MODULE TITLE:  **Creating Technical Documentation**

NOMINAL DURATION: **40** hrs

**LO1.**  **Identify and analyze documentation needs**

**What Is Technical Documentation?**

Technical documentation is the printed or online documentation that describes the construction of a computer system.

* The documentation usually consists of texts and diagrams.



**Media for Technical Documentation include:**

* Paper
* Online/web
* Electronic/Adobe Acrobat software
* CD/DVDs
* Floppy Disk

**Purpose of Technical documentation**

* The purpose of technical documentation is to provide information for people who use, build and maintain computer system.
* Computer engineers, technicians, network engineers, administrators, system analysts, system designers and other computer professional need to know how a system works.
* Other people who need to refer to the documentation include project managers, system managers and computer operations staff
* It helps to Effective development and maintenance of the system.

**Examples of Technical Documentation include:**

* System or project specifications
* System design
* System functionality
* Reports
* Help references
* Brochures
* Technical manuals
* Operational procedures
* Training materials
* Self-paced tutorials
* On-line help
* User guides

**Every document should have:-**

* Title
* Author’s name (*if relevant*)
* Abstract
* Acknowledgment
* Header and footer on every pages
* The Appendix

**LO2. Design documentation**

Documentation is an important communication tool when developing a new system or maintaining an existing system.

All user requirements are gathered, analyzed, and documented to create or maintain information systems.

* **Identifying required information**

To identify the required information:

* **Consider the availability of the information needed**. The information that you need is dependent on the depth and breadth of the knowledge that you are seeking. Broader information is usually much easier and faster to find than specific information.
* **Know the source of the information you want**.

The Source of information can be:

* Newspapers :( old media which is filled with Information on Any topic).
* Internet: Start Google Search engine and type Required Information.
* Local People: Talk to people who are related to Subject of your Research.
* **Creating consistent document standard, templates and style**

**Standard**

* Standard is guidelines for producing documentation
* It is also used to provide consistency and quality of documentation.

**Classification of Documentation Standards**

* Industry standards
* Organizational standards
* Project standards

**Templates**

* A template is an outline that contains the structure and format of document, and standard text and diagrams.
* It helps to establish and maintain standard document.

**Documentation tools**

* The software tools such as Word processing, HTML, Visio that enable you to draw technical diagrams are an example of software documentation tools.

**Point of Interest for documentation**

* The purpose of documentation is to assist people in undertaking certain tasks.
* Standards for producing documentation help ensure the quality and consistency.
* Templates are specific tools that used to help documentation developers to follows a standard layout.
* Software tools such as word processing and desktop publishing software help developers to produce technical documentation.

Documentation consists of:

* Overviews that indicate the structure and components of the system
* A detailed design of the system
* The user interface - how interaction with the system occurs, such as input and output screens
* A data dictionary that describes the data and processes within the system
* Test data that describes the testing that will occur
* Information on maintenance of the system, for when changes occur to an existing system.

**Documentation Development**

* The development of a documentation can involve a number of people:
* systems analysts
* system designers
* data analysts
* technical/manual writers (documentation specialists)
* Programmers and software testers.

**Documentation Maintenance**

* Errors are discovered in the system. The documentation can be used to locate the system where the errors are occurring.
* Having good documentation will save time, as information about how the system works will be easily accessible.
* The system needs to be changed as a result of the changing needs of the organization or because of external forces.
* **Understanding the system functionality**
* **Functional requirements**

**Functional requirements** are observable tasks or processes that must be performed by the system under development. For example, a functional requirement of a stock trading system is "must update and remember stock prices;"

* **Non functional requirements**

**Non-functional requirements** are qualities or standards that the system under development must have or comply with, but which are not tasks that will be automated by the system.

**A Non-functional requirement** is a [requirement](https://en.wikipedia.org/wiki/Requirement) that specifies criteria that can be used to judge the operation of a system.

* **System requirements (specification)**

**System requirements are** the [hardware](http://www.webopedia.com/TERM/H/hardware.html) and [software](http://www.webopedia.com/TERM/S/software.html) components of a [computer system](http://www.webopedia.com/TERM/C/computer_system.html) that are required to [install](http://www.webopedia.com/TERM/I/install.html) and use software efficiently.

The software manufacturer will list the system requirements on the software package. If your computer system does not meet the system requirements, then the software may not work correctly after installation. System requirements for operating systems will be hardware components, while other application software will list both hardware and [operating system](http://www.webopedia.com/TERM/O/operating_system.html) requirements.

System requirements are most commonly seen listed as minimum and recommended requirements. The minimum system requirements need to be met for the software to run at all on your system, and the recommended system requirements, if met, will offer better software usability.

**LO3. Develop documentation**

* **Writing technical documentation**

**Methodologies for producing documentation**

* A methodology describes the approach and the steps used in particular discipline (order/regulation).
* A widely accepted methodology for developing computer system documentation is the standard documentation process. The starting point in this process is the documentation library blueprint.

**Producing technical documentation**

The standard technical documentation development process consists of the following steps:

* Planning
* Drafting
* Reviewing
* Testing
* Producing
* Distributing
* Updating

**Planning**

* Investigating the problem
* Defining the target audience-their skills levels and needs
* Determining documentation requirements
* Designing the documentation
* Selecting suitable methods

**Drafting**

* Drafting is the actual writing of the documentation and is usually the most time consuming task.
* Several writing techniques can be used to make the documentation understandable to the user.

**Reviewing**

* After the document has been drafted, various aspects including content, grammar and style, clarity, standards and interest should be checked by someone other than the writers.

**Testing**

Before you begin testing you will need to document the test process.

 Test process documentation is the task of detailing exactly what, when and how software will be tested.

A careful and detailed test process document will document the plans for testing and all of the results from the test process.

**Developing technical documentation may also include:**

* System requirements
* System flow chart
* Data flow diagram
* Structured English
* Data dictionary
* User interface
* Maintenance history log book

**System chart/ diagram**



A **data flow diagram** (**DFD**) is a graphical representation of the "flow" of data through the system.

This technique is used at the analysis stage.



**The data flow diagram shows:**

* The processes
* The flow of data to and from these processes
* Where the data is stored
* Who or what interact with the system by inputting data into the system or by receiving data from it.

**Structured English (pseudo code)**

Structured English is a technique that uses normal English language to describe each process in the data flow diagram.

* An example is the specification for the process called Print event results.

In English, we can describe the process as follows:

* List every race on the day, in order of the start time of the race.
* List the race description, including the age group and the time it starts.
* List the name and club of each athlete, and their finishing time in the race, in order from first to last.
* If the athlete did not complete the race, print “DNC” instead of a time.



**Data Dictionary**

A [data](http://www.businessdictionary.com/definition/data.html) [dictionary](http://www.businessdictionary.com/definition/dictionary.html) [defines](http://www.businessdictionary.com/definition/define.html) the [structure](http://www.businessdictionary.com/definition/structure.html) of the database itself and is used in control and [maintenance](http://www.businessdictionary.com/definition/maintenance.html) of a [database](http://www.businessdictionary.com/definition/database.html). Most database management systems keep the data dictionary hidden from [users](http://www.webopedia.com/TERM/U/user.html) to prevent them from accidentally destroying its contents.

Data dictionaries do not contain any actual [data](http://www.webopedia.com/TERM/D/data.html) from the database, only bookkeeping information for managing it.

Among other [items](http://www.businessdictionary.com/definition/item.html) of [information](http://www.businessdictionary.com/definition/information.html), it [records](http://www.businessdictionary.com/definition/record.html):

* what data is stored
* Name, [description](http://www.businessdictionary.com/definition/description.html), and [characteristics](http://www.businessdictionary.com/definition/characteristic.html) of each data element
* [Types](http://www.businessdictionary.com/definition/type.html) of [relationships](http://www.businessdictionary.com/definition/relationship.html) between [data elements](http://www.businessdictionary.com/definition/data-element.html)
* [Access rights](http://www.businessdictionary.com/definition/access-rights.html) and [frequency](http://www.businessdictionary.com/definition/frequency.html) of [access](http://www.businessdictionary.com/definition/access.html).

**User Interface**

An **interface** is a set of [commands](http://www.webopedia.com/TERM/C/command.html) or [menus](http://www.webopedia.com/TERM/M/menu.html) through which a user communicates with a system.

The **user interface** is one of the most important parts of any system because it determines how easily you can make the system do what you want.

User interface determines how commands are given to the system and how [information](http://www.businessdictionary.com/definition/information.html) is displayed on the [output](http://www.businessdictionary.com/definition/screen.html) device. There are three main [types](http://www.businessdictionary.com/definition/type.html) of user [interfaces](http://www.businessdictionary.com/definition/interface.html):

1. [Command-driven](http://www.webopedia.com/TERM/M/menu_driven.html) interface: the user must know the [machine](http://www.businessdictionary.com/definition/machine.html) and program-specific [instructions](http://www.businessdictionary.com/definition/instructions.html) or [codes](http://www.businessdictionary.com/definition/codes.html).
2. [Menu-driven](http://www.webopedia.com/TERM/M/menu_driven.html) interface: user chooses the commands from lists displayed on the screen.
3. [Graphical user interface (GUI)](http://www.businessdictionary.com/definition/graphical-user-interface-GUI.html): user gives commands by selecting and clicking on [icons](http://www.businessdictionary.com/definition/icon.html) displayed on the screen.

**Maintenance history log book**

Maintenance histories are written notes that provide documentation about the upkeep of a certain piece of equipment. This documentation can prove useful to a variety of different businesses. These histories are particularly useful in [maintenance management](http://www.wisegeek.com/what-is-maintenance-management.htm) because they help businesses ensure their equipment is kept in good condition.

