

## ASSIGNMENT 1

# Development of the Internet

*E-Commerce, BTEC National Diploma in Computing, year 1*

**To:** Adam Smith  
**From:** Marina Guseva  
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## History of the Internet

The global communications network has come a long way since 1969, when a few room-sized machines connected four universities in America, to today where the internet underpins corporate networking.

In 1957 The USSR launches Sputnik, the first artificial earth satellite. In response, the United States forms the Advanced Research Projects Agency (ARPA) within the Department of Defense (DoD) to establish US lead in science and technology applicable to the military. They were trying to figure out an important strategic problem: they needed a military network that could survive a nuclear strike, decentralized so that if any locations (cities) in the U.S. were attacked, the military could still have control.

Communicational network of the day was chained point-to-point which meant that each link was dependent on the link before it. This is when an idea of a complex network connection was conceived, the new structure would allow information to find its own way to the destination point even if some part of the network would be destroyed.

### 1961

In July Leonard Kleinrock publishes the first paper on packet switching theory, which forms the basis for the creation of the Internet.

### 1965

Ted Nelson invents the term Hypertext to describe links to other texts embedded in a text. 25 years later Tim Berners-Lee makes hypertext available to all network users with his World Wide Web project.

### 1969

In April, 1969, the first RFC (Request for Comments) document, which launches a series of technical publications about the Internet, is realised.

The installation of the first node of ARPANET was done on 2 September 1969. By the end of 1969 the network consisted of four Honeywell DDP-516 minicomputers each with 12K of memory, connected by 50Kbps leased lines.

The first message sent 2 October, 1969, laid the foundation for the internet, according to UCLA, which is behind the birthday event. The first message, an attempt to log in to a remote site, was only successful in sending two characters before the system crashed.

## 1971

The ARPANET grows to 23 hosts connecting universities and government research centers around the country.

## 1972

The first e-mail program was created by Ray Tomlinson.

ARPANET was currently using the Network Control Protocol or NCP to transfer data. This allowed communications between hosts running on the same network.

## 1973

Development began on the protocol later to be called TCP/IP; it was developed by a group headed by Vinton Cerf from Stanford and Bob Kahn from DARPA. This new protocol was to allow diverse computer networks to interconnect and communicate with each other. The ARPANET goes international with connections to University College in London, England and the Royal Radar Establishment in Norway.

## 1974

Telnet, the packet-switching network was set up by Bolt, Beranek & Newman.

## 1977

In November, 1977, the first three-network demonstration takes place.

## 1979

The first USENET newsgroup was established by Tom Truscott and Jim Ellis, two grad students at Duke University, and Steve Bellovin at the University of North Carolina. Users from all over the world join these discussion groups to talk about the net, politics, religion and thousands of other subjects.

## 1983

On January 1st, every machine connected to ARPANET had to use TCP/IP. TCP/IP became the core Internet protocol and replaced NCP entirely.

Domain Name System (DNS) was developed. This allowed packets to be directed to a domain name, which would be translated by the server database into the corresponding IP number. This made it much easier for people to access other servers, because they no longer had to remember numbers.

## 1987

The number of Internet hosts exceeds 10,000.

## 1990

Merit, IBM and MCI formed a not for profit corporation called ANS, Advanced Network & Services, which was to conduct research into high speed networking. It soon came up with the concept of the T3, a 45 Mbps line.

Tim Berners-Lee and CERN in Geneva implements a hypertext system to provide efficient information access to the members of the international high-energy physics community. The ability to combine words, pictures, and sounds on Web pages excites many computer programmers who see the potential for publishing information on the Internet in a way that can be as easy as using a word processor

## 1992

The first audio and video broadcasts take place over a portion of the Internet known as the "MBONE."

NSFNET (National Science Foundation Network) backbone upgraded to T3 (44.736Mbps)

## 1993

Mosaic, the first graphics-based Web browser, becomes available. Traffic on the Internet expands at a 341,634% annual growth rate.

## 1994

Pizza Hut offers pizza ordering on its Web page. First Virtual, the first cyberbank, opens.

## 1995

James Gosling and a team of programmers at Sun Microsystems release an Internet programming language called Java, which radically alters the way applications and information can be retrieved, displayed, and used over the Internet.

\$50 annual fee is imposed on domains, excluding .edu and .gov domains which are still funded by the National Science Foundation.

