



5 : Technical Writing and Effective Communication

IT3106 – Communication Skills II

Level II - Semester 1

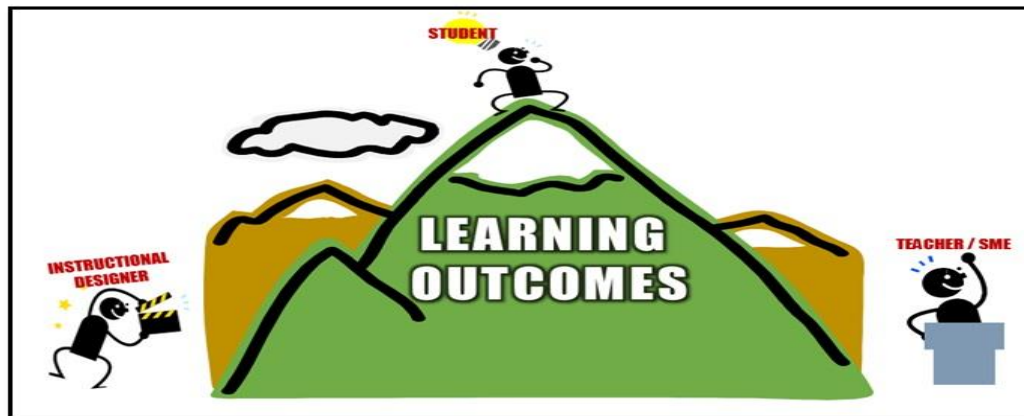
Overview

This is the fifth topic of the course module, Communication Skills (EN3106). This section will introduce the aspects related to Technical Writing and Effective Communication. Further, it will give insights into the tools which makes the technical writing process easier. Additionally, the section introduce few technical documents knowing of which would helpful during and after the degree program.

Intended Learning Outcomes

At the end of this lesson, you will be able to;

- Express concepts/ideas/proposals effectively to different audiences/stakeholders in a given context.
- Employ various tools and technologies in aid of effective professional and technical communication.



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References

[REF1] Laplante, P. A., (2018) Technical Writing: A Practical Guide for Engineers, Scientists, and Nontechnical Professionals -Routledge; 2nd edition.

[REF3] Oetiker, T., Partl, H., Hyna, I. And Schelgl, E., (1995). The not so short introduction to LATEX2e. Electronic document available at <http://www.tex.ac.uk/tex-archive/info/lshort>.

5.4 Writing Tools

“It is essential to have good tools, but it is also essential that the tools should be used in the right way”

--Wallace D. Wattles --

5.4.1 Introduction to Writing Tools

Tool categorization

- Authoring tools
 - Screen capturing and annotating tools
 - Picture drawing and image editing tools
 - Publishing tools
-
- Both Free and Open Source Software (FOSS) and Proprietary commercial software can be found for each category
 - Content of the module will be focusing mostly on FOSS and freely available authoring software and tools (cloud or standalone)

5.4.1 Introduction to Writing Tools

Authoring tools

- Authoring tools can range from pen and paper to interactive digital documents.
- Based on the requirements of the technical documentation, a number of aspects need to be considered in choosing an authoring tool.
 - Cost of ownership
 - Import and Export
 - Productivity tools and features
 - Teamwork
 - Cross platform support
 - Security and permission



5.4.1 Introduction to Writing Tools

Choosing Authoring tools - Cost of ownership

- The tool used should be financially feasible for the author or organization
 - Licensing
 - may have to purchase the software
 - Cost of hosting
 - if it is a collaborative tool, then you may have to host it in a server and maintain
 - Cost of keeping documents
 - If you have purchased an online solution (SaaS solution) then there will be additional cost for document retention

5.4.1 Introduction to Writing Tools

Choosing Authoring tools - Cost of ownership

- Cost of backup
 - ❑ Additional devices, online storage, etc.
- Cost of plugins and extensions
 - ❑ License or subscription may cover only the basic software. There could be plugins needed to be purchased from third parties
- Etc.



