




FOUNDATIONAL CONCEPTS



Surafel S.

2023

About The Course

 *The two-credit unit course will consist of a **Writing Guide** and 14 study units with **Four Modules**:*

Module 01:

- ▶▶ *Will give the foundational concepts such as define technical report writing, describe why it is needed, list and describe its components, explain its significance in science and technology, and indicate how you should plan technical report writing.*

Module 02:

- ▶▶ *will indicate how to write specific aspects of a technical report - the 'Title, Introduction, Materials and Methods, Results/Findings, and Discussion.*
- ▶▶ *will discuss on how to prepare and use tables, graphs, citations, and references.*
- ▶▶ *Will describe the report contents, requirements and designs and so on.*

Module 03:

- ▶▶ *Will discuss briefly the **Technical Report Writing Guideline of the institute**.*
- ▶▶ *Will discuss writing laws.*

Module 04:

- ▶▶ *Will discuss briefly the Technical Report Presentation, **tips and recommendations**.*

The Session is more practicing and assignments will be given and follow-up presentations will be conducted

Course Objective

 *On successful completion of the course, you should be able to:*

- ✦ Define, in your own words, what constitutes a good technical report.
- ✦ Describe accurately the components of a technical report.
- ✦ Assess correctly the value of technical reports in science and technology.
- ✦ Plan efficiently a technical report writing exercise on a given subject.
- ✦ Select an appropriate title for a technical report.
- ✦ Name and write reasonably well every facet of a technical report.
- ✦ Indicate clearly and logically the Results/Findings of a technical report.
- ✦ Discuss intelligently a technical report's findings for its target audience.
- ✦ Demonstrate the judicious and economical use of illustrations, citations, and references in a technical report.
- ✦ Describe with own word those technical diagrams used to reflect idea.
- ✦ Acquire the required skill while joining the tech environment.

References

Books:

- ✦ “*A Guide to Technical Report Writing*” by Joan van Emden.
- ✦ “*Writing for Engineers (Macmillan Study Skills)*. 4th ed. By Van Edmen, J and Becker, L.
- ✦ The Guardian and Observer style guide:
www.theguardian.com/info/series/guardian-and-observer-style-guide
- ✦ “*Doing Good and Doing Well: Teaching Research-Paper Writing by Unpacking the Paper.*” by Baglione, Lisa.
- ✦ “*How to Write Scientific Journals of the Highest Standards*” by Jalalian Hosseini, M.
- ✦ “*The Handbook of Nonsexist Writing*” by Miller, Casey, and Kate Swift,
- ✦ “*How to solve and write up homework problems*” Sherman, Alan T

Writing..

"The beautiful thing about learning is that no one can take it away from you." — B.B. King

Writing..

🔗 The activity or occupation of **composing text for publication.**

🔗 **Writing is used** to store information, make a permanent record, and **for communication.**

🔗 Purpose of Writing.

- ✍ *To Inform*
- ✍ *To Entertain*
- ✍ *To Explain*
- ✍ *To Persuade*
- ✍ *To Argue*
- ✍ *To Evaluate*
- ✍ *To Express*

Purpose	Definition	Examples
To inform	Communicate ideas and information to others	Journalistic writing, lab reports, research, economic reports, business reports
To entertain	Use language in a humorous way and is usually combined with explaining, informing, or arguing.	Brief joke, newspaper column, television or podcast script, Internet home page tidbit
To explain	Gather facts and combine with experience to clarify who or what something is, how it happened, or why something happened. Also called "expository writing."	Definition essay, process piece, cause-effect explanations
To persuade	Use appeals of logic, emotion, and character to prove a point. May not be fairly presented.	Advertisement, debate
To argue	Special kind of persuasion that fairly and accurately appeals to logic, emotion, and character and uses evidence in stating point of view	Problem-solution, research
To evaluate	Specific kind of argument, that argues for the merits of a subject and presents evidence for support	Book, movie, restaurant or music review
To express	Thoughts and feelings of author on a specific topic. Often informal	Journal or diary entry, letter, poetry, personal narrative

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Writing-Forms

1

Persuasive Writing

Convinces

Persuasive writing is any type of text that aims to convince readers about a particular issue or action by providing reasons for doing so.

Examples

- Covering letter
- Recommendation letter
- Newspaper editorials

2

Narrative Writing

Tell Stories

Narrative writing is a type of nonfiction literature in which the writer describes events in chronological order.

Examples

- Short stories
- Historical writing
- Novels

3

Expository Writing

Inform

Expository writing is the kind of writing you do to explain things. It can be a description of a process, an explanation of how something works, or an account of a historical event.

Examples

- Textbooks
- News stories
- How to articles

4

Descriptive Writing





Describes




This writing lets readers experience a subject or environment through the writer's words. It evokes feelings, creates mental images and leaves a lasting impression on readers.

Examples

- Poetry
- Fictional novels
- Memoirs





Writing- Styles

-  Writing style refers to the **particular way in** which a **writer** expresses their ideas, thoughts, and messages through their writing.
-  It encompasses elements such as tone, voice, word choice, sentence structure, and overall presentation.
-  Writing style is influenced by factors such as the writer's personality, purpose, audience, and the genre or context of the writing.
-  Here are some common writing styles:

-  **Formal**: Formal writing style is often used in academic, professional, or official settings. It tends to be objective, precise, and professional in tone. It emphasizes clarity, proper grammar, and formal language.
-  **Informal**: Informal writing style is more relaxed and conversational in tone. It is commonly used in personal communication, casual writing, or informal settings. It may include colloquial language, contractions, and a more relaxed approach to grammar and punctuation.
-  **Technical**: Technical writing style is used to communicate complex information in a clear and concise manner. It focuses on clarity, accuracy, and precision. Technical writing often includes specialized terminology and follows a specific structure or format.

Writing- Styles

 *Here are some common writing styles:*

-  **Descriptive**: *Descriptive writing style aims to create vivid and sensory-rich descriptions to engage the reader's imagination. It uses sensory details, figurative language, and imagery to paint a picture or evoke emotions.*
-  **Persuasive**: *Persuasive writing style is used to convince the reader to adopt a particular viewpoint or take a specific action. It employs persuasive techniques, logical arguments, emotional appeals, and rhetorical devices to influence the reader's opinion or behavior.*
-  **Narrative**: *Narrative writing style tells a story or recounts events. It often includes characters, a plot, and a sequence of events. Narrative writing aims to engage the reader and create an immersive storytelling experience.*
-  **Academic**: *Academic writing style is used in scholarly or research-based writing. It is characterized by a formal tone, rigorous analysis, and adherence to specific citation and referencing styles. It focuses on clarity, objectivity, and presenting evidence-based arguments.*

