

Abbreviations and Terminology in ICT | UGC NET Paper 1

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ICT: General Abbreviations and Terminology

The general abbreviations and terminology in ICT is an important topic of UGC NET Paper 1. The abbreviations and terminology of ICT are discussed in two parts; Terminology in ICT and Abbreviations in ICT.

Terminology in ICT

Abort: To stop a program or function before it has finished.

Algorithm: A set of instructions that provides a solution to a given problem.

Animation: A simulation of movement created by displaying a series of pictures, or frames. For example, cartoons on television.

ANSI: American National Standards Institute, a powerful industry association of USA, promoting Programming language standards.

Antivirus: Program A utility that searches a hard disk for viruses and removes any, that is found.

Architecture: A design. It can refer to either hardware or software or to a combination of hardware and software. The architecture of a system defines its broad outlines.

ASCII: American Standard Code for Information Interchange. This is a seven/eight-bit code widely used in computers for the transfer of data.

Bandwidth: The amount of data that can be transmitted in a fixed amount of time. It is usually expressed in bits per second (bps) or bytes per second.

Bit: The smallest unit of information in computer system. Bit is short for binary digit; either a "1" or a "0".

Boot: The process of getting the computer started.

Byte: A byte is made up of 8 bits. The amount of memory it takes to store a single character.

Cache: A separate area of Primary Memory (RAM) where the computer stores a copy of frequently used information for quick access. This is meant to speed up the operation of the hard disk.

CD-ROM: Compact Disk-Read Only Memory. This is a permanent storage device used to store large quantities of information that need not be changed.

CGA: Color Graphics Adapter. Low-resolution screen (640×200 pixels) with colour capability.

Character: A number, letter, symbol, or punctuation mark.

Chip: A small piece of silicon-containing thousands or millions of electrical elements. Also called an Integrated Circuit (IC).

Compatible: The ability of one device or program to work with another device or program. For example, a printer and a computer are said to be compatible if they can be connected to each other.

Conventional Memory: The first 640K of electronic Memory (RAM) in a computer used to run OS and applications.

Debug: In computer-related systems, fixing software related problem is known as debugging.

Digitize To scan a piece of artwork in very fine detail and store it in a form that a computer understands.

DOS: It stands for Disk Operating System. It is a single-user operating system.

DVD: Digital Versatile Disc or Digital Video Disc

Dynamic: Refers to actions that take place at the moment they are needed rather than in advance.

EDP: Electronic Data Processing.

E-Mail: Electronic Mail. A facility to send electronic messages to another person on a computer network.

End-User: The end-user is the individual who uses the product after it has been fully developed and marketed.

EPROM: Erasable Programmable Read-Only Memory. A type of ROM that can be programmed or reprogrammed usually by exposing a normally covered sector to UV-Light.

Extended Memory: Memory in addition to conventional memory used to run and manage applications; together with expanded memory, it helps PCs to address increased amounts of data in memory.

Fax/Facsimile: A way of transmitting copies of documents over telephone lines. Fax is short for Facsimile.

Gigabyte: Abbreviated as GB, is equal to 1024 MB. **GUI Graphical User Interface.** A user interface that works visually and is based on the selection of actions using a mouse or a similar pointing device to click on icons or to pick options from menus; see also icon.

Hertz: A unit of frequency that means Cycles per Second.

High Density: The amount of information a disk can hold. High-Density disks hold more information than Double Density disks.

Hypertext: A method of presenting information so the user can view it in a non-sequential way, regardless of how the topics were originally arranged. It has now evolved as a flexible software technology to create electronic books provides fast and flexible access to search criteria and provides quick access to information in large documents.

HTML: HyperText Markup Language. A markup or structuring language used to describe Web and Intranet documents. It is used to define structure, appearance and placement of HTML elements including, fonts, graphics, text, hypertext links to other sites and many more details.

IBM: International Business Machines, a USA based multinational Company.

Icon: A graphical screen element that executes one or more commands when selected with a mouse or other pointing device

IDE: Integrated Device Electronics, a standard used for connecting hard drives to a computer. IDE hard drives are very common and relatively inexpensive.

Intel: The manufacturer of the most popular microprocessors or CPUs.

Intelligent: Printer combining laser, computer and photocopying technology.

Internet: The world's largest computer network that links many of the scientific, research and educational computers as well as commercial networks. The internet uses TCP/IP protocols, and computers on the Internet can run on any operating system, like, several variations of UNIX, Windows NT, and VMS etc.

Intranet: In the most general sense, a private corporate network that uses Internet technology-based software and TCP/IP protocol standards. Many companies use intranets for tasks as simple as distributing a company letter and for tasks as complex as posting and updating technical support bulletins to service personnel worldwide. An intranet does not always include permanent connection to the Internet.

Kilobyte (K, KB) Approximately one thousand characters; actually 1024bytes.

LAN An acronym for local area network. A system of PCs that are located relatively near to each other and connected by wire so that individual users can cooperatively process information and share resources; see also WAN.

Laptop Computer: A portable computer, small enough to be held on a lap, but slightly larger than a notebook computer.

LED: Light Emitting Diode. An electronic device that lights up when electricity is passed through it.

Light Pen: An input device that allows a user to write on or point to a special pad or the screen of a pen-based computer, such as a PDA.

Macintosh: A PC based on a Motorola microprocessor employing GUI. Apple Macintosh has been in use since the late eighties.

Macro: A symbol, name, or key that represents a list of commands, actions or keystrokes.

Math co-processor: Part of the microprocessor; a companion chip designed to perform complex calculations.

Megabyte (M, MB): Approximately one million characters; actually 1,048,576 bytes. A measure of memory or storage.

Megahertz (MHz): A measure of processing speed. The higher the value, the faster a computer can work.

Microprocessor: A single chip containing all the elements of a computer's CPU.

MIPS: Million Instructions Per Seconds, a unit for measuring the speed of a computer.

MotherBoard: The main circuit board of a computer, which carries electrical signals to and from various parts of the computer.

Multimedia: A computer system that combines text, graphics, animation, music, voice and video media; may include stereo speakers as an output device.

Multiprocessing: It refers to a computer system's ability to support more than one process at the same time. It is also called multitasking.

Nibble: Half a byte i.e. 4bits.

Non-Volatile Memory: This is data storage that does not lose its contents on power off; for example, ROM.

Notebook Computer: A portable computer, approximately 8½ by 11 inches, that fits inside a briefcase.

Numeric keypad: The part of a keyboard that looks like an adding machine, with 10 digits and mathematical operators; usually located on the right side of the keyboard.

Office-Automation: The use of computer systems to execute a variety of office operations, such as word processing, accounting and Email.

