may not be as involved in formal communication as a top-level executive. The various types of communication not only help an organization to grow, but also enable the communicators to develop the required skills.

However, though most professionals are well aware of the importance of communication, they do not develop their skills to good effect in their sphere of work. The more people participate in the communication process, the better they develop their skills in collecting and organizing information, analysing and evaluating facts, appreciating the difference between facts and inferences, and communicating effectively. To become an effective communicator, one needs to communicate, communicate, and communicate. There is no other way out.

GENERAL AND TECHNICAL COMMUNICATION

Communication is important not only in an organization but also in one's daily life. It is an integral part of daily activity. When an alarm clock goes off, it is communication through

sound, urging one to get out of bed. When one feels loyal towards a particular brand of toothpaste, it is possible that the television (TV) commercials for that brand have been successful in communicating the message. Watching news on TV, saying goodbye to one's family, or calling a cab and giving directions are all different types of communication. At the workplace, all activities revolve around oral or written communication. Interacting with one's boss, reading the newspaper at home, or even dreaming in one's sleep are all examples of communication.

Messages that are non-technical or informal in nature are categorized as general-purpose communication, whereas messages pertaining to technical, industrial, or business matters belong to the category of technical or business communication. Table 1.1 shows the differences between the two categories.



Communication in everyday life

Table 1.1 DIFFERENCES BETWEEN GENERAL AND TECHNICAL COMMUNICATION

General communication	Technical communication
Contains a general message	Contains a technical message
Informal in style and approach	Mostly formal
No set pattern of communication	Follows a set pattern
Mostly oral	Both oral and written
Not always for a specific audience	Always for a specific audience
Does not involve the use of technical vocabulary or graphics, etc.	Frequently involves jargon, graphics, etc.

OBJECTIVES AND CHARACTERISTICS OF TECHNICAL COMMUNICATION

Technical communication takes place when professionals discuss a topic with a specific purpose with a well-defined audience. Technical communication usually has the following objectives:

- To provide organized information that aids in quick decision-making
- To invite corporate joint ventures
- To disseminate knowledge in oral or written form

Let us take an example of a customer who has bought a washing machine and does not know how to use it. The customer reads the instructions in the user manual and gradually learns to operate the washing machine without any assistance. This is an example of successful technical communication. When you are

confused about which camera to buy, the salesperson explains all the technical features of each model to you. If that helps in your buying decision, it is successful technical communication again.

Technical communication has to be correct, accurate, clear, appropriate, and to the point. Correct information is objective information. The language should be clear and easy to understand. If the communication is through a user manual for a phone, remember that people will usually never use it unless they are stuck. And if they are stuck, they will look for instant information to solve their problem. The information must be brief and arranged sequentially so that it is easy for a user to find relevant information. It is also vital that the technical information provided in the manual be accurate.

PROCESS OF COMMUNICATION

For sharing information, two parties are required—the sender and the receiver—without whom communication, which is an interactive process, cannot take place. At any given time, one is active and the other is passive. However, this is not sufficient; there should also be cooperation and understanding between them. Through what they have to communicate, the sender and receiver mutually influence each other. They should have a mutually accepted code of signals making up a common language. So, communication can

Communication can be defined as the exchange of information, ideas, and knowledge between a sender and a receiver through an accepted code of symbols.

be defined as the exchange of information, ideas, and knowledge between a sender and a receiver through an accepted code of symbols. It is termed effective only when the receiver receives the message intended by the sender in the same perspective. Otherwise it becomes miscommunication.

Communication Cycle

Consider the communication process shown in Figure 1.1. The communication cycle involves various elements, as discussed in the following paragraphs.

The first step is *formulation*, wherein the sender forms the content of the message to be sent. This formulation depends on the level of experience, intelligence, knowledge, and purpose of the sender.

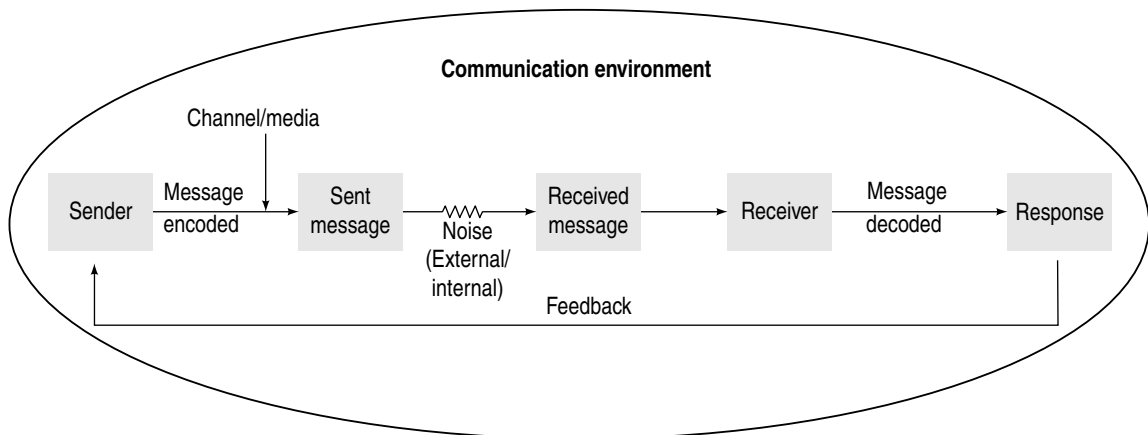


Figure 1.1 THE PROCESS OF COMMUNICATION

The content, once formed, is called the *message*. The sender *encodes* the message using a basic *tool*. This tool is nothing but the language used—words, actions, signs, objects, or a combination of these. Once encoded using proper language, the message is ready to be delivered. This delivery happens through *channels* or media of communication. It can be face-to-face, on paper, or through electronic or digital media such as the Internet. The *receiver* receives the message, *decodes* it, and acts on it. If the message received is the same as the message sent, there will be an appropriate response; if not, there will still be a response, but probably an inappropriate or unexpected one, as there has been a breakdown or interference in the communication. This may happen because of *noise*. *Noise affects the decoding part of the communication process.*

'How well we communicate is determined not by how well we say things, but how well we are understood.'