Writing- The Process or Stages

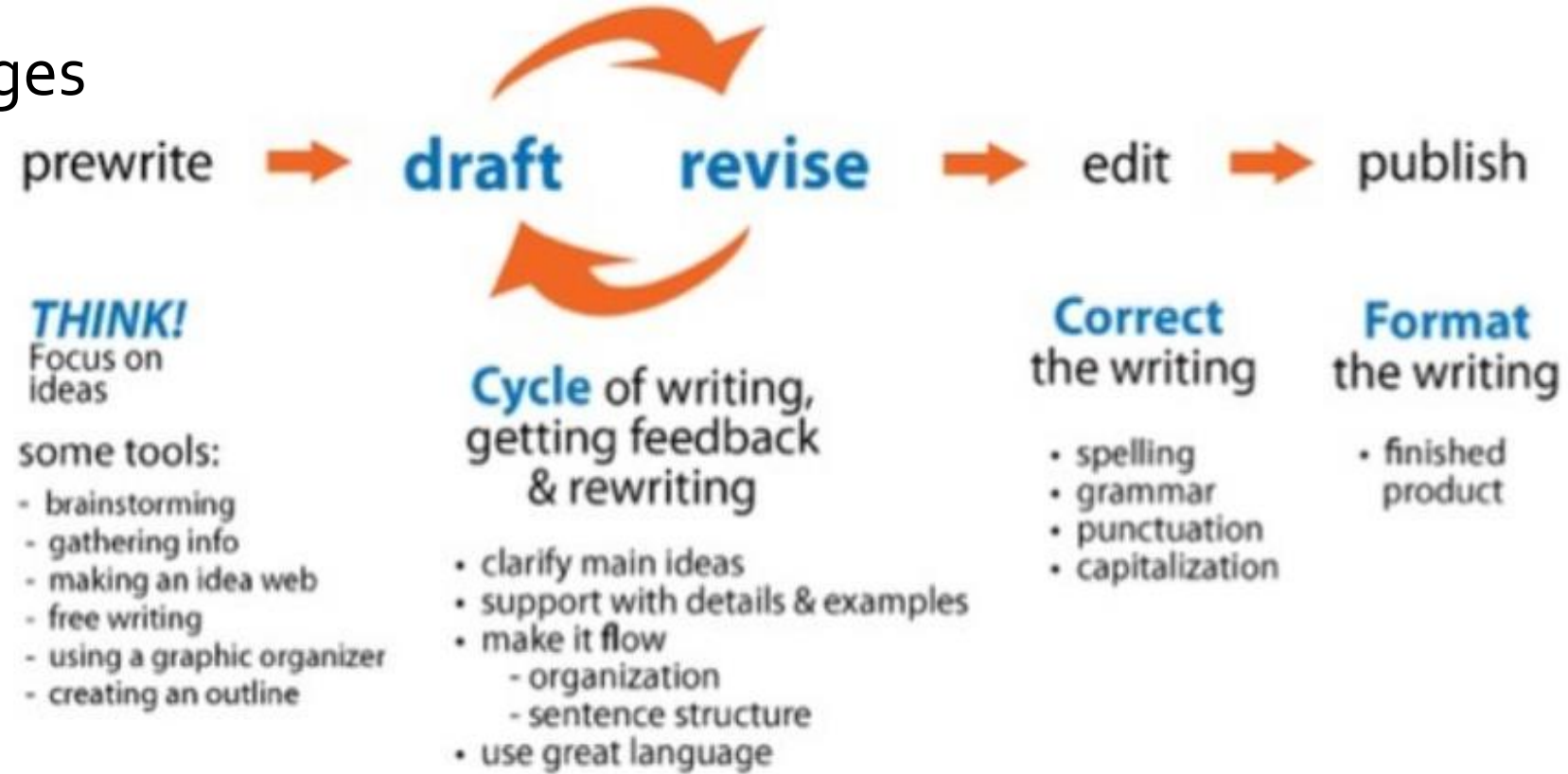
►► **Prewriting** covers all the thinking and planning you do for a writing assignment. It includes thinking about the assignment, identifying a topic, collecting details, and creating a writing plan.

►► **Writing** the first draft means getting your ideas on paper. A first draft is your first look at your writing and your first chance to see how well things are coming together.

►► **Revising** refers to changing and improving your first draft. It's your opportunity to think about what you've written and then add, cut, or change it as needed. Your goal is to make all of your ideas clear and complete.

►► **Editing** is checking your revised writing line by line for errors. Also proofread for errors after writing the final copy of your writing.

►► **Publishing** refers to sharing the final copy of your writing. Publishing comes in many different forms depending on the purpose and audience for your writing.



Writing- Elements of the Process

- 🔗 students must understand the writing process and learn how to integrate their knowledge and ideas into their essays.
- 🔗 The writing process consists of elements that help a writer to develop text that is reflective, clear, and coherent.
- 🔗 The following are the four elements of the writing process:
 1. Planning
 2. Organizing
 3. Writing
 4. Editing and revising

Writing-Understanding Difficulties.

- ▶▶ Writing is a complex process that requires students to attend to multiple elements while also monitoring their performance.
- ▶▶ *Students need to learn not only to pay attention to the rules and mechanics of writing but also to develop effective and efficient composition skills.*
- ▶▶ Negotiating and coordinating basic skills, knowledge, form, purpose, attention to an intended audience, and the rules of written language can prove difficult even for skilled writers.
- ▶▶ *Here we highlights some of the major differences between struggling writers (including students) and successful ones.*

Writing-Understanding Difficulties.

	Struggling Writers	Successful Writers
Plan	<ul style="list-style-type: none">• <i>Are unaware of the purpose or process of writing</i>• Have little or no knowledge of the text structure of an essay• <i>Have difficulty developing plans and staying focused on the topic</i>• Experience greater writing anxiety and decreased motivation	<ul style="list-style-type: none">• Analyze the task• <i>Understand and apply all the elements of an essay</i>• Create goals for their writing• <i>Develop plans to achieve their goals</i>
Organize	<ul style="list-style-type: none">• <i>Produce fewer ideas</i>• Fail to organize their thoughts	<ul style="list-style-type: none">• Develop additional ideas• <i>Organize their ideas</i>

"You don't have to be great to start, but you have to start to be great." – Zig Ziglar

Writing-Understanding Difficulties.

Struggling Writers

Successful Writers

Write

- *Plan what they are going to say as they write*
- Use imprecise and nonspecific vocabulary
- *Struggle to convey their thoughts, ideas, and opinions*
- Write fewer sentences
- *Focus on mechanics rather than on clarity and organization*





- Write using an organized plan but adjust goals when obstacles arise
- *Use vocabulary accurately*
- Experience fewer difficulties with the elements of an essay
- *Generate sentences that support their ideas*

Edit and Revise

- *Experience problems with grammar, punctuation, and spelling*
- *Place words and letters too close or too far from each other*
- *Do not review and make corrections*

- Edit spelling, capitalization, and punctuation
- Make more content revisions
- Correct overall appearance

Writing- the POW+TREE Strategy.

