

Wednesday

19/2/2025

19/2/24 Lecturer: Dr. Nick / Miss Chigozie Eze / Emma

COURSE: CRE 121

Topic: Information Management and communication
Technology

Unit 1: Internet tools and Resources

Good communication is when you report to the right person at the right time

Objectives

- Introduction: Population Explosion, Knowledge Explosion
- there are two types of Internet communication
 - i Synchronous communication (happening face to face, real time)
 - ii Asynchronous communication (happening over time)

Synchronous communication (Real time communication)

This type of communication happens instantly, with all participants interacting in real time, just like a face to face conversation. It requires both the sender and receiver to be online at the same time.

Example

- i Video calls & voice calls (Zoom, Google Meet, WhatsApp, etc.)
- ii Live chats & instant messaging (FB messenger, WhatsApp, etc.)
- iii Online gaming (Multiplayer games like Free Fire, Call of Duty)
- iv Live streaming & webinars (YouTube live, Twitch and Microsoft teams)

- Characteristics

- i Requires immediate response.
- ii Enhances collaboration and quick decision-making
- iii Best for real-time discussions and urgent matters

2. Asynchronous communication (Delay communication)

This type of communication does not require both participants to be online at the same time. Messages can be sent and received at different time, providing flexibility.

Examples

- i Emails (Gmail, Outlook, Yahoo mail)
- ii Text messages (SMS, WhatsApp, Telegram, messages are sent without instant replies)
- iii Discussion forums & online groups (Reddit and Quora)
- iv Recorded videos & podcasts (YouTube tutorial, educational podcasts)

Characteristics

- i participants respond at their convenience
- ii allows for thoughtful and detailed responses.
- iii useful for documentation, learning and long-term communication

N/B Both types of communication are essential in different scenarios, depending on the urgency and nature of the conversation

Internet Tools : Web, Email, Voice Mail

Search engine

- i A machine that helps us to look for something
- Examples: Google, firefoxe, Edge, Internet Explorer, opera mini, Phoenix, chrome, Yahoo.

System Software

- i these are the ones that come with the system when you buy it. Example: Search engine

Application Software

- i these are the ones that you install when you need them.
- Example web browsers

World Wide Web, Search Engine and Web browser

i these are linked together

Application of Internet Resources in Education

five component of Communication

1. Sender
2. Message
3. Receiver
4. feedback
5. Channel

Types of Reading Approach

- i Skimming : studying it
- ii Scanning : Scanning through it

Thursday 20/2/25

Technology and the Evolution of ICT

Lady Ada Lovelace developed Pascal's programming language improving Charles Babbage's Abacus, which contributed to the foundation of Modern Computing.

The need for technology emerged through different means such as scripts, pictures, gestures, and body movement which were early ways of recording and transmitting information.

A Research Topic must be a problem you want to solve.

Steps in Research

- 1 identify the Problem - clearly define what needs to be solved
- 2 objective - determine the aim of the Research

Specific Objectives

- to know if they sleep late
- to know if they are living far
- to know if they travelled from a far distance

As man progressed towards modernization, ICT also evolved, becoming enriched with newer technologies.

NB: Without the Internet, ICT would not be possible.

The most important element of communication is the Internet.

Internet

1. Understanding the Internet

- the Internet is a global network that connects computers worldwide; allowing communication and information sharing.
- it works using TCP/IP (Transmission Control Protocol and Internet protocol) which sets the rules for data exchange.

2. Types of Internet communication

- i Synchronous communication
- ii Asynchronous communication

3 IoT (Internet of things)

Iot refers to devices connected to the Internet that communicate automatically

Examples

- Smart home devices (e.g. Alexa, Smart TVs, Security cameras)
- Wearable technology (e.g. Smartwatches, Fitness Trackers)
- Connected Vehicles (e.g. GPS tracking, Smart cars).

4 The Role of Search engines and web browsers

the Role of Search engines and web browsers

search engine : A tool that helps users find information on the internet e.g Google, Bing, Yahoo

web browser : An application used to access the Internet e.g Chrome, Firefox, Edge and Safari

5. System and Applications Software

OSI - Open System Interconnection (Protocol)

ISO - International Standard Organisation

Introduction

Ict (Information and Communication Technology) has evolved alongside Human Civilization to meet the need for communication. From early form like scripts, gestures and body movements communication has advanced significantly.