—Andrew Grove

The transmission of the *receiver's response* to the sender is called *feedback*. Feedback is essential, as it measures the effectiveness of communication. When a message is sent, the communication cycle is complete only when there is a response from the recipient of the message. Otherwise, the message needs to be re-sent. When a response is received, the message has been successfully delivered

to the other party. For example, you put up a notice asking the members of your student council to attend a meeting on a specified date, at a particular time, at the location mentioned. On the day of the meeting, you find that some of them have come while the others have not turned up. In this case you have obtained both positive and negative responses to your message. However, since you have got some feedback, the communication process is complete. You also know that it has been effective, at least from your side. Hence, to know whether the communication has been successful or not, there must be some feedback, which is nothing but an observation of the recipient's response. *The communication is fully effective only when there is a desired response from the receiver.*

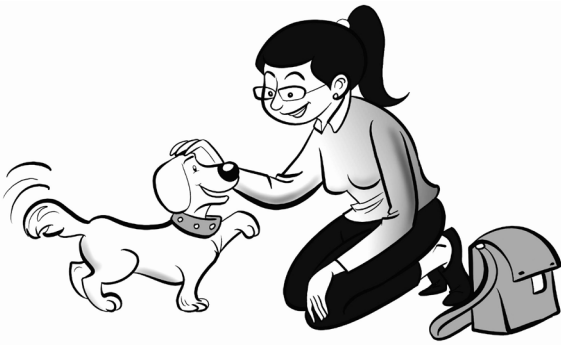
Effective communication takes place in a well-defined set-up. This is called the *communication environment*. A classroom is the communication environment when a teacher delivers lectures to students. If such a communication is attempted without a proper environment, it will not have the desired effect. Similarly, a teacher's cubicle becomes the communication environment when a student privately approaches the teacher. Thus, the essentials of *effective communication* are as follows:

- A well-defined communication environment
- Cooperation between the sender and the receiver
- Selection of an appropriate channel
- Correct encoding and decoding of the message
- Feedback

LEVELS OF COMMUNICATION

Having understood the communication process, let us now study the various levels at which human communication takes place (we will discuss only four levels in this chapter):

- Extrapersonal
- Intrapersonal
- Mass
- Interpersonal
- Organizational



Extrapersonal Communication

Communication between human beings and non-human entities is extrapersonal. For example, when your pet dog comes to you wagging its tail as soon as you return home from work, it is an example of extrapersonal communication. A parrot responding to your greeting is another example. More than any other form, this form of communication requires perfect coordination and understanding between

the sender and the receiver because at least one of them transmits information or responds in sign language only.

Intrapersonal Communication

Intrapersonal communication takes place within an individual. We know that the brain is linked to all parts of the body by an electrochemical system. For example, when you begin to 'feel hot', this information is sent to the brain and you may decide to 'turn on the cooler', responding to instructions sent from the brain to the hand. In this case, the relevant organ is the sender, the electrochemical impulse is the message, and the brain is the receiver. Next, the brain assumes the role of sender and sends the feedback that you should switch on the cooler. This completes the communication process. This kind of communication pertains to thinking, which is the basis of information processing. Without such internal dialogue, one cannot proceed to the further levels of communication—interpersonal and organizational. In fact, while we are communicating with another party, our internal dialogue with ourselves continues concurrently—planning, weighing, considering, and processing information. You might have noticed that at times you motivate yourself or consciously resolve to complete a certain task. Self-motivation, self-determination, and the like take place at the intrapersonal level.



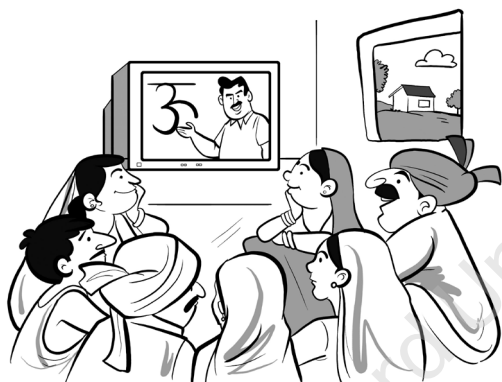
Interpersonal Communication

Communication at this level refers to the sharing of information among people. To compare it with other forms of communication, such as intrapersonal, organizational, etc., we need to examine how many people are involved, how close they are to one another physically, how many sensory channels are used, and the feedback provided.

Interpersonal communication differs from other forms of communication in that there are few participants involved, they are in close physical proximity to each other, many sensory channels are used, and feedback is immediate. Also, the roles of the sender and receiver keep alternating. This form of communication is advantageous because direct and immediate feedback is possible. If a doubt occurs, it can be instantly clarified. Note that non-verbal communication plays a major role in the interpretation of a message in this form of communication due to the proximity of the people involved.

Interpersonal communication can be *formal* or *informal*. For example, your interaction with a sales clerk in a store is different from that with your friends and family members; the interaction between the panel members and the candidate appearing at an interview is different from the conversation between two candidates waiting outside. Hence, depending upon the formality of the situation, interpersonal communication takes on different styles.