## 1996

1996 - Users in almost 150 countries around the world are now connected to the Internet. The number of computer hosts approaches 10 million.

## 2002

Currently the Internet Society, the group that controls the INTERNET, is trying to figure out new TCP/IP to be able to have billions of addresses, rather than the limited system of today( each IP consists of for of 32 bits – four octets of 8 bits each – therefore there are 2<sup>32</sup> or approximately 4.3 billion unique combinations, which form the IP addresses) The problem that has arisen is that it is not known how both the old and the new addressing systems will be able to work at the same time during a transition period.

## Business & the Internet

Internet has dramatically changed the way the business is being conducted. The Internet, initially used by scientists, has become vital for business. Many companies exist solely on-line and make their profits only by trading on the Internet.

Some of these companies have grown into some of the largest retailers. Other companies provide information and services to assist businesses and individuals with a variety of tasks. All have in common the use of the Internet to attract and interact with customers that they may have never had otherwise.

World Wide Web is a great help for companies to let the customers know that the business exists. It has enabled companies to operate globally without necessarily having any physical presence outside of one location, and operations can be integrated efficiently through the Internet medium.

The Web is arguably the most powerful advertising tool used in today's business world. Three years ago a web site was a bit of a novelty but today it's an essential marketing tool. People go to the web everyday to compare products and services before buying.

The growth of e-commerce has definitely changed the way many companies do business. Looking back a few years ago, companies were limited geographically but with the e-commerce these barriers are removed, which allows even small companies go internationally. This also allows customers to purchase your products from the comfort of their own home using their credit card.

Politicians see eCommerce as the way forward and essential in making the UK business community compete successfully around the world

## How a web site could improve the business and revenue models to improve profits?

An e-commerce web site is an Interactive channel for business and it allows to:

- Be open 24 hours a day, 7 days a week
- Be open to the whole of the world
- Avoid postal delays (a web site can get information to people immediately)
- Provide immediate and up to date information (updating a web site is relatively easy compared to updating printed brochures)
- Avoid huge costs for reprinting brochures
- Interact with customers (on-line forms requesting information can be filled in by customers and you receive the answers almost immediately via email)
- Promote your company
- Increase awareness of the company
- Increase awareness of the products and services
- Increase the customer base
- Use full colour and multimedia
- Immediate international sales presence
- Opportunity of making revenue from banner/ads placing
- Ability to build orders in several days

## How intermediaries have been affected due to e-commerce?

As e-commerce is rapidly developing and both companies and customers find on-line trading very convenient there seems to be no need in an intermediary any more. A web site is quite successfully replacing them.

By eliminating the middlemen, companies can sell their products directly to customers, cheaper and faster.

Amazon.com is a classic example. This is the world's largest bookstore and one of the most successful e-commerce companies. It was created as a new business solely for the web. It sells the products directly to the customers and this is where disintermediation happens. WWW incredibly helps Amazon to reduce on staff, distributors and many administrative costs. Therefore, a customer gets the products cheaper.

However on the other hand, Amazon.com doesn't really cut out the middleman: it is the middleman itself. It stands between the author and the reader, the musician and the listener.

The whole middleman thing is still in place. When you click to buy a book on Amazon.com, the book doesn't get mailed to you straightaway. Someone still has to do the job: Amazon doesn't publish the books itself and therefore it needs to contact the initial supplier, to do packing and only then deliver the book to you. The process of creating new intermediaries between customer and supplier is called reintermediation. E-commerce doesn't cut out the intermediaries completely.

## Why would a company implement an eProcurement system?

EProcurement refers to purchasing electronically, usually via an electronic procurement application.

Companies implement eProcurement systems to make easier and automate the process of purchasing raw materials from the product manufacturer, eliminate individual buying, reduce the cost of products, reduce the number of suppliers and reduce the cost per transaction. These savings improve the bottom line.

## Web site's evaluation

### eBay.com (C2C)

#### Business model

This is an example of consumer-to-consumer e-commerce, where the Internet is used as a platform for consumers to trade among themselves, with the website offering support and services.

#### Their system

EBay is a service provider – both the sellers and buyers are the customers. It helps buyers and sellers exchange goods using a dynamic auction system.

