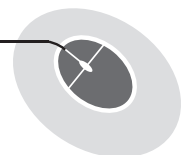# 8 Smart Internet

LEARNING OUTCOMES

After the lesson, students will be able to:

- » Understand the history of the Internet.
- » Describe the features of the Internet.
- » Define the term blog and its structure.
- » Define cloud computing.
- » List the advantages and disadvantages of cloud computing.
- » Describe the types of cloud computing.
- » Define cyber security
- » Define cyber ethics
- » Describe Artificial Intelligence (AI).

WARM UP

Have a discussion on the various uses of the Internet.

CHAPTER NOTES

- » Internet (Interconnected Network) is a global system of interconnected computer networks that uses a protocol called the Internet Protocol (TCP/IP) to link to billions of devices around the world. This network carries a vast range of information.

- » The exchange of information has led to an improvement in the standard of living for many people across the globe. Although the Internet was widely used for academic purposes since the 1980s, its commercial

use incorporated its services and technologies into virtually every aspect of modern life.

» The Internet originated with the U.S. government, which began building a computer network in the 1960s known as ARPANET. ARPANET is considered the first known group of interconnected computers. This system was used to transfer confidential data by the military.

» This data sharing technology was then opened to educational institutes in the United States. The system was replaced by new networks operated by commercial Internet service providers in 1995. The Internet was brought to the public on a larger scale at around this time.

» World Wide Web is a part of the Internet, which supports hypertext documents, allowing users to view and navigate different types of data.

» E-mail is the most popular reason people use the Internet. You can create, send, and receive e-mail messages in fraction of seconds. You only need an e-mail program and an account on an Internet mail server.

» News includes tens of thousands of newsgroups where each newsgroup hosts discussions on a specific topic as per the user's interest.

» Telnet is a specialised service that lets you use one computer to access the contents of another computer using a telnet host.

» File Transfer Protocol (FTP) is useful for finding and copying software files, articles and other types of data.

» Instant messaging is a service that allows users to communicate over the Internet just as if they are having a face-to-face conversation.

» A blog, which is the short form for weblog is an online journal or informational website displaying information in reverse chronological order, with the latest posts appearing first. It is a platform where a writer or even a group of writers share their views on an individual subject.

» Blogging can be seen as a form of social networking service

» A typical blog combines text, digital images, and links to other blogs, web pages and other media related to its topic. The ability of readers to leave publicly viewable comments, and interact with other

commentators, is an important contribution to the popularity of many blogs.

» In education, blogs can be used as instructional resources. These blogs are referred to as edublogs.

» The term 'weblog' was coined by Jorn Barger on 17 December 1997.

» A blogger is someone who runs and controls a blog. He or she shares his or her opinion on different topics for a target audience. People maintained blogs before the term was coined, but the trend gained momentum with the rise of automated published systems.

» The main purpose of a blog is to connect you to the relevant audience. Another one is to boost your traffic and send quality leads to your website. The more frequent and better your blog posts are, the higher the chances for your website to get discovered and visited by your target audience.

» Great blogging makes your business look more credible, which is particularly important if your brand is still young and fairly unknown. It ensures presence and authority at the same time.

» The appearance of blogs changed over time, and nowadays blogs include different items. But, most blogs include some standard features and structure. Here are common features that a typical blog will include:

  ○ Header with the menu or navigation bar
  ○ Main content area with highlighted or latest blog posts
  ○ Sidebar with social profiles, favorite content, or call-to-action
  ○ Footer with relevant links like a disclaimer, privacy policy, contact page, etc.
  ○ Blogs and websites

» Cloud computing means that instead of all the computer hardware and software you're using sitting on your desktop, or somewhere in your company's network, it's provided for you as a service by another company via the Internet.

» All these services are stored in the cloud and exist in some digital space. OneDrive, Google Drive and Google Keep are popular examples of

cloud computing software and apps.

» For businesses, the cloud has the potential to transform operations, as well as cut costs.

» Offices running computer networks would no longer have to deal with software installation for each computer, as well as licenses. Uses of the cloud include data storage, offering remote access to any work related data.

» At the corporate level, it can be either for the in-house operations, or as a deployment tool for software or services the company develops for the public.

» The most obvious use of cloud computing is the mobility that it brings, both to the user as well as to the corporate and business user.

» Advantages of cloud computing: The services are free from capital expenditure; most of the cloud providers are truly reliable in offering their services; the users can get onto the applications needed basically from anywhere. Some of the applications even function offline; cloud computing offers yet another advantage of working from anywhere across the globe, as long as you have an Internet connection. Even while using the critical cloud services that offer mobile apps, there is no limitation of the device used; in cloud computing, the server suppliers regularly update your software including the updates on security, so that you do not need to agonise on wasting your crucial time on maintaining the system; cloud computing offers great security when any sensitive data has been lost. As the data is stored in the system, it can be easily accessed even if something happens to your computer.