Parallel Port: An outlet on a computer used to attach a device, such as a printer. A parallel port sends data (bits) down the wire side by side (parallel to each other).

Pentium: The fifth generation of microprocessors. The Pentium is 2 to 3 times faster than the 80486, the fourth generation of microprocessors.

Peripheral: Any piece of hardware attached to the outside of a computer. Examples are printers and modems.

Pixel: Short for "Picture Element". A Pixel is the smallest dot the computer can control on the screen.

Portable computer: A small computer that usually runs on batteries. In the categories of portable computers are laptop, notebook, sub-notebook and palmtop.

Protocol: In networking and communications, the formal specification that defines the procedures to follow when transmitting and receiving data. The protocol defines the format, timing, sequence and error checking used on the network.

Resolution: The size and quantity of dots that make up a printed page, screen or scanned image.

Runtime: Error An error that occurs during the execution of a program.

Scanner: An input device used to copy a printed document into a computer's memory in digital form, without requiring manual keying.

SCSI: Small Computer System Interface. A standard for connecting a hard drive to a computer.

Serial Port: An outlet on a computer used to attach a device, such as a modem. A serial port sends data (bits) down the wire one at a time (in a series).

Service Pack: It is an update to a software version that fixes an existing problem, such as a bug or provides enhancements to the product that will appear in the next version of the product.

TCP/IP: Transmission Control Protocol / Internet Protocol is a set of communication protocols that encompass media access, packet transport, session communications, file transfer, e-mail, and terminal emulation. TCP/IP is supported by a large number of H/W and S/W vendors and is available on many computer systems, from PCs to mainframes.

Troubleshoot: To isolate the source of a problem and fix it. In the case of computer systems, troubleshoot is usually used when the problem is hardware related.

UNIX: A multiuser operating system.

Upgrade: A new version of a software or hardware product designed to replace an older version of the same product.

UPS: Uninterruptible Power Supply. It is a power supply that includes a battery to maintain power in the event of a power cut for several minutes to some hours.

Utility: A program that performs a very specific task, usually related to managing system resources.

Vector Graphic: A method of creating graphic images on a computer by telling it to draw lines in particular positions. An advantage of a vector graphic is that it can be enlarged or reduced in size without loss of sharpness or distortion. Most modern image creation and editing packages can save images in vector graphic format.

Video Card: An electronic circuit board inside a computer, which controls the display on the Monitor, i.e. the computer screens. Video cards are usually add-on cards inserted into expansion slots, although sometimes video circuitry is incorporated into the Motherboard. Usually referred to as a graphics card these days.

Videoconferencing or Video Conferencing: A computer-based communications system that allows a group of computer users at different locations to conduct a “virtual conference” in which the participants can see and hear one another as if they were in the same room participating in a real conference.

Videodisc: A technically obsolete Storage Medium, an Optical Disc, 12 inches in diameter, used mainly to store still images or video clips. Now replaced by CD-ROMs and DVDs. See CD-ROM, Digital Video Disc, Interactive Video (IV).

Videodisc Player: Equipment used for accessing information – usually still images or video clips – stored on videodiscs. Now technically obsolete.

Video Memory: The dynamic memory available for the computer’s Display Screen. The greater the amount of memory, the greater the possible colour depth and resolution of the display. Also known as Video RAM (VRAM).

Virtual Learning Environment (VLE): A VLE is a Web-based package designed to help teachers create online courses, together with facilities for teacher-learner communication and peer-to-peer communication.

Virtual Reality: The simulation of an environment by the presentation of 3D moving images and associated sounds, giving the user the impression of being able to move around with the simulated environment. Users wear helmets and visors that convey the images and sound and gloves that give them the experience of touching objects.

Virtual World: A type of online three-dimensional imaginary world or game in which participants and players adopt amazing characters or avatars and explore the world, engaging in chat or playing complex games. See Avatar, MMORPG, MUVE.

Virus: A virus is a nasty program devised by a clever programmer, usually with malicious intent. Viruses can be highly contagious, finding their way onto your computer's hard drive without your being aware of it and causing considerable damage to the software and data stored on it.

Visual Display Unit (VDU): A Monitor connected to larger computers. Usually referred to as VDU. Rather an old-fashioned term nowadays, Display Screen being the currently favoured term.

Vodcast: A contraction of Video Podcast. A type of Podcast that incorporates video as well as audio.

VoIP: Abbreviation for Voice over Internet Protocol, i.e. audio communication using the Internet instead of telephones. Skype and Ventrilo are examples of VoIP.

Volatile Memory: Used to describe the internal main Memory of a computer that loses its contents when power is switched off. RAM is volatile memory as the information is stored in memory chips as an electric charge.

W3C: Abbreviation for World Wide Web Consortium. An international non-profit organisation which acts as a resource centre for the World Wide Web, and is active in setting technical standards.

WAN: Abbreviation for Wide Area Network. A network of computers located at geographically separate sites.

WAP: Abbreviation for Wireless Application Protocol. A system that enables you to browse online services, e.g. relating to information about the weather, traffic conditions, shopping, etc via a special type of mobile phone. WAP is the mobile phone equivalent of the World Wide Web.

WAV: Short for Waveform Audio Format. A format for storing high-quality audio files. Somewhat hungry in terms of storage space compared to the MP3 and WMA audio file formats.

Web 2.0: Contrary to what many people think, Web 2.0 is not a new version of the World Wide Web. The term arose as the name of a series of conferences, the first of which was held in 2004: <https://www.web2summit.com>. Essentially, Web 2.0 is an attempt to redefine what the Web is all about and how it is used, for example, new Web-Based communities using Blogs, Podcasts, Wikis and Social Networking websites that promote collaboration and sharing between users.

Webcam: A camera connected to a computer that enables it to transmit images and videos to the Internet.

WebCT: A Virtual Learning Environment (VLE). Blackboard and WebCT announced an agreement to merge in October 2005. Effectively, Blackboard has now taken over WebCT.

Weblog: The full form of the term Blog.

Webmail: A facility for creating, sending and receiving messages via the Internet. Webmail offers an alternative to using email software such as Outlook or Eudora.

Webquest: A Webquest is a task-oriented activity in which the learner draws on material from different websites in order to achieve a specific goal.

Web Server or Webserver: A computer or a software package running on a computer that delivers, i.e. serve. Every Web server has an IP Address and possibly a Domain Name. For example, if you enter the URL <https://www.scholarify.in> in your browser, this sends a request to the server whose domain name is www.scholarify.in. The server then fetches the page named index.htm and sends a copy of it to your browser. By far the most popular Web server software in use worldwide is the Open Source **Apache software**. Litespeed, NGINX etc. are also the web servers.