5.4.1 Introduction to Writing Tools

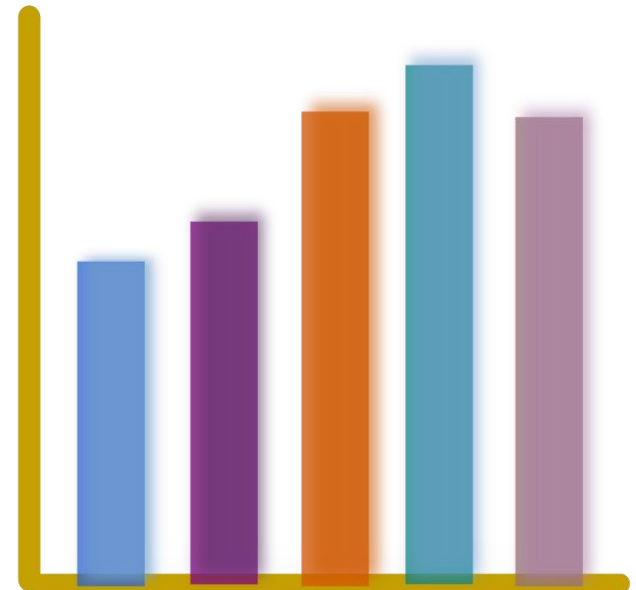
Choosing Authoring tools - Import and Export

- The tool should support the formats you want to import to your technical document
 - Using templates to prepare the document
 - Importing drawings, charts, etc.
 - Importing subsections from other tool
 - Etc.
- The tool should support the output you want produce
 - Formatting, fonts, etc.
 - File types such as PDF, DOCX, ODF, etc.
 - Quality printed outputs
 - Vector graphic support
 - Etc.

5.4.1 Introduction to Writing Tools

Choosing Authoring tools - Productivity tools and features

- Writing tool may support productivity tools built-in or as plugins
 - Grammar and spell checking
 - Centralized styling capabilities
 - Optimize image and chart placement
 - Reference management
 - Version management
 - Content reuse
 - Conditional content
 - Etc.



5.4.1 Introduction to Writing Tools

Choosing Authoring tools - Teamwork

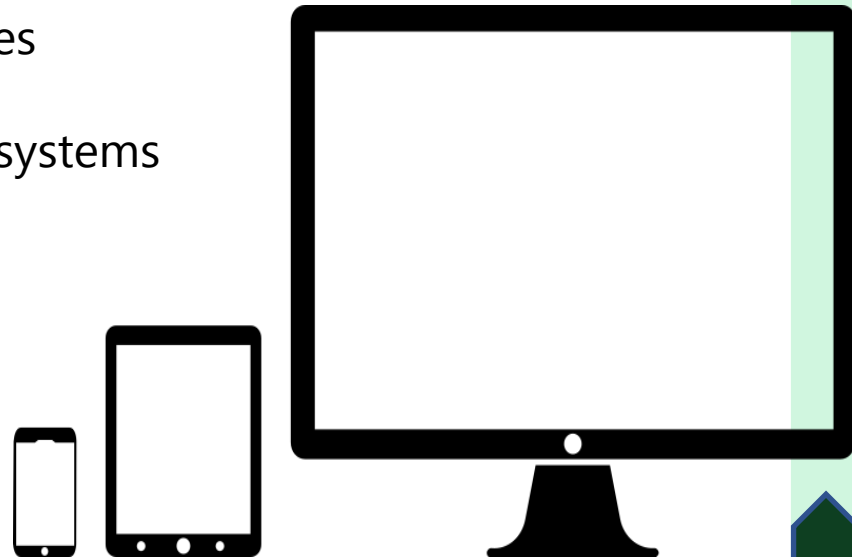
- Real time collaboration
 - Each member of the team will participate simultaneously on content development
- Workflow based collaboration
 - The document preparation work is defined as a workflow where each member would contribute to the work sequentially
- A free tool supporting both these needs to a certain extent is Google Docs.



5.4.1 Introduction to Writing Tools

Choosing Authoring tools – Cross platform support

- Different technical writing personal may prefer different platforms depending on their expertise, availability, suitability to the circumstances, etc.
- Requirement could be:
 - Support on multiple device types
 - Support on multiple operating systems



5.4.1 Introduction to Writing Tools

Choosing Authoring tools – Security and permission



- Granting access to the technical document may have security or permission requirements at different granularity
 - The technical document could be having confidential information
 - The document may need to protected from changing
 - The document may need to protect from printing
 - Etc.

