

Technical Report Writing and Presentation: A Necessary Tool for Effective Engineering Practice and Technological Advancement

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ABSTRACT: Technical report writing and presentations are the backbone of interdisciplinary communications among professionals in all areas of business and government activities. They are effective tools for selling an idea or product, outlining a plan or procedure, or explaining a problem and the recommended solutions. This paper therefore, discusses how a professional engineer, scientist or technologist should take advantage of the tool by being convinced of the importance of writings and presentations, understanding the related human interfaces, and appreciating the scope and relationship of the various elements that must be considered.

Key Words: Writing, Communication, Presentation, Visual Aids, Technical, Audience, Report.

1. INTRODUCTION

The inability of the average engineering graduate to convey his ideas or plans to others is not only a handicap to himself, personally, but it is one reason that the profession is not recognized as one of the learned professions today as expressed by Harrington (1950)[1]. Most engineers and scientists devote all the time they have to study professional theories and advancement, but fail to recognize that their ideas are of little value until they can be transmitted to others in forceful and lucid manner. Many engineers, scientist technical managers and other technical professionals faced with the requirement to present a technical paper, explain an engineering proposal, propagate a scientific breakthrough, or outline a management plan can draw upon formal training for the techniques needed to effectively communicate face to face with an audience.

Technical report writing and presentations are a vital aspect of almost every phase of governmental, industrial, and academic worlds. Various establishments use highly sophisticated

presentations to sell their products or services to potential customers. Likewise, government agencies, companies and non-governmental establishments use technical writing and presentations to outline and explain proposals for initiating new projects and to report progress and achievements in those projects as they proceed and even after they have been completed

Technical report writing and presentations can also be used in

- (i) Describing a new engineering technical policy or organization.
- (ii) Defining the scope and requirements of a new engineering / technical or manufacturing project.
- (iii) Reporting the results of a laboratory experiment, project design and report, or analytical study.
- (iv) Describing the plans for a new project or special facility.
- (v) Presenting papers at conferences or symposia/seminars.

For effectiveness of any technical report writing and presentation as modeled by Woelfle (1975)[2], it must be tailored to the requirements and conditions of a particular application. Such tailoring requires effective consideration of several variables, such as the size and nature of the audience, the venue or location and characteristics of the facilities to be used, the types and quality of the visual aids that can be prepared and used, finally, the amount of time allocated and money available for the presentation. The class and quantity of information that will be collected from the presentation, the availability of existing materials, and the length of time available for the preparation must also be considered. Since so many parameters are to be taken into consideration, careful planning is a necessary ingredient for all effective technical report writing and presentations.

In planning technical report writing and presentations, one must first and foremost take into consideration the audience to be addressed. Since the whole purpose of a presentation is to communicate particular information to the audience, the presenter should know as much as possible about his particular audience and then tailor his presentations accordingly. The attitude of the audience is also of great importance to be considered because the approach for a “friendly” audience would be significantly different than for the same subject presented to an “unfriendly” or “skeptical” audience. The size of the audience must not be overlooked since it has a significant

impact on planning a presentation. Other factors are the anticipated physical and psychological environments, the length of presentation or writing and the time of the day scheduled for the technical presentation. These factors allow the presenter to maximize the effectiveness of his presentation for his specific audience.

Visual aids’ usage is also a major ingredient to be considered in planning and executing a technical presentation. The processes and equipment used to prepare and utilize visual aids have evolved rapidly over the past few years. The most widely used now is power point technique with the aid a computer and an overhead projector.