As Mankind progressed towards Modernization, Ict also grew incorporating newer technologies from print media (i) Simple audio and video gadgets, eventually leading to the development of computer technology.

Today, Advanced computer technology has become an integral and inevitable part of life one of its most important and core elements is the Internet

Internet and Communication

The Internet facilitates the transmission and reception of digital data. However, in the past, proprietary standards created barriers to communication, making it difficult for one system to communicate with another.

To address this issue, the OSI model and ISO developed protocols to standardize communication between systems.

Key Protocols in Internet Communication:

1. FTP (File Transfer Protocol) - used to transfer files over the Internet
2. HTTP (HyperText Transfer protocol) - facilitates the transfer of Web pages on the world wide web
3. HTTPS (HyperText transfer protocol secure) - Ensures Secure communication over the web.
4. SMTP (Simple Mail Transfer Protocol) - Used for sending emails

the OSI model - the seven layers of communication

the OSI Model is a conceptual framework that standardizes communication functions across different networking systems. It consists of seven layers each responsible for a specific function.

1. Physical layer (OSI/ISO)

- Deals with hardware and physical connections e.g. cables, network interfaces, electrical signals.
- This layer is responsible for the transmission of raw binary data (bits) over a physical medium.

Examples: Phone signals, fiber optics, radio waves

2. Data Link layer

- Ensures error-free data transfer between two connected nodes.
- It creates frames from bits and sends them on the network layer.
- If there is a network available, it powers the bit transfer, otherwise, the bits remain in the Physical layer.

3. Network layer

- responsible for routing and forwarding data packets from one device to another

- It determines the best path for data transmission
Examples: Internet protocol (IP) is used at this layer for addressing devices

4. Transport Layer

- Ensure reliable data transfer b/w devices
- It establishes connections between hosts and ensures that messages arrive in order and without errors
Examples: TCP (Transmission control protocol) ensures reliable delivery of messages

5. Session Layer

- manages and controls communication sessions b/w computers
- It is responsible for establishing, maintaining and terminating sessions.

Examples: Initiating and terminating calls on whatsapp

6. Presentation Layer

- converts data into a format that can be understood by the applicant layer
- ~~responsible for network services such as email, web~~

~~web browsing and file transfers~~

~~examples: web browsers, email clients, whatsapp~~

- Responsible for encryption and decryption of data for secure transmission

~~example: Data compression in multimedia files~~

7. APPLICATION LAYER

- the interface b/w the user and the network
- responsible for network services such as email; web browsing and file transfers.

~~examples: web browsers, email clients, whatsapp~~

Internet and Web Communication

the Internet consists of billions of interconnected web pages that are transferred using HTTP - it is commonly referred to as the world wide web (www)

key concepts in web communication

- web pages: When you visit a website and request information, the displayed content is a web page
- Search engines: Example - Searching "UNN.edu.ng" on Google.

- Secure communication: websites with HTTPS ensures that data is transmitted securely.
- Data Transfer: The Internet uses FTP for file transfer and SMTP for emails communication

Understanding Packets in Data Communication

In networking, data is broken down into smaller units called packets before being transmitted. Each packet contains:

- Bits and frames: The smallest unit of digital communication
- packet structure: A combination of frames that make up the message.

N.B: Bits and frames alone do not make sense until they are arranged in a meaningful way at higher levels

Assignment

Historical Background of the Internet

Dr. Nicholas Eze

21/2/25

Internet in Education

There are many uses of internet in Education which can be as follows:

1. ~~Instructional~~ Instructional Materials can be made available to student online. e.g. Written materials Various presentations, Assignments can be given online, Even the Instructions can be conveyed through Internet, etc
2. The Learner get the Scope of learning desired courses anywhere, anytime thereby making learning more flexible, interesting and meaningful irrespective of geographical location and you see each other face to face
3. Internet also help in removing the age restriction. Both young and old people can learn online and you will not know. for learners ranging from young to adult can enhance their learning as per there need
4. Online Conferences can be Organized Online for the learners from different places having Common Interest. People

that have interest in there course can join the Conference online

5. the learning that requires prior preparation can also be provided through the interest with load of instructional materials available time.

