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Emerging Trends

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4.1 INTRODUCTION

The rapid growth of technology is not at all surprising but what surprises is the rate at which the technology is growing and evolving, impacting our lives in a way no one could have imagined some decades ago. Today, you can listen to news or play your favourite music without getting up from your place, by just giving spoken instructions. Based on your preferences or search history, your online shopping store recommends products for you and you are surprised with their thoughtful matching choices, no ? All this and much more, possible because of modern age technologies.

In this chapter, we shall talk about some recent trends in computing and information technology. So, let us begin.

4.2 ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) basically refers to the ability of a machine or a computer program to think and learn. In simple words, field of AI revolves around bringing out technologies that help build machines that can think, act, and learn like humans.

An AI based program and technology should bring out these things :

- ❖ Firstly, it should be able to mimic human thought process and behaviour e.g., learn from mistakes, catching up with new ideas, learning new things from new experiences (this ability is called **heuristics**.) etc.
- ❖ Secondly, it should act in a human-like way – *intelligent, rational, and ethical*, i.e., it should be able to take right decisions in ethical ways.

Thus, modern AI machines are designed and programmed to :

- ❖ work with minimum human intervention.
- ❖ create and update knowledge base, which keeps updating.
- ❖ having heuristic abilities (i.e., to learn from past mistakes, decisions and outcomes).

Most famous example of AI today is **social humanoid robot Sophia**, who has been awarded citizenship of *Saudi Arabia*.

Other common examples of AI today are :

- ❖ *Siri* or *Alexa* – the personal assistants that have already become the new normal for thousands of people around the globe.
- ❖ smart home devices like Google's *NEST*,
- ❖ self-driving cars like those produced by *Tesla*,
- ❖ online games like *Alien : Isolation*.

It is predicted that in coming 5 to 10 years AI will grow tremendously. AI based machines would outperform humans in tasks such as *translating languages, writing school essays, driving trucks etc.* However, more complicated tasks like *operating in place of a surgeon or coming out with heart-touching emotional books or bestsellers etc.* will take machines much more time to learn. AI is expected to master these skills in coming decades.

Let us now talk about Machine Learning (ML), which is a popular subdomain of AI.

4.2.1 Machine Learning (ML)

Machine Learning is a sub-area of artificial intelligence, which refers to the ability of computers to independently find solutions to problems by recognizing patterns in databases using statistical techniques. Machine Learning enables computers to recognize patterns on the basis of *specific algorithms* called *models* and data sets and to develop adequate solution concepts. Therefore, in Machine Learning, artificial knowledge is generated on the basis of experience.

NOTE

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ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) refers to the ability of a machine or computer program to think, learn and evolve.

MACHINE LEARNING

Machine Learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed after initial trainings using test and training data and algorithms.