Strategy		Activity
 Pick an idea or opinion.		Formulate an opinion and state that opinion clearly.
 rganize and generate notes and ideas for each part of the TREE.		Organize notes by completing a graphic organizer:
	Topic Sentence	Formulate a topic sentence expressing an opinion.
	Reason	Give at least three reasons to support the topic sentence.
	Explanation	Explain your reasons.
	Ending	Formulate a statement to summarize the topic sentence.
 rite and say more.		Write a complete paragraph. Follow the plan developed using the TREE strategy.

Report...?

"I think it's possible to ordinary people to choose to be extraordinary." — Elon Musk

Report.

- 🔗 A report is a document that provides information about a specific topic, issue, or event.
- 🔗 It typically presents data, findings, analysis, and recommendations based on research, observation, or investigation.
- 🔗 Reports are commonly used in various fields and industries to communicate information, evaluate situations, and inform decision-making processes.
- 🔗 In general, a report is a structured document that provides information, analysis, findings, or recommendations on a specific topic or subject matter. Reports are typically written to communicate information in a clear, concise, and organized manner. They can be formal or informal, depending on the context and intended audience.
- 🔗 Reports serve various purposes and may be used in different fields, including business, academia, science, government, and more. Some common characteristics of reports include:

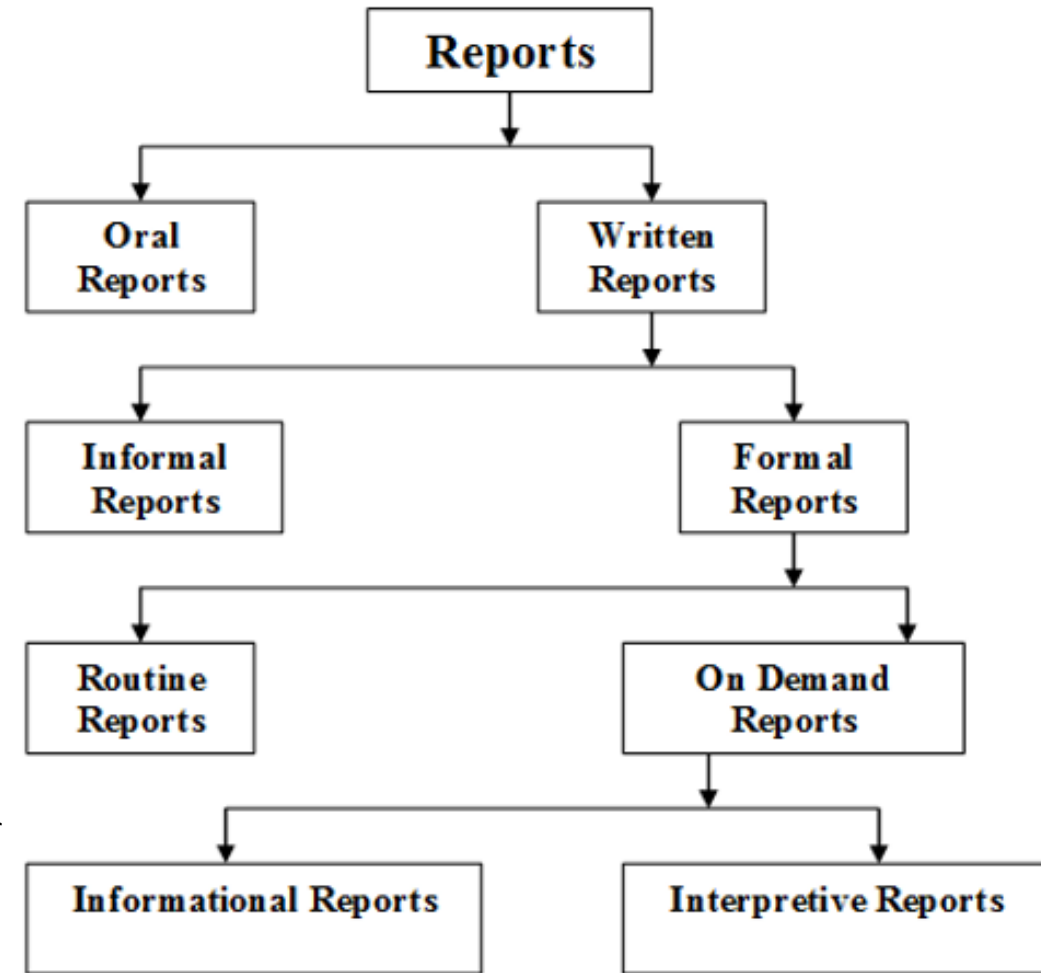
Report- Characteristics

🔧 Here are some key characteristics of a report:

- ✍️ **Purpose:** Reports are created to convey information, analyze data, or present findings related to a specific subject or problem.
- ✍️ **Structure:** Reports generally have a structured format with sections such as an introduction, methodology, findings, analysis, conclusions, and recommendations. The specific sections and their order can vary depending on the purpose and requirements of the report.
- ✍️ **Objectivity:** Reports aim to present information in an objective and unbiased manner, relying on evidence, data, and analysis to support the presented findings or conclusions.
- ✍️ **Audience:** Reports are typically written for a specific audience, which can range from supervisors, managers, or clients to the general public. The content and level of technicality can vary depending on the intended readership.
- ✍️ **Research and Analysis:** Reports often involve gathering data, conducting research, analyzing information, and drawing conclusions based on the collected evidence. The level of depth and rigor of the research depends on the nature of the report and its intended purpose.
- ✍️ **Recommendations:** Many reports include recommendations or suggestions based on the findings and analysis. These recommendations are intended to guide decision-making or provide actionable steps to address the issues identified in the report.

Report- Types

- ✗ Reports may be oral or written. But it is very difficult to rely on oral reports in the execution of business. It is as ephemeral as any other oral communication unless tape-recorded. Thus in the world of work, most of the reports are written only because a written report is relatively more accurate and permanent.
- ✗ A report may be formal or informal but informal reports are, in fact, rare and seldom come in practice. Thus the reports in practice are mostly formal reports.
- ✗ Formal reports are the reports which are routine reports or the ones which are prepared on demand.
- ✗ Routine reports are regular, recurring reports that provide updates on ongoing activities, processes, or operations within an organization.
- ✗ On-demand reports are generated in response to a specific request or need for information. Unlike routine reports, which follow a predetermined schedule, on-demand reports are generated as and when required. These reports are typically tailored to address a specific question, problem, or decision-making requirement.
- ✗ On demand reports are of two types:-
 1. Informational Reports
 2. Interpretive Reports



Report- Kinds

🔗 Here are some well known Kinds of a report:

- ✍ **Business Report**: *Business reports provide information and analysis on various aspects of a business, such as financial performance, market research, project updates, or strategic planning. They are used to inform decision-making, assess performance, and communicate important information within an organization.*
- ✍ **Research Report**: *Research reports present findings and analysis from a research study or investigation. They typically include an introduction, methodology, data analysis, results, and conclusions. Research reports are commonly used in academic, scientific, or market research fields to contribute to knowledge and inform further studies or actions.*
- ✍ **Project Report**: *Project reports document the progress, outcomes, and evaluation of a specific project. They outline the project's objectives, methodologies, resources used, timelines, and budget. Project reports help stakeholders understand the project's impact, effectiveness, and lessons learned for future projects.*
- ✍ **Incident Report**: *Incident reports are used to document and analyze incidents or accidents that occur in various settings, such as workplaces, healthcare facilities, or public spaces. They provide a factual account of the incident, including the details of what happened, who was involved, and any actions taken. Incident reports are essential for identifying causes, preventing future incidents, and ensuring appropriate responses.*

Report- Kinds

🔧 Here are some well known Kinds of a report:

- **Progress Report:** *Progress reports are used to track the status and progress of ongoing projects or initiatives. They provide updates on milestones achieved, tasks completed, challenges faced, and next steps. Progress reports are crucial for project managers, team members, and stakeholders to monitor project timelines, budgets, and overall progress.*
- **Technical Report:** *Technical reports provide detailed information, analysis, and explanations of technical processes, systems, or products. They are often used in engineering, scientific research, or technology fields to communicate complex information to technical audiences. Technical reports may include specifications, diagrams, experimental data, and recommendations.*
- **Audit Report:** *Audit reports provide an independent assessment and evaluation of financial statements, processes, or systems of an organization. They are conducted by auditors to ensure compliance, accuracy, and transparency. Audit reports help stakeholders gain confidence in the financial integrity and controls of an organization.*
- **Financial Report:** *Financial reports provide a comprehensive overview of an organization's financial performance. They include financial statements such as income statements, balance sheets, and cash flow statements. Financial reports help stakeholders, investors, and management assess the financial health, profitability, and efficiency of a business.*

Technical Report

- 📢 A technical Report is a document that provides detailed information about a specific topic, project, or research in a technical or scientific field.
- 📢 A technical Report (also **scientific report**) is a document that describes the process, progress, or results of technical or scientific research or the state of a technical or scientific research problem.
- 📢 Technical Reports are considered "non-archival" publications, and so are free to be published elsewhere in peer-reviewed venues with or without modification.
- 📢 Examples Technical Reports include **proposals**, regulations, **Specification**, **Requirements or Requests**, **manuals**, **procedures**, **progress**.
- 📢 Some key components of a technical report: Title Page, Abstract or Executive Summary, Introduction, Methodology, Result, Discussion, Conclusion, Reference, Appendices.
- 📢 **A technical report presents the output of some technological work.** For instance installing and managing IT services. A research report presents some finding about a research project, not yet finished or rather of secondary interest, which would not be published in a journal. It might also be an intermediate report on a study in progress.

Technical Report- Characteristics

☒ Technical Accuracy:

- *It refers to the precision, correctness, and reliability of the technical information presented within the report. Technical accuracy ensures that the data, analysis, findings, and conclusions shared in the report are based on sound scientific principles, accurate measurements, valid research methods, and reliable sources.*

☒ Consistency in Presenting:

- *It refers to maintaining uniformity and coherence in the way information is organized, structured, and presented throughout the report. Consistency enhances readability, comprehension, and professionalism. Some of the key considerations for achieving consistency Formatting and Styling, Structure and Organization, Terminology and Nomenclature, Language and Tone, Referencing and Citations, Visual Elements, and Writing Conventions*

☒ Clarity:

- *It ensures the information presented is easily understood by the intended audience. A clear report effectively communicates complex technical concepts, data, findings, and recommendations in a concise and understandable manner.*

☒ Conciseness:

- *It involves presenting information in a clear and succinct manner, without unnecessary repetition or wordiness. A concise report effectively conveys the key points and findings while avoiding excessive details or verbosity. You should say what you have to say in the shortest possible form,*

☒ Persuasiveness:

- *It involves presenting information, arguments, and recommendations in a compelling and convincing manner to influence the readers' opinions or actions. Persuasive reports aim to persuade the audience to accept a particular viewpoint, adopt a specific course of action, or make informed decisions based on the presented information.*

“Reading without reflecting is like eating without digesting.” – Edmund Burke

Technical Report- Characteristics

☒ Interest:

- *You must retain the interest of your reader throughout the report without being chatty or colloquial. You can make your report lively by making it lucid, remembering that businessmen, industrial and financial executives, and other professionals who are going to read your report are human, too!.*

☒ Technical Content:

- *Technical reports focus on conveying technical or scientific information related to a specific subject or project. They delve into detailed explanations, analysis, and findings that require specialized knowledge or expertise in the subject matter.*

☒ Objective and Factual:

- *Technical reports present information in an objective and factual manner, relying on evidence, data, and research rather than personal opinions or biases. They aim to provide an accurate and unbiased account of the topic being addressed.*

☒ Formal Language:


- *Technical reports employ formal and technical language specific to the subject matter. They may use industry-specific terminology, acronyms, or abbreviations that are familiar to the target audience.*

☒ Targeted Audience:

- *Technical reports are written for a specific audience with a technical or scientific background. The level of technicality and depth of detail may vary depending on the intended readership, but the report should be comprehensive enough to meet the requirements and expectations of the target audience.*

Technical Report- Contents

Title Page

 *The format for this page may vary, however, the following information is always included: report title, who the report was prepared for, who the report was prepared by, and the date of submission. This is not a numbered page of the report.*

Abstract:



 *An abstract is a concise description of the report including its purpose and most important results. An abstract must not be longer than half a page and must not contain figures or make reference to them. The results may be summarized in the abstract but qualitatively, not quantitatively. No specific technical jargon, abbreviations, or acronyms should be used. This is not a numbered page of the report.*

Table of Content:

 *Technical reports employ formal and technical language specific to the subject matter. They may use industry-specific terminology, acronyms, or abbreviations that are familiar to the target audience.*

Introduction:


- *This section give the objective of the work, a brief description of the problem, and how it is to be attacked. It also provide the reader with an overview of why the work was performed, how the work was performed, and the most interesting results.*

Background Theory:


- *Include, if necessary, a discussion of relevant background theory. For example, Include any preparation*
- *specified in the lab manual..*

Technical Report- Contents


Design/Theoretical Analysis

 Give the details of your design procedure. Be sure to introduce and describe your design work using sentences, equations alone are not sufficient. Use citations if you wish to refer the reader to reference material. Divide this section into subsections where appropriate..

Abstract:

 Give the details of your design procedure. Be sure to introduce and describe your design work using sentences, equations alone are not sufficient. Use citations if you wish to refer the reader to reference material. Divide this section into subsections where appropriate.

Procedure:

 At a minimum, the author discusses the procedure by describing the method used to test a theory, verify a design or conduct a process. Presentation of the procedure may vary significantly for different fields and different audiences, however, for all fields, the author should BE BRIEF and get to the point.

Result and Discussion:

- Present the results of the work performed using neatly organized and completely labeled tables and/or graphs whenever possible. When comparative data is available, present the data in a way that facilitates the comparison..