Website: An area on the World Wide Web where an organisation or individual stores a collection of pages of material – Web pages. The pages are usually interlinked with one another and with other websites. Every website has a unique Web Address or URL. The full URL of the **Scholarify** website is <https://www.scholarify.in>

Wifi: Wireless Fidelity, also known as wireless networking, a way of transmitting information without cables that is reasonably fast and is often used for laptop computers within a

business or a university or school campus instead of a Local Area Network (LAN) that uses cable connections.

Wiki: A website or similar online resource which allows anyone to set up a resource in which content can be created collectively. Its important feature is that it allows anyone who views the wiki to add to or edit the existing content as if they were adding to or editing, for example, someone else's Word document.

Wild Card or Wildcard: In a question-answer dialogue which aims not to be over-sensitive about spelling, the teacher may decide to allow for aberrations by declaring certain characters "wild".

Windows: The name of a range of several different Graphical User Interface (GUI) operating systems produced by the Microsoft Corporation. Windows 3.0 and Windows 3.1 were the first operating systems of this type, produced by Microsoft, to appear in the early 1990s. Microsoft Windows is currently the most widely used GUI for personal computers. It exists in various versions, e.g. Windows 95, 98, ME, NT, 2000 and XP.

Windows Explorer: Microsoft's tool, provided as part of Windows, that enables you to inspect and manage folders and files stored on your computer. My Computer is an alternative tool, also provided as part of Windows.

Wireless Mouse: A Mouse that does not require a cable connection to a computer, but which operates via infrared or radio signals.

Wizard: Software that guides the user step-by-step through a complex task, such as setting up software on a network or configuring a printer to output data in a special format, e.g. for printing labels from a database program.

WMA: Abbreviation for Windows Media Audio. Microsoft's audio encoding format which offers high-quality output with lower file sizes. See MP3, WAV, which are alternative audio file formats.

Word: A popular word-processing package, produced by Microsoft. See Word-processor.

Word snake: An exercise in which all the spaces in a sentence have been removed, the learner's task is to put the spaces back into the correct positions in the sentence.

Workstation: A term that is rather loosely used these days. Most people use it in the context of any computer that forms part of a Network. Formerly, this term was applied to a

particular type of powerful computer used for scientific and engineering calculations, e.g. the Sun Workstation.

WorldCALL: The worldwide umbrella association for CALL. <https://www.worldcall.org>, which has the aim of helping countries that are currently underserved in the applications of ICT. The First World Conference on CALL was held at the University of Melbourne, Australia, in 1998. The Second World Conference on CALL took place in Banff, Canada, in 2003. The 2008 WorldCALL conference will take place in Japan.

World Wide Web: Usually referred to simply as the Web. This is the most powerful and fastest-growing Internet service. The World Wide Web was the brainchild of Tim Berners-Lee, who in 1989 invented the HTML coding language that is the basis of the Web. The Web became a public service in 1993. It is a huge collection of resources of information, including learning materials, which is accessed by means of a computer program known as a Browser. The World Wide Web is only part of the Internet, but many people treat both terms as synonyms.

Worldwide Web Consortium (W3C): An international non-profit organisation which acts as a resource centre for the World Wide Web and is active in setting technical standards. The current Director of W3C is Tim Berners-Lee, the inventor of the Web.

Worm: A computer worm is a self-replicating hostile computer program, similar to a Computer Virus. A virus attaches itself to and becomes part of another program, but a worm is self-contained and does not need to be part of another program to propagate itself. Worms can cause considerable damage to computers.

WORM: Acronym for Write Once Read Many. Now a rather dated term, originally applied to a type of Optical Disc on which information could be written just once and could not be amended or erased.

Write Protect: To protect a Storage Device, File or Folder so that its contents cannot normally be altered or erased. This may be done physically, e.g. by moving a notch on a floppy disc's casing, or more commonly these days – through software that designates the device, file or folder as read-only.

WYSIWYG: Acronym for What You See Is What You Get, dating back to the pre-Windows and preMac period, when what you saw on the screen, e.g. in a Word document, was not necessarily what appeared on your Printer – something we now take for granted.

XML: Abbreviation for eXtensible Markup Language. XML is a specification emanating from the World Wide Web Consortium (W3C) that allows Web designers to create their own language for displaying documents on the Web. XML is an extension to the standard language for creating Web pages, HTML, and makes it possible to create websites containing more complex interactivity.

Yahoo: A popular Search Engine.

Y2K: Millennium Bug.

YouTube: A website to which you can upload your own video clips and view video clips uploaded by others

Zip Disc: A portable type of disc used to store around 100Mb of data. Zip discs have become obsolete since the arrival of smaller and more convenient storage devices with much greater storage capacity, e.g. the increasingly popular Flash Drive or Memory Stick.

Zip Drive: A type of disc drive that accepts portable zip discs. Zip drives themselves are also portable and can be connected to almost any computer.

Zip: Used as a verb to describe the process of compacting files or programs in order to cut down the amount of storage space they require by compressing them into one tightly-packed file and thus to make it easier for them to be transported on floppy discs or transmitted electronically to other locations, e.g. via the Internet. Proprietary programs, such as WinZip or WinRar, can be used to zip data and files.

General Abbreviations and Terminology in ICT

There is a number of abbreviations in the computer or ICT domain. Some useful and important abbreviations are the following:

Abbreviations Full-Form

IBM	International Business Machine
IDN	Integrated Digital Networks
IrDA	Infrared Data Association
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
JPEG	Joint Photographic Experts Group

JRE	Java Runtime Engine
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LSI	Large Scale Integration
MAN	Metropolitan Area Network
MAR	Memory Address Register
MBR	Memory Buffer Register
MIDI	Musical Instrument Digital Interface
MIPS	Millions of Instructions Per Second
MNP	Microcom Network Protocol
MPEG	Moving Pictures Experts Group
MS-DOS	MicroSoft Disk Operating System
MVT	Multiprogramming with Variable Tasks
NIC	Network Interface Card
NICNET	National Informatics Center NETwork
NOS	Network Operating System
OCR	Optical Character Recognition
OMR	Optical Mark Reader
OSI	Open System Interconnection
OSS	Open Source Software
PAN	Personal Area Network
PDF	Portable Document Format
PDL	Program Design Language
PDP	Program Data Processor
PIP	Peripheral Interchange Program
PROM	Programmable Read-Only Memory
RAM	Random Access Memory
SDLC	Software Development Life Cycle
SEQUEL	Structured English QUery Language
SGML	Syntax for Generalized Markup

