Web Development and Database Administration Level III

Based on November, 2023 Version-II Occupational Standard (OS)

Module Title: Monitoring and Supporting Data Conversion

Module code: EIS WDDBA3 M09 0323

Nominal duration: 30 Hours

Prepared by: Ministry of Labor and Skill

November, 2023 *Addis Ababa, Ethiopia*

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Ministry of Labor and Skills

Table of Contents

Acknowledgment

Ministry of Labor and Skills wish to extend thanks and appreciation to the many representatives of TVT instructors and respective industry experts who donated their time and expertise to the development of this Teaching, Training and Learning Materials (TTLM).

Acronym

GIF ---------- Graphics Interchange Format

JPG ---------- Joint Photographic Experts Group

MS Access---------- Microsoft Access

PDF---------- Portable Document Format

PNG ---------- Portable Network Graphic

SQL---------- Structured Query Language.

TIF ---------- FTag Image File Format

XLS ---------- Microsoft Excel spreadsheet.

XML---------- Extensible Markup Language

Introduction to the Module

This module provides as the process of translating data from one format to another. It involves the planning of steps and mapping of data fields to convert one set/type of data into a different, more desired, format. .The goal of data conversion is to prevent data loss or corruption by maintaining the integrity of the data and embedded structures.

This module covers the units:

- Monitor data conversion
- Support data conversion

Module Instruction

For effective use this modules trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Perform Operation Sheets which were provided at the end of units
4. Do the “LAP test” giver at the end of each unit and
5. Read the identified reference book for Examples and exercise

Unit One: Monitor Data Conversion

This unit is developed to provide you the necessary information regarding the following content coverage and topics

- Current data model methodologies.
- Conversion support documentation.
- Back up data before conversion.
- Identification Client requirement.
- Software, hardware or environmental pre-requisites
- Validation data accuracy and integrity.
- Data conversion tools.
- Documentation of data rejection behavior of the conversion.

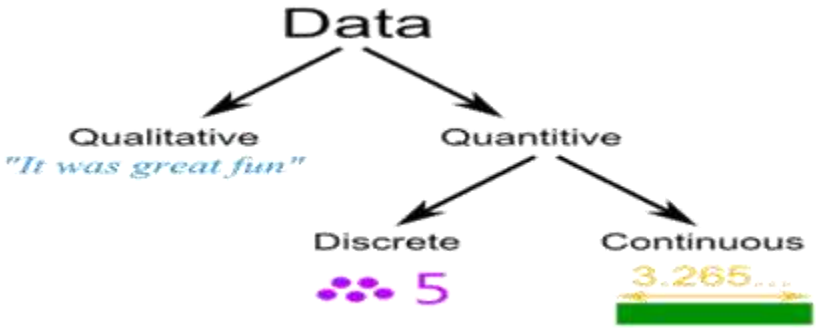
This unit will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Identify data model methodologies
- Apply Convert support document.
- Protect data before conversion.
- Understand Client requirements.
- Identify Software, hardware or environmental pre-requisites.
- Validate data accuracy and integrity
- Understand data conversion tools
- documents data rejection behavior of the conversion

1.1. Current data model methodologies

- Defining concepts of data conversion and Data Terminologies
  - Data is raw facts or unorganized things (such as alphabets, numbers, or symbols) that refers to, or represent, conditions, ideas, or objects.
  - It can be qualitative or quantitative.
  - Qualitative data is descriptive information (it describes something)
  - Quantitative data is numerical information (numbers).



- Discrete data can only take certain values (like whole numbers)
- Continuous data can take any value (within a range)
- Put simply: Discrete data can be counted, Continuous data can be measured
- **Qualitative**:
  - It is brown and black
  - It has long hair
  - It has lots of energy
- **Quantitative:**
  - Discrete:
    - ✓ It has 4 legs
    - ✓ It has 10 fingers
  - Continuous:
    - ✓ It weighs 25.5 kg
    - ✓ It is 565 mm tall
    - ✓ Data conversion is the conversion of one file or database from one format (from one physical environment) to another.

- **Types of conversion**:
  - Database conversion (SQL, MySQL, MS Access, XLS, XML etc)
  - File format conversion (PDF to Word)
  - Image conversion (GIF to JPG, TIFF, PNG etc)
  - Character or string conversion(numeric to alphabet or vice versa)
- **Understanding Data and Its Characteristics**

Data Conversion Systems and Tools Data Conversion Tool allow you to convert data both from and to (both sides are supported) a wide variety of formats, including:

- SQL Server Tables
- Oracle Tables
- ODBC Tables
- OleDb Tables
- Microsoft Access Tables
- XML Files

- **Data Modeling Methodologies**

Data modeling is the formalization and documentation of existing processes and events that occur during application software design and development.

Data modeling techniques and tools capture and translate complex system designs into easily understood representations of the data flows and processes, creating a blueprint for construction or re-engineering.

A data model can be thought of as a diagram or flowchart that illustrates the relationships between data.