Conclusion:

- In this final section of the body of the report, the author should briefly bring everything together. It is similar to the abstract except that now the results are concluded upon in a quantitative way.

Work Site and Appendix:

Technical Report – Other related concepts

☒ Technical proposal.

§ *Which is normally prepared by a company to convince another company or institution of its technical capability to offer a specific service or perform a specific task. It is usually expensive*

☒ Technical brief.

- § *Where a new idea is presented in sufficient depth to enable the recipient (the contractor or consultant) to assess its practicability and cost.*
- § *A concise document that provides an overview or summary of a specific technical topic, project, or concept.*
- § *It is typically used to communicate key information in a condensed and easily understandable format.*
- § *Technical briefs are commonly employed in technical and scientific fields to convey important details, updates, or recommendations to a broader audience.*

☒ Technical Note.

- § *A concise document that provides specific technical information or instructions related to a particular topic or problem.*
- § *It is typically shorter and more focused than a comprehensive technical report.*
- § *Technical notes are commonly used in technical and scientific fields to communicate specific details, updates, or solutions to a targeted audience.*

Technical Writing

- 📢 Common written form through which computer scientist communicate their findings.

Technical writing is a niche, user-centric form of writing used to disseminate information on technical or specialized topics, such as software applications, environmental regulations, or medical procedures.

- 📢 Technical writing is simply **any writing that conveys technical content**. This is often in the form of specifications, instructions, procedures, or policies. Technical communication in computer science can come in any of those forms, and the content will (obviously) be about computer science topics.
- 📢 Developer and software teams also use technical writing throughout the life of a product, whether to describe the development, use, or upgrade of a product.
- 📢 This writing style simplifies complex information and processes, allowing readers to use that information for an intended purpose – such as using technology, executing a project, onboarding a user, exemplifying a complex process, or informing a large audience.
- 📢 Any type of computer science documentation is highly technical and requires critical thinking skills as well as knowledge of programming languages and scientific and technical products.

Technical Writing – Purpose

- ▶ To present a solution to a problem in order to prompt action.
- ▶ *Convince the reader of your position Persuade them to act, or Inform them of your findings.*
- ▶ Create an opportunity to clearly communicate a solution to a problem Recommend action, and aid decision making.
- ▶ *Accurately and objectively compose and present information on an object, idea, process, or event (the "communication objective").*
- ▶ *Promote or "sell" an idea, product or service through rational/logical presentation (the "marketing objective").*
- ▶ Clarify issues that may have remained obscure before the report was produced (the "educational objective").
- ▶ *Put forward ideas in a conventional, usable or acceptable form (the "social objective").*
- ▶ Recommend a specific course of action, or non-action (the "judicial objective").

Technical Writing – Versus Other Writing

Type of Writing	Definition	Purpose	Audience	Language
Technical writing	A written form of technical communication used in a variety of technical fields	Its purpose is getting something done	Specific readers	Direct, factual, and straightforward
Creative writing	A piece of writing for entertainment and education	To entertain, provoke, inspire	General reader/audience	Informal and artistic
Academic writing	Writing that focuses on proving a theory or viewpoint in one way and emphasizes one specific subject	To demonstrate what a person knows	A teacher or students or some people related to the field	Complex, formal, precise, explicit, accurate
Business writing	The process of communicating business ideas and concepts through written words	To enable a reader to know or do something	Fellow businessmen, employees, and clients	Concise, clear, engaging language
Literary writing	A subjective personal view which the writer expresses through his themes, ideas, thoughts	To amuse and cheer readers	General readers	Creative, imaginative, using literary techniques

Technical Writing – Versus Essays

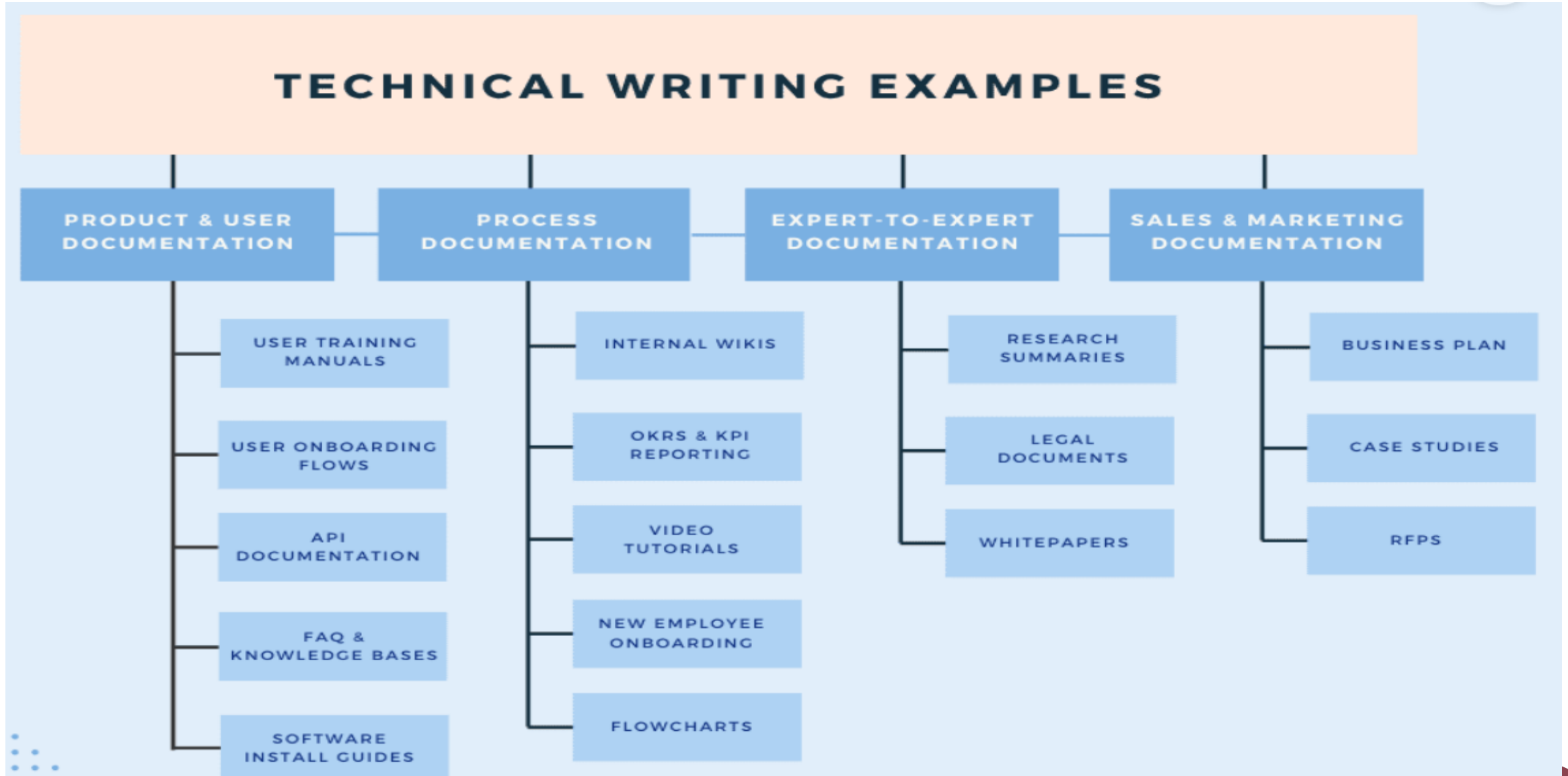
Components	Technical Writing	Essays	Summary
Development	<ul style="list-style-type: none">• Uses examples, anecdotes, testimony, data, research	<ul style="list-style-type: none">• Uses examples, anecdotes, testimony, data, research	Same for both
Grammar	<ul style="list-style-type: none">• It is important!	<ul style="list-style-type: none">• It is important!	Same for both
Organization	<ul style="list-style-type: none">• Provides an introduction, body, and conclusion• Uses a subject line vs. a thesis and itemization of points vs. transitional words• Uses topic sentences only when needed, dependent upon the type and length of correspondence	<ul style="list-style-type: none">• Provides an introduction, thesis statement, body paragraphs, transitional words, and topic sentences	Similar in some ways, different in others
Style	<ul style="list-style-type: none">• Uses short, denotative words; short sentences; and short paragraphs	<ul style="list-style-type: none">• Uses longer, connotative words; longer sentences; and longer paragraphs	Different
Document Design	<ul style="list-style-type: none">• Uses highlighting techniques, such as graphics, headings, subheadings, various fonts, white space, bullets, etc.	<ul style="list-style-type: none">• Not usually a factor	Different