Moreover, most interpersonal communication situations depend on a variety of factors, such as the psychology of the two parties involved, the relationship between them, the circumstance in which the communication takes place, the surrounding environment, and finally the cultural context.



Mass Communication

Mass communication is meant for large audiences and requires a medium to transmit information. There are several mass media such as journals, books, television, and newspapers. The audience is heterogeneous and anonymous, and thus the approach is impersonal. Press interviews given by the chairman of a large firm, advertisements for a particular product or service, and the like take place through mass media. This type of communication is more persuasive in nature than any other form, and requires utmost care on the part of the sender while

encoding the message. Oral communication through mass media requires equipment such as microphones, amplifiers, etc., and the written form needs print or visual media. The characteristics of mass communication are as follows:

Large reach Mass communication has the capacity to reach audience scattered over a wide geographical area.

Impersonality Mass communication is largely impersonal, as the participants are unknown to each other.

Presence of a gatekeeper Mass communication needs additional persons, institutions, or organizations to convey the message from a sender to a receiver. This 'gatekeeper' or mediator could be a person or an organized group of persons active in transferring or sending information from the source to the target audience through a mass medium. For example, in a newspaper, the editor decides which news makes it to the hands of the reader. The editor is therefore the gatekeeper in this mass communication process.

VISUAL AIDS IN TECHNICAL COMMUNICATION

Visual aids are an important part of written technical communication. You might have observed that most technical reports, whether they are laboratory reports, project reports, or feasibility reports, include illustrations

An illustration is a visual representation such as a drawing, painting, photograph, or other work of art that stresses subject more than form.

such as tables, graphs, maps, diagrams, charts, or photographs. In fact, text and illustrations are complementary in technical communication. Visual aids are also used extensively in presentations, to support the facts and figures being presented. Graphics can be used to represent the following elements in technical writing:

Concepts

This element depicts non-physical, conceptual things and their relationships. If you want to show how your company is organized, that is, the relationships between the different departments and officials, you could set up an organization chart—boxes and circles connected with lines that show how everything is hierarchically arranged and related. This is an example of a graphic depicting a concept.

Objects

Photographs, drawings, diagrams, and schematics are the types of graphics that show objects. If you are describing a fuel-injection system, you will probably need a drawing or diagram to explain the system properly. If you are explaining how to graft a fruit tree, you will need some illustrations of how it is done.

Numbers

Numbers are used while presenting data and statistics. If you are discussing the rising cost of housing in a particular city, you could use a table, with the columns showing the data for five-year periods since 1995. The rows could be for different types of housing. You could show the same data in the form of bar charts, pie charts, or line graphs.

Words

Graphics are also used to depict words. You have probably noticed how textbooks put key definitions and examples in boxes with words.

To further understand visual aids, let us answer the following questions:

- When to use?
- Why to use?
- How to use?
- What are the types?



When Illustrations are very effective when there is a mass of statistics and complex ideas to be represented. Statistical data is best explained through tables, graphs, charts, maps, diagrams, or photographs. As already mentioned, text and illustrations are complementary in technical communication. Hence, whenever the information to be communicated is too complicated or technical to transmit just through words, we use visual aids. However, they should not be used just for the sake of using them.

Why Visual communication has more impact than verbal communication. Using illustrations has many advantages:

- Arouses interest and focuses on essentials
- Leads the reader to quicker comprehension
- Supports and reinforces words
- Saves much time and effort in explaining and interpreting complex ideas
- Explains the data in much lesser space but with greater accuracy
- Simplifies numerical data
- Emphasizes and clarifies certain facts and relationships
- Makes the descriptions vivid and eye-catching
- Renders a professional flavour to the communication

How The following are some guidelines to use illustrations effectively. The illustrations should be

- neat, accurate, and self-contained
- appropriate to the data
- labelled completely
- self-contained
- integrated with the text
- placed as close to the first reference as possible
- sized appropriately so that they are clear even upon reproduction
- such that they create a good balance between the verbal and the visual

Types Figure 1.2 classifies the various types of illustrations. It is clear from this figure that though there are various kinds of visual aids, they can be broadly classified into two main categories, namely tables and figures. All illustrations other than tables are usually categorized under figures.

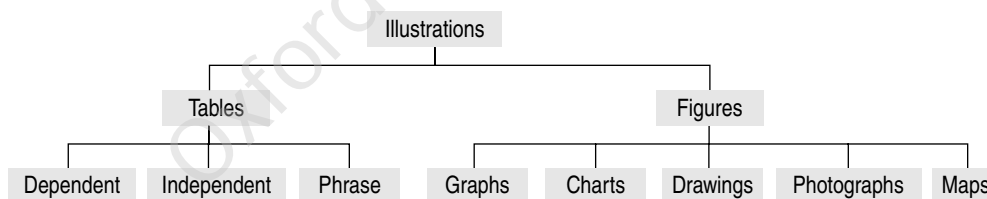


Figure 1.2 TYPES OF ILLUSTRATIONS

In the process of selecting and designing illustrations, the question of which type to use always arises. Which type of illustration can be used most effectively to accomplish the desired objective? What type will present the facts more clearly? Before these questions can be answered, and before the actual work of selecting and designing the illustration can begin, the following preliminary steps must be taken. First the material must be arranged in some sort of systematic order: a series, a distribution, or some other logical arrangement. Next, we must be thoroughly familiar with the material and be aware of the implications of its use. The final step involves a decision about the type of illustration to be used. Several factors are considered for a decision of this kind, such as the nature of the data, the anticipated use, and the intended audience. These factors are usually interrelated.