There are several different approaches of data modeling, including:

- ✓ **Conceptual Data Modeling**: identifies the highest-level relationships between different entities.
- ✓ **Logical Data Modeling**: illustrates the specific entities, attributes and relationships involved in a business function.
- ✓ **Physical Data Modeling**: represents an application and database-specific implementation of a logical data model.

- **Data Conditioning and cleaning**

Data cleaning is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset. When combining multiple data sources, there are many opportunities for data to be duplicated or mislabeled. If data is incorrect, outcomes and algorithms are unreliable, even though they may look correct. There is no one absolute way to prescribe the exact steps in the data cleaning process because the processes will vary from dataset to dataset. But it is crucial to establish a template for your data cleaning process so you know you are doing it the right way every time.

Data conditioning (Pre-processing) is the use of data management and optimization techniques which result in the intelligent routing, optimization and protection of data for storage or data movement in a computer system.

Data cleaning is the act of detecting and removing or correcting dirty data (i.e.: data that is incorrect, out-of-date, redundant, incomplete, or formatted incorrectly).

Data Cleaning helps to increase the overall efficiency of your data management systems and leads to an increase in the productivity of the organization.

- **Data Transformation and integration**

Data transformation is one of the collective processes known as extract, transform or load which is one of the most important processes in data warehouse implementation from different data sources.

Data Integration is the process of combining heterogeneous data sources in to a single queriable schema so as to get a unified view of these data.

1.2. Conversion support documentation

Obtaining and applying conversion supporting documentation is an important part of the data conversion process. This documentation typically includes a detailed description of the data being converted, the format and structure of the data, and any rules or standards that must be followed during the conversion process.

To obtain this documentation, you should reach out to the owners or custodians of the data and request the appropriate documentation. Once you have the documentation, you should review it

thoroughly and ensure that you understand all the requirements and guidelines for the conversion process.

During the conversion process, you should refer to the documentation frequently to make sure that you are following all the guidelines and rules. If you encounter any issues or questions during the conversion process, you should reach back out to the owners or custodians of the data for clarification.

By obtaining and applying conversion supporting documentation, you can ensure that the data conversion process is accurate, complete, and compliant with all the necessary requirements and standards.

Monitoring the data conversion process is an important aspect of ensuring a successful project outcome. To monitor data conversion, you should consider the following:

- Define monitoring criteria: define the criteria that will be used to monitor the data conversion process. This may include data accuracy, completeness, consistency, and integrity.
- Establish monitoring processes: Establish processes for monitoring the data conversion process. This may include using automated tools, manual review, or a combination of both.
- Monitor the conversion process: monitor the data conversion process regularly to ensure that it is running smoothly and that all requirements and specifications are being met.
- Identify issues: Identify any issues or challenges that arise during the conversion process and develop a plan to address them.

- Communicate with stakeholders: Communicate regularly with stakeholders to provide updates on the progress of the data conversion process and to address any concerns or issues that arise.
- Conduct testing: Conduct testing to ensure that the converted data is accurate and complete and that it meets the necessary requirements and specifications.

By monitoring the data conversion process, you can identify any issues or challenges early on and take corrective action to address them. This will help to ensure that the end result meets the necessary requirements and specifications and that the project is successful

- **Reading and Analyzing Existing Data Conversion Documents**

The data conversion process can often be a complex and difficult task during an implementation. When performing data conversions, you must include analysis of your source data and continues through to system testing and user acceptance.

Throughout the conversion process, we perform quality control checks to ensure correctness of the conversion.

1.3. Back up data before conversion.

Protecting production data is a critical aspect of the data conversion process. One way to protect production data is to ensure that you have a backup of all the data before starting the conversion process. This backup should be kept in a secure location and should be easily accessible in case of any issues or errors during the conversion process.

To ensure that you have a backup of the production data, you should create a backup schedule that takes regular backups of the data. This schedule should be based on the frequency of data updates and the criticality of the data. For example, if the data is updated frequently and is critical to the business, you may want to take backups every few hours or daily.

In addition to taking backups, you should also test the backup process to ensure that the backups are complete and accurate. This testing should be done regularly to ensure that the backup process is working properly.

By taking action to ensure backups before conversion, you can protect production data and ensure that you have a reliable fallback in case of any issues or errors during the conversion process.

1.4. Identification Client requirements.

Determining and impacting the requirements of the client on business operations is a critical aspect of any project. To do this effectively, you should first understand the client's requirements and how they impact the business operations. This involves engaging with the client and asking questions to understand their needs and expectations.

Once you have a clear understanding of the client's requirements, you should evaluate how they impact the business operations. This involves assessing the current business processes and identifying any changes or modifications that may be required to meet the client's needs.

You should then develop a plan to implement the changes or modifications. This plan should include timelines, resource requirements, and any potential risks or issues that may arise during the implementation process.

Throughout the implementation process, you should communicate regularly with the client to ensure that their requirements are being met and that any issues or concerns are addressed in a timely manner. You should also monitor the impact of the changes on the business operations and make any necessary adjustments to ensure that the business continues to run smoothly.