"None of us is as smart as all of us." — Ken Blanchard

Technical Writing – Why CS?

- ▶ ***In-team communication.*** First, technical writing can help you communicate more easily with your teammates.
- ▶ ***Out-group communication.*** You can also use your technical writing abilities to communicate with out-groups more efficiently, especially if those groups have limited technical knowledge.
- ▶ ***Problem solving and internalization.*** Developers are problem solvers, so technical writing forces you to get into the habit of putting abstract concepts into understandable words; it broadens your vocabulary, and in some ways changes how you think about the world.
- ▶ ***Help guides and documentation.*** On a more straightforward level, technical writing is a useful skill in creating help guides and other forms of documentation for the software you develop.
- ▶ ***Software design and user empathy.*** If you have a hand in coming up with high-level concepts for the software, or tailoring ideal features into something that's usable, technical writing can also give you a better sense of user empathy.
- ▶ ***Career value (and future options).*** Technical writing makes you a more valuable employee or vendor, possibly earning you a raise if you can implement the skill appropriately.

Technical Writing – Example



Technical Writing – Example

1. User Manuals

- ✍ User guides are instruction training manuals written for novice end-users to help them with products ranging from consumer products such as electronics or appliances to B2B SaaS tools and solutions.
- ✍ These manuals are user-friendly and well-illustrated to highlight common issues and features.
- ✍ Additionally, technical writers must collaborate with engineers, programmers, and product designers to cover all the bases.

Date and Time: Clock Properties

Chapter 16Router Properties

Table 16-1Device Properties

Element	Description
Enable Secret Password	Cisco Configuration Professional (Cisco CP) supports the enable secret password. The enable secret password allows you to control who is able to enter configuration commands on this router. We strongly recommend that you set an enable secret password. The password will not be readable in the Cisco CP Device Properties window, and it will appear in encrypted form in the router configuration file. Therefore, you should record this password in case you forget it. The Cisco IOS release that the router is running may also support the enable password. The enable password functions like the enable secret password, but was encrypted in the configuration file. If an enable password is configured using the command-line interface (CLI), it is ignored if an enable secret password is configured.
Current Password	If a password has already been set, this area contains asterisks (*).
Enter New Password	Enter the new enable password in this field.
Reenter New Password	Reenter the password exactly as you entered it in the New Password field.

Date and Time: Clock Properties

Use this window to view and edit the date and time settings on the router.

How to Get to this Screen
Click **Configure > Router > Time > Date and Time**.

Related Links

- [Date and Time Properties](#)

Field Reference

Table 16-2Clock Properties

Element	Description
Date/Time	You can see the router date and time settings on the right side of the Cisco CP status bar. The time and date settings in this part of the Clock Properties window are not updated.

Technical Writing – Example

2. Software Installation Guides

- ✍ Computer software must be equipped with software documentation, such as installation guides, to assist users through the software implementation and installation process.
- ✍ A well-written installation guide must include detailed workflows, video tutorials, FAQs, and a troubleshooting guide. Often the programmers automate the process, and the technical writer authors alert boxes and the ReadMe file.
- ✍ Software installation guides can be easily created, published, and maintained with software documentation tools.

The screenshot displays a user interface for an 'Installation Guide Optical Drive'. The interface is divided into two main panels. The left panel, titled 'Installation Guide Optical Drive', contains a list of steps: 'Description' (with a green checkmark), 'Step by Step Installation Guide', '1. Setup' (with a green checkmark and a 'Trainee' icon), '2. Procedure', '1. Prepare Drive Bay' (with a green checkmark), '2. Fit Drive' (with a green checkmark), '3. Connect IDE/SATA Cable to Drive' (with a red circle), '4. Connect Power Cable to Drive' (with a red circle), and '5. Connect IDE/SATA Cable to Motherboard' (with a red circle). The right panel, titled 'Setup', includes a video player showing a hand holding an optical drive with the title 'How to Install an Optical Drive' and a 'Watch later' button. Below the video is a 'FORM' section with 'Required Items *' (Compatible Optical Drive, IDE or SATA Cable, Free four pin power connector) and 'Before installation *' (Device powered off, Device unplugged).


Technical Writing – Example

3. Standard Operating Procedures

- Standard operating procedures (SOPs) are holistic processes to help employees work in unison and accomplish various tasks in an organization.
- SOPs are a form of process documentation that ensures smoother internal operations and workflows by making business processes more efficient and economical.
- Examples of an SOP document include anything from payroll processing to manufacturing guidelines.

The diagram illustrates a Standard Operating Procedure (SOP) document for a New Vehicle Purchase Process. The document is divided into sections: Title, Department, Date & ID, Purpose, Definitions, and Procedure. Annotations highlight key features: 'Title' points to the document title; 'Department Date & ID' points to the department and date information; 'Users can quickly refer to the purpose and not read the whole SOP' points to the Purpose section; 'Complete step-by-step instructions' points to the Procedure section; 'Department head signs off' points to the Department Head Approval signature; and 'Clarify any upcoming jargon' points to the Definitions section.

Title → Standard Operating Procedure:
New Vehicle Purchase Process

Department Date & ID → Department: Admin Support
14/05/16 – SOP #AS-0013
Department Head Approval: 

Users can quickly refer to the purpose and not read the whole SOP → **Purpose:**
To establish guidelines for purchasing a new vehicle. All Admin Support staff are responsible for following this SOP.