The type of data will often aid in the selection of the appropriate type of media. For example, if the data were quantitative in nature, the selection might be from one group of charts; if the data were more qualitative in nature, the selection might be made from another group.

The following pages provide samples of various types of illustrations and also briefly explain the purpose for which each of these types is used.

Tables

A table is a systematic arrangement of numbers, words, or phrases in rows and columns, used to depict original numerical data as well as derived statistics. It permits rapid access to and relatively easy comparison of information. If the data is arranged chronologically (for example, sales figures over a ten-year period), the table can show trends—patterns of rising or falling activity. Of course, tables are not necessarily the most clear or vivid means of showing such trends or relationships between data—that is why we have charts and graphs (discussed later in this chapter).

The most important use of tables is for presenting numerical data. Imagine that you are comparing different models of laser printers in terms of physical characteristics such as height, depth, length, weight, and so on—you can use a table in this case.

Traditionally, the title of a table is placed on top of the table or in the first row of the table. If the contents of the table are obvious and there is no need to cross-reference the table from anywhere else in the communication, the title can be omitted. To avoid complications, tables can be considered as figures (the same as other graphics), and numbered within the same sequence.

As shown in Figure 1.2, there are three types of tables:

- Dependent
- Independent
- Phrase

Dependent tables are those whose contents cannot be understood without going through the text. This type is used for presenting less data (Figure 1.3). Independent tables are the most commonly used ones. Though the text should explain each table, readers need not go through the text to understand the contents of these tables (Figure 1.4). Phrase tables are used when the data is in words or phrases instead of numerical figures (Figure 1.5).

TABLE I Details of inpatients admitted on 14.11.15	
General ward	35
Special ward	15
Maternity ward	10

Figure 1.3 DEPENDENT TABLE

Advantages and Disadvantages

The tabular form of presentation, while simple for the communicator, has both advantages and disadvantages. A lot of numerical figures can be depicted through a table. A number of combinations are possible in the tabular form; for example, numeric and non-numeric data can be depicted together. However, it also has certain disadvantages: while it is a part of visual depiction, yet, visually, the details are not evident at a

TABLE II Fatal road accidents 2011–15 (% wise)

Year	Pedestrians	Cyclists	Others	Total	%
2011	2380	830	1310	4520	19.7
2012	2315	850	1615	4780	20.8
2013	2255	805	1750	4810	20.9
2014	2460	750	2060	5270	22.9
2015	2050	735	800	3585	15.7
Total	11460t	3970	7535	22965	100
Percentage	50%	17%	33%	100%	

Figure 1.4 INDEPENDENT TABLE**TABLE III**

Goods	Durability	Nature/metal	Availability
Wires	Long lasting	Copper	Freely
Utensils	Long lasting	Steel	Scarce

Figure 1.5 PHRASE TABLE

glance. Occasionally, the writer might, in the process of putting in too much data, make it too detailed and complicated. Finally, there is very little visual appeal in tables.

Style and Formatting Guidelines for Tables

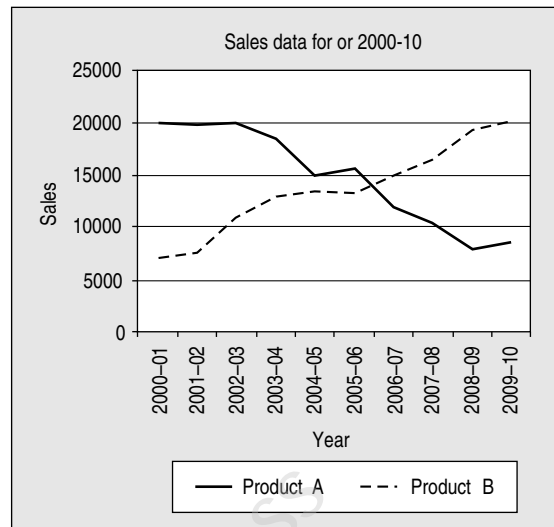
- In the text just preceding the table, refer to the table. Explain the general significance of the data in the table; do not expect readers to figure it out entirely for themselves.
- Do not overwhelm readers with monster 11-column, 30-row tables. Simplify the table data down to just that amount of data that illustrates your point—without, of course, distorting that data.
- Do not put the word or abbreviation for the unit of measurement in every cell of a column. For example, in a column of measurements all in millimetres, do not put ‘mm’ after every number. Put the common abbreviation in parentheses along with the column or row heading.
- Right- or decimal-align numbers in columns. If the two entries in a column are 123 and 4, 4 should be right below 3, not below 1.
- When there is some special point you need to make about one or more of the items in the table, use a footnote instead of clogging up the table with the information.
- Most of the advanced word-processing software packages, such as Word and WordPerfect, now have table-generating tools. You do not have to draw the lines and other formatting details.

Graphs

Graphs are actually just another way of presenting the same data that is presented in tables—in a more impressive and interesting way. At the same time, however, a chart or diagram offers less detail or precision than tables. Figure 1.6 shows the difference between a table [Figure 1.6(a)] of sales figures for a 10-year

TABLE 1 Sales data for 2000–10

Year	Product A	Product B
2000–01	20000	7000
2001–02	19899	7500
2002–03	20100	11000
2003–04	18500	13000
2004–05	15000	13500
2005–06	15500	13250
2006–07	12000	15000
2007–08	10500	16500
2008–09	8000	19258
2009–10	8500	20136