» Disadvantages of cloud computing: In order to get the benefits of cloud computing, your business must always have an Internet connection; not all cloud providers are created equally. When you use cloud computing for storage and backup, you should ideally be working with a provider who offers the value of unlimited bandwidth; you are essentially trusting another party to take care of your data. You trust that they will maintain their data centres and servers with the same care as you would, if not more; cloud hacking cases have shown that not all cloud providers are as secure as they claim to be; if you experience any technical issues, you have no choice but to call your

provider's technical support for help.

» There are three different ways to deploy cloud services: On a public cloud, on a private cloud or on a hybrid cloud.

» Public clouds are owned and operated by third-party cloud service providers, which deliver their computing resources like servers and storage over the Internet. Microsoft Azure is an example of a public cloud.

» A private cloud refers to cloud computing resources used exclusively by a single business or organisation.

» Hybrid clouds combine public and private clouds, bound together by technology that allows data and applications to be shared between them.

» Cyber security is the practice of protecting systems, networks and programs from digital attacks. These cyber attacks are usually aimed at accessing, changing or destroying sensitive information; extorting money from users; or interrupting normal business processes.

» The purpose of cyber security is to help prevent cyber-attacks, data breaches and identity theft and can aid in risk management.

» The process of keeping up with new technologies, security trends and threat intelligence is a challenging task. However, it's necessary in order to protect information and other assets from cyber threats, which take many forms.

» Ransomware is a type of malware that involves an attacker locking the victim's computer system files -- typically through encryption -- and demanding a payment to decrypt and unlock them.

» Malware is any file or program used to harm a computer user, such as worms, computer viruses, Trojan horses and spyware.

» Social engineering is an attack that relies on human interaction to trick users into breaking security procedures in order to gain sensitive information that is typically protected.

» Phishing is an activity where fraudulent e-mails are sent that resemble e-mails from reputable sources; however, the intention of these e-mails is to steal sensitive data, such as credit card or login information.

» Business protection against malware, ransomware, phishing and social engineering.

- » Protection for data and networks.
- » Prevention of unauthorised users.
- » Improves recovery time after a breach.
- » Improved confidence in the product for both developers and customers.
- » Cyber ethics is a set of moral choices that individuals make when using Internet-capable technologies and digital media.
- » Artificial Intelligence (AI) is an area of computer science that emphasises on the creation of intelligent machines that can work and react like humans. It includes learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction.
- » AI can be categorised as either weak or strong. Weak AI is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI.
- » Strong AI is an AI system with generalised human cognitive abilities. When presented with an unfamiliar task, a strong AI system is able to find a solution without human intervention.
- » AI has already entered many areas of our working and private lives. By means of smart algorithms, machines today are capable of doing incredible things with facial and speech recognition such as Alexa and Siri. With error rates under five percent, many systems can perform better than humans.
- » Machine vision: It is used in a range of applications from signature identification to medical image analysis.
- » Natural Language Processing (NLP): The processing of human -- and not computer -- language by a computer program. One of the older and best known examples of NLP is spam detection, which looks at the subject line and the text of an e-mail and decides if it's junk.
- » Robotics: A field of engineering focused on the design and manufacturing of robots.
- » Self-driving cars: These use a combination of computer vision, image recognition and deep learning to build automated skill at piloting a vehicle while staying in a given lane and avoiding unexpected

obstructions, such as pedestrians.

- » This technology does not possess enough common sense. Even if coded with common sense and learning capabilities, it is difficult for it to get as much common sense as humans.
- » Robots replacing jobs can lead to severe unemployment.
- » Humans can become too dependent on AI and lose their mental capacities.
- » Machines can easily lead to destruction, if put in the wrong hands.
- » Machines may be able to store enormous amounts of data, but the storage, access, and retrieval is not as effective as in case of the human brain.
- » Machines are able to perform repetitive tasks for long, but they do not get better with experience, like humans do.

DEMONSTRATION

- » AI applications in real life.

LAB ACTIVITIES

Use AI applications such as speech to text converter in the the lab.

ASSESSMENT

Teacher can assess students on the basis of the following:
1. Cyber safety and cyber ethics that every student should follow.
2. Advantages and disadvantages of cloud computing.
3. Ways in which Artificial Intelligence (AI) helps us in our lives.

SUGGESTED CLASS ACTIVITIES

Use the following AI apps:
1. Siri (on Apple phone)
2. Cortana (on Windows 10)