5.4.1 LaTeX – A tool for Technical Writing [REF3]

Why LaTeX?

- LaTeX is a free and open source tool that has a number of features in supporting technical writing.
- When it comes to large files with graphics, LaTeX is way faster than other competitive software
- Features required for scientific writing is readily available and integration is seamless
- Compatible with all the available personal computer operating systems
- Switching into different formatting standards can be done in matter of minutes.
- Conditional content management is very easy

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5.4.1 LaTeX – A tool for Technical Writing [REF3]

Why LaTeX?

- Version management can be done similar to source code version management. E.g. Using Git
- Centralized styling capabilities required across multiple documents can be managed with ease
- References management is easy
- Including math equations with correct notations is one of the biggest advantages from the beginning
- Clarity of the output of LaTeX document is provided even with default configurations

LaTeX require a fair amount of learning to get familiar with the syntax which is similar to a markup language.

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5.4.1 LaTeX – A tool for Technical Writing [REF3]

Installing LaTeX on Windows

- Install MiKTeX - <https://miktex.org/download>
- Install TexMaker UI - <https://www.xm1math.net/texmaker/>

Installing LaTeX on Ubuntu GNU/Linux

- Install TexLive – `sudo apt install texlive-latex-extra`
- Install TexMaker UI - <https://www.xm1math.net/texmaker/>

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5.4.1 LaTeX – A tool for Technical Writing [REF3]

Introduction to LaTeX

- Refer following videos with practical examples.
 - Introduction to LaTeX – Part I
 - <https://www.youtube.com/watch?v=cySEn-ucEDc>
 - Introduction to LaTeX – Part II
 - <https://www.youtube.com/watch?v=3J5k5re-p8c>

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5.4.1 LaTeX – A tool for Technical Writing [REF3]

- **Using Figures in LaTeX**

- Refer following video with practical examples.

- <https://www.youtube.com/watch?v=7Be8EAJqlxU>

- **Using Tables in LaTeX**

- Refer following video with practical examples.

- https://www.youtube.com/watch?v=77Xda_hX3wg

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5.4.1 LaTeX – A tool for Technical Writing [REF3]

- **Referencing in LaTeX**

- Refer following video with practical examples.

- <https://www.youtube.com/watch?v=SLWXzeDxllc>

Overleaf is a popular online platform for LaTeX. Free online introduction to LaTeX is available at [https://www.overleaf.com/learn/latex/Free_online_introduction_to_LaTeX_\(part_1\)](https://www.overleaf.com/learn/latex/Free_online_introduction_to_LaTeX_(part_1)).

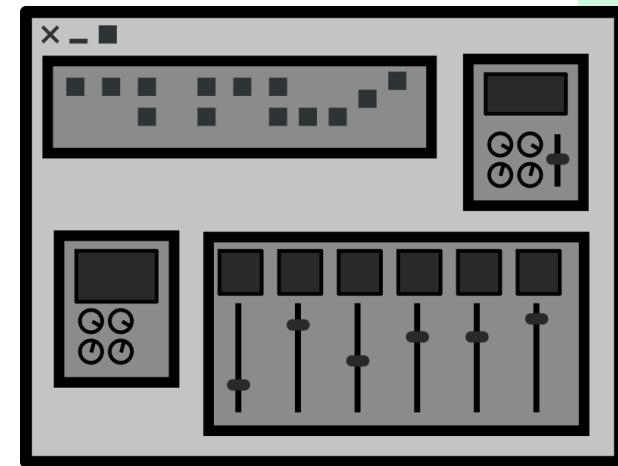
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5.5 Technical Reporting

5.5.1. System Requirements Specification

- A document that defines and details the functions and features of a system or software application.
- The document is used to:
 - Establish an agreement between the organization requiring a software/system and the software/system provider.
 - Estimate costs, schedules, and risks.
 - Establish a basis for validation and verification.

A sample structure and details required for a System/Software Requirement Specification is provided as a reference material. The LaTeX version of the document is also made available for you to use.



5.5 Technical Reporting

5.5.2. Technical Procedures [REF1]

- Technical procedures are descriptive documents that include step-by-step instructions for assembling, processing, or organizing things.



