SH.S.N.SIDHESHWAR SR SEC PUBLIC SCHOOL
NOTES
SUBJECT: COMPUTERS
CLASS : 9th
Session 2026-27

BOOK KAIZEN

UNIT 1: AI REFLECTION PROJECT CYCLE AND ETHICS

Chapter 1 2 and 3

Meaning of AI

Artificial intelligence (AI) is computer software that can think, learn, and do things that usually need human intelligence**. Instead of just following a strict list of rules, AI looks at millions of examples to find patterns. It uses these patterns to solve problems, make decisions, and create new content.**

Applications of AI

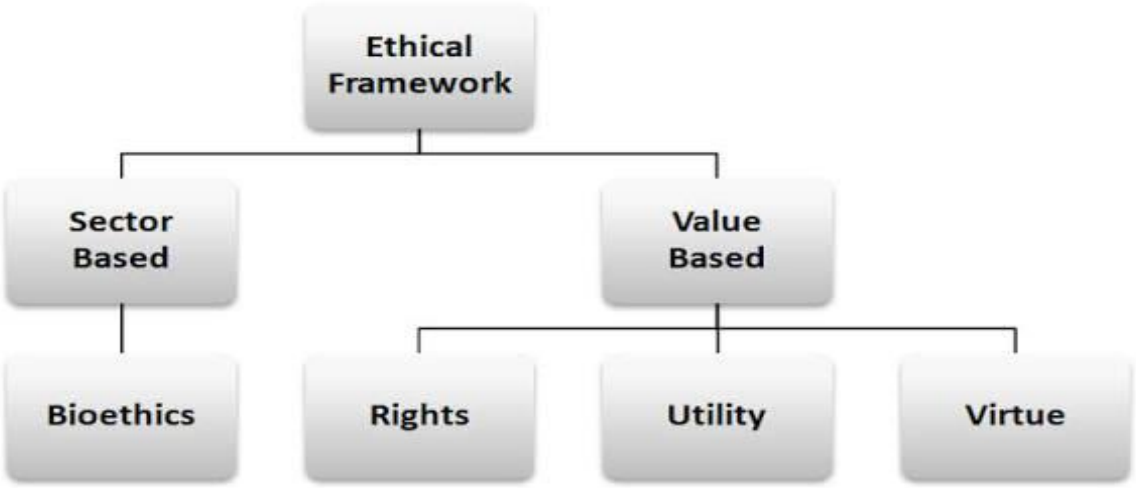
- **Healthcare:** AI analyzes medical images (X-rays, MRIs) to detect diseases like cancer, assists in robotic surgeries, and predicts patient health risks to allow for proactive treatment

- **E-Commerce & Retail:** Recommendation engines on platforms like Amazon analyze your browsing behavior and purchase history to provide highly personalized product suggestions.

- **Finance & Banking:** Machine learning algorithms continuously monitor transactions in real-time, instantly flagging anomalous activities for fraud detection and conducting automated risk assessments
  .
- **Transportation & Navigation:** AI powers ride-sharing apps, route optimization tools, and self-driving vehicles by interpreting sensor data and recognizing obstacles to make split-second driving decisions.

- **Customer Service & Content:** Conversational AI and generative tools use Natural Language Processing (NLP) to automate human-like interactions, generate text, create images, and assist with writing tasks.
-

Ethics of AI



SECTOR BASED

Healthcare: Doctors follow **Medical Ethics**. The core rules are to do no good (Beneficence), avoid harm (Non-maleficence), respect patient choices (Autonomy), and ensure fair care (Justice). They also keep secrets safe, like patient health records.

Technology: Tech Ethics focuses on data privacy, avoiding bias in Artificial Intelligence (AI), and building safe software. Tech workers should not sell user data without asking.

Finance: Financial Ethics requires honesty and no lying. Workers must never steal money, misuse client funds, or use secret information to win in the stock market.

Law: Legal Ethics means lawyers must keep client secrets. They must also be totally honest with the judge and court.

Government: Public Sector Ethics demands public servants work for the people, not themselves. They must avoid conflicts of interest, where their personal money crosses with their job duties.