	Language
SIMM	Single In-line Memory Module
SNA	Systems Network Architecture
SNOBOL	StriNg Oriented and symBolic Language
SQL	Structured Query Language
SSI	Small Scale Integration
TCP	Transport Control Protocol
TDM	Time Division Multiplexing
UDP	User Datagram Protocol
ULSI	Ultra Large Scale Integration
UPC	Universal Product Code
URL	Uniform Resource Locator
USB	Universal Serial Bus
UTF	Unicode Transformation Format
VAN	Value Added Network
VCR	Video Cassette Recorder
VDT	Video Display Terminal
VDU	Visual Display Unit
VGA	Video Graphics Array
VLE	Virtual Learning Environment
VoIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminal
WAP	Wireless Application Protocol
WiMAX	Worldwide Interoperability for Microwave Access
WLAN	Wireless Local Area Network
WLL	Wireless Local Loop
WORM	Write Once Read Many
XHTML	eXtensible HyperText Markup Language
XML	eXtensible Markup Language
X.400	Electronic Mail Protocol
X.500	Directory Server Protocol

The published abbreviations and terminology are all correct. If you find any human error, or wrong abbreviations and terminology, please inform us through comments.

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Internet, Intranet, email, Audio and Video Conferencing

Basics of Internet

The basics of internet, intranet, email or audio and video conferencing can be better understood if we understand first the computer network. A computer network is the backbone of the internet and related activities.

Networking

A network is simply an interconnection of one or more computers for the purpose of sharing information and resources (printers, storage devices, and application).

Computer Networks means an interconnected set of an autonomous system that permits distributed processing to information.

Five components of Networking:

1. **Sender Computer**
2. **Sender equipment (Modem)**
3. **Communication Channel (Telephone Cables or wireless device)**
4. **Receiver Equipment (Modem)**
5. **Receiver Computer**

Types of Network

Classification Based on Geographical Coverage:

Local Area Network (LAN): A local area network is a relatively smaller and privately-owned network with a maximum span of 10 km.

Metropolitan Area Network (MAN): MAN is defined for less than 50 Km and provides regional connectivity within a campus or small geographical area.

Wide Area Network (WAN): A wide Area Network (WAN) is a group Communication Technology provides **no limit** of distance.

Classification Based on Channel

1. Point to Point Network: When a packet is sent from one router to another intermediate router, the entire packet is stored at each intermediate router, stored there till the output line is free and then forwarded. A subnet using this principle is called point to point or packet-switched network.

Topologies for a point to point Subnet

- **Star:** Each device has a dedicated point to point link only to a central controller, usually called a
- **Tree:** A tree topology is a variation of a
- **Ring:** Each device has a dedicated point to point line configuration only with the two devices on either side of
- **Bus:** One long cable act as a backbone to link all the devices in the

2. Broadcast Networks: Broadcast networks have a single communication channel that is shared by all the machines on the network.

Intranet

An intranet can be an excellent method for sharing organizational information and creating internal communication channels. An intranet is an ideal way to communicate in a secure environment. An intranet provides a way to communicate with a common technology.

Intranets allow organizations to make effective use of their digital organizational information resources, offering interoperability, ease of use, security, and cost-

effectiveness.

Intranet is:

- A collection of resources to which only internal users have access.
- A private network inside an organization, similar to the Internet, but which is for internal use only, and is not accessible to the public.
- Users of an Intranet can exchange electronic mail (email), send files (FTP), browse web (WWW) pages, and connect to any other computer. Just like the normal internet, however, only people within an organization can use the intranet.
- Intranets are often separated from the Internet by using a firewall.
- Organizations use Intranets to manage projects, provide employee information, distribute data and information, internal communication

Advantages of Intranet:

- Data can be stored centrally
- Allows easier maintenance of data
- Web-based interface for access o common technology for communication
- Ability to access from anywhere in the world

Internet

The **Internet** is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to link several billion devices worldwide. It is also known as “**network of networks**” that consists of millions of private, public, academic, business, and government networks.

Various applications of internet:

- Exchange messages using e-mail (Electronic mail).
- Transfer files as well as software.
- Browse through information on any topic on the web.
- Communicate in real-time (chat) with others connected to the Internet.
- Search databases of government, individuals and organizations.
- Read news available from leading newsgroups.
- Send or receive animation and picture files from distant places.
- Set up a site with information about your company’s products and services.

The **World Wide Web** commonly known as the Web or “www” developed by **Tim Berners – Lee** in 1989, is a system of interlinked hypertext documents that are accessed via the Internet. These multimedia pages are ever-changing.

A **web browser** (commonly referred to as a browser) is a software application for retrieving, presenting and traversing information resources on the World Wide Web.

Ex. *WorldWideWeb (First Web Browser), Netscape, Internet Explorer, Opera, Mozilla Firefox, Safari (Apple), Google Chrome, UC Browser etc.*

Various Features of a Web Browser

A web browser has the following features:

Menu bar: The menu bar, located at the very top of the screen, can be accessed using the mouse. Actions that are in black can be performed, while actions that cannot be performed will be in grey or lightened.

Toolbar: The toolbar is located at the top of the browser; it contains navigational buttons for the Web. Basic functions of these buttons include:

Home	Opens or returns to starting page
Back	Takes you to the previous page
Forward	Takes you to the next page
Print	Prints current page
Stop	Stops loading a page
Reload	Refresh/redisplays the current page
Search	Accesses search engine

Location bar: The location bar, below the toolbar, is a box labelled “Location,” “GoTo,” or “Address.” You can type in a site’s address and press the Return or Enter key to open the site.

Status bar: The status bar is located at the very bottom of the browser window. You can watch the progress of a web page download to determine if the host computer has been

contacted and text and images are being downloaded.

Scroll bar: The scroll bar is the vertical bar located on the right of the browser window. You can scroll up and down a web page by placing the cursor on the slider control and holding down the mouse button.

A **website** is a set of related web pages served from a single web domain.

Uniform Resource Locator abbreviated as URL is the Address for web sites. Most of them begin with HTTP (HyperText Transfer Protocol), followed by a colon and two In most web browsers, the URL of a web page is displayed on top inside an address bar. An example of a typical URL would be "<https://www.scholarify.in>".

A **Hyperlink** is a reference to data that the reader can directly follow either by clicking or by hovering or that is followed automatically.

Downloading means to receive data to a local system from a remote system, or to initiate such a data

Uploading refers to the sending of data from a local system to a remote system such as a server or another client with the intent that the remote system should store a copy of the data being

ELECTRONIC MAIL (e-mail)

Electronic Mail (e-mail) was invented by "**John Von Neumann**". Electronic Mail transfers the data from one system to another system in the form of messages (text), pictures (images), multimedia messages.