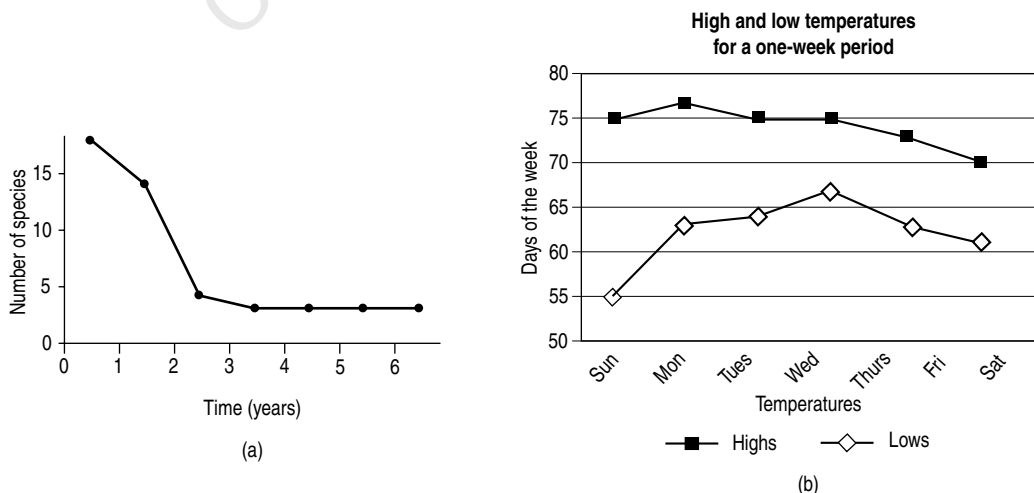
Figure 1.6 (A) TABLE PRESENTING SALES DATA FOR A TEN-YEAR PERIOD**Figure 1.6 (B) LINE GRAPH SHOWING THE SAME DATA**

period and a *line graph* [Figure. 1.6(b)] for the same data. The graph presents a better sense of the overall trend but not the precise sales figure.

Producing Graphs

As with illustrations, the following options are available for creating graphs: photocopying from other sources, generating graphics using special software, and manually drawing original graphics. Many spreadsheet application software packages (such as MS Excel) have fancy features for generating graphs—once the data is fed and the format specified, the application generates the required graph. Several types of graphs can be used. The various types are rectilinear or line graph, bar graph, pie graph, scatter graph, pictorial graph, and surface graph.

Line graphs Line graphs [Figure 1.7(a) and (b)] are used to show continuous change with respect to time. For example, the increase, decrease, or no change in temperature along with time can be depicted

**Figure 1.7 LINE GRAPHS**

through a line graph. If two or three experiments have been conducted, the three different readings can be depicted using three lines.

Several trends (indicated by lines) over a specific period of time can be depicted by the line graph, indicating trends over time and allowing easy comparisons. However, a little caution should be exercised if the lines cross each other at points, as this can confuse the reader. Preferably, if there are criss-crossing lines, only three variables should be plotted, as too many variables would prevent the fine distinctions from being noticed, leading to erroneous conclusions.

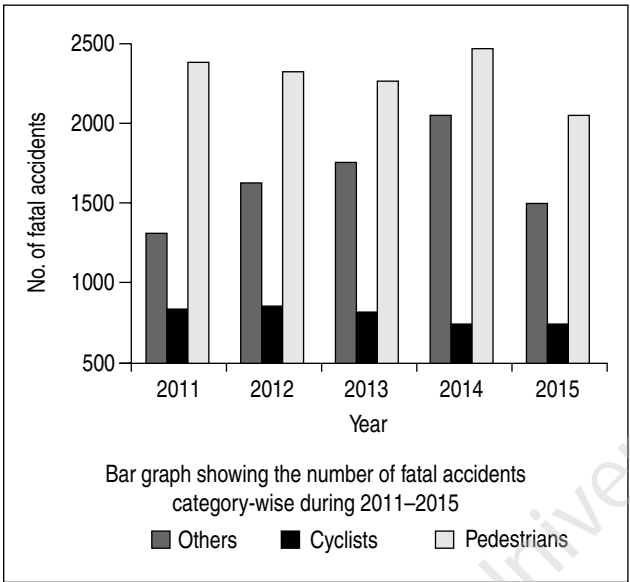


Figure 1.8 BAR GRAPH WITH THREE VARIABLES

Presentations in this form are advantageous as they have a convincing impact, and two or more variables can be stacked without leading to difficulties in grasping the details. The colour and schematic designs added

Bar graphs Bar graphs are effective in emphasizing the comparison of various data items. They can be used to depict the quantity of different items during the same period or the same item during different periods.

These are the simplest to construct and very easy to understand. They could be of various types: vertical with singular or multiple bars stacked (Figure 1.8) or comparative and horizontal. If these graphs depict more than one variable, two colours or designs are used to highlight the difference between the two variables. These graphs are comparative and if more than two variables in terms of the same time frame are used, a stacked vertical or horizontal bar graph is used. The greatest advantage of these bar diagrams is that they can also be used with a three-dimensional effect.

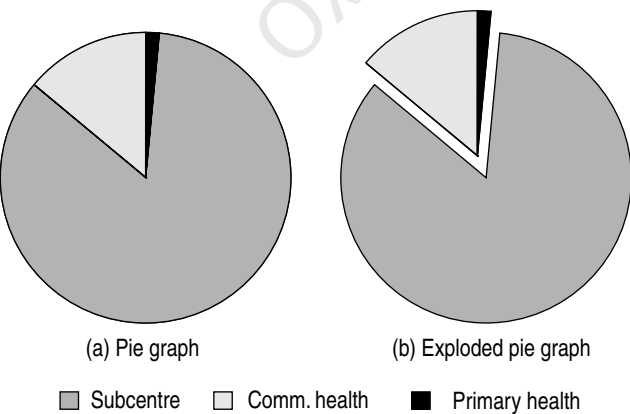


Figure 1.9 PIE GRAPH

Pie graphs Alternatively known as a *percentage graph* or *circle graph*, a pie graph is a circular chart divided into sectors, illustrating proportion (Figure 1.9). In such type of graph, the arc length of each sector (and consequently its central angle and area) is proportional to the quantity it represents. This is one of the most popular forms used to depict the share of various categories making up a certain quantity

and their correlations to the whole as a percentage. If there is a need to emphasize a particular segment, it is detached from the pie and referred to as the *floating wedge*. Such a pie is referred to as an *exploded pie*.