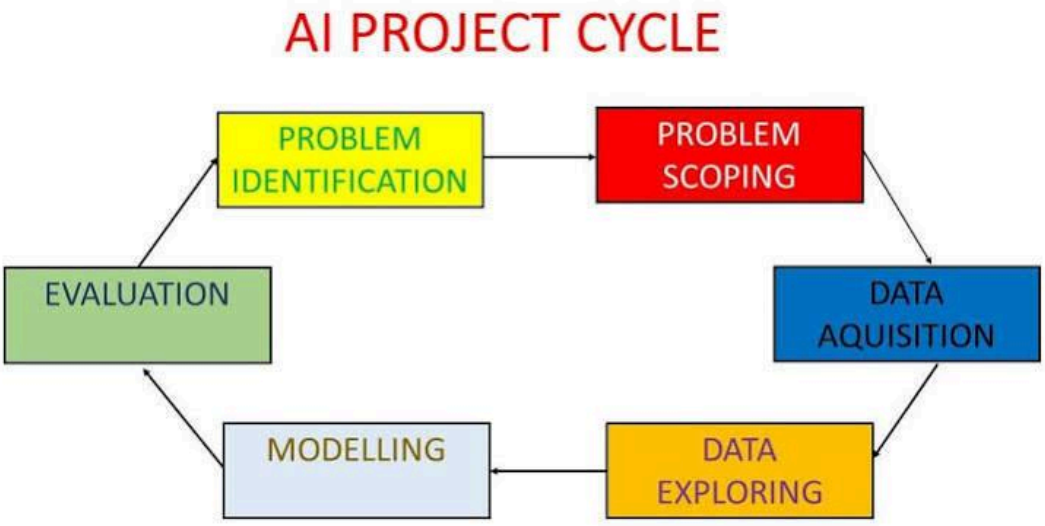
Business & Retail: Corporate Ethics covers treating workers fairly, paying them equally, and caring for the planet

VALUE BASED

Value-based ethics uses your core beliefs to guide right and wrong. Think of it like a personal compass. Your beliefs point you in the right direction when making tough choices. Here is a helpful starter list of ethical values you can use every day:

- **Honesty:** You tell the truth. You do not cheat or steal.
- **Integrity:** Your actions match your words. You do the right thing, even when no one is watching.
- **Respect:** You treat others the way you want to be treated. You value their feelings.
- **Responsibility:** You own your choices. You do what you promise to do.
- **Compassion:** You care about others. You try to help people who are sad or hurt.
- **Fairness:** You treat everyone equally. You do not pick favorites.
- **Courage:** You stand up for what is right. You speak up against unfairness.

AI Project Cycle



EXERCISE UNIT 1 Page no 21-23 ABE
Page No 55-58 ABE
Page No 68-72 ABE

1. Problem Scoping

This initial phase involves identifying a specific real-world problem and defining the goals for your AI system. A common tool used here is the **4Ws Problem Canvas**:

- **Who:** Who are the stakeholders experiencing the problem?
- **What:** What is the nature and evidence of the problem?
- **Where:** Where does the problem occur?
- **Why:** Why is it important to solve this issue, and how will stakeholders benefit?

2. Data Acquisition

To train an AI model to make predictions, you must collect relevant and reliable data from authoritative sources. Data can be gathered using methods like web scraping, surveys, API integrations, and IoT sensors. This collected information is divided into training data (to build the model) and testing data (to validate it).

3. Data Exploration and Preparation

Raw data must be cleaned and preprocessed before it is useful. This stage involves removing errors, handling missing values, and visualizing the data using charts and graphs to uncover hidden patterns, trends, and correlations.

4. Modeling

This is the core of the AI lifecycle. Here, developers select the most suitable algorithms (such as supervised learning, unsupervised learning, or neural networks) and train the system using your refined dataset.

5. Evaluation

Once trained, the model must be tested using unseen test data to measure its performance, accuracy, and efficiency. If the model fails to meet the required benchmarks, it is refined and evaluated again until it performs optimally.