By determining and impacting the requirements of the client on business operations, you can ensure that the project is successful and that the client's needs are met while minimizing any disruption to the business operations

1.5. Software, hardware or environmental pre-requisites

Identifying and confirming software, hardware, or environmental pre-requisites is an important part of the conversion planning process. To do this, you should review the conversion plan and identify any software, hardware, or environmental requirements that are necessary for the conversion process.

Once you have identified these requirements, you should confirm that they are available and meet the necessary specifications. This may involve testing the hardware and software to ensure

that they are compatible with the conversion process and that they meet the necessary performance requirements.

If any gaps or issues are identified during this process, you should develop a plan to address them. This may involve upgrading hardware or software, adjusting the conversion plan to accommodate the limitations, or finding alternative solutions that meet the requirements.

It's important to confirm these pre-requisites before starting the conversion process to avoid any delays or issues during the conversion process. By identifying and confirming these pre-requisites early on, you can ensure that the conversion process runs smoothly and that the end result meets the necessary requirements and specifications.

1.6. Data Conversion Tools

- Software
- Hardware
- Environmental Pre-Requisites (Dust, Heat, Extreme Cold, Temperature Stability, Air Circulation and Moisture)

Dust and Dirty environment increases the overheating problem and mostly affects

- The Motherboard.
- The Processor and Power Supply fan.
- The CD-drive's Lens and Floppy drive's head.
- The Add-in card connection.
- The cable connection.
- The mouse and keyboard.

1.7. Validation data accuracy and integrity

Validating data accuracy and integrity is a critical part of the data conversion process. To do this, you should develop a validation plan that includes the following steps:

- **Define the validation criteria**: Define the criteria that will be used to validate the data. This may include data accuracy, completeness, consistency, and integrity.
- **Develop the validation proces**s: Develop a process for validating the data. This may include using automated tools, manual review, or a combination of both.

- **Validate the data**: Execute the validation process and review the results. Identify any discrepancies or errors and make the necessary corrections.
- **Re-validate the data**: After making corrections, re-validate the data to ensure that all errors have been addressed.
- **Document the validation results**: Document the results of the validation process, including any errors or discrepancies that were identified and how they were addressed.
- **Obtain sign-off**: Obtain sign-off from the appropriate stakeholders, including the client, to confirm that the data is accurate and meets the conversion specifications.

By following this validation plan, you can ensure that the data is accurate and meets the necessary specifications before it is used in the production environment. This will help to minimize any errors or issues that may arise during the production phase of the project.

- Validating data accuracy and integrity according to conversion specifications.
- Validating data accuracy and integrity is a critical part of the data conversion process. To do this, you should develop a validation plan that includes the following steps:
- Define the validation criteria: Define the criteria that will be used to validate the data. This may include data accuracy, completeness, consistency, and integrity.
- Develop the validation process: Develop a process for validating the data. This may include using automated tools, manual review, or a combination of both.
- Validate the data: Execute the validation process and review the results. Identify any discrepancies or errors and make the necessary corrections.
- Re-validate the data: After making corrections, re-validate the data to ensure that all errors have been addressed.
- Document the validation results: Document the results of the validation process, including any errors or discrepancies that were identified and how they were addressed.
- Obtain sign-off: Obtain sign-off from the appropriate stakeholders, including the client, to confirm that the data is accurate and meets the conversion specifications.
- By following this validation plan, you can ensure that the data is accurate and meets the necessary specifications before it is used in the production environment. This will help to minimize any errors or issues that may arise during the production phase of the project.

- Identify the cause of the rejection: Identify the reason why the data was rejected by the conversion tool. This may involve reviewing the error logs or working with the development team to troubleshoot the issue.
- Determine if the data can be corrected: Determine if the rejected data can be corrected or if it needs to be excluded from the conversion process.
- Develop a plan for correcting the data: If the data can be corrected, develop a plan for how to correct it. This may involve manual correction or the use of automated tools.
- Exclude the data from the conversion process: If the data cannot be corrected, exclude it from the conversion process and develop a plan for how to address any impacts this may have on the business operations.
- Document the rejected data: Document the rejected data, including the reason for the rejection and any actions taken to correct it or exclude it from the conversion process.

By developing a plan for handling rejected data, you can minimize the impact on the conversion process and ensure that the end result meets the necessary specifications and requirements.

1.8. Documentation of data rejection behavior of the conversion.

Documenting data rejection or errant behavior of the conversion process is an important part of the data conversion process. To do this, you should develop a documentation plan that includes the following steps:

- **Define the documentation requirements**: Define the types of data rejection or errant behavior that need to be documented. This may include data that is rejected by the conversion tool, data that is corrupted during the conversion process, or any other issues that arise during the process.
- **Develop the documentation process**: Develop a process for documenting the data rejection or errant behavior. This may include using a tracking system, logging errors, or using a spreadsheet to track the issues.
- **Document the data rejection or errant behavior**: Document the data rejection or errant behavior as it occurs. Include details such as the date and time of the issue, the type of data that was rejected or corrupted, and any error messages that were generated.