An e-mail address normally consists of three parts.

1. Name of the User
2. "@" Sign
3. It comes after @ sign and it is the name of the DNS.

Example: scholarify @ gmail .com

Scholarify (user name)

Gmail.com (Domain name System)

In the e-mail window, you can find “folder Pane” at the left side of the window. It has a set of folders named as Composed mail, Inbox, Out Box, Sent Items, Drafts, Trash, Spam etc.,

- **Inbox:** used to store incoming
- **Sent Items:** used to store mail that has already been
- **Deleted Items (Trash):** used to store deleted mail up to 30
- **Draft folder:** use to store mail that is not yet
- **Spam:** used to store the unsolicited bulk e-mail up to 30
- **Compose Mail:** use to create a new

When you start to compose an e-mail, the following activities have to do:

- **To:** To type the e-mail address of the person to whom you want to send a mail-in this box.
- **Subject:** To type a few words about the subject of the letter you want to write.
- **CC (Carbon Copy):** To type the e-mail address of the other recipients in this box, each address is separated by a comma (,). When you complete the mail and click the “Send” button, then the mail will automatically be sent to all the recipients. Here, all the recipients will know who the other recipients are.
- **BCC (Band Carbon Copy) or (Blind Curtsey Copy):** If you don’t want them to know who else have received copies, you can type the addresses in the BCC text, In this case, only you (the sender) will know the identity of all the recipients of mail.
- **Reply:** You can send your reply using the same The subject box will have the same subject, but with the words “Re:” before it.
- **Forward:** You can send the forward message using the same The subject box will have the same subject, but with the words “Fwd:” before it.
- An **email attachment** is a computer file sent along with an email message. One or more files can be attached to any email message and be sent along with it. The first email was sent by **Ray Tomlinson** to himself in 1971.
- The **Drafts folder** retains copies of messages that you have started but is not yet ready to send.

Important points of e-mail

Hotmail, a free e-mail service provided by Microsoft which was established in 1995 was co-founded by an Indian American entrepreneur **Sabeer Bhatia** along with **Jack Smith** in **July of 1996**.

An **Internet Protocol address** (also known as an **IP address**) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network. It acts as an identifier for a computer. It is a unique address for every computer.

Top-level domain: Each part of a domain name contains certain information. The first field is the hostname, identifying a single computer or organization. The last field is the top-level domain, describing the type of organization and occasionally country of origin associated with the address.

For e.g. – .com – **Commercial**, .edu – **Educational**, .org – **organisation**, .net – **Network**, .in – **India etc.**

Protocols:

- Transmission Control Protocol (TCP)
- User Datagram Protocol (UDP)
- Internet Protocol (IP)
- Post Office Protocol (POP3)
- HyperText Transfer Protocol (HTTP)
- File Transfer Protocol (FTP)
- Internet Control Message Protocol (ICMP)
- Internet Message Access Protocol (IMAP)

Audio and Video Conferencing

Audio conferencing

Audio conferencing is where two or more people in different locations use technology like a conference bridge to hold an audio call. Audio conferencing is different from a traditional phone in that all participants dial into a central system that connects them instead of directly dialling each other. Audio conferencing aims at achieving communications and collaboration simultaneously. Many audio-conferencing products may also come with online collaboration elements standard or optional, like screen-sharing capabilities, to further enhance the value of audio meetings.

Video conferencing

Video conferencing is a technology-enabled type of meeting where two or more people, in different geographic locations, conduct live visual conferences through the internet for the purpose of communicating and collaborating. Video conferencing software (or hardware) enables transmission of high-quality audio, static images—sometimes full-motion video images—and text-based messages between multiple locations. As long as they have a webcam (an embedded camera), a desktop, laptop or mobile phone device can be used for video conferencing.

Web Conferencing (Internet Based)

Web Conferencing is an online service by which you can hold live meetings, conferencing, presentations and training via the internet (particularly on TCP/IP connections). Users can connect to the conference either by telephone or using the computer's speakers and microphone through a VoIP connection.

Web conferencing usually allows real-time point-to-point communication as well as multitask communications from one sender to many receivers in separate locations. Depending on the service, either an application (additional software) is downloaded and installed or a web-based application is launched in the attendee's browser.

Web conferencing software or website makes collaboration easier, with the following common features:

- **Whiteboard:** which allows you or your attendees to draw or annotate a shared screen.
- **Screen sharing**, so you can share with other conference attendees something on your local workstation.
- **Audio conferencing**, for times when an audio-only call is sufficient.
- **Webinars**, which allows you to present to a group while maintaining control over who can contribute (i.e., every attendee can hear you, but no one else can present during the session).
- **Online meetings**, which are basically scheduled conferences that include the ability for you to send out invitations and block off time on the requested attendees' calendars.
- **Mobile access or apps**, so that people can participate even when on the go.
- **Real-time chat**, which allows people to text type during the conference. This is useful for sharing links during discussions and making notes.

Most popular Audio and Video Conferencing Software or websites:

- [**Skype**](#)

- [Zoom](#)
- [GoToMeeting](#)
- [Workplace by Facebook](#)
- [CISCO WebEx](#)
- **Hangout Meets**
- [ZOH0](#)

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Digital Initiatives in Higher Education

Digital Initiatives in Higher Education

Digital Initiatives in Higher Education: Digital revolution is bringing in sweeping changes in the Higher Education landscape. Every institute is taking various initiatives in promoting digital education.

The technology of online education and all the digital initiatives have the possibility to revolutionize higher education scenario in the near future.

The use of technology through online education in higher education also becomes imperative due to the following factors:

- a) Affordable:** Online education is cheaper than formal education without compromising on quality, thanks to low infrastructure costs and large learner base.
- b) High Quality:** Online Education is directly delivered by the best teachers, assuring a high quality of instruction.
- c) Inclusive:** Online Education addresses the rural-urban divide which is manifested by the fact that at present India has 4.5% of graduates in rural areas as against 17% in urban areas. For females, the disparity is starker: 2.2% female graduates in rural areas, as against 13% female graduates in the urban areas.

d) Employability: By a flexible curriculum that is in line with the current market requirements, online education can enhance the employability quotient in the youth.

e) Uses internet: The penetration of IT infrastructure is expected to increase internet users from 40.9 Cr in 2016 to 73.5 Cr by 2021. This will enhance access to online courses to the youth.

f) Smart Phones: Increasing penetration of smartphones, which is expected to increase to more than 60 Cr (2021), would further facilitate the use of the online courses using the telecom spectrum.

g) Higher spend: The households spend on higher education is going to increase in future, affording an opportunity for the hitherto unreached population to the portals of higher education.

h) Retraining the workforce: The pressing need of the employment sector for re-training and career up-gradation as per the needs of the market is best served by online education leading to Life-long learning.

i) Skilling the unskilled: The Skill India Mission would certainly require online courses for reaching out to a large number of unskilled or semi-skilled population to help them to upgrade their skills.

The education through digital mission holds promise since it is accessible to everyone, it is affordable, it can overcome the shortage of quality faculty and it can enhance the enrollment in the higher education system. The digital learning platforms provide opportunities for lifelong learning.

These are the Digital Initiatives in Higher Education by MHRD, UGC etc.

SWAYAM:

The 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) is an integrated platform for offering online courses and covering school (9th to 12th) to Post Graduate Level.

Further reading: [Study Notes on Swayam](#)

SWAYAM Prabha:

SWAYAM Prabha is an initiative to provide 32 High-Quality Educational Channels through DTH (Direct to Home) across the length and breadth of the country on a 24X7 basis. It has curriculum-based course content covering diverse disciplines. This is primarily aimed at making quality learning resources accessible to remote areas where internet availability is still a challenge.

Further reading: [Study Notes on Swayam Prabha](#)

National Digital Library (NDL):

The National Digital Library of India (NDL) is a project to develop a framework of virtual repository of learning resources with a single-window search facility. There are more than 3 crore digital resources available through the NDL. The contents cover almost all major domains of education and all major levels of learners including life-long learners. More than 50 lakh students have registered themselves in the NDL, with about 20 lakh active users. The NDL is available through a mobile app too. It may be accessed on ndl.gov.in.

Spoken Tutorial:

They are 10-minute long, audio-video tutorial, on open source software, to improve employment potential of students. It is created for self-learning, audio dubbed into all 22 languages and with the availability of online version. The languages are C, C++, Java, PHP, Python, PERL, Scilab, OpenFOAM, OpenModelica, DWSIM, LibreO and many more. The Spoken Tutorial courses are effectively designed to train a novice user, without the support of a physical teacher.

Free and Open Source Software for Education (FOSSEE):

FOSSEE is a project promoting the use of open-source software in educational institutions (<https://fossee.in>). It does through instructional material, such as spoken tutorials, documentation, such as textbook companions, awareness programmes, such as conferences, training workshops, and Internships. Textbook Companion (TBC) is a collection of code for solved examples of standard textbooks. About 2,000 college students and teachers have participated in this activity & close to 1,000 TBCs have been created in Scilab and made them available for free download.

Virtual Lab:

The Virtual Labs Project is to develop a fully interactive simulation environment to perform experiments, collect data, and answer questions to assess the understanding of the knowledge acquired. In order to achieve the objectives of such an ambitious project, it is essential to develop virtual laboratories with state-of-the-art computer simulation technology to create real-world environments and problem handling capabilities. There are about 225 such labs operational, with more than 1800 experiments and benefitted more than 15 lakhs students.

E-Yantra:

E-Yantra is a project for enabling effective education across engineering colleges in India on embedded systems and Robotics. The training for teachers and students is imparted through workshops where participants are taught the basics of embedded systems and programming. More than 275 colleges across India have benefited from this initiative. All the projects and code are available on the e-Yantra website www.e-yantra.org as open-source content.

ShodhGanga:

Shodhganga” is the name coined to denote digital repository of Indian Electronic Theses and Dissertations set-up by the INFLIBNET Centre. The Shodhganga is set-up using an open-source digital repository software called DSpace developed by MIT (Massachusetts Institute of Technology) in partnership between Hewlett- Packard (HP). Shodhganga provides a platform for research scholars to deposit their PhD theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs (Electronic Theses and Dissertations) submitted by the researchers.

Shodhgangotri:

Under the initiative called “ShodhGangotri”, research scholars/research supervisors in universities are requested to deposit an electronic version of approved synopsis submitted by research scholars to the universities for registering themselves for the PhD programme. Now it is expanded to MRPs/PDFs/ Emeritus Fellowship etc. The repository on one hand, would reveal the trends and directions of research being conducted in Indian universities, on the other hand, it would avoid duplication of research.

e-Shodh Sindhu:

More than 15,000 international electronic journals and e-books are made available to all the higher educational institutions through e-ShodhSindhu initiative. This allows access to be the best educational resources in the world using digital mode. The INFLIBNET, Gandhinagar, Gujarat is implementing the Scheme.

e-Vidwan:

It is a database of experts and National Researcher's Network that is initiated by INFLIBNET.

The objectives of e-VIDWAN are to:

- collect academic and research profiles of scientists, faculty and research scientists working in leading academic and R&D organizations in India and abroad;
- quickly and conveniently provide information about experts to peers, prospective collaborators, funding agencies, policymakers and research scholars in the country;
- establish communication directly with the experts who possess the expertise needed by research scholars;
- identify peer reviewers for review of articles and research proposals; and
- create information exchanges and networking opportunities among scientist.

The database can be used for selection of panels of experts for various committees and task forces established by the Ministries / Govt. establishments for monitoring and evaluation purposes. Further, the availability of single point expert database will help the policymakers and funding agencies in decision-making and policy intervention.

Talk to a Teacher:

Talk to a Teacher developed by IIT Bombay, is an initiative of the National Mission on Education through ICT, funded by MHRD to provide free access to a few selected graduate and postgraduate courses, taught at IIT Bombay by distinguished faculty members and scholars at large. It uses the A-View collaboration tool developed by Amrita University for providing virtual classrooms to the faculty across the country.

Campus Connectivity:

Establishment of 1 GBPS Connectivity to universities and 20 512 Kbps broadband connectivity to colleges has been provisioned under NMEICT. A total of 600 Universities have been connected through 1 Gbps Optical Fibre; 22026 Colleges have so far been connected with 10 Mbps bandwidth. On the lines of 'Digital India' initiative of the PMO, the

MHRD has now decided that the campuses of Universities, (having 1 Gbps bandwidth) shall be made WiFi-enabled campus. Already all the IITs, IIMs, and NITs have established WiFi campuses. The process of laying the optical fibre and provision of the WiFi in Central Universities is currently underway.

National Academic Depository (NAD):

It is an initiative of the Ministry of Human Resources Development, Govt. of India (MHRD) to facilitate digital issuance, storage, access and verification of Academic Awards issued by Academic Institutions. NAD is a Unique, Innovative and Progressive initiative under “Digital India” theme towards achieving Digital enablement of the Education Records. NAD aspires to make the vision of Digital Academic Certificates for every Indian a reality. This touches the lives of Indian youth and empowers them with Digital, Online, Trusted, Verifiable Certificates which are accessible in a secure manner at all times. NAD promises to do away with difficulties/inefficiencies of collecting, maintaining and presenting physical paper certificates.