5.5 Technical Reporting

5.5.2. Technical Procedures [REF1]

- A procedures document should contain:
 - Purpose of the procedure
 - Safety information
 - Preconditions—what must be true before the procedure is conducted?
 - Qualifications of those who will conduct the procedure
 - List of materials
 - List of tools
 - Step-by-step instructions
 - Post conditions—what will be true if the procedure is followed correctly?
 - Troubleshooting section
 - List of frequently asked questions (FAQs)

5.5 Technical Reporting



5.5.3. User Manuals [REF1]

- Technical writer need a good understanding of the overall system to write user manuals
- Technical writers should thereby involved in all phases of the product development
- User manual should be written at the end of the development process as features will change until the final system delivery
- More visual content
- Organized based on task or workflow

A sample structure and details required for a User Manual is provided as a reference material.

5.6 Preparing a Curriculum Vitae / Résumés

Résumé is one of the most personal of business communications and most important technical document that you will ever prepare

- Résumés should be short. If a Résumé is more than two pages, then you should be having good reasons to do so.
- Common elements of a Résumé include:
 - Name and contact information
 - Statement of objective and summary
 - Experience
 - Education /Training
 - Certifications
 - Expertise
 - Awards and Honors
 - Affiliations
 - References

A great résumé does not guarantee that you will get hired—you have to sell yourself during the interview and afterward



5.6 Preparing a Curriculum Vitae / Résumés [REF1]

- You should be willing to left things off if they do not give much benefit to the position you are applying or not very prominent.
- Example: Summary
- The following summary is too generic and
- does not signify your value to the employee / hiring organization

Almost six years of (extensive) programming experience in various languages with five years of extensive Web development (programming and design). Expert in MySQL database design.

- The following summary is an example
- for one that you should include.

More than 30 years of experience as an engineering professional from junior engineer to vice president of technology for a Fortune 500 company. Earned PhD in electrical engineering, with over 300 publications and 27 patents in embedded telecommunications technologies.



5.6 Preparing a Curriculum Vitae / Résumés [REF1]

- **Experience**

- Your experience is probably the most important component of the résumé
- you need to be thorough, accurate, and honest in your reporting
- List all experiences in reverse chronological order, with your most recent experience listed first
- Include duration for each experience (E.g. Jan. 2000 - June. 2005)
 - Bad statement
 - *Part of a team that developed a \$1 billion weapons system*
 - Good statement
 - *Wrote software acceptance test scripts and conducted acceptance testing for a \$1 billion classified weapons system.*

Be careful. Some organizations do not like to reveal their specific information even through a résumé

5.6 Preparing a Curriculum Vitae / Résumés [REF1]

• Education and Training / Certifications

- Dates of achievements or accreditation is important
- Depending on the level of education, you might have to limit the details of primary qualifications.
 - Example: Providing O/L and A/L results after graduation
- Focus on the employer's interest for knowing your qualifications to evaluate
 - Hint: Focus on educational qualifications related to the position

People value time.
If people have to spend more time
on reading to get the essence
out of your resume, they
might lose interest halfway
through



5.6 Preparing a Curriculum Vitae / Résumés [REF1]

- **References**

- Always ask permission before listing someone as a reference.
- List references who can discuss your abilities and experiences.
- References who still work at the company where you claim the experience are more effective than those who no longer work at that company.
- You should have a supervisor as your reference, not a peer or subordinate.
- Don't list relatives unless they were a direct or indirect supervisor and you disclose the relationship.
- Customize the list of references you use based on the type of job for which you are applying.

5.6 Preparing a Curriculum Vitae / Résumés [REF1]

Tips for organizing the résumé

- Order of the items matter
 - Start with either your experience or your education—whichever is more impressive
- Do your homework, study about the organization and organize the content of your resume according to their preference or job description
- Highlight your strengths
- Honesty is the best policy
- Strictly avoid humor in your résumé.
- delivering your résumé via special means (e.g., by private courier) doesn't usually help. Let the quality of your experience and education win you the job.

5.7 Dissertation

- The structure of the dissertation could change from institute to the particular degree program.
- A more generic structure for a dissertation would be:
 - Introduction
 - Literature / Background study
 - Methodology
 - Design
 - Results and Evaluation
 - Conclusion
 - Future work
 - References



BIT dissertation guideline is provided as a reference material.