TOPIC 3: HISTORY OF ICT

LEAD IN

I Computer is certainly one of the greatest inventions in human history. In what ways have computers changed human lives? Think about the following:

transportation	social life	leisure	business	education	health

II Why do you think the following concepts are important for the history of computers? Put them in order of appearance, starting from the oldest to the most recent inventions. Then skim the text to check your answers.

	programming languages
	digital computers
	quantum computers
	search engine
1	abacus
	keyboard
	punch cards
	computer program

The history of IT

By Rahul Awati

The history of information technology began long before the modern-day computer was ever invented, but the term *information technology* is a relatively recent development. The phrase first appeared in a 1958 *Harvard Business Review* article in the 1980s: "Over the last decade a new technology has begun to take hold in American business, one so new that its significance is still difficult to evaluate ... The new technology does not yet have a single established name. We shall call it *information technology*." Information technology has evolved and changed ever since. It is no longer just about installing hardware or software, solving computer issues, or controlling who can access a particular system. In fact, today's modern hyper-connected data economy would collapse without information technology.

The slow evolution of computers and computing technology

Before the modern-day computer ever existed, there were precursors that helped people achieve complex tasks. The earliest known calculating tool, in use since 2400 B.C, is the abacus. It consists of rows of movable beads on a rod that represent numbers. Another mechanical computing device, the Pascaline, invented by Blaise Pascal in 1645, used gears and cogs to calculate taxes.

But it wasn't until the 1800s that the idea of programming devices really came along. At this time Joseph Marie Jacquard developed a special type of weaving machine called the Jacquard loom which could produce fabrics with intricate patterns. This system used punched cards that were fed into the loom to control the weaving patterns. Computers well into the 20th century used the loom's system of automatically issuing machine instructions.

In the 1820s, English mechanical engineer Charles Babbage invented the Difference Engine to aid in navigational calculations. This was regarded as the birth of modern computing. Then in the 1830s, he released plans for his Analytical Engine. Babbage's pupil, Ada Lovelace, brought these plans beyond simple math calculations and designed a series of operational instructions for the machine, now known as a computer program. The Analytical Engine would have been the world's first general-purpose computer, but it was never completed, and the instructions were never executed. Many of the data processing and execution capabilities of modern IT, such as conditional branches (if statements) and loops, are derived from the early work of Jacquard, Babbage and Lovelace.

Herman Hollerith, an American inventor and statistician, also used punch cards to feed data to his census-tabulating machine in the 1890s. Hollerith's machine recorded statistics by automatically reading and sorting cards numerically encoded by perforation position. His Tabulating Machine Company, founded in 1911, was later renamed International Business Machines Corp. (IBM).

German engineer Konrad Zuse invented Z2, one of the world's earliest electromechanical relay computers, in 1940. It had very low operating speeds that would be unimaginable today. Later in the 1940s came Colossus computers, developed during World War II by British codebreakers. These computers intercepted and deciphered encrypted communications from German cipher machines.

Around the same time, British mathematician Alan Turing invented the Bombe, a machine that decrypted messages from the German Enigma machine. In his paper "On Computable Numbers" in 1936, Turing suggested that programmable instructions could be stored in a machine's memory to execute certain activities. This concept forms the very basis of modern computing technology.

By 1951, British electrical engineering company Ferranti Ltd. produced the Ferranti Mark 1, the world's first commercial general-purpose digital computer. MIT's Whirlwind, also released in 1951, became the first computer that enabled users to input commands with a keyboard.

The IT revolution picks up pace

As computers evolved, so did the field of IT. From the 1960's onward, the development of screens, text editors, hard drives, fiber optics, integrated circuits, programming languages, etc., set the stage for an IT revolution.

In the 1940s, '50s and '60s, governments, defense establishments and universities dominated the IT field. However, it also spilled over into the corporate world with the development of office applications such as spreadsheets and word processing software. This created a need for specialists who could design, create, adapt and maintain the hardware and software required to support business processes. Today's IT sector is no longer the exclusive domain of mathematicians. It employs professionals from a variety of backgrounds and skillsets, such as network engineers, programmers, business analysts, project managers and cybersecurity analysts.

The information revolution and the invention of the internet

Many IT technologies owe their existence to the internet and the World Wide Web.

The modern internet originated from ARPANET, a U.S. government-funded network that was conceptualized by MIT scientists in the 1960s. ARPANET grew into an interconnected network of networks from just four computers. It eventually led to the development of Transmission Control Protocol (TCP) and Internet Protocol (IP). This enabled distant computers to communicate with each other virtually.

Tim Berners-Lee introduced the World Wide Web, a web of information retrievable by anyone, in 1991. In 1996, the Nokia 9000 Communicator became the world's first internet-enabled mobile device. By this time, the world's first search engine, the first laptop computer and the first domain search engine were already available.

Since these inventions, the IT realm has quickly expanded. Today, IT encompasses tablets, smartphones, voice-activated technology, nanometer computer chips, quantum computers and much more.

READING COMPREHENSION

I Read the text again and complete the missing parts of the table below:

no.	Year	Inventor	Invention	Characteristics / Details
1		/	abacus	
2	1645			used punched cards to produce weaving patterns
3		Charles Babbage		
4			Analytical Engine	
5				processed data for the US census
6			Colossus	
7		Alan Turing		
8		MIT		
9			ARPANET	
10	1991			

II Find the words in the text that have the following meaning:

1. forerunner, predecessor (n.)
2. complex (adj.)
3. computation (n.)
4. ring, circle (n.)
5. to carry out, perform (v.)
6. to decode (*two options*, v.)
7. marketable, saleable (adj.)
8. remote (adj.)
9. not physically (adv.)
10. come from (v.)

III Choose the correct option.

1. Today's modern hyper-connected ***economy / economics*** would collapse without IT.
2. Weaving machines can make ***factories / fabrics*** with intricate patterns.
3. Konrad Zuse invented the world's earliest ***rely / relay*** computer.
4. ARPANET is a US government ***-founded / -funded*** network that was created by MIT scientists.
5. Many IT technologies ***own / owe*** their existence to the internet and the world wide web.

IV Make the correct word form.

1. The world wide web is a web of information _____(RETRIEVE) by anyone. (anyone can retrieve it).
2. Alan Turing wrote a paper " *On* _____(COMPUTE) *Numbers*" where he suggested that _____(PROGRAM) instructions could be stored in a machine's memory.
3. An abacus consists of rows of _____(MOVE) beads.
4. Today's IT sector is no longer the _____(EXCLUDE) domain of mathematicians.

FOCUS ON VOCABULARY

I Insert the words in the right place in the text:

magnetic	**predecessor**	**commercial**	**computers**	**detachable**	**speed**
continuously	**analog**	**demand**			

Ever since mankind invented computing devices, data storage capacities have always been a major concern. As 1) _____ got more advanced, data storage needs have increased, which created a continuous 2) _____for storage capacities.
The era of 3) _____ storage began in 1928, when Fritz Pfleumer, a German engineer, invented the audiotape, which can store 4) _____ signals. In 1951, magnetic tapes began to be used for computer data storage. In 1932, Gustav Tauschek from IBM invented the drum memory, which was considered the 5) _____ of hard disk drives.
In 1949, Dr. An Wang from the Harvard University Laboratory came up with magnetic core memory. In 1956, IBM's Reynold B. Johnson led the R&D team to invent the world's first hard drive, the IBM 305 RAMAC. Floppy disks were introduced by IBM and were widely used from the mid-1970s to the late 1990s. Floppy disks are slow in access 6) _____ and small in capacity, but they are 7) _____ and easy to carry.
In 1982, Sony and Philips released CDP-101, the world's first 8) _____ CD audio player, and CD became popular. The storage density of CD technology has been 9)

_____ improving over the years, and CD-ROM, DVD, D9, D18, and Blu-ray technology have appeared.

II Study the table below. Can you add some more suffixes to the list?

nouns		adjectives	verbs	adverbs
-tion distribution **-ment** arrangement **-ism** capitalism **-ship** mentorship **-al** refusal	**-er** marketer **-or** debtor **-ee** employee	**-ful** stressful **-able/ible** flexible **-ive** competitive **-ed** talented	**-ate** dominate **-ify** clarify **-ise/ize** customize **-en** strengthen	**-ly** permanently

III Fill in the table with the right form. Then chose a word from each column and make a sentence about the evolution of computers using these words.

Study tip: WORD FAMILIES

When learning new words, always try to group and remember words which are related to one another through meaning and form:
e.g. *to compute >> computer >> computational* etc.

NOUN	ADJECTIVE	VERB	ADVERB
		to invent	
evolution			
			automatically
	commercial	-	
retrieval			
	programmable		-
		to compute	
	varied		
		to execute	
difference			

IV What storage devices were mentioned in the text above? Do you know any other ways of storing your computer data? Which ones are most reliable in your opinion?