6. Research works can also be carried out by both the learners as well as teachers with the E-learning - there are topical bases

Web Browsers and Internet Access

To access the Internet to view what is in the Internet the way they are a browser is used to get to a search engine. Such as typing:

Microsoft Internet Explorer, Opera Mini etc. that enable the user to display text, images on the local Area Network

In website development there are so many pages:

- Home

- About
- Department
- facilities

Some examples of web browser

Browser (ICAP, Links, Ezoine, Mosaic)

Learning Activity

Find out Browser ID, is elaborated on your PC and note the steps in connecting to the Internet using the particular browser

There are different types of web browsers that are available and they all come with a variety of features

- (1) ICAP
- (2) Internet Explorer
- (3) Lynx
- (4) Mosaic
- (5) Mozilla
- (6) Mozilla Firefox
- (7) Nescap
- (8) Safari
- (9) Opera
- (10) Chrome
- (11) Edge

Digital Library (E-Library)

E-Library materials that are gotten online and going online to download material.

Learning

Individualized as well as group Method of Learning

can be applied online with the help of various Internet tools like E-mail, discussion forum, chat room, WWW, etc. which are discussed in the next segments of this tools.

Internet Tools

Internet tools are those we use to facilitate learning, Teaching, Research etc.

Web browser: looking into the network of something. If we consider literal meaning of the two terms WEB implies Network and BROWSER means "LOOK THROUGH")

In this context web browser means looking through the network of something

If this meaning applied in the context of the Internet then it roughly means looking through a network of the information pages available in the ~~network~~ Internet.

A browser is an application that provides a way to look at and interact with very all the Information

on the Web

Technically a web browser uses HTTP to make request of web servers through the Internet on behalf of browser users.

NB: the work of the HTTP is to fetch web pages

Examples of web browser:

chrome, mozilla firefox, safari, Internet Explorer etc

In other words, it is an application software that allows one to view pages on the world wide web (www).

it is a programme installed on your personal computer locally like mozilla firefox, safari, Internet Explorer that is used.

27/02/25

Rules or Guidelines for Searching

- The more specific keyword will be the specific and accurate results.

E.g if you type lesson note and computer lesson note the computer lesson will give you exactly what you are looking for

- Be straight to the point

E.g if you type lesson note it is general, but if you type computer lesson note it will give you what you are looking for

- Place quotes ("") around the topic.

When you place quote, it will give you the exact answer

E.g "Rome history lesson plan"

some search engines also perform this same function

When + sign is in front of the keyword.

Uses of Search engine

- they are a source for accessing the information from different website
- In addition to searching text, ~~searching~~ ^{Search} engine would also search graphics, sounds and other kind of files
- Search engine will also help you find the news from the press
- It can also be used to search newsgroup posting whether online or offline, event and perform services such as chat, instant messaging

- Product searches for Online Shopping and its Online Shops are cheap.
- It provides search or access to data bases or third parties and such access will enable you to search Assignment

Miracle wants to get Information on Method of teaching Computer how would She Access the related Information on the Internet

- ### Application of Internet resources to Education
- Computer technology is now used for learning (E-learning)
 - Computer technology is fast being adapted widely in Education
 - Computer technology now E-learning is the concept Used in Education

NB E-learning is the Instruction that delivered electronically in part or wholly via a web browser through the Internet or an Intranet or through multimedia platforms such as cd rom or DVD

There are two forms of eLearning

- Online E-learning
- Offline E-learning

NB - the forms are categorized on the bases of the availability of Internet. In this context, Online learning can be facilitated when the computer is connected to the Internet. It could be used offline when the learner studies with the help of computer technology in the absence of Internet connection.

Internet Resources

1. WWW (Worldwide web)

This is an eLibrary on computer having billions of web pages well placed by setting standard set of rules to be navigated by thousands of web users.

It is the computer-based network of Information resources that a user can move through by using links from one document to another information on the www. It is spread or scattered over computers all over the world but with the availability of internet.

