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# English for Scientific & Technical Writing

Ramesh Manukonda<sup>1</sup>, Prof. S. Prasanna Sree<sup>2</sup>

<sup>1</sup>Research Scholar, Dept of English, Andhra University, Visakhapatnam.

<sup>1</sup>Assistant Professor, Department of English, DADI Institute of Engineering & Technology, Anakapalle, Visakhapatnam.

<sup>2</sup>Professor, Dept of English, Andhra University, Visakhapatnam.

**Abstract:** *‘Communication is important not only in an organization but also in our daily life. When we use communication pertaining to technical, industrial or business matters belong to the category of technical or business communication’.*

*Scientific and technical writing, a form of technical communication, is a style of writing used in fields of diverse as computer hardware and software, engineering, chemistry, the aerospace, industry, robotics, finance, consumer electronics and biotechnology. Technical writing teams or departments are often referred to as Information development, User Assistance, Technical Documentation, or Technical Publications. Technical writers themselves may be called API writers, information developers, documentation specialists, documentation engineers, or technical content developers.*

*Specific areas to be elaborated on the full paper.*

*“ Nature of scientific and technical documentation-basics of scientific and technical documentation- organization in technical and scientific documentation – style in technical and scientific documentation –ABC of good technical and scientific documentation – history of technical and scientific documentation’. Broadly speaking, technical documentation can be categorized into three types, depending on the style of writing, the level of knowledge transferred and the target audience.*

*End user assistance: These information products help a user understand how to use a technical software or hardware product. Traditional technical documentation: here the objective of the writer is to communicate with a specific audience.*

**Keywords:** *Scientific and Technical writing; diversified fields; technical documentation, traditional technical documentation.*

## I. INTRODUCTION

### A. Organisation of Scientific Reporting and Writing

There is no precise formula for the organization of scientific reports. The material in any report should be presented in an order that leads logically towards a conclusion or conclusions. The various sections of the report are organized so that each of them has its logical conclusions.

Almost every scientific communication should have three functional elements. This does not mean that it should be divided by boundaries into three distinct parts. But functionally it should have a beginning, middle and an end.

The beginning orients the reader and supplies him with background material, so that he will see how the subject of the paper fits into the general scheme of things. It prepares the reader for the main presentation of information-the middle. The beginning is often called Introduction, which states the purpose of the investigation and describes the basic scheme of the procedure or methods used. It orients the reader by supplying as much historical background as necessary and then describing the present problem. It may define the scope of the study, discussing limitations or qualifications.

Technical Writing/Reporting is a specialized branch of the field of communication. Technical Writing is used in all fields of science, technology, agriculture, engineering and social sciences. Any branch of knowledge requiring a systematic study involves the use of scientific and technical writing for the purpose of recording and reporting information. It is an art of recording information on specialized fields accurately and effectively and passing it on to those who have to use and process it. Technical writing uses structure, rather than the physical presence of the writer, to achieve clarity. It has to be clear, simple and well ordered communication to transmit the facts and findings.

### B. Importance and Scope of Technical Reporting

The typical undergraduate students regard the writing of reports as a dull and superfluous chore. Consequently, they have little desire for instruction in technical writing. One of the main reasons for this state of affairs is that the undergraduates-particularly in their earlier years-seem to have very little to say. As they progress through college and to graduate school or industry, they develop a body of knowledge. At some time in their career, they acquire some information or some idea that they want to pass on to others. This is when they need to acquire skills in technical reporting.



### C. *Big Organizations*

The complexity of an organization increases exponentially with its size and soon there is the need for written records and communications. Only through a full exchange of information can the various divisions of large organization co-ordinate their efforts effectively.

### D. *Small Organizations*

But even a small organization has a vital need for accurate technical reporting. How was a special part fabricated last year? How was a test performed? What are the precautions to be observed with seldom used instrument? Written records furnish authoritative answers to many questions as these, and increase the efficiency of organization that maintains vigorous reporting procedure.

### E. *Scientific Organizations*

In many of the scientific organizations, particularly those doing experimental work or research, the young employees chief communication with his superiors is through his written (or oral) reports. Often the superior has no other criterion by which to judge an employees work. Moreover, these scientific organizations do nothing but investigation, testing, experimentation, or research. Their only tangible product is the report. If they are to have anything to show for their efforts, they must do thorough job of reporting.

Many industrial and research organizations nowadays place so much value on high quality reports that they maintain separate editorial departments to write technical report or to edit and polish them. Reports have achieved a recognized position of importance in our technological world.

### F. *Functions of Technical Writing*

Technical Reporting is different from creative writing because it deals with scientific facts and does not present an imaginary view of reality. Scientific and Technical Writing is objective in content and systematic in form. It is always precise, exact, and to the point so that it may have the desired effect on the reader and lead to the required action.

### G. *Education and Research*

Journals publish technical material on specialized fields and are circulated amongst the scientists and scholars. All these writings must conform to the rules of scientific and technical reporting so that they are properly understood and appreciated. All types of articles such as Technical Articles; Semi-technical Articles; Popular Articles; Research Papers and Dissertations ,Theses and Technical Bulletins are covered under the ambit of Technical Writing.