6. Deployment

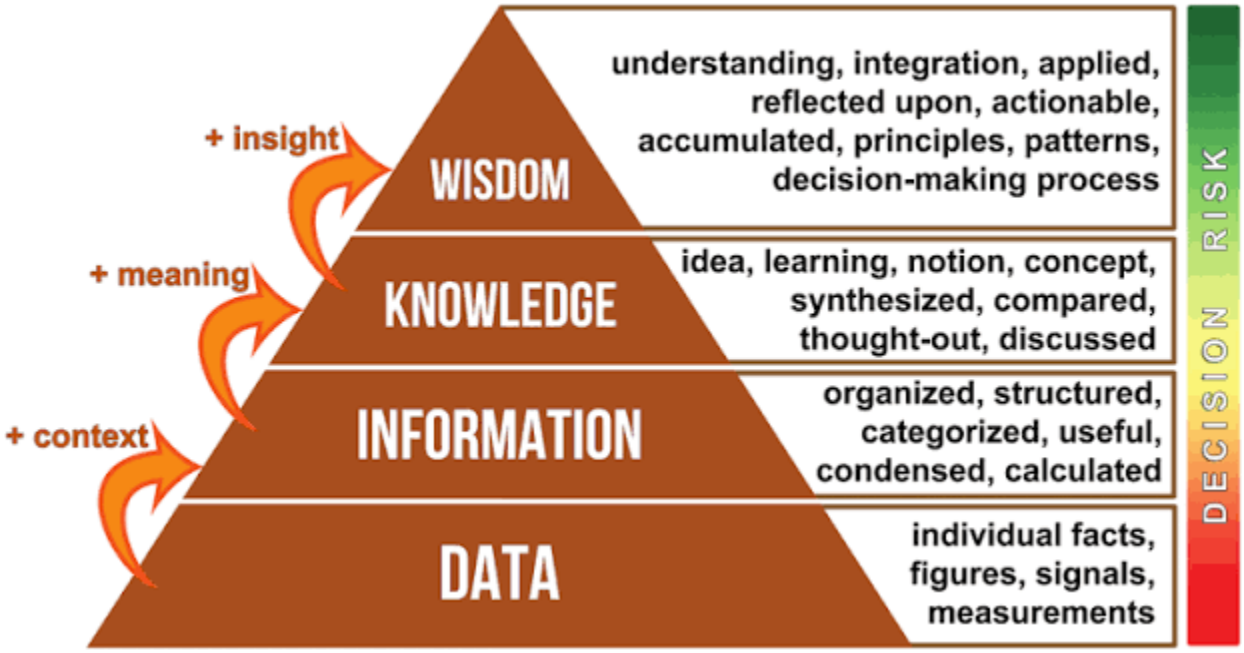
After verifying the model's reliability, it is integrated into a real-world production environment so end-users can access and interact with the AI solution.

7. Monitoring and Maintenance

AI systems operate in dynamic environments. Post-deployment, the system is continuously monitored to ensure stability, track performance degradation,

UNIT II DATA LITERACY Chapter 4

DATA LITERARCY PRYAMID



Importance of data literacy

Informed Decisions: It helps you make smart choices using facts instead of just feelings. [1]

The DIKW Pyramid: It teaches the journey of data: raw facts turn into useful Information, which gives you Knowledge, and finally leads to Wisdom (making the right decision).

Spotting Trends: You learn to read charts, graphs, and tables to understand patterns over time.

Problem Solving: It trains your brain to break down complex, real-world problems into simple steps.

Privacy and Security: You learn the difference between Data Privacy (getting consent and keeping your info safe) and Data Security

DEFINE THE FOLLOWING

Data Privacy
Data Security
Cyber Security

1. Data privacy is your right to control who sees and uses your personal information. It ensures companies handle your private details—like your name, address, and photos—responsibly. It is like choosing who gets to look inside your personal diary.
2. Data security is a rule that forces companies to keep their high-risk AI systems safe from hackers, system failures, and data theft throughout their entire life.

It requires developers to lock down three main areas:

- **System Security:** Preventing bad actors from tricking, tampering with, or stealing the AI.
- **Data Protection:** Ensuring the data the AI learns from is clean, accurate, and kept safe from leaks.
- **Risk Management:** Having a continuous plan to spot and fix dangers to public health, safety, or human rights
-

3. Cyber Security

   Cybersecurity is the practice of protecting networks, systems, devices, and digital data from unauthorized access, cyberattacks, and data breaches. It integrates technology, processes, and user policies to ensure the

confidentiality, integrity, and availability of information against threats like ransomware, phishing, and malware.

- **Enable 2-Step Verification:** Turn on two-step verification (2SV) for all your personal and professional accounts to add an extra layer of security.
- **Manage Software Updates:** Set your operating systems and applications to update automatically. These updates contain critical security patches against newly discovered vulnerabilities.
- **Protect Communications:** Avoid using unsecure public Wi-Fi networks. If you must use them, consider using a Virtual Private Network (VPN) to encrypt your internet traffic.
- **Backup Data:** Safeguard important photos and key documents by regularly backing them up to an external hard drive or secure cloud storage.
- **Prevent Malware:** Ensure your antivirus software is active, up to date, and perform regular scans. Never download third-party software or apps from unknown sources.

Chapter 5

TYPES OF DATA

1. Quantitative Data (Numeric)

This data is all about numbers and things you can measure or count. AI uses it to make predictions or spot trends.

- **Discrete Data:** Numbers that can be counted as exact, whole units (like the number of buses).
- **Continuous Data:** Numbers that can be measured precisely and can have decimals (like a temperature or air quality index).

2. Qualitative Data (Textual/Categorical)

This data describes qualities, words, or categories that cannot be measured with numbers. It answers "what kind?".

- **Textual Data:** Words and phrases. AI uses this to understand sentiments or answer questions (like an online customer review).
- **Categorical Data:** Labels with no natural order (like a person's favorite color, blood type, or gender).