Auctions typically last 3-7 days from the time the seller places an ad. Bidders click on an item and input a bid, with the maximum they are willing to pay. EBay makes bids on the buyers' behalf in increments, and notifies the seller and winning bidder by e-mail at the end of the time period, who then contact each other to effect the transaction.

#### Effectiveness of their web site

California-based eBay Inc, eBay.com is the leader in this area, and also the longest running and the most innovative. Products on offer range from antique vases to computer screens, from Barbie dolls to chrome ratchet handles. EBay is an online auction site projected to exchange six billion dollars in 2001. You can buy even an airplane on eBay. The goods are listed in categories to create user-friendly environment. You can browse the categories, place a search enquiry, use the site map and create your own account on eBay.

#### How it makes the revenue

EBay acts as a listing agent, receiving a listing fee from the seller.

Well known companies such as IBM, VeriSign, Sun Microsystems and others have placed their ads on eBay web site, eBay, in turn, gets paid for providing the space.

#### Benefit from eProcurement

Ebay.com is a service provider. Other business companies would be benefited from eprocurement by getting listed on the eBay's web site.

#### Their needs

- Buyers, who are interested in purchasing the products
- Sellers, who are interested in selling the products
- The web site, which allows to make a bargain and all the transactions

## IBM.com (B2B)

#### Business model

This is an example of business-to-business e-commerce, based on Internet technology. IBM communicates and exchanges products with other corporations.

#### Their system

IBM – International Business Machines – is the global company and a leader in information technology. It is a reputable manufacturer, which provides high-quality business/military/medical equipment, computer hardware and software, mainly to large organizations.

Before making the equipment they need to buy the raw material. They place an on-line inquiry and then suppliers offer bids over the Internet and IBM chooses the most competitive bid.

There is an on-line catalogue on their web site where all the products and services IBM offers are listed.

IBM is also listed on on-line Stock Market and relays on shareholders. In 2001 it had 673,967 shareholders.

#### Effectiveness of their web site

The web site is a crucial part of IBM business. There is a choice of 68 different countries/languages where you can easily jump to and read about IBM's activity in there. It also has a built in search engine to help customers find needed information and make the navigation as easy as possible. A user can also view invoices on-line, set up their own account, home page preferences and many other features.

#### How it makes the revenue

IBM sells products and services to other business organizations. In 2001 their total revenue was \$85.9 billion and Net income made up \$7.7 billion

In addition they sell shares and raise money from general public.

#### Benefit from eProcurement

Eprocurement system plays an important role in IBM's business. The company is buying up the raw material and then builds up the electronic machines for the future sale.

#### Their needs

- Buyers (typically big manufacturers)
- Sellers (supplier of parts and raw-materials)
- The web site (to allow to make a bargain and all the transactions)

## PCWorld.com (B2C)

#### Business model

This is an example of business-to-customer e-commerce. PCWorld.com sells its products to consumers over the Internet for their own use.

#### Their system

PC World and PCWorld.com (www.pcworld.com) are published by PC World Communications, Inc., the world's leading IT media, research, and exposition company. Initially based at San Francisco, USA, now it is recognized in many countries including UK.

PCWorld.com specializes mainly in computer hardware but also in the software. It lets a customer shop online at their own pace, carefully choose the goods, compare

prices, read reviews, get full product specification and pay by credit card. Once the items are ordered and all the customer details are confirmed the PCWorld.com will do the delivery and send out an invoice.

They also give links to other related online web sites such as Microsoft.com, Dell.com, Compaq.com and etc. You can also subscribe for a PCWorld magazine and newsletters.

#### Effectiveness of their web site

PCWorld.com is the Web's trusted resource for users of computer products, reaching an average of 1.5 million visitors per month. The site offers quick access to authoritative reviews of computer products, the most current product pricing information, continuously updated news, an extensive library of carefully evaluated freeware and shareware, interactive tools, and free newsletters. PCWorld.com is the winner of three Maggie Awards for Best Online Publication.

#### How it makes the revenue

PC world.com sells products of many different computer manufactures, like an intermediary, and this is its main revenue.

They also offer other business companies to place ads on the PCWorld.com for some fee.

#### Benefit from eProcurement

EProcurement would let PCWorld.com lower the purchasing costs of computer equipment from the makers by 20%. It would work efficient, quickly and easily.

#### Their needs

- Customers, who wish to buy the products
- Suppliers, the manufacturers of computer equipment
- The web site, which allows to make a bargain and all the transactions