- **Assign responsibility:** Assign responsibility for documenting and addressing the data rejection or errant behavior. This may include the project manager, the development team, or other stakeholders.
- **Develop a plan for addressing the issues**: Develop a plan for how to address the data rejection or errant behavior. This may involve manual correction, the use of automated tools, or other actions.
- **Review and update the documentation**: Review and update the documentation regularly to ensure that it is accurate and up-to-date.

By documenting data rejection or errant behavior, you can identify trends and patterns in the conversion process and take corrective action to address the issues. This will help to ensure that the end result meets the necessary specifications and requirements.

Self- check 1

Part I. Choose the best answer

1. Which of the following is not qualitative data type?
   A. It is brown and black
   B. It has long hair
   C. It has 4 legs
   D. All
2. Which of the following is not quantitative data type?
   A. It has 4 legs
   B. t has long hair
   C. Revenue in dollars.
   D. Age in months or years.
3. Which of the following is not monitor data conversion process?
   A. Define monitoring criteria
   B. Establish monitoring processes
   C. Validate the data
   D. All.
4. Which of the following is used to develop validation plan?
   A. Define the validation criteria
   B. Develop the validation process
   C. Validate the data
   D. All.

Part III. Short Answer Questions

1. What is data?
2. What is Data conversion?
3. Write down at least five advantage of Data Conversion?
4. What is information?
5. What is back up data?

Unit Two: SUPPORT DATA CONVERSION

This unit is developed to provide you the necessary information regarding the following content coverage and topics

- Verification of data
- Store, update and export convert data
- Data loading and indexing on the production server
- Documentation of backup copies of conversion files

This unit will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Understand and verify data.
- Store, update and export converted data
- identify data load and indexing on the production server
- Document backup copies of conversion files

2.1. Verification of data

Verifying results based on a relevant checklist is an important part of the data conversion process. To do this, you should develop a checklist that includes all the relevant requirements, specifications, and standards that must be met during the conversion process.

Once you have developed the checklist, you should use it to verify the results of the conversion process. This may involve reviewing the data, comparing it to the original data, and checking for any errors or discrepancies.

If any issues or discrepancies are identified during the verification process, you should document them and develop a plan to address them. This may involve making corrections to the data, adjusting the conversion process, or finding alternative solutions that meet the requirements.

It's important to document the results of the verification process, including any issues or discrepancies that were identified and how they were addressed. This documentation can be used to track the progress of the conversion process and to ensure that all requirements and specifications have been met.

By verifying results based on a relevant checklist, you can ensure that the conversion process is accurate, complete, and compliant with all the necessary requirements and standards.

- **Present verify data and signing by appropriate person**

Presenting the results of the data conversion process to the appropriate person and obtaining sign-off is an important step in the project. To do this, you should develop a presentation that includes all the relevant information about the conversion process, including the goals, timeline, challenges, and results.

Once you have developed the presentation, you should schedule a meeting with the appropriate person or group to present the results. During the presentation, you should highlight the key findings and outcomes of the conversion process, including any issues that were encountered and how they were addressed.

After the presentation, you should obtain sign-off from the appropriate person or group. This sign-off confirms that the results of the conversion process meet the necessary requirements and specifications, and that the project is complete.

It's important to document the sign-off, including the date, time, and names of the individuals who provided it. This documentation can be used to track the progress of the project and to ensure that all necessary approvals have been obtained.

By presenting the results of the data conversion process to the appropriate person and obtaining sign-off, you can ensure that the project is complete and that all requirements and specifications have been met.

2.2. Store, update and export convert data

- **Sorting data**

Sorting data is the process of arranging items into meaningful order so that you can analyze it more effectively.

Example:

- sort text data into alphabetical order
- sort numeric data into numerical order

- **Updating Data**

The modification of data that is already in the database is referred to as updating. The update operation allows you to change an existing database record in a logical or physical file. You can update individual rows, all the rows in a table. Each column can be updated separately without affecting other columns.

UPDATE table name

SET column1=value, column2=value2...

WHERE some_column=some_value

To perform an update, you need three pieces of information:

A. The name of the table and column to update,
B. The new value of the column,
C. Which row(s) to update?

- **Exporting data**
  - ✓ You can export data from one application to another application using the Export Wizard.
  - ✓ Exporting lets you share data from one application by providing a copy of data.

- **Ensuring Data Quality**

DBMS provides a set of features that enable you to ensure the quality of data that is moved from source systems to your data destination. Data profiling is a feature that enables you to analyze the content and structure of your data to determine inconsistencies, anomalies, and redundancies in the data.

- **Collection, Organization and Analysis of Data and Information**

The data is typically organized to model relevant aspects of reality (for example, the availability of rooms in hotels), in a way that supports processes requiring the information (for example, finding a hotel with vacancies).

