Near East University

Faculty of Engineering

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Electronic Commerce using ASP And HTML

Graduation Project
Com-400

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ABSTRACT

Electronic commerce is a means of enabling and supporting such changes on a global scale. It enables companies to be more efficient and flexible in their internal operations, to work more closely with their suppliers, and to be more responsive to the needs and expectations of their customers. It allows companies to select the best suppliers regardless of their geographical location and to sell to a global market.

One special case of electronic commerce is electronic trading, in which a supplier provides goods or services to a customer in return for payment. A special case of electronic trading is electronic retailing, where the customer is an ordinary consumer rather than another company. However, while these special cases are of considerable economic importance, they are just particular examples of the more general case of any form of business operation or transaction conducted via electronic media. Other equally valid examples include internal transactions within a single company or provision of information to an external organisation without charge.

Simpuly we can say that the electronic commerce is modern way to make you shopping throug the internet.

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Introduction

This project provides a brief introduction to electronic commerce. It discusses the nature of electronic commerce, considers its scope and impact, and outlines several examples. It then identifies a number of open issues and the actors responsible for addressing those issues.

Also you will find a lot of information about the ASP (Active Server Page), which is related with the electronic commerce because when you decide to make an electronic commerce web page that's mean you will need to use the active server page, because you are going to deal with database. For example "Global Tradepoint Network" The Global Tradepoint Network is a huge network of business information, developed under the UN-supported Electronic Trade Efficiency Programme. By interfacing to established national databases, the network aims to supply key trading data for countries across the world. Such data might cover, for example, market information, transportation options and prices, insurance facilities, credit availability, customs requirements, and import/export regulations.

The objective of this project is to show you how the e-commerce works,you will get it through four chapters and conclusion .

Chapter one is talking about the internet in generaly .

Chaoter two talks about the HTML (Hypertext Markup Language), it is a langueg useing to creat a web page in the internet.

Chapter three talkes about how to creat an database using ASP,in ths chapter you will find some ASP's codes and some lessons to how to use the ASP.

Chapter four is talking about the electronic commerce , what is it , how does it workes and alot of information about the electronic commerce.

Finaly iam wishing that the project will get your satisfaction .

Chapter one

What is The Internet

1.1 What is the Internet?

The Internet is a network of networks, linking computers to computers sharing the TCP/IP protocols. Each runs software to provide or "serve" information and/or to access and view information. The Internet is the transport vehicle for the information stored in files or documents on another computer. It can be compared to an international communications utility servicing computers. It is sometimes compared to a giant international plumbing system. The Internet itself does not contain information. It is a slight misstatement to say a "document was found on the Internet." It would be more correct to say it was found through or using the Internet. What it was found in (or on) is one of the computers linked to the Internet.

Computers on the Internet may use one or all of the following Internet services:

- Electronic mail (e-mail). Permits you to send and receive mail. Provides access to discussion groups often called Listservs® after the software they operate under.
- Telnet or remote login. Permits your computer to log onto another computer and use it as if you were there.
- FTP or File Transfer Protocol. Allows your computer to rapidly retrieve complex files intact from a remote computer and view or save them on your computer.
- Gopher. An early, text-only method for accessing internet documents. Gopher has been almost entirely subsumed in the World Wide Web, but you may still find gopher documents linked to in web pages.
- The World Wide Web (WWW or "the Web"). The largest, fastest growing activity on the Internet.

A commonly asked question is "What is the Internet?" The reason such a question gets asked so often is because there's no agreed upon answer that neatly sums up the Internet. The Internet can be thought about in relation to its common protocols, as a physical collection routers and circuits, as a set of shared resources, or even as an attitude about interconnecting and intercommunication. Some common definitions given in the past include:

- a network of networks based on the TCP/IP protocols,
- a community of people who use and develop those networks,
- a collection of resources that can be reached from those networks.

Today's Internet is a global resource connecting millions of users that began as an experiment over 20 years ago by the U.S. Department of Defense. While the networks that make up the Internet are based on a standard set of protocols (a mutually agreed upon method of communication between parties), the Internet also has gateways to networks and services that are based on other protocols.

To help answer the question more completely, the rest of this paper contains an updated second chapter from "The Whole Internet User's Guide and Catalog" by Ed Krol (1992) that gives a more thorough explanation. (The excerpt is published through the gracious permission of the publisher, O'Reilly & Associates, Inc.)

1.2 What is a Browser?

A browser is a computer program that resides on your computer enabling you to use the computer to view WWW documents and access the Internet taking advantage of text formatting, hypertext links, images, sounds, motion, and other features. Netscape and Internet Explorer are currently the leading "graphical browsers" in the world (meaning they facilitate the viewing of graphics such as images and video and more). There are other browsers (e.g., Macweb, Opera). Most offer many of the same features and can be successfully used to retrieve documents and activate many kinds of programs.

Browsers all rely on "plug-ins" to handle the fancier files you find on the Web. Plug-ins are sