Lecture 1

Learning outcomes:

- *Introduction to Information Technology (IT) – history and role in society.*

Introduction: Information Technology (IT)

- In a general context, Information Technology (IT) is the use of computers, networks, and other electronic systems to store, retrieve, transmit, and manipulate data and information.

- In a modern context, the term ‘IT’ is commonly used to describe computers and networks within a business environment. It refers to their applications in: generating, handling, storing, regaining, transmitting, exchanging, studying and securing all data or information in an electronic format. IT is also used as an umbrella term to cover: television, telecommunication equipment, software, e-commerce and the internet.

Why do we need information technology?

- Information technology drives much of what we do in our personal and professional lives. It is the foundation of our communication, technological advancement, innovation, sustainability and recreation. We use information technology on a personal level to connect and communicate with others, play games, share media, shop and be social.

- From a career perspective, information technology is largely responsible for much of our business operations and spans nearly every industry. From healthcare to food services, manufacturing to sales, and beyond, we rely on IT to help connect us to others, store and manage information and create more efficient processes.

History of IT

- The history of IT spans from early information management to the development of networked computers and the internet, while its modern role is characterized by its pervasive influence on global systems, economic growth, and daily life.

❖Pre-Mechanical Era (before 1450s):

➢Use of simple tools like abacus, tally sticks.

❖Mechanical Era (1450s–1840s):

➢Invention of printing press, early calculators (Pascal's calculator, Babbage's Difference Engine).

❖Electromechanical Era (1840s–1940s):

➢Telegraph, telephone, punched card systems.

❖Electronic Era (1940s–present):

➢First generation (1940s–1950s): Vacuum tubes, ENIAC.

➢Second generation (1950s–1960s): Transistors.

➢Third generation (1960s–1970s): Integrated Circuits (ICs).

➢Fourth generation (1970s–present): Microprocessors, personal computers.

➢Fifth generation (present and future): Artificial Intelligence, cloud computing, quantum computing.

What is IT today?

❖Information technology is no longer just about installing hardware or software, solving computer issues, or controlling who can access a particular system. Today, IT professionals are in demand, and they also:

- create policies to ensure that IT systems run effectively and are aligned with an organization's strategic goals;
- maintain networks and devices for maximum uptime;
- automate processes to improve business efficiency;
- research, implement and manage new technologies to accommodate changing business needs; and
- maintain service levels, security and connectivity to ensure business continuity and longevity.

Role of IT in Society

❖Business & Economy:

E-commerce, digital payments, online banking, automation.

❖Education:

E-learning platforms (Coursera, edX, Khan Academy), digital libraries.

❖Healthcare:

Telemedicine, electronic health records, AI diagnostics.

❖Government (E-Governance):

Online services, digital identity (e.g., Aadhaar in India, Estonia’s e-ID).

❖Communication:

Email, instant messaging, video conferencing, social media.

❖Daily Life:

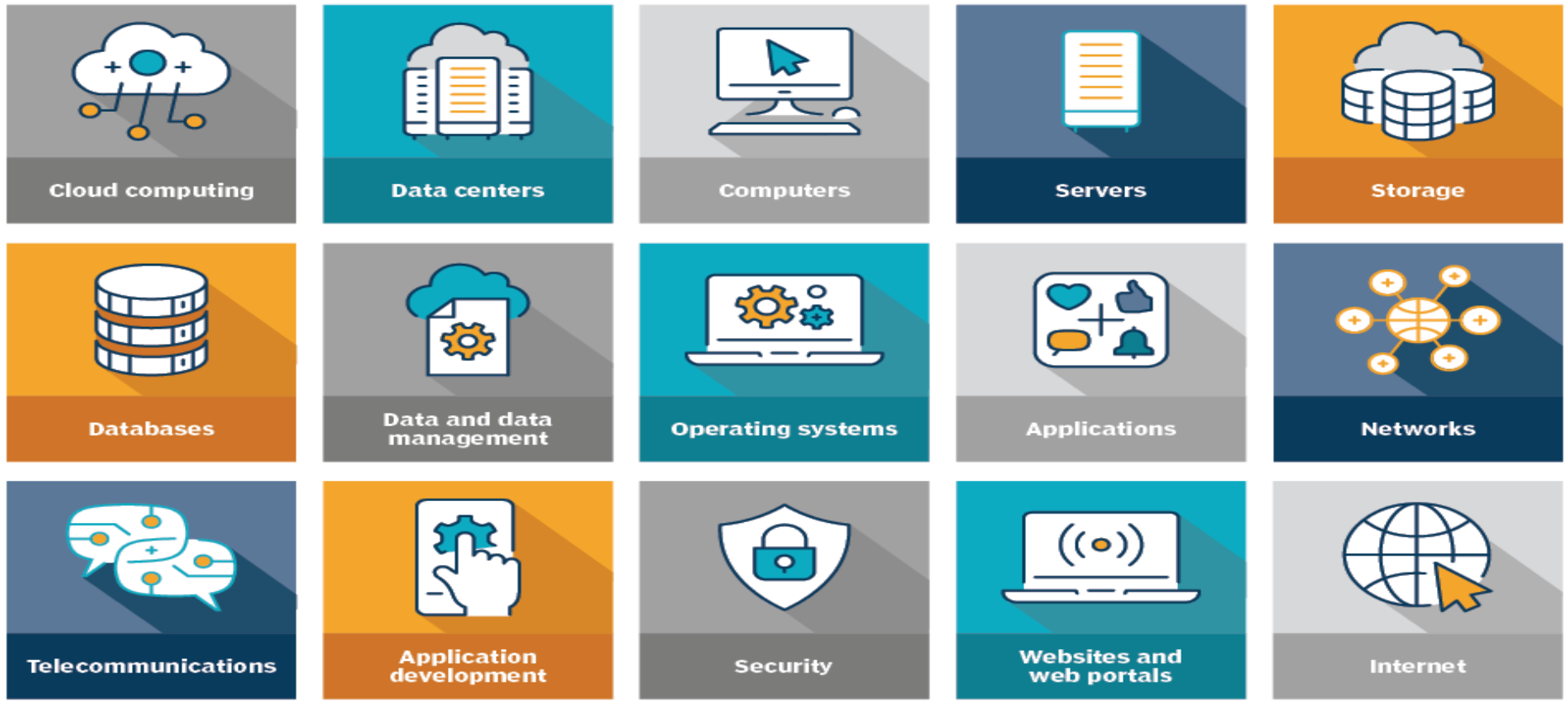
Smart homes, online shopping, streaming services.

Opportunities and Challenges

- Information Technology has evolved from basic counting devices to advanced AI-driven systems. It has become a critical enabler of progress, improving efficiency, communication, and global connectivity.

- While IT offers numerous benefits, it also poses challenges and risks. The rapid pace of technological advancements requires companies to constantly adapt and update their IT infrastructure. The rising demand for skilled IT professionals is expected to grow, creating opportunities for experts in software development, cybersecurity, and data analysis. However, businesses must also prioritize addressing issues related to IT security, privacy, and data protection to mitigate potential risks and drive their digital transformation initiatives to stay ahead of the competition.

Information technology components and functions



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