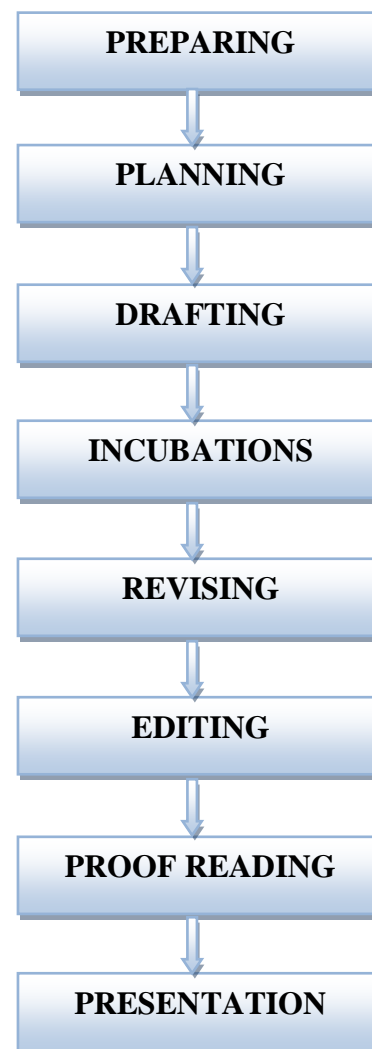
Finally, referencing and citations are very necessary aspects of technical report writing and presentation to be considered for effective planning and execution of any presentation. As established by Maxine et al. (1996)[3] and Kelvin et al. (2003)[4], there are different methods of referencing nowadays depending on what subject the author is actually writing on. These are, (1) IEEE- Institute of Electrical Electronic Engineers’ style, (2)The Oxford style, (3) MLA- Modern Language Association style, (4) APA- American Psychological Association style, (5) The Harvard System, (6) CBE- The Council of Biology Editors style, (7) AWC- Alliance for Computer and Writing’s style.

Madueme (2008)[5] stated that referencing and citations give credibility to technical reports, reflect the thoroughness, quality and originality

are assured through citations. Odinma (2008)[6] is of the opinion that a good technical report writing and presentation should therefore be devoided of plagiarism, contain adequate references / citations and must contain something new or original.

2. MODELLING A TECHNICAL REPORT WRITING / PRESENTATION

It is tempting to believe that there is a secret formula for writing technical papers and that if you could just discover it, your life would be much easier as opinioned by Maxine et al. (1996)[3]. Assurance is hereby given to every engineering personnel that no such formula exists, and no one is a failure because he has not discovered one. Nevertheless, researchers who have studied the process of composing, agree that writers do seem to follow particular patterns of behavior comparable to those that occur in other creature activities. The procedure for modeling technical report writing could be based on the structure developed by Maxine et al. (1996)[3].



PREPARING: In this stage, the writer reads, brainstorms, and interacts with people in order to decide what he wants to write about and generates ideas about it.

PLANNING: The writer in this stage develops his ideas and organizes his materials. He does his by preparing working lists, outlines summaries and charts.

DRAFTING: The writer here starts to put words down on paper. One may compose one or more

drafts, rethinking and remodeling or reshaping his works as he deems necessary.

INCUBATING: Here, the writer takes his time off to digest his ideas. Solutions or better ideas could come in during his period.

REVISING, EDITING AND PROOF

READING: In this stage the author reviews what he has written, revising to make changes in topic/organization, or audience adaptation, editing to make small changes in style and readability and finally, proofreading to get rid of some mechanical problems such as spelling and punctuation errors.

3. CLASSIFICATION OF TECHNICAL REPORT WRITING / PRESENTATIONS

Technical report writing and presentations take the form of official letters, memorandum reports, research proposals, project/contract proposals, tendering letter, engineering design reports, results and discussions, journal paper publications, seminar or conference presentation, organization of meetings etc. Each of these classes has a format, language, style and mode of representation different from others.

Experience has shown that engineers, technologist, scientists, engineering and science students lack the special skill in technical communication. In most cases their write – ups and presentations lack the right words, phrases and style most essential for expressing ideas or results from investigation tests, experiments or

projects. It is also true that many engineers have lost most tenders to improper technical proposal presentation or tendering method. Students of engineering most times mess up their reports in their industrial training reports, seminars, projects even laboratory tests' reports and end up making themselves laughing stocks.

At this stage a look is taken at some of the classes of technical reports that are commonly used.

- **MEMORANDUM REPORTS:** Memorandum report usually called memo is normally written to a specific person or group of persons concerning a familiar topic to both the writer and recipient.
- **RESEARCH PRPOSAL:** A research proposal is normally given to an undergraduate or a post graduate student as a prelude to his or her project or thesis as the case may be by his or her supervisor.
- **PROJECT:** This is a write-up of an independent research work for oral examination of an undergraduate student for award of a degree.
- **THESIS OR DISSERTATION:** Thesis or dissertation is a report of an independent research for export assessment and eventual oral examination of a post-graduate student for award of a higher degree.
- **TECHNICAL REPORT:** A technical report is a report normally written at the end of a project. It is almost same as a memorandum but it is normally a more complete document than a memorandum.