The pie graph captures the attention of the reader more effectively than probably any other presentation would. Within one graph itself, the various segments can be highlighted. In addition to the colour pattern used, the categorization of the segments can be given within, outside, or alongside the graph. However, there could be occasions when the difference is very minor and it might get blurred; for example, a segment depicting 0.5% may become too small to notice. Hence, it is not advisable to use pie graphs if the number of variables in your data is more than five, as it becomes difficult for the human eye to detect the relative percentage of too many cluttered items.

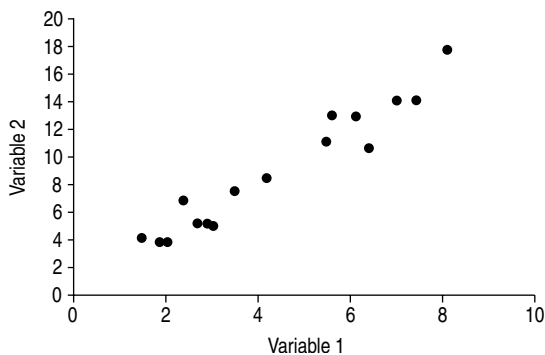


Figure 1.10 SCATTER GRAPH

with the variables represented. This graph is self-explanatory; for example, if a graph were to indicate the population boom in the last five years, human figures could be used, thus illustrating the point being made by the writer. In such an example, a cluster of the figures or pictures would indicate an excessive number during that period. This type of graph is not used extensively for business reports.

The advantage of pictograms is that large numbers can be presented by a single cluster of figures. Much time and effort goes into the design of this graph so as to make it truly representative of the situation it seeks

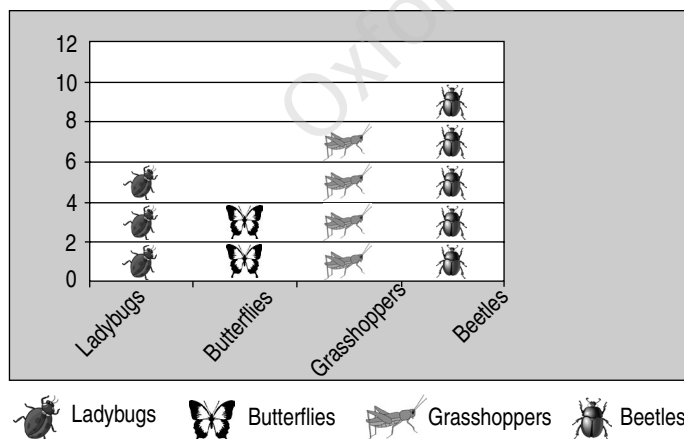


Figure 1.11 PICTORIAL GRAPH

to address. However, it is not very useful for business reports, which contain more concrete data that cannot be represented pictorially. As pictograms are eye-catching, they are suitable for magazines (Figure 1.11).

Area graphs Area graphs can be used to show how something changes over time. Usually, the x axis represents the time period and the y axis represents the variable being measured. Area graphs can be used to plot data that has peaks (ups) and valleys (downs), or data that was collected in a short time period.

These graphs also help to compare trends

over a period of time. For example, when an area graph is plotted to show the water consumption in a particular educational campus, the total consumption of water in that campus as well as the consumption in individual areas can be shown (see Figure 1.12).

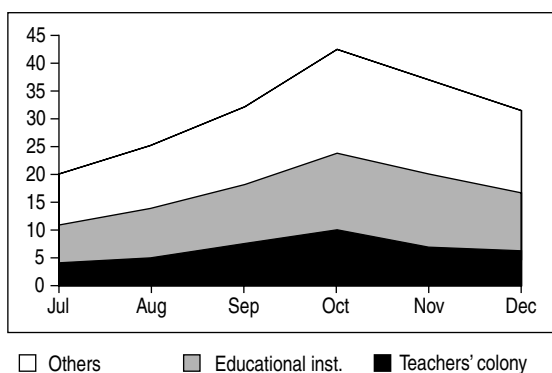


Figure 1.12 AREA GRAPH

While index lines are predominant in line graphs, the area between the lines is highlighted in an area graph. In addition, shades of colours are also used. A darker shade is used at the bottom, and as the plot goes higher and higher, the shades become lighter. In Figure 1.12, the peak shows the total water consumption in the campus.

Charts

There are two types of charts: organization charts and flow charts.

Organization Charts

Organization charts are generally used to illustrate the various positions or functions of an organization. Most of the communication channels in an organization are described through such charts. These charts can also be used to depict the organization of various other ideas such as the different sets of instructions given to subordinates or the different decisions taken for a particular project. Figure 1.13 shows how different options can be organized in the form of an organization chart.

Flow Charts

Flow charts present a sequence of activities from start to finish. They are normally used to illustrate processes, procedures, and relationships. The various elements in the chart are generally depicted through

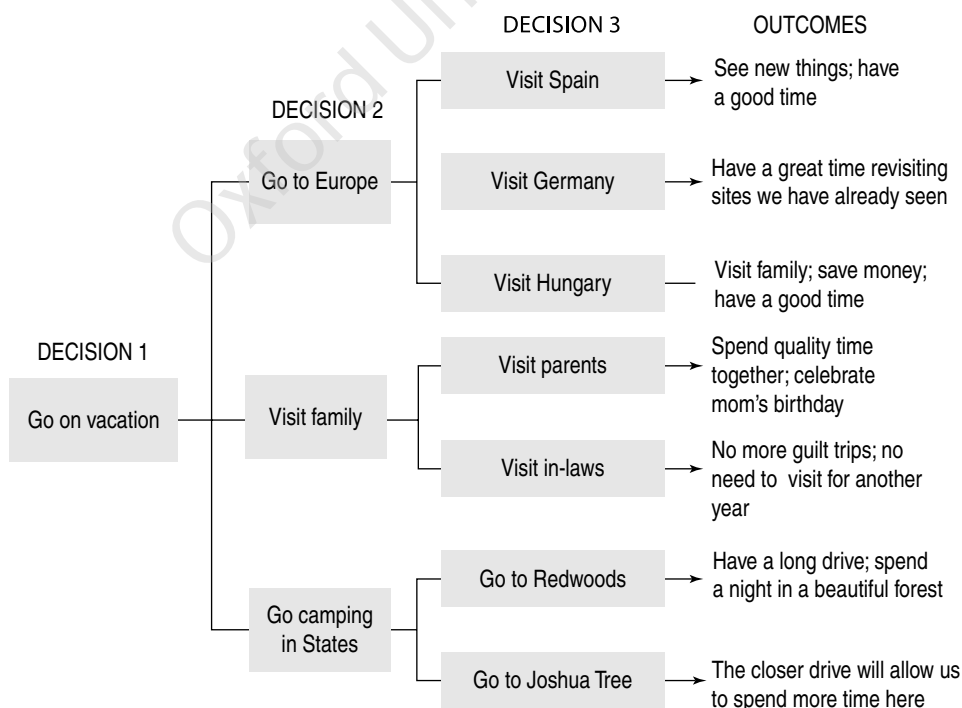


Figure 1.13 ORGANIZATION CHART

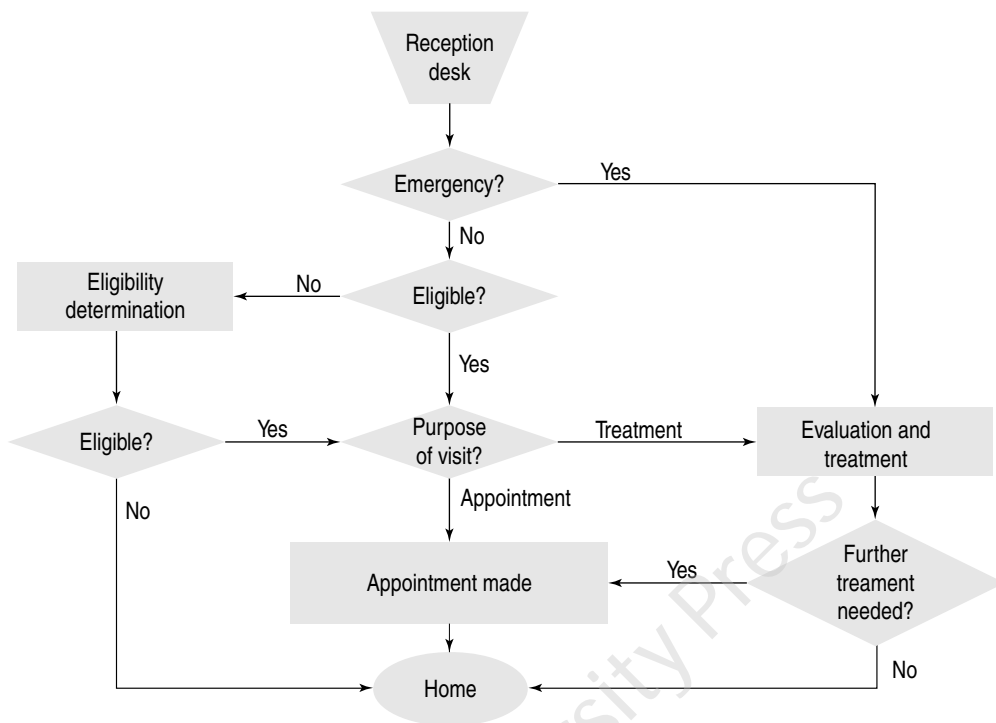


Figure 1.14 FLOW CHART

Charts are often used to make it easier to understand large quantities of data and the relationships between different parts of the data.

geometrical figures (Figure 1.14). Circular or oval boxes are used to indicate the start or stop of the procedure, diamond-shaped boxes represent decision-making steps, and rectangular boxes indicate processing steps. Arrows indicate the process flow.

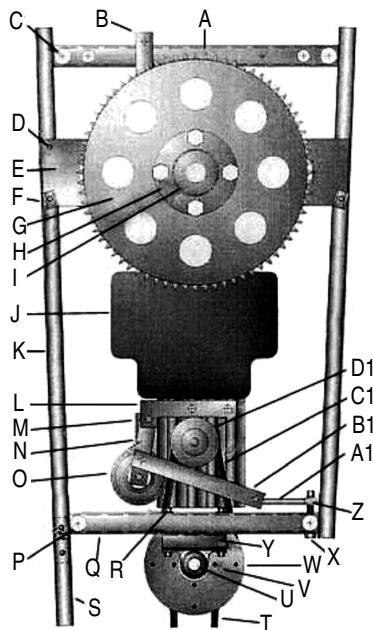
Drawings and Diagrams

In technical documents, drawings and diagrams are used to depict the objects, processes, circuits, etc. that are being described. Diagrams can be used to show the normal, sectional, or cut-away view of an object.

Drawings and photographs range from those showing minimal detail to those illustrating maximal and minute details. For example, a simple line drawing of how to graft a fruit tree reduces the detail to simple lines representing the hands, the tools, the graft stock, and the graft. On the other hand, there can be complex diagrams showing a schematic view of systems; for example, the wiring diagram of a clock radio, which hardly resembles the actual physical system at all. These graphics with their gradations of detail have varying uses.

In instructions, simple drawings (often called *line drawings* because they use just lines, without other detail such as shading) are the most common. They simplify the explanations and the objects so that the reader can focus on the key details. In descriptions, detailed drawings are used, including those with shading and depth perspectives. Figures 1.15 and 1.16 show examples of technical drawings.

Several application software programs as well as the Internet provide clip arts, which are pre-made images of fairly common objects such as computers and telephones. These images can be used in technical documents along with suitable labels.



- | | | | |
|----|--------------------------------------|----|-----------------------------|
| A | Upper crossmember front | O | Idler pulley |
| B | Control rod support | P | Rotor tower tubes |
| C | Rotor tower tubes | Q | Middle crossmember |
| D | AN 3 bolts | R | Motor mount spacers |
| E | Lower main rotor bearing crossmember | S | Tail boom tubes |
| F | Support tube bracket | T | Tail rotor belt B 210 gates |
| G | Main rotor sprocket to tooth | U | Jack shaft |
| H | Main rotor sprocket hub | V | 3/4 Pillow block bearings |
| I | Main rotor shaft | W | Driven pulley |
| J | 503 rotax or larger | X | AN4 bolts |
| K | Main frame long runs | Y | 1 x 3 bolts |
| L | Idler pulley bracket | Z | Clutch lever |
| M | Idler pulley engine spacket | A1 | MW 4 rod ends |
| N | Idler pulley swing arms | B1 | Engagement arms |
| C1 | Belts (5) super HC 3V280 gates | D1 | Drive pulley |

Figure 1.15 SAMPLE DRAWING SHOWING A BELT DRIVE

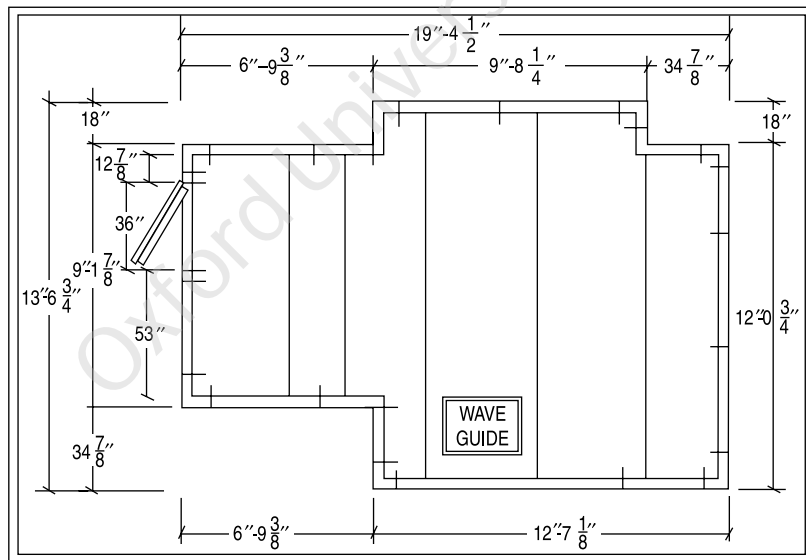


Figure 1.16 SAMPLE DIAGRAM

One difference between photography and other forms of graphics is that a photographer, in principle, just records a single moment in reality, with seemingly no interpretation.

Photographs

Photographs are often used in feasibility, recommendation, and evaluation reports. For example, if you are recommending a photocopier, or if you want to compare various cars, automated teller machines, etc., you might want to include photographs to support your report.

Photographs give the reader a realistic view of the object. However, they should have a good enough resolution so that they are clear even upon reproduction. Irrelevant details can be removed from photographs by working on the negatives.

Maps

Maps graphically represent spatial relationships on plane surfaces. They are used to establish a frame of reference and to facilitate the understanding of spatial relationships that are difficult to describe in words, especially to serve as navigational aid. They may take different forms, such as the map of a political territory (town, state or country), the layout of a store or a manufacturing plant, or the market area of a business. They are appropriate when discussing or presenting statistical data through geographical indicators or expressing relationships between locations.

The choice of scale for a map depends on its purpose and the amount of detail to be shown. It should be an accurate representation of the geographic details (places, buildings, streets, etc.). Cross-hatching or shading in maps is used to portray absolute amounts, rates, ratios, and percentages of data, such as health statistics, population, employment, traffic flow, and land usage. Colours, symbols, and pictograms may be used to make maps more appealing and attractive.

EXERCISES



1. What do you understand by the term technical communication? Explain its importance with examples.
2. Human communication takes place at different levels. How can you distinguish between intrapersonal and interpersonal communication?
3. What are the characteristics of mass communication? Explain the term gatekeeper.
4. How can visual aids enhance technical communication? What points should be borne in mind while using visual aids?
5. Project: Visit a few organizations (academic institutions/business enterprises/industries) and determine the communication patterns existing there. Classify them into oral and written categories. Also figure out the direction in which these flow. Prepare a two-page report on each of your visits.