This part portion of the Internet having a collection of text, pictures, sound, video clips, graphics and other information all arranged in pages and linked together via the Internet. It offers a wide range of education opportunities for self learning. A vast amount of educational material can be accessed through the www.

The students and teachers both can use it in different ways for the education purpose accessing and storing Educational Information for the students

1. Reference work: the learners or the students can use the web pages to get the desired Educational Information in the form of texts, images, graphics and videos. This information can be used for the following purpose:
 - reference work by accessing, downloading e-books, notes, essays and other documents, presentation.

2 Education presentation : Power point is helpful when we do an Educational presentation

3 Project: the requirement for the award of degree that require a project

Dr NICK

28th/2/25

www helps students in learning "on real time".

there should password so that it would be for only student and so that during an online class the lecturer is called facilitator

dynamic you login with your details on the same website static, while other can't login

there are educational games that students can play

4/04/25

Information and Communication technology (ICT) are the ~~technic~~ technologies used for accessing, transmitting, processing, gathering, manipulation of Information

Information is referred to as output result after processing of data

types of Information

- Conceptual Information

- Empirical 11

~~Induced~~ Procedural 11

Policy 11

directive 11

stimulatory 11

unit

1. conceptual Information ^{are} ~~is~~ information that is based on idea, concept, theory and belief.
2. Empirical Information are Information that are gotten through observation, experimentation and verifiable methodologies
3. Procedural Information¹⁵ describe how to carry out a procedure in order to perform a specific task
4. Policy Information relates to law, regulation and
5. directive Information is more of description of a particular activities
6. stimulatory Information: refers to a provocative reaction respond that stimulate reaction which can be negative or positive

function of I.T. profession

1. development and installation of program
2. designing complex computer network
3. design and management Information database
4. Software design

tele-Communication Network

- is a group of terminal nodes and links that are connected together to enable communication

Component of telecommunication Network

- computer system
- terminal (nodes)
- softwares
- Signals
- communication channel
- communication Network

Signal can be analogue ^{and} ~~or~~ digital Signal

- analogue Signal - refers to the Electromagnetic Signals

Use for Voice Communication

Digital signal are digital Electromagnetic Signal that transmit data codes as one bit and zero bits

Communication Channel: refer to the medium required for information communication to take place.

Devices

Fiber Optics, Twisted Pairs, ^{cable} Optical cable

Communication Network: are the technologies that indicates how network perform its tasks

Types of communication technology (Topology)

1. star Network

2. Bus Network

3. Ring Network

Star Network: Different computer will attach / connect to one computer & the central computer can be called center.

bus Network: is a parallel connection of computer network

Types of telecommunication

1. Local Area Network
2. Wide Area Network
3. Metropolitan Area Network
4. Inter network
5. Intra network and Extra Network
6. wireless network

Local Area network: refers to interconnection of different computer and other IoT gadget together within a place

It is design for small areas, like office, group of building or factory

Features of Local Area Network

1. resource Sharing
2. software application Sharing
3. internet resources Sharing
4. data security
5. centralized data

Wide Area Network: this is type of network that covers large distance such state of a country as well as large city

features

1. It covers a large distance
2. Message can be sent quickly over the large distance
3. Share software and resource with connecting
4. everyone can share same data

Metroplitan Area Network

this network is to span over a bigger city to is often connecting local area network into a bigger network

features

1. extremely efficient

2. fast communication

3. it provide a greater access to MAN and WAN

Inter Network (Internet)

Inter network is a networking type that connects two or more network together for the purpose of data sharing, resource sharing and information sharing - It uses various devices such as routers, bridges, hub and gateway.

Intranet and Extranet:

Intranet is a telecommunication network that is designed to services a particular group of company or organization

Wireless Network

This is the type of network that connects to each other without wire rather it makes use of radio transmission, wave transmission etc.

function of telecommunication network

1. transmit information from one nodes to another
2. It reduces interruption during communication
3. It makes sure right message is received by the right or expected user
4. It is responsible for managing and controlling the speed of transmission
5. It also convert message from one format to the other
6. It controls the flow of data

8a Examples of telecommunication

Satellite, radio, fibre optics, Telephone towers

Uses of communication

1. distance communication
2. Entertainment
3. Banking Sector (customer service, bank transfer)
4. communication in Business

Advantages

1. It reduces cost
2. It saves time

3. It helps in quick decision making
4. It helps in Advertisement

Disadvantage

1. Limited feedback
2. Network challenge
3. Cyber theft

Telecommunication Media

1. Wired transmission e.g. cable, copper cable.
2. Radio transmission e.g. a radiating antenna. It is used to convert time varied Electric current into electric magnetic ~~wave~~^{wave} which propagate through a medium such as air or space.