Definitions:
RM: Resource Management
PO: Purchase Order


Procedure:
1. Director approves purchase of the new vehicle(s)
2. Requestor identifies vehicle(s) to be surplused in exchange for the new vehicle(s). (Process AS-0022)
3. And so on...


Department head signs off →


Clarify any upcoming jargon →

Complete step-by-step instructions →

4. API Documentation

 API documentation helps your customers' developers interact easily with a product's code to implement an API effectively. It contains instructions and tutorials to simplify integration with other APIs such as web-API, software API, and SCPIs.

 API documentation refers to the set of documents or resources that provide information and instructions on how to use and interact with an Application Programming Interface (API).

 API documentation is crucial for developers who want to integrate and utilize the functionality of an API in their applications or systems.

Documentation

Whether you're new to the DBX Platform or seasoned in all things sync, this is where you'll find out how to develop applications with Dropbox. We offer official SDKs for several popular programming languages.

Pre-built components

Get up and running quickly with our easily embeddable components that enable users to select, save, or embed content from and to Dropbox.

- [Chooser](#)

The Chooser is the fastest way to get files from Dropbox into your web, Android, or iOS app. It's a small component that enables your app to get files from Dropbox without having to worry about the complexities of implementing a file browser, authentication, or managing uploads and storage.

- [Saver](#)

The Saver is the easiest way to add files to your users' Dropbox accounts. With two clicks, a user can download files of any size into their Dropbox, making those files available on all their computers and devices as soon as the download completes. The Saver works on web and mobile web—all with just a few lines of code.

- [Embedder](#)

The Embedder allows you to use shared links to embed previews of Dropbox files or folders inside your web app.

API Reference

Use the Dropbox User or Business APIs to build more complex custom applications and integrations.

- [HTTP Reference](#)

Start here for a basic reference for the Dropbox endpoints available.

- [API Explorer](#)




It's easy to prototype and test examples with our API Explorer.

- [Changelog](#)

See what's new and the latest changes to the API here.

Technical Writing – Example

5. Service Level Agreements (SLA)

-  An SLA is a legally binding contract between a provider and a customer that outlines services, guarantees, warranties, and other mutually negotiated items between the two parties.
-  A Service Level Agreement (SLA) is a contract or agreement between a service provider and a customer that defines the expected level of service and the responsibilities of both parties.
-  SLAs are commonly used in various industries, including technology, telecommunications, and outsourcing, to establish mutually agreed-upon standards for service delivery.

Service	Description	SLA Target	Performance Metric	Measurement
Cloud Service A	Interdepartmental communication service	99.999%	Resource Availability	MTTR, MTTF
Cloud Storage A	Storage service	99.9999%	Resource Availability, Response Time	MTTR, MTTF, Percentage Capacity Utilization
Cloud Networking A	Hardware Endpoints	99.999%	Resource Utilization, Response Time	MTTR, MTTF, Data transmission rate
...		

Technical Writing – Example

6. ***Request for Proposal (RFP)***

- ✍ An RFP is a business document that announces a project and solicits bids from multiple qualifying contractors.
- ✍ The writing style of this document is persuasive, and a poorly-written RFP document can ensure whether or not the deal will be successful.
- ✍ It is a document issued by an organization or company to solicit bids and proposals from potential vendors or service providers.
- ✍ The RFP outlines the organization's requirements, objectives, and evaluation criteria for a specific project, product, or service.
- ✍ Vendors then submit their proposals in response to the RFP, detailing how they will meet the organization's needs.



Technical Writing – Example

7. Case Studies & White Papers

- ✍ Case Studies and White Papers are two types of documents commonly used in business and research contexts to present in-depth analysis, insights, and findings.
- ✍ The writing style of white papers and case studies is unique, along with the formatting. Both documents are written for a specific target audience and require technical writing skills. Case studies are written in a passive voice, while white papers are written in an active voice.
- ✍ A case study is a detailed examination of a specific situation, project, or problem, usually focusing on a real-world scenario. Case studies often aim to provide an in-depth understanding of a particular subject, showcase practical examples, and highlight the outcomes or solutions achieved.
- ✍ A white paper is an authoritative report or guide that presents a problem, explores a specific topic, or proposes a solution or position on a particular issue. White papers are typically more research-oriented and often serve as thought leadership documents.

Overview of Amazon Web Services

AWS Whitepaper



Technical Writing – Rules

- ✍️ A good report is easy to recognize.
 - 🔴 Its title is precise and informative, its layout and format are well organized,
 - 🔴 The binding is easy to handle and opens flat to reveal both text and diagrams.
- ✍️ Reading a well written report is pleasurable: the style is accurate, fluent and concise, with headings to indicate the content of each section.
- ✍️ The report writing laws, which are as follows:
 1. *The reader is the most important person.*
 2. *Keep the report as short as possible.*
 3. *Organize for the convenience of the report user.*
 4. *All references should be correct in all details.*
 5. *The writing should be accurate, concise and unobtrusive.*
 6. *The right diagram with the right labels should be in the right place for the reader.*
 7. *Summaries give the whole picture, in miniature.*
 8. *Reports should be checked for technical errors, typing errors and inconsistency.*
 9. *The report should look as good as it is.*
 10. *The reader is the most important person.*
- ✍️ The first law is repeated because it is the only law which should never be broken. Flexibility and adaptation may be useful, but only to make the report more accessible to the reader.

Technical Writing – Standards

- 🏰 Technical writing standards refer to guidelines and best practices that ensure consistency, clarity, and effectiveness in technical documentation.
- 🏰 These standards help technical writers create documents that are accurate, understandable, and user-friendly.
- 🏰 Some of The well known standards are:
 - ⚡ ISO 215:2019 - "Technical product documentation - Presentation of design-process information."
 - ⚡ ISO 10209:2012 - "Technical product documentation - Vocabulary - Terms relating to technical drawings, product definition and related documentation."
 - ⚡ ISO 690:2010 - "Information and documentation - Guidelines for bibliographic references and citations to information resources."
 - ⚡ ISO 7144:1986 - "Documentation - Presentation of theses and similar documents."
 - ⚡ ISO 8217:2017 - "Petroleum products - Fuels (class F) - Specifications of marine fuels."
 - ⚡ ISO 12215 series - "Small craft - Hull construction and scantlings."
 - ⚡ IEEE Standards: The Institute of Electrical and Electronics Engineers (IEEE) has various standards related to technical report writing, including IEEE 830 for software requirements specifications and IEEE 829 for software test documentation.

Technical Writing – Topics

- ✍ In the context of technical writing, a topic refers to the subject or theme that your technical report focuses on. It represents the main area of interest or the subject matter that you will be exploring, analyzing, or presenting information about in your report.
- ✍ Choosing a topic is an essential step in the technical writing process as it determines the scope and direction of your report. The topic should be relevant to your field of study, align with the objectives of your report, and be of interest to your intended audience.
- ✍ When selecting a topic, consider its significance, feasibility, and relevance to current trends or challenges in your field. It should be specific enough to allow for in-depth analysis but broad enough to provide sufficient content for your report.
- ✍ Computer science topics can be divided into several categories, such as artificial intelligence, big data and data science, human-computer interaction, security and privacy, and software engineering.