E-Kalpa:

It is another MHRD/ NMEICT initiative for creating Digital-Learning Environment for Design in India. It has successfully achieved the following project objectives, on completion of its phase I:

- Digital online content for learning Design with e-Learning programs on Design
- Digital Design Resource Database including the craft sector
- Social networking for Higher Learning with Collaborative Learning Space for Design
- Design inputs for products of National Mission in Education through ICT.

Digital Initiatives for School Education

e-Pathshala:

The digital India campaign has promoted extensive use of ICTs in the teaching-learning process. The e-Pathshala, a joint initiative of Ministry of Human Resource Development (MHRD), Govt. of India and National Council of Educational Research and Training (NCERT) has been developed for showcasing and disseminating all educational e-resources including textbooks, audio, video, periodicals, and a variety of other print and non-print materials for Students, Teachers, Parents, researchers and educators.

It provides access to digital textbooks for all classes, graded learning materials and enables participation in exhibitions, contests, festivals, workshops, etc.

e-Basta:

e-Basta is a framework to make schoolbooks accessible in digital form as e-books to be read and used on tablets and laptops. The main idea is to bring various publishers (free as well as commercial) and schools together on one platform.

Besides the portal, a back-end framework to facilitate the organization and easy management of such resources have also been made, along with the web-based applications that can be installed on tablets for navigating the framework.

Sugamya Pustakalaya:

Sugamya Pustakalaya is an online library that contains books accessible to the blind, people, with low vision or to persons with any other print disability.

The library houses publications across diverse subjects and languages and multiple accessible formats. It has been created by Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice and Empowerment in collaboration with member organizations of Daisy Forum of India (DFI) and powered by TCS Access.

Diksha:

National Teacher Platform (NTP) branded as “Diksha” is an initiative of the Ministry of Human Resource Development, Government of India. It is a state-of-the-art platform built to host Open Educational Resources (OER) and tools for Teachers in Schools, Teacher Educators in Teacher Education Institutes (TEIs) and Student Teachers in TEIs. It is built considering the whole teacher’s life cycle – from the time student teachers enrol in TEIs to after they retire as teachers.

Saransh:

Saransh is a tool for comprehensive self-review and analysis for CBSE affiliated schools and parents. It enables them to analyse students’ performance in order to take remedial measures. Saransh brings schools, teachers and parents closer, so that they can monitor

the progress of students and help them improve their performance. It is a Central Board of Secondary Education (CBSE) initiative.

The MHRD and other institutions are working for better higher education to all. The govt. is focused on ICT based teaching-learning experiences. We hope, there will be more digital initiatives in higher education in the near future.

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ICT and Governance (e-Governance)

ICT and Governance

ICT and Governance: According to the revised syllabus, ICT and Governance is a new topic of UGC NET Paper 1. Before the discussion of the topic, get familiar with the term “ICT” and “Governance”.

Information and Communication Technology (ICT)

According to **UNESCO**, *“ICT is a scientific, technological and engineering discipline and management techniques used in handling information and application and association with social, economical and cultural matters”*.

World Bank defined as *“ICT consists of hardware, software, networks, and media for collection, storage, processing, transmission, and presentation of information (voice, data, text, images).”*

American Library Association (1983) defined information and communication technology (ICT) as:

The application of computers and other technologies to the acquisition, organization, storage, retrieval, and dissemination of information.

The computers are used to process and store data, while telecommunication technology provides information communication tools, which make it possible for users to access databases and link them with other computer networks at different locations.

Governance:

According to **the United Nations Development Programme (UNDP)**, governance is the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences.

World Bank defined governance as ***the method through which power is exercised in the management of a country's political, economic and social resources for development.***

In brief,

Governance is the systems and processes that ensure the overall effectiveness of an entity whether a business, government or multilateral institution.

E-Governance

World Bank defined as "E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions."

According to the **United Nations**; ***"E-government is defined as utilizing the Internet and the world-wide-web for delivering government information and services to citizens."***

ICT + Governance = e-Governance

So, we can define,

E-government involves using information technology, and especially the Internet, to improve the delivery of government services to citizens, businesses, and other

government agencies. E-government enables citizens to interact and receive services from the federal, state or local governments twenty-four hours a day, seven days a week.

Objectives of e-Governance

The following are the objectives e-Governance:

To build an informed society: An informed society is an empowered society. Only informed people can make a responsible Government. Access to every piece of information of the Government and of public importance is one of the basic objectives of E-Governance.

To increase Government and Citizen Interaction: E-Governance aims at building a feedback framework, to get feedback from the people and to make the government aware of people's problems and to find solutions with their active involvement. To encourage citizen participation – E-governance aims to restore democracy to its true meaning by improving citizen participation in the Governing process, by improving the feedback, access to information and overall participation of the citizens in the decision making.

To bring transparency in the governing process: E-governance carries an objective to make the Governing process transparent by making all the Government data and information accessible to people. It is to make people know the decisions, and policies of the Government.

To make the Government accountable: Government is responsible and answerable for every decision taken by it. E-Governance aims to help the Government to be more accountable than now by bringing transparency and making the citizens more informed.

To reduce the cost of Governance: E-Governance also aims to reduce the cost of governance by cutting down expenditure on physical delivery of information and services particularly by cutting down on stationery, which amounts to most of the government expenditure.

To reduce the reaction time of the Government: Normally due to red-tapism and other reasons, the Government takes long to reply to people's queries and problems. E-Governance aims to reduce the reaction time of the Government to the people's queries and problems.

Advantages of e-Governance

Following are the important advantages of e-Governance:

Speed: Technology makes communication speedier. Internet, Phones and Cell Phones have reduced the time taken in normal communication.

Cost Reduction: Paper-based communication needs lots of stationary, printers, computers, etc. which calls for continuous heavy expenditure. Internet and Phones make communication cheaper saving valuable money for the Government.

Transparency: Use of ICT makes governing process transparent. This is possible when every piece of information of the Government is uploaded on the internet and is available for the public to peruse. The current governing process leaves many ways to conceal the information from the people. ICT helps the information available online, eliminating all possibilities of concealing information.

Accountability: Once the governing process is made transparent the Government is automatically made accountable. Accountability is the answerability of the Government to the people. It is the answerability for the deeds of the Government and accountability makes a responsible Government.

Scope of ICT and Governance (e-Governance)

Governance is all about the flow of information between the Government and Citizens, the Government and Businesses and the Government and Government. E-Governance covers all these relationships as follows:

- **Government to Citizen (G2C)**
- **Citizen to Government (C2G)**
- **Government to Government (G2G)**
- **Government to Business (G2B)**

Government to Citizen (G2C):

Government to Citizen relationship is the most basic aspect of E-Governance. The G2C relation includes the services provided by the Government to the Citizens. In modern times, Government deals with many aspects of the life of a citizen which include the public utility services i.e. Telecommunication, Transportation, Post, Medical facilities, Electricity, Education and some of the democratic services relating to the citizenship such as Certification, Registration, Licensing, Taxation, Passports, Aadhar Card, ID Cards etc. The

relation of a citizen with the Government starts with the birth and ends with the death of the citizen. Therefore E-Governance in G2C relationship will involve facilitation of the services flowing from Government towards Citizens with the use of Information and Communications Technology (ICT). Some of the emerging areas in G2C can be listed as follows:

E-Citizenship: E-Citizenship will include the implementation of ICT for the facilitation of Government Services relating to citizenship of an individual. It may involve online transactions relating to issue and renewal of documents like Ration Cards, Passports, Election Cards, Identity Cards, etc. It is required for the Government to create a virtual identity for every citizen so as to enable them to access the Government services online. For the same, the Government would need to create a Citizen Database which is a huge task.

E-Registration: E-Registration will cover the online registration of various contracts. Many of these contracts and transactions require registration for giving it legality and enforceability. Such registration may also be made ICT enabled. E-registration will help to reduce a significant amount of paperwork.

E-Transportation: E-Transportation includes ICT enabled services of Government, relating to Transport by Road, Rail, Water or Air. This may involve online:

- booking and cancellation of tickets,
- knowing the status of vehicles, railways, boats and flights,
- issue and renewal of driving licences,
- registration and renewal of vehicles,
- transfer of vehicles,
- payment of the fees of licences and-
- payment of fees and taxes for vehicle registration.

E-Health: E-Health services include ICT enabled health services of the Government. Under this, the interconnection of all hospitals may take place. Patient database and local pharmacy database may also be created.

E-Education: E-Education would cover the implementation of ICT in education. Distant as well as classroom education needs facilitation through the use of ICT. For instance, use of the internet reduces the communication time required in distance education. Internet may also help in conducting online classes.

E-Help: E-Help refers to the facilitation of disaster and crisis management using ICT. It includes the use of technologies like the internet and SMS for the purpose of reducing the response time of the Government agencies to the disasters. Online information relating to disasters, warnings and calls for help can assist the Government and the NGOs to coordinate their work and speed up the rescue work.

E-Taxation: E-Taxation will facilitate the taxing process by implementing ICT in the taxing process. Online tax due to alerts and online payment of taxes would help transact faster.

Citizen to Government (C2G):

Citizen to Government relationship will include the communication of citizens with the Government arising in the Democratic process like voting, campaigning, feedback, etc.

E-Democracy: The true concept of Democracy includes the participation of citizens in the democratic and governing process. Today due to the increased population the active participation of the citizens in the governing process is not possible. The ICT can help to enable the true democratic process including voting, public opinion, feedback and Government accountability.

E-Feedback: E-Feedback includes the use of ICT for the purpose of giving feedback to the Government. Lobbying is pursuing the Government to take a certain decision. Use of ICT can enable online feedback to the Government, online debates as to the Government services.

Government to Government (G2G):

G2G relationship includes the relationship between Central and State Government and also the relationship between two or more Government departments.

E-Administration: E-administration would include the implementation of ICT in the functioning of the Government, internally and externally. Implementation of ICT can reduce the communication time between the Government Departments and Governments. It can substantially reduce paperwork if properly used. E- the administration will also bring speed and transparency to the administration of Government Departments.

E-Police: The concept of E- Police is little different from Cyber-Police. Cyber Police require technology experts to curb electronic/cybercrimes. E-police refers to the use of ICT for the purpose of facilitating the work of the Police department in investigation and

administration. The concept of e-police includes databases of Police Officers, their performances, Criminal databases – wanted as well as in custody, the trends in crimes and much more. ICT can help reduce the response time of the Police department and also reduce cost by reducing paperwork.

E-Courts: The concept of E-Court includes the ICT enablement of the judicial process. Technology may help distant hearing, online summons and warrants and online publication of judgment and decrees.

Government to Business (G2B):

E-Taxation: Corporate sector pays different types of taxes, duties and dues to the Government. Payment of these taxes and duties will be made easier by E-Taxation. Online taxing and online payment of taxes can help reduce the cost and time required for the physical submission of taxes. ICT can also help cross-check the frauds and deficiencies in payment, further bringing accuracy and revenue to the Government.

E-Licensing: Companies have to acquire various licenses from the Government, similarly the companies have to acquire various registrations. ICT enablement of the licensing and registration can reduce time and cost.

E-Tendering: E-Tendering will include the facilities of online tendering and procurement. It alerts to new opportunities of business with the Government, and also online submission of tenders and online allotment of work. It will reduce the time and cost involved in the physical tendering system.

Emerging Areas for ICT and Governance in India

Agriculture Allied Services: To provide real-time information to the farmers on crop prices, the new technique, use of fertilizers, post-harvest processing, disbursement of cash and monitoring of agricultural credit. Farmers can use a network of telecentres to co-ordinate their planning.

Education: Literacy is the key challenge which affects major problems of society and only e-governance is one of the probable ways, which can solve the problem. As rural India suffers from inadequate education services, e-governance can play an important role in the delivery of education to rural areas. Using technology, students in these villages can be taught by teachers in urban areas. With this in mind, the Government of India has taken significant

effort by launching of 'EDUSAT' the first Indian satellite built exclusively for serving the educational sector.

Health and Sanitation: E-governance can be used as a tool for comprehensive management of hospitals and health centres in the villages to ensure the proper delivery of health-related services in rural India. ICT is being used in developing countries to facilitate remote consultation diagnosis and treatment. The immunization process can also be covered by e-governance so that the percentage of child vaccination can be improved to a great extent. An infant child can be registered, and as a result of that his/her vaccination detail can be uploaded to a centralized database of the portal. An SMS service can be implemented to remind the parents about the scheduled vaccination day for their child. It will also help not only in the process of immunization but also in monitoring the vaccination programmes in various states.

ICT in energy conservation: Information and Communication Technologies can play a crucial role in achieving an energy-efficient and low-carbon economy. The European Commission has put ICT at the forefront of an energy revolution. Using ICT in a smart way could help to reduce energy consumption in buildings by 17%, transport and logistics by 27%, and save 15% in total carbon emissions by 2020. ICT can improve energy efficiency in several ways.

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