### H. *Industry/Service sector*

The written word is very important at every stage of Industrial development. Industrial reports are must for spread of latest advances in the vast field of Industry. They provide guidance to Industrial concerns and keep us abreast of the Information about the products coming out of the Industrial unit. Service manuals and guidance manuals are efficient tools to provide specifications to the users. Technical Reports include all kinds of reports such as Form Reports on a given Performa; Article Reports, Formal Reports such as Annual Reports, Quarterly Reports; Manuals and Formal Correspondence such as letters, memoranda etc

### I. *Format and Structure of Technical Reporting*

The nature of the subject, the purpose of the scientific report and the reader for whom the report is written determine the form and structure of the report. Every written communication has a specific purpose and a specific audience. It should be carefully planned and constructed to fit both.

Every scientific and technical communication has one certain clear purpose: to convey information and ideas accurately and efficiently. The objective requires that the communication be: (1) as clear as possible; (2) as brief as possible; and (3) as easy to understood as possible.

Any communication, if it is to be effective and efficient, must be designed for the needs and the understanding of a specific reader or group of readers. One must, therefore, have adequate knowledge of the educational and professional background of the readers. The language and style of the report depends, to a great extent, on the academic and professional background of its readers. We



need to have an idea of what the reader expects from the report and his level of understanding. A reader who is unfamiliar with the subject may find the level of the reporting too high.

On the other hand, attempting to explain every basic concept and obvious technical terms to the reader who is already familiar with subject will make the report unnecessarily tedious and boring. Writing should be aimed at the average reader, but should also cater to those at either extreme of the range. It should interest the more knowledgeable reader and be intelligible to the reader who is less familiar with the subject.

#### *J. The contents*

The subject of the report primarily determines the nature of the contents. Report writing is meaningless when the writer is not clear about the subject of his report. However, the detailed aspects of the contents are determined by the purpose for which the report is written. Basic questions (5 Ws i. e. What, Why, Who, Where, When, and How) need to be answered satisfactorily before one sets out to write the report. The answers depend on the usefulness of the information to the reader and his interest in the subject, the details of the work carried out, and the recommendations and suggestions one intends making and their implications.

#### *K. A framework for the parts*

Any form of scientific writing always begins with the general statement about its nature and scope. It should give background information, define the nature and extent of the problem, explain the objectives and highlight the need for present investigation.

#### *L. Emphasis of the Significant*

The most common fault found in most of the scientific reports is the burial of the really important and significant ideas under a mass of details. One must make a conscious, planned effort to keep ones key ideas uncovered.

#### *M. Prominent Position*

Perhaps the most fundamental way of making an idea stand out is to put it in a prominent position. The most prominent position in any report or paper is the very beginning. Even though one has not yet led up to it logically; one can often put across ones major thesis most effectively by stating it right at the start and later supplying support for it. A secondary prominent position is the end, particularly in a short communication.

#### *N. Elimination of Detail*

One sure way to stress important information is to remove unessential material. On the other hand, you may need to include a lot of details for record purposes. If you do, you can usually put them into an appendix leaving your main discourse uncluttered.

#### *O. Liberal use of subheads*

Subheads make the structure of the exposition apparent. They help to supply the reader with the frame work on which to fasten the parts. Subheads serve as convenient and efficient signposts. They let the reader know that he has reached the end of one subject and is about to begin a new one. When one is studying a long or complicated exposition, the reader may have to go back and reread in order to refresh his memory. He can find the material he is looking for very much more easily if he is supplied with subheads.

#### *P. Repetition*

Psychologists tell us that children learn by repeated experience. The same process works on even the sophisticated and highly educated scientists. If you want to be sure that an idea does not fade into the background, repeat it. Say it over and over. If you can say it in a different way each time, the repetition will be subtle and therefore, palatable; but dont shy away from the even bald, frank repetition, if your point is important enough to warrant it.

#### *Q. Visual aids and tables*

Visual aids-graphs, curves, drawings, diagrams, photographs often present information in a striking and efficient manner. They can be used to reinforce and emphasize key ideas.

#### *R. Typography*

Capital letters, larger type size, boldface and italics are all effective means of emphasis, if not overused.





### S. *Specific Mention*

It is all right to be explicit and say This is a particularly important point, or This is an important part of the report. Such statements may be made along with the material they refer to, or they may be made separately in a letter of transmittal or preface.

The middle is usually the longest part of the report. It can be organized in many different ways:

It tells what you did. (Description)

It tells what you found out. (Results)

It analyzes, interprets and discusses these results. (Discussion)

The end is sometimes labelled conclusions. It brings together the various subjects that have been discussed and shows their relationships with each other and with broader fields. It leaves the reader with some thoughts about one phase of it. This end section makes the exposition come to a logical and an obvious termination.

It is commonly believed that in order to be objective, the scientific report must present only facts, never opinion. However, engineers and scientists are employed not only to discover facts but also to draw inferences from those facts and to make decisions based on them. Therefore, the scientific report must often present the judgment and opinions of its writer or his organization. But the opinion should be impartial and based as soundly as possible on demonstrated facts.



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