Technical Writing – Topics

 A strong computer science topic is clear, well-defined, and easy to understand.

Good Topics

- **Specific and focused:** A good topic narrows down the subject matter and provides a clear focus for your report. For example, "Optimization Techniques for Convolutional Neural Networks in Image Classification."
- **Relevance and significance:** A good topic addresses current challenges, emerging technologies, or important issues in the field. It contributes to the existing body of knowledge. For example, "Exploring the Potential of Quantum Computing for Cryptography."
- **Feasibility:** A good topic is practical and achievable within the available resources, time, and expertise. It should allow for data collection, analysis, and meaningful conclusions. For example, "Performance Analysis of Cloud-Based Database Management Systems."
- **Research-oriented:** A good topic encourages investigation and analysis. It provides an opportunity to explore different perspectives, compare existing approaches, or propose novel solutions. For example, "Comparative Study of Machine Learning Algorithms for Sentiment Analysis."

Technical Writing – Topics

 A strong computer science topic is clear, well-defined, and easy to understand.

Bad Topics

- **Broad and vague:** A bad topic lacks specificity and fails to provide a clear direction for the report. For example, "Computer Security."
- **Overdone or outdated:** A bad topic focuses on well-explored areas with limited potential for originality or innovation. For example, "Introduction to HTML."
- **Unrealistic or unfeasible:** A bad topic sets unrealistic expectations, requires extensive resources or expertise beyond your reach, or lacks available data for analysis. For example, "Developing a Fully Autonomous Self-Driving Car Prototype."
- **Lack of relevance or significance:** A bad topic does not address current challenges or does not contribute to the advancement of knowledge in the field. For example, "History of Computer Science."

Technical Writing – Topics



Tips for creating a topic

- **Research and stay updated:** Stay informed about the latest advancements, trends, and challenges in computer science. Read academic journals, attend conferences, and follow reputable sources to identify current and relevant topics.
- **Identify your interests:** Consider your personal interests and areas of expertise within computer science. Choosing a topic that aligns with your passions will motivate you throughout the research and writing process.
- **Define the scope:** Determine the scope of your report by narrowing down the focus of your topic. Consider specific subfields, technologies, applications, or problems within computer science.
- **Conduct a literature review:** Before finalizing your topic, conduct a literature review to identify existing research and identify any gaps or areas that need further exploration.
- **Formulate a research question or objective:** Clearly articulate the research question or objective that your report will address.
- **Consider feasibility:** Assess the feasibility of your topic in terms of available resources, time constraints, and data availability.
- **Discuss with your advisor or instructor:** Consult with your advisor or instructor to seek their guidance and feedback on your proposed topic.
- **Brainstorm and refine:** Brainstorm multiple topic ideas and evaluate them based on the criteria mentioned earlier (specificity, relevance, feasibility, and research orientation).

"The only thing you absolutely have to know is the location of the library." - Albert Einstein

Technical Writing – Topics

1. Performance Analysis of Sorting Algorithms: A Comparative Study
2. Implementation and Optimization of Image Processing Algorithms for Object Recognition
3. Secure Coding Practices: Best Practices and Techniques for Writing Secure Software
4. Design and Implementation of a Distributed File System for Cloud Storage
5. Evaluating the Performance and Scalability of NoSQL Databases in Big Data Applications
6. Developing a Recommendation System using Machine Learning Algorithms
7. An Analysis of Different Approaches for Data Encryption and Decryption
8. Design and Implementation of a Chatbot using Natural Language Processing Techniques
9. Exploring the Application of Blockchain Technology in Supply Chain Management
10. Performance Comparison of Different Machine Learning Libraries for Data Analysis
11. Design and Development of a Web Application with Responsive Design and User Experience Evaluation
12. An Investigation into the Performance and Security of Web APIs
13. Design and Implementation of a Real-Time Streaming Analytics System for IoT Data
14. Building a Sentiment Analysis System for Social Media Data using Natural Language Processing
15. Evaluating the Performance of Deep Learning Models for Image Classification Tasks
16. Design and Implementation of a Secure Authentication System using Multi-Factor Authentication
17. Analyzing the Performance and Scalability of Cloud-based Database Systems
18. Developing a Mobile Application with Offline Capabilities and Synchronization
19. An Investigation into the Impact of Caching Strategies on Web Application Performance
20. Design and Implementation of a Recommender System for E-commerce Platforms

Technical Writing – Common Mistakes of CS Students

- 📌 Poor organization, Lack of focus and specificity
- 📌 Misreading the reader
- 📌 Lengthy sentences
- 📌 Big words
- 📌 Poorly defined topic
- 📌 Inadequate content
- 📌 Dull, wordy prose
- 📌 Poor page layout
- 📌 Stopping after the first draft
- 📌 Inconsistent usage
- 📌 Inappropriate use of technical jargon
- 📌 Neglecting proper citation and referencing
- 📌 Inadequate proofreading and editing
- 📌 Lack of visual aids and illustrations:
- 📌 **Writer's block** -Writer's block is the inability to start putting words on paper or computer, and it stems from anxiety and fear of writing.
- 📌 **Writing in “technicalese”** — technicalese is language more complex than the concepts it serves to communicate.

Students Title Selection

📌 CS1RD13 -Daniel

🎮 Group All

📌 CS2RD13 -Hamelmal

📄 Group 01

📄 Group 03

📄 Group 05

📄 Group 02

📄 Group 04

📄 Group 06

📌 CS3RD13 -Abrham

🌍 Group 01-4

🌍 Group 05

🌍 Group 06

Students Group Assignment 01

- *Only Handwriting is allowed*
- *Dead Line Next Class*
- *If not submitted with the deadline IT will be disqualified*

1. Explain the major attributes of technical reports.
2. List and explain the components of a technical report.
3. List the types of technical reports normally encountered in science and technology.
4. Explain the key differences of **Technical Report, Proposal, Brief and Notes**.
5. Discuss the statement that 'writing for publication is the ultimate goal of science.'
6. Identify and list the resources you will need for writing a good technical report.
7. State the importance of syntax in composing the titles of technical reports.
8. Discuss the basic things to do before writing a good introduction to a technical report or scientific paper.
9. Is technical report writing a necessary component of every employee's professional skill? Why?
10. How does technical report writing compare/contrast to traditional essays? Explain?
11. List out at list five threats of Technical Report Writing? Discuss each of them in detail?
12. For each of the topics submitted prepare the Audience Projection report with one page?

Group 01: Question 1 and 7

Group 02: Question 2 and 8

Group 03: Question 3 and 9

Group 04: Question 4 and 10

Group 05: Question 5 and 11

Group 06: Question 6 and 12

END OF THE CHAPTER

*Thank
you*