Forms of radio wave

- i. radio wave propagation
- ii. atmospheric propagation
- iii. surface "

It uses ~~beam divergences~~ and atmospheric refraction

Atmospheric Propagation

It travels through the air
electromagnetic wave it travels through the air along
a single path from transmitter to receiver.

Surface Propagation

Electromagnetic wave travels along the surface of
the earth as in a wave form
terrestrial antenna

Reflected Propagation

The wave is reflected propo

The electromagnetic wave travel to the receiver by
reflection on a smooth surface or edge

10/04/2025

Internet of Things (IoT)

Mr Emmanuel Asogwa

IoT refers to a network of physical devices, appliances
and other object that are embedded with sensors
softwares and network connections allowing them to
connect and share data.

they can only communicate with devices that are connected (Network, Internet) there are phones & switches that use IoT

Applications of IoT in Industry

1. It can be used to monitor environmental condition in the firm
2. Managing traffic pattern with smart cars and other automotive devices
3. Controlling machine and processes in Industry or factory
4. Tracking inventory and shipping (moving goods with the help of GPS)
5. Monitoring of Temperature, humidity and sensor
6. You can also use to monitor machine performance
7. It saves time

Importance of IoT

1. It saves time
2. It saves life (It improves security)
3. It improves efficiency
4. It can be used to monitor industrial equipment
5. It helps in decision making
6. Cost saving
7. It can be used to monitor energy usage
8. Enhanced customer's experience

Technologies behind IoT [possibilities of IoT]

1. Sensor: these are devices that can detect change in the

environment such as temperature, humidity, light, motion
or pressure

actuators: this is a device that can cause physical
change in the environment such as opening and closing
a valve or driving an e-motor

connectivity technologies: this helps to transmit
IoT data from sensor and actuators to the cloud (center)

Different connectivity devices

Bluetooth

Wi-Fi

cellular

and other wan or wired area network

cloud computing: it provides the infrastructure and tools that
are needed to store and analyze data

big data Analytics: to make sensor data useful; business
owners need to use analytical tools to extract patterns
in order to make machine learning algorithms, data visualiza-
tion, predictive analytics models.

Security and privacy technology! Data being generated
by IoT are secured from threats, intrusion, attack.

Example of security and privacy technology

1. Encryption detection System
2. Access control system
3. intrusion Detection System

Artificial Intelligence (AI)

AI is a process of building intelligent machines from vast volume of data, causing the machine to learn and relearn and perform human-like task

AI is also the ability of a machine that typically require human intelligence such as learning, decision making and problem solving

Key components of AI

1. Machine Learning: It makes AI to learn and relearn.
2. Deep Learning: Advance of machine learning (subset of machine learning)
3. Cognitive computing: Ability to recreate human thought
4. Neural Network: Using neuron similar to the brain
5. Natural language processing: Ability to process & interpret layer
6. Computer Vision: Ability to identify patterns & pictures and interpret it

Types of AI

1. Narrow AI: programmed / trained to perform a specific task, its operation is limited with a set of parameters.
It is goal-oriented
2. General AI: it performs any intellectual task within a human-like efficiency. It is general (e.g. chatbot)
3. Super AI: it performs functions on any task better than a human being. (e.g. Solving a puzzle game, making judgements)

Application of AI in business

1. IT operation: it helps IT unit or team to quickly go through large amounts of data in a reduced amount of time. It helps to provide a real-time insight to operations.
2. Marketing and Sales forecasting: AI tools help process big data in order to forecast future spending trends and conduct competitors analysis. This helps an organization to gain a deep understanding of its place
3. Customer service (chatbot)
4. Marketing & sales