Chapter 3: Trending Technologies

1. Artificial Intelligence (AI)
Definition: AI is the ability of machines to simulate human intelligence, such as learning, reasoning, and problem-solving.
Example:

- **Chatbots** like ChatGPT
- **Voice Assistants** like Siri or Alexa

2. Robotics
Definition: Robotics is the design, construction, and operation of robots that perform tasks automatically.
Use Case:

- Industrial robots used in car manufacturing
- Surgical robots in healthcare

3. Robotic Process Automation (RPA)
Definition: RPA uses software robots to automate repetitive and rule-based tasks.
Example:

- Automating invoice processing in businesses
- Data entry in HR systems

4. Some Popular Robots with Working

- **ASIMO (Honda)**: Walks, talks, and recognizes people.
- **Sophia (Hanson Robotics)**: AI-based humanoid robot that can engage in conversation.
- **Roomba (iRobot)**: A robotic vacuum cleaner that autonomously cleans floors.
- **Boston Dynamics Spot**: A robotic dog used for inspections and surveillance.

5. Machine Learning (ML)
Definition: ML is a subset of AI where systems learn from data and improve over time without being explicitly programmed.
Example:

- Email spam filters
- Product recommendations on e-commerce sites

6. Data Science
Definition: Data science involves collecting, analyzing, and interpreting large sets of data to extract useful information.
Applications:

- Fraud detection
- Predictive analytics in business and healthcare

7. Internet of Things (IoT)
Definition: IoT refers to the network of physical devices connected to the internet that collect and share data.
Examples:

- Smart home devices (lights, thermostats)
- Fitness trackers

8. Edge Computing
Definition: Edge computing processes data near the source of generation (e.g., devices) rather than relying solely on the cloud.
Benefits:

- Faster response time

- Reduced bandwidth usage

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9. Augmented Reality (AR) vs Virtual Reality (VR)

Feature	Augmented Reality (AR)	Virtual Reality (VR)
Environment	Adds digital elements to real world	Fully immersive digital environment
Equipment	Smartphone, AR glasses	VR headset
Interaction	Real world + virtual elements	Entirely virtual world

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10. Examples of AR and VR Applications

- **AR Examples**:
  - Pokémon Go
  - IKEA Place (visualize furniture in your room)
- **VR Examples**:
  - Oculus VR gaming
  - Virtual tours of museums

11. 3D Printing

Definition: 3D printing is a process of creating three-dimensional solid objects from a digital file.
How It Works:

- The printer adds material layer by layer to form the object.

12. 3D Printing Objects

Examples of 3D Printed Objects:

- Prosthetic limbs
- Miniature models
- Tools and spare parts
- Customized toys