I.e.: A **maintenance log** is a document that records who did what, when, and why. Maintenance logs are extremely useful for troubleshooting recurring or obscure problems, as they provide a record of all work performed on the system and may shed light on hard-to-spot interactions between seemingly unrelated symptoms. In short, they’re the history of the system.

* **Applying content format and style**

**Writing style**

* The style of writing is an important factor in determining the quality of documentation (both online and printed).
* The following features can influence how well the documentation is understood by the reader:
* Language
* Word simplicity
* Sentence and paragraph length
* Spelling and grammar
* Consistency
* Active voice
* Word emphases

**Language**

* Use a conversational style so that the reader feels the communication is directed at them – for example, ‘restart your computer’, rather than ‘restart the computer’.
* You aim is to explain thing simply and clearly.

**Simplicity**

* Use word that are common in conversation rather than the more formal, often longer word usually used in literature.

**Spelling and grammar**

* Spelling and punctuation are important. Incorrect spelling may make the meaning unclear, or distract the reader.
* Incorrect spelling also gives an impression of poor-quality documentation. Spell checking software is readily available and will find many spelling errors.
* Check your grammar, either by yourself or preferably by someone else who is a grammar expert.

**Active voice**

* Wherever possible, use the active voice. ‘Active voice’ means the subject carries out the action.
* Active voice is simpler, shorter, and easier to follow.

**Active voice example**

An example of active voice is: **Check the data for errors, then press the enter key.**

Compare with the following example of the passive voice:

 ***After the data is typed, it should be checked for errors, and then the key is pressed***

**Word emphases**

* Use underlining, bolding, capitals and italics sparingly and consistently to alert the reader to an important point.
* Overuse of word emphases can distract or confuse the reader.
* Bullets are an effective device for emphasizing a series of points.

**LO4. Evaluate and edit documentation**

* **Analyzing and gathering feedback**

Gaining feedback from appropriate person enables you to revise the designed system again to satisfy your customers. By getting customer feedback, you can make your customers happier.

* **Implementingfeedback mechanisms in line with organization policies**

Client feedback can be implementing in line with the organization policies through:

* Prototyping
* Verbal feedback
* Informal feedback
* Formal feedback
* Questionnaire
* Survey
* Group discussion
* **Prototyping**

A **prototype** is an early sample or model built to test a concept or process to enhance precision by system analysts and users.

Prototyping serves to provide specifications for a real, working system rather than a theoretical one.

Some Advantages of Prototyping:

* Reduces development time.
* Reduces development costs.
* Requires user involvement.
* Developers receive quantifiable user feedback.
* Facilitates system implementation since users know what to expect.
* Results in higher user satisfaction.
* Exposes developers to potential future system enhancements.
* **Verbal feedback**

Verbal feedback should be used to supplement, support or as part of other evaluation activity. It can be formal or informal.

**Informal feedback** is a type of feedback which offer daily encouragement to team members and discuss comments from customers. It can often give the employee a sense of job performance and can give motivation.

**It** is most often used to evaluate just after a training event. Sometimes it may be in the form of a throw away comment or something more specific.

Informal verbal feedback is good for:

* Validation of learning and meeting of objectives levels.
* Carrying out formative assessment of training programmes.

**Formal Feedback** is documented feedback. In some cases this may be a form of corrective counselling intended to make an employee aware of their performance or lack of performance.

Formal verbal feedback is good for:

* Informing the tutor of any immediate reactions to the training.
* Allowing the facilitator to focus subsequent evaluations around specific issues.
* **Questionnaire**

Questionnaires are effective mechanisms for efficient collection of certain kinds of information.

Questionnaires may have only two options (yes/no) or multiple options or rank scaling, etc.

 All the readers need to do is tick the most appropriate answer according to them.

 Example: How satisfied were you with the training?

1. Overall quality of the training

 ◎ Excellent ◎ Good ◎ Satisfactory ◎ Poor

1. Attitude of the trainer

 ◎ Excellent ◎ Good ◎ Satisfactory ◎ Poor

1. Trainer's knowledge of the topics

 ◎ Excellent ◎ Good ◎ Satisfactory ◎ Poor

1. Handouts and training aids

 ◎ Excellent ◎ Good ◎ Satisfactory ◎ Poor

1. What would you recommend to the trainer to be done differently? (Please use the back of the paper if you need more space.)
* **Survey**

A **survey** is a data collection tool that used to gather information about individuals.

A **feedback survey** is designed to collect feedback from clients about their interactions with a business.

* Feedback surveys help businesses improve the quality of their information, products, and services.
* **Group discussion**

After group discussion, the group provides feedback to the trainer or facilitator.

It is rated on various parameters such as attitude, confidence, communication, interpersonal skills, and flow of thoughts.