- **Organization of data**

Organization of data is any one of the data management conventions for physical and spatial arrangement of the physical records of a data set.

- **Analysis of data**

Analysis of data is the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. Data from various sources is gathered, reviewed, and then analyzed to form some sort of finding or conclusion.

- **Information**

Information is processed data that can affect behavior, a decision or outcome.

It is valuable that is:-

- accurate and timely
- specific and organized for a purpose
- presented within a context that gives it meaning and relevance
- Can lead to an increase in understanding and decrease in uncertainty

2.3. Data loading and indexing on the production server

Data loading is the process of copying and loading data or data sets from a source file, folder or application to a database or similar application. It is usually implemented by copying digital data from a source and pasting or loading the data to data storage or processing utility.

Index Server Catalogs Index Server lets you use catalogs to conduct searches both on local directories and on directories on other machines. A catalog contains the index of the contents of

the directories in its scope (i.e., a collection of directories that is indexed and searched as a unit). In other words, a catalog is the highest level of organization in Index Server—it contains the index for one or more scopes, which are simply references to subdirectories that you want to include in the catalog.

2.4. Documentation of backup copies of conversion files

Maintaining and documenting backup copies of conversion files is an important part of the data conversion process. To do this, you should develop a backup plan that includes the following steps:

- Determine the backup schedule: Determine how often backups will be taken and how long they will be retained. This may depend on the frequency of data updates and the criticality of the data.
- Identify backup storage locations: Identify the locations where backup copies of the conversion files will be stored. This may include cloud-based storage, local servers, or external hard drives.
- Develop a backup process: Develop a process for taking backups of the conversion files. This may involve using automated tools or manual processes.
- Test the backup process: Test the backup process to ensure that it is working properly and that the backup copies of the conversion files are accurate and complete.
- Document the backup process: Document the backup process, including the backup schedule, storage locations, and backup process itself.
- Maintain and update backup copies: Maintain and update the backup copies of the conversion files regularly to ensure that they are up-to-date and accurate.

By maintaining and documenting backup copies of conversion files, you can ensure that you have a reliable fallback in case of any issues or errors during the conversion process. This will help to minimize any disruption to the business operations and ensure that the end result meets the necessary requirements and specifications.

- **Develop clear and coherent technical documentation**

Developing clear and coherent technical documentation is an important part of the data conversion process. To do this, you should follow these best practices:

- Define the audience: Define the target audience for the technical documentation. This may include developers, testers, project managers, or other stakeholders.
- Use clear and concise language: Use clear and concise language that is easy to understand. Avoid technical jargon or acronyms that may not be familiar to the audience.
- Use visual aids: Use visual aids such as diagrams, flowcharts, or screenshots to help explain complex concepts or processes.
- Organize the documentation: Organize the documentation in a logical and consistent manner. Use headings, subheadings, and bullet points to break up the content and make it easier to read.
- Include examples: Include examples to illustrate how to perform specific tasks or use specific features.
- Update the documentation: Update the documentation regularly to ensure that it is up-to-date and accurate.

Self-check 2

Part I: True False Questions

1. **_____**Data loading is the process of copying and loading data or data sets from a source file, folder or application to a database or similar application**?**
2. **_____** Analysis of data is any one of the data management conventions for physical and spatial arrangement of the physical records of a data set.
3. **_____** Update operation allows you to change an existing database record in a logical or physical file.

Part II. Short Answer Questions

1. What is the advantage of Verification of data?
2. What is sorting data?
3. What is Data loading?
4. What is data Analysis?
5. What is the Organization of data?

