

## INDIVIDUAL TASK 2

### DATA ESSENTIALS, TYPES, BIG DATA AND ETHICS

My Daily Data Inventory – Track the types and sources of data you interact with daily (e.g., mobile apps, website, sensors) and classify them as structured, semi-structured or unstructured.

#### INTRODUCTION

Data is the foundation of today's digital world and plays a vital role in decision-making across industries. Data essentials refer to the fundamental qualities that make data useful and reliable, such as accuracy, completeness, consistency, timeliness, and security. Data can be classified into different types, including structured data stored in databases like Microsoft SQL Server, unstructured data such as images and videos, and semi-structured data like JSON or XML files. In the modern digital economy, data is often referred to as the “new oil” because of its immense value. Every digital interaction—online shopping, social media usage, banking transactions, GPS navigation, healthcare records—produces data. Organizations analyze this data to understand patterns, improve services, reduce risks, and make strategic decisions. However, along with the benefits of data usage come responsibilities and ethical concerns. Therefore, it is important to understand the fundamentals of data, its classifications, the concept of Big Data, and ethical guidelines governing its use.

#### Data Essentials

Data essentials refer to the fundamental principles and concepts that guide how data collected, processed, stored, analysed, and managed effectively.

#### Meaning and Concept of Data

Data consists of raw facts, measurements, observations, or symbols collected from various sources. These raw elements do not have meaning on their own unless they are processed and interpreted.

For example:

- A list of numbers such as 25, 30, 28 represents raw data.
- When analysed as “average temperature of the week,” it becomes information.

Thus:

- Data is the input
- Information is the output after processing
- Knowledge is gained after understanding information

This transformation from data to information to knowledge is critical in decision-making processes.

Online classes, assignment submissions, and LMS portals generate academic data such as login time, grades, attendance, and uploaded files.

## Role of Data in Decision-Making

Modern decision-making is heavily data driven. Earlier, decisions were often based on intuition or experience. Today, organizations depend on analytical evidence.

For example:

- Retail companies analyse sales data to manage inventory.
- Banks analyse transaction patterns to detect fraud.
- Hospitals analyse patient records to identify disease trends.
- Governments use census data for policy planning.

Data reduces uncertainty and helps in making logical, evidence-based decisions.

## Why Data Quality is Important

### 1. Supports Accurate Decision-Making

Organizations depend on data to make critical decisions. For example:

- A company decides how much inventory to order based on sales data.
- A hospital decides treatment plans based on patient medical records.
- A bank approves loans based on customer financial data.

If the data contains errors, missing values, or incorrect entries, decisions based on that data will also be incorrect.

Example:

If sales data incorrectly shows high demand due to duplicate entries, the company may overproduce goods and suffer financial loss.

Therefore, accurate data ensures reliable decision-making.

### 2. Improves Business Performance

High-quality data helps organizations:

- Identify customer preferences
- Improve marketing strategies
- Reduce operational costs

For example:

An e-commerce company analyzing clean and structured customer purchase data can recommend better products and increase sales.

If data is messy or inconsistent, analytics tools cannot generate meaningful insights.

### 3. Enhances Customer Satisfaction

Customer data is used to personalize services and improve user experience.

Examples:

- Personalized product recommendations
- Customized email marketing
- Targeted advertisements
- Faster customer support responses

If customer data is incorrect (wrong phone number, wrong address, duplicate accounts), it leads to poor service and dissatisfaction.

Good data quality ensures better customer interaction and trust.

## Challenges in Maintaining Data Quality

### 1. Human Errors

Manual data entry mistakes cause incorrect information.

### 2. Data Integration Problems

Combining data from multiple systems may create inconsistencies.

### 3. Rapid Data Growth

Large volumes of data make monitoring difficult.

### 4. System Migration Issues

Moving data from old systems to new systems may cause data loss or corruption.

### 5. Lack of Data Governance

Without proper policies and monitoring, data quality decreases over time.

### 6. Data Security Issues

Unauthorized access, cyberattacks, or hacking can modify or damage data. If data is stolen or altered, its accuracy and reliability are affected.

### 7. Lack of Standardization

When organizations do not follow uniform formats and rules for data entry, inconsistencies occur. Different formats for dates, names, or codes create confusion and errors.

## Conclusion

Every individual generates significant amounts of data daily through smartphones, social media, online transactions, and digital devices. This data can be classified into structured, semi-structured, and unstructured forms.

The concept of Big Data explains how large volumes of diverse and fast-moving data are processed to generate valuable insights. However, ethical considerations such as privacy, security, consent, and responsible usage are equally important.

Understanding data essentials and ethical principles helps in becoming a responsible digital citizen and future data professional.