How Data is Used in the 3 AI Domains

- **Computer Vision:** Uses **Visual Data**. This includes digital photos and videos to teach AI how to recognize objects and patterns (e.g., facial recognition).
- **Natural Language Processing (NLP):** Uses **Text** and **Speech Data**. This includes emails, books, and voice recordings to teach AI how to understand or translate human language (e.g., Alexa or chatbots).
- **Data Science / Machine Learning:** Uses **Numerical** and **Statistical Data**. This includes spreadsheets and tables to predict outcomes (e.g., predicting house prices).

DATA ACQUISITION

Data acquisition (DAQ or DAS) is the process of sampling real-world physical conditions and converting them into digital numeric values a computer can process. It forms the foundation of control systems, testing, and AI by gathering data from sensors, amplifying it, and digitizing it.

Sources of Data Acquistion

Primary data is fresh, first-hand information you collect yourself for a specific goal.
Secondary data is pre-existing information that someone else already gathered for another purpose.

Here are the main sources and methods to get both types of data:

Primary Sources (Original & Direct)

- **Surveys and Questionnaires:** Asking people a specific list of questions.
- **Interviews:** Having a direct conversation to ask open-ended questions.
- **Observations:** Watching and recording actions in a natural setting.
- **Experiments:** Testing a new idea and measuring the results.
- **Focus Groups:** Leading a group discussion with a few people to get their opinions. [

Secondary Sources (Pre-existing & Second-hand)

- **Government and Public Records:** Using official data from agencies (e.g., census reports).
- **Academic Journals and Books:** Reading published research studies.
- **Company Data:** Looking at old sales records, budgets, or yearly reports.
- **Online Databases:** Searching through digital libraries or industry databases.
- **Media:** Gathering info from news articles, magazines, or websites.

DATA PROCESSING

Data processing is the systematic transformation of raw data into structured, actionable information. It involves collecting, cleaning, organizing, and analyzing data to extract meaningful insights. This cycle enables organizations to make informed, data-driven decisions and improve operational efficiency.

1. Data Collection

You gather raw data from various sources like databases, websites, sensors, or APIs. This data is the fuel for you

2. Data Cleaning

Raw data is often messy. This step removes duplicates, fixes missing values (like filling blanks with an average), and removes outliers (unusual data points that can confuse the AI).

3. Data Transformation

AI models only understand numbers. This step converts text into numbers and normalizes values to a standard range (for example, scaling all numbers to be between 0 and 1). This ensures the model treats all inputs fairly.

4. Feature Engineering

This step involves selecting the most important data points or creating new ones to help the model learn better. For example, instead of using "date of birth" and "today's date", you might calculate a new feature: "age".

5. Data Splitting

You divide your cleaned data into three parts:

- **Training set** (70% - 80%): The AI uses this to learn.
- **Validation set** (10% - 15%): Used to tune the AI's settings and prevent it from just memorizing the answers.
- **Testing set** (10% - 15%): Used to test the final AI on completely unseen data to check its accuracy.

DATA INTERPRETATION

Data interpretation is the process of reviewing organized information to assign meaning and draw conclusions. While *analysis* finds the facts, *interpretation* explains *why* those facts matter. Professionals use these insights to make smart, evidence-based choices.

METHODS OF DATA INTERPRTATION

Common methods of data interpretation focus on two main data types:

1. Quantitative Methods

These methods use numbers and math to measure results. They tell you exactly "how much" or "how many."

- **Statistical analysis:** Uses math rules to check information. Common tools include the **mean** (average), **median** (the middle number), and **standard deviation** (how spread out the numbers are).
- **Trend analysis:** Looks at historical information to spot patterns over time. It helps forecast future outcomes.
- **Correlation analysis:** Measures if two things move together. For example, seeing if higher prices lead to fewer sales.

2. Qualitative Methods

These methods use text, words, and opinions to explain behavior. They answer the "why" or "how."

- **Thematic analysis:** Finds repeated ideas in text. For example, grouping customer survey complaints to find a common bug.
- **Content analysis:** Sorts and organizes text into groups or categories to see how often specific topics appear.

Visualization Techniques

Raw numbers are hard to read. Visualization tools make it easier to see patterns and spot outliers (numbers that are much higher or lower than the rest):

- **Bar graphs** compare different categories side-by-side.
- **Pie charts** show how a whole is divided into parts.
- **Line graphs** track changes over time, like daily website traffic.

CHAPTER 6 TABLEAU PRACTICAL FROM BOOK

EXERCISE

Unit 2 Page 85 ABE
Page 114 ABE
Page 135 ABE