- **TERM PAPER:** This is normally a write-up given to under graduates during their course of study. It is almost same as a project only that is normally on a sub-topic and never defended.
- **CONTRACT PROPOSAL OR SIMPLY A PROPOSAL:** This is usually an appeal letter i.e. report written to a sponsor soliciting for a financial support. This is normally to convince the sponsor of the value of your idea and to convince him that your company has capabilities (manpower) and facilities to deliver the expected results.
- **ENGINEERING DESIGN REPORT:** The intention of a design report is to communicate information on engineering design of components, infrastructure, equipment etc. normally submitted to government or commercial establishment. One major feature is its self-explanatory nature and must contain all relevant information necessary for the design to be carried out by competent persons.

The format or structure of each of the above discussed classes differ from each other and are properly documented by Kelvin et al. (2003)[4] and Obi (2009)[7].

4. IMPORTANCE OF TECHNICAL REPORT WRITING AND PRESENTATIONS.

(a) Technical writing and presentations contain expository materials, they are often persuasive, and frequently involve audio-visual aids. They normally have the serious purpose of acquainting

an audience with information about a specific matter, often with the intent of aiding or influencing decision making.

(b) Good technical writing and presentations are the mark of a true professional. As your engineering career progresses, the more presentation (both oral and written) you give, the more you are promoted and the more success you make in your field. Presentations could be made inside and outside your organization, such as Professional Societies, Schools, NGOs etc. Much of your success professionally depends on the effectiveness of the writings and presentations you make at group problem – solving sessions within your organization or professional body.

(c) Successful presentations are avenues of advancement. Technical writings and presentations often occur at times of crucial importance to an establishment, government or professional body. If one therefore, makes one excellent presentation-just one-it may lead to a significant decision about either the individual or the professional body as the case may be.

(d) Mastery of presentation is part of your professional growth. Here, the effectiveness of a presenter or writer depends upon what kind of person the writer / presenter is, how much he knows about his subject and how well educated he (the writer / presenter) is in general. Therefore, one's personal growth is involved. Based on the theory developed by Woelfle (1975)[2], if one wants his standards, the standards of his

profession, his responsibility as an educated citizen, and his own self-directed efforts to keep growing professionally, he makes it imperative for himself to give serious attention to both oral and written presentations at all times.

It is therefore necessarily important for Technical professionals to translate complex and innovative ideas into action. Imagine if all your findings, analyses, conclusions and recommendations were well documented and communicated, what your advancement in technology would have been by now.

5. CONCLUSION / RECOMMENDATIONS

It may not be out of place to say that poor foundation in technical report writing and presentations in tertiary institutions nowadays is the main cause of the problem. Some Engineering graduates, Scientist and Technologists of the eighties and back could effectively do technical report writing and presentations, the same could not be said of the present day graduates. Apart from inadequate number of lecturers in our respective Universities who are technical report writing and presentation literate, the die-hard approach of most Engineering Deans, heads of Department and Departmental Curriculum Officers to stick to their old tradition with passion hatred to change remains a pathetic sight to behold. Engineering education is dynamic and usually moves to the direction of the changing world. This paper dealt with what technical report writing and presentations is, it's importance to engineering practice and education, it is

therefore the authors' view that technical report writing and presentations be given its rightful place in all the Universities, Polytechnics and Engineering / Technical training institutions. In order to curb this anomalies and generate serious interest in this all – important aspect of engineering knowledge and practice, the following recommendations are made:

- (a) Credit loads allotted to technical report writing and presentations in University and all higher Engineering Institutions be increased.
- (b) Engineering and Technical Undergraduates should be exposed to technical report writing and presentations from 200 level.
- (c) Professional bodies to increase marks allotted to technical report writing during professional interviews and on how well a registrable member is in technical oral presentation before registration.
- (d) University Libraries and Engineering Departmental libraries should be encouraged to update their stocks with recent books on technical report writing and presentations.

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