Operation sheet 2.1 monitoring and Supporting Data

Operation Title: PDF to word converter using Microsoft word 2019

Purpose: to allows for easy editing and manipulation of the content

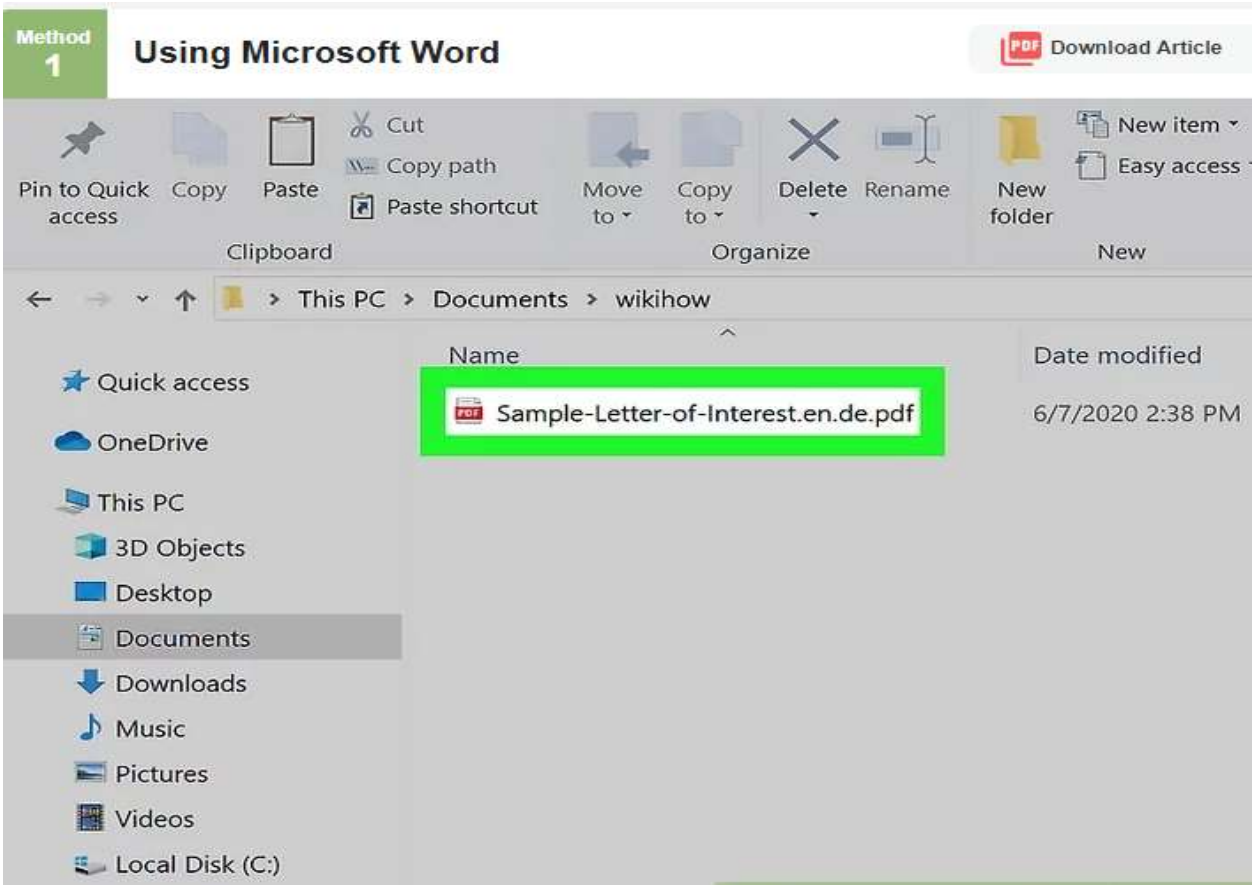
Conditions or situations for the operations:

- ✓ Safe working area
- ✓ Properly operated tools and equipment

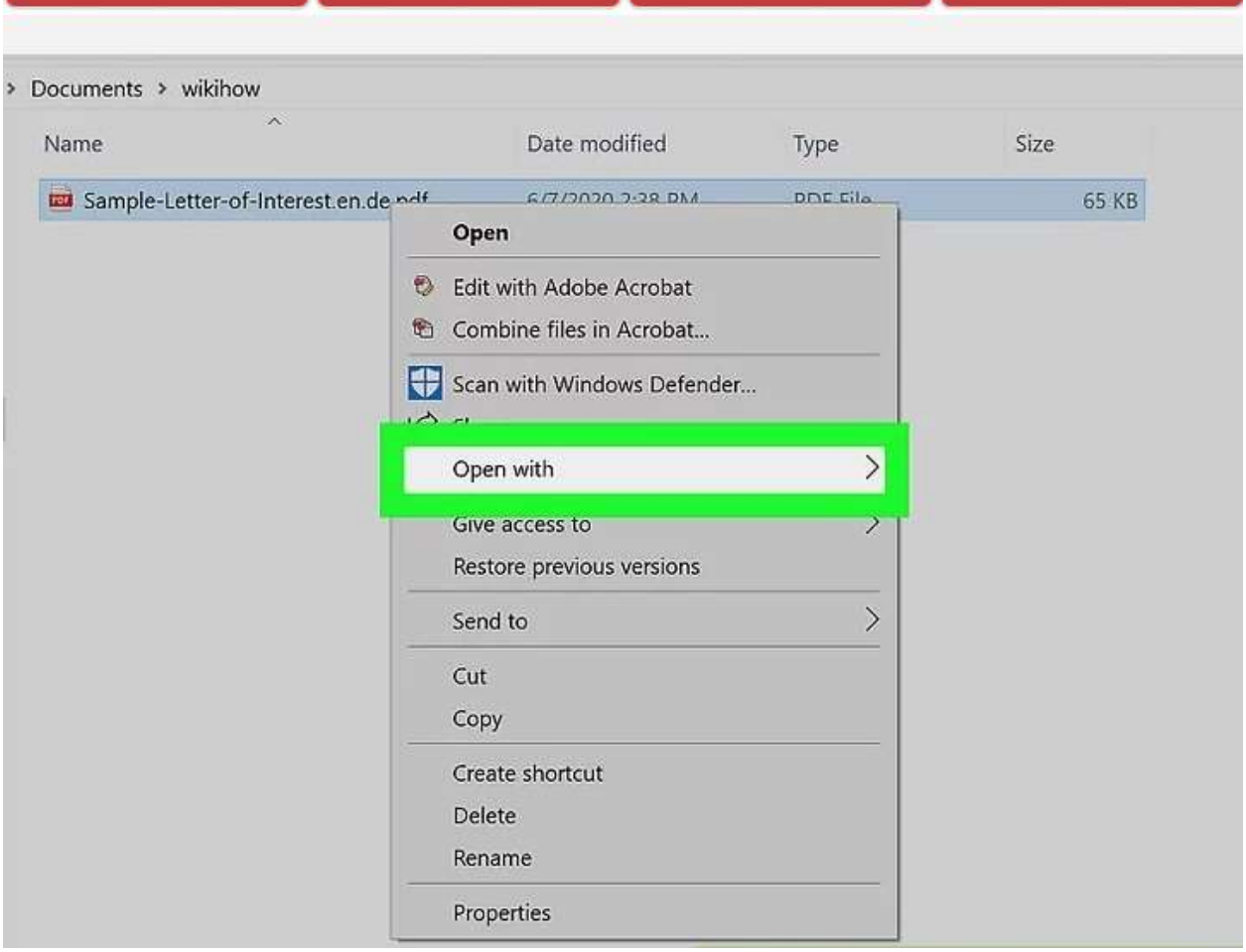
Equipment Tools and Materials:

- ✓ Microsoft word 2019
- ✓ Hardware
- ✓ Software

Steps in doing the task

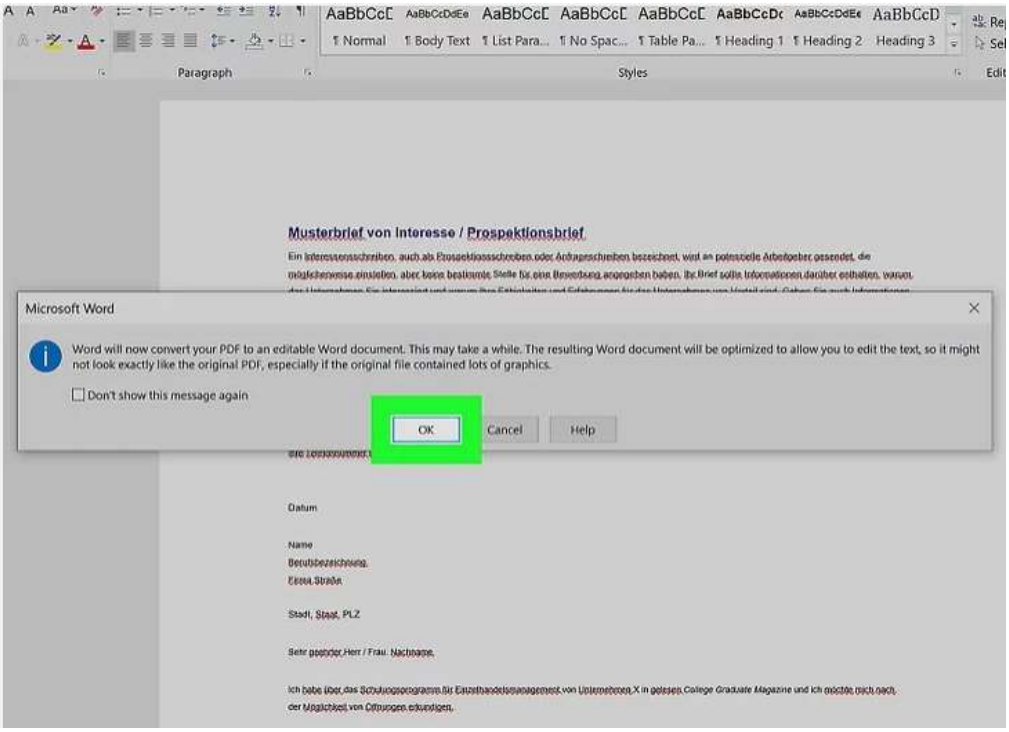


1. **Right-click the PDF** you want to open. If you're using a Mac and don't have a right mouse **button, press Control** as you click the file. This will open a context menu.



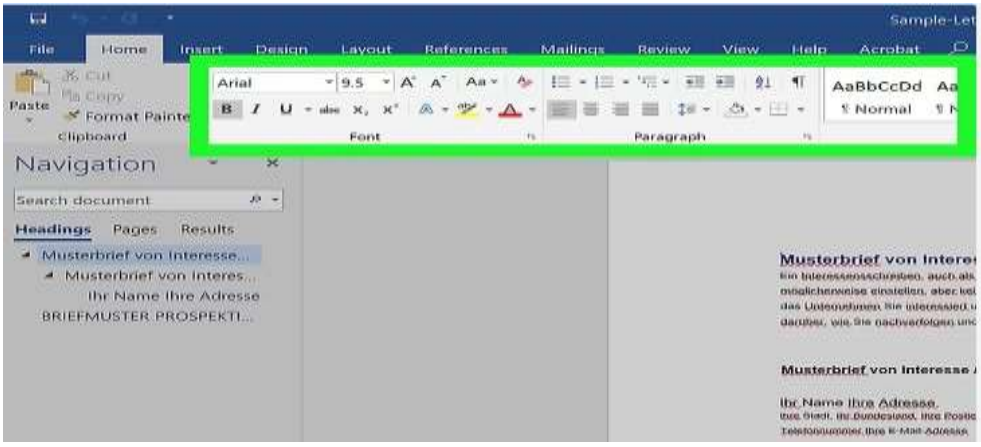
2. Select Open with. It's near the top of the menu. Another menu will expand.

3 Click Word or Microsoft Word on the menu. This opens Word and attempts to display the PDF

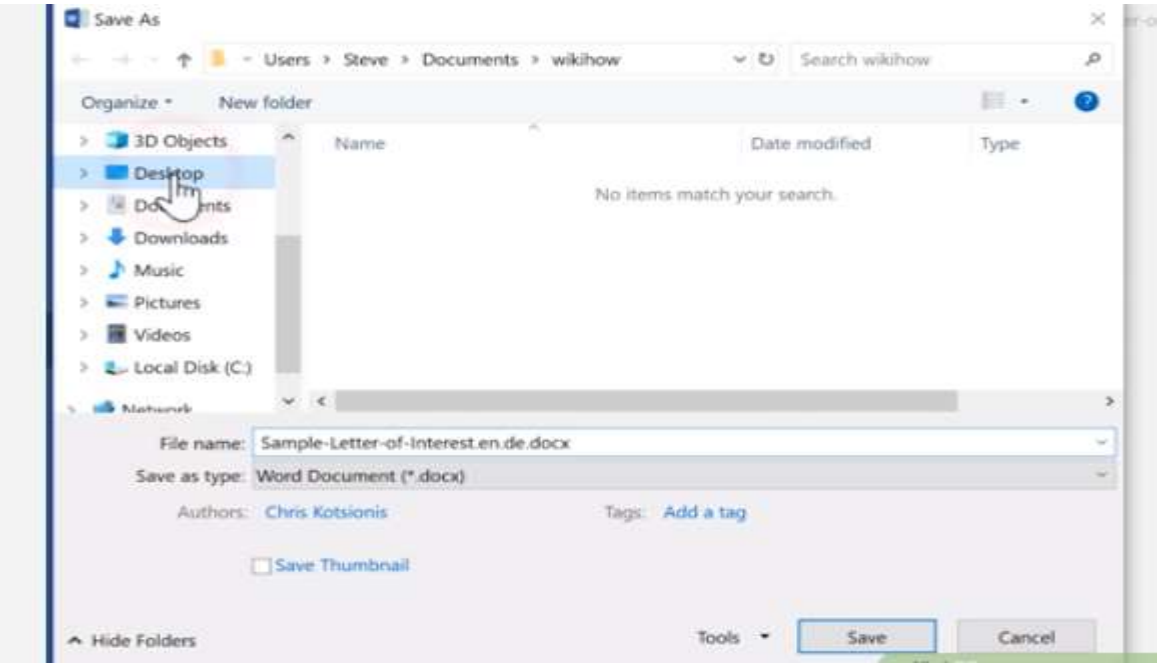


4 **Click OK** to convert the file. Word will convert the file to its own format and display the results. If you're converting a larger file, it can take a few minutes to complete.

Edit the Word document. The converted document may not have perfect page to page correspondence due to line and page breaks, graphics, and other details. Making manual adjustments may be necessary.



4. Edit the Word document. The converted document may not have perfect page to page correspondence due to line and page breaks, graphics, and other details. Making manual adjustments may be necessary.



5. Save the converted PDF. Once you're ready to save the converted file as its own Word document, do the following:

✓ **Windows** — Click File, click **Save As**, **click This PC**, enter a file name, **select a save location on the left side of the window, and click Save**.

Mac — Click File, **click Save As**, enter a name, **select a file location, and click Save**.

Lap Tests

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks accordingly.

Task 1: Monitor the conversion process

Task2: Identify challenges that arise during the conversion process

Task3: Conduct testing.

Task3: Verifying the results based on a relevant checklist

Task 4: Document backup copies of conversion files

Reference

URL

https://www.studypool.com/documents/29001171/monitoring-and-supporting-data-conversion
https://www.talend.com/resources/what-is-data-conversion/

https://www.integrate.io/glossary/what-is-data-conversion/

https://www.netapp.com/data-management/what-is-data-migration/

Books

The Data Conversion Handbook, Edited by Walt Kester, Newnes, 2005, ISBN 0-7506-7841-0.

Developer's Profile

No	Name	Qualification	Field of Study	Organization/ Institution	Mobile number	E-mail
1	Frew Atkilt	M-Tech	Network & Information Security	Bishoftu Polytechnic College	0911787374	frew.frikii@gmail.com
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