EMERGENCE OF THE INTERNET

Subject – E- Commerce

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- The Internet has revolutionized the computer and communications across the world.
- The Internet has a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers irrespective of geographical location.
- The Internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure.

Origin of the Internet

- The origins of the internet are rooted in 1950's United States of America.
- The Cold War was at its peak and huge tensions existed between America and the Soviet Union.
- Both superpowers were in possession of deadly nuclear weapons and people lived in fear of long-range surprise attacks.
- The climate of fear within the US was augmented by the launch of the satellite, 'Sputnik 1' in 1957 by Soviet Union.
- The Sputnik 1 satellite was the first man-made object to orbit the Earth and could circle the planet in just 96 minutes.
- The Soviet Union's demonstration of its scientific superiority led US to form the Advanced Research Projects Agency (ARPA) in 1958.

- ARPA brought together some of the best scientific talents in the country.
- Their aim was to help American military technology to get supremacy over its enemies and prevent them to introduce further scientific surprises.
- The cold war was instrumental in providing huge funds to surprising scientific research activities in different areas including nuclear power, weapons, space technology and computers.

WHO INVENTED THE INTERNET?

- Computers in the 1950's were big, expensive machines exclusively used for military purpose and scientists for research.
- The new machines were powerful but limited in numbers, and hence access to these machines was much restricted.
- At the same time as the formation of ARPA, **Paul Baran**, an engineer of the RAND Corporation was asked to research how the US Air Force could keep control of its fleet if a nuclear attack ever did occur.
- In 1964 Baran proposed a communication network with no central command point.
- If one point was destroyed, all surviving points would still be able to communicate with each other.
- He called this a distributed network.

- Paul Baran's idea for a new type of distributed net work appealed to **Lawrence Roberts**, the chief scientist at ARPA who was responsible for developing computer networks.
- Building on the conceptual work of fellow American scientists, **J.C.R. Licklider** and **Leonard Kleinrock**, **Roberts** made two separate computers in two different places talk to each other for the first time in 1965.

- Roberts' two-computer experimental link used a telephone line with an acoustically coupled modem and transferred digital data using 'packets'.
- A 'packet' is a small chunk of data that can vary in size but is typically around 1500 bytes.
- A large message is split into thousands of individual, equal-sized packets.
- The theory of packet-switching was thus developed.
- Packet switching is the technique of sending packets over a distributed network.
- Each packet is sent individually on different routes through the network and then reassembled in the right order when it arrives at its final destination.
- The packet switching method is very reliable and allows data to be sent securely.
- Another big advantage of packet switching is that it uses bandwidth very efficiently and doesn't need a single dedicated link, like a telephone call does.

- The Internet was conceived in 1969, when the Advanced Research Projects Agency (a Department of Defence organization) funded research of computer networking.
- The world's first packet-switching computer network was introduced in 1969.
- Computers at the University of California Los Angeles (UCLA), the Stanford Research Institute (SRI), the University of Utah and University of California Santa Barbara (UCSB) were connected using separate mini-computers known as 'Interface Message Processors' or 'IMPS'.
- The IMPS acted as gateways for the packets and have since evolved into 'routers'.

- Leonard Kleinrock at UCLA sent the first message across the network to the Stanford computer.
- Kleinrock tried to type 'login' but the system crashed after the letters 'L' and 'O' had appeared on the far-off monitor.
- A second attempt proved successful and more messages were exchanged between the two sites.
- That was the birth of ARPANET.
- More computers were quickly connected to the ARPANET and by 1973 thirty academic, military and research institutions had joined the network.
- As more networks of computers attempted tơjoin ARPANET, there felt a need for an agreed set of rules for handling the packets.

- Two American computer scientists, Bob Kahn and Vint Cerf proposed a new method to send the packets through a network in a digital envelope, or a 'datagram', in 1974.
- The address on the datagram can be read by any computer but only the final host machine can open the envelope and read the message inside.
- The method was called transmission- control protocol and became popularly known as TCP/IP.
- TCP/IP allowed computers to speak the same language and ARPANET quickly grew to become a global interconnected network of networks, or 'Internet'.

- Cheaper technology and the appearance of desktop computers in the early 1980's allowed the rapid development of local area networks (LANS) and as a result,
- the internet flourished An increase in the amount of computers on the network made it difficult to keep track of all the different IP addresses.
- This problem was solved by the introduction of the Domain Name System (DNS) in 1983.
- Invented by Paul Mockapetris and Jon Postel at the University of Southern California,
- the DNS is the phone book of the internet and converts IP addresses which was difficult to remember into simple names.

- IP stands for Internet Protocol and when combined with TCP, helps internet traffic find its destination.
- Every device connected to the internet is given a unique IP number known as an IP address and the number can be used to find the location of any internet connected device in the world.
- The invention of DNS, the common use of TCP/IP and the popularity of email caused an explosion of activity on the internet.
- The network suddenly increased from 2000 hosts in 1986 to 30,000 by the end of 1987.
- People could now send messages to each other, read online news and swap files over the network.
- An advanced knowledge of computing was still needed to dial-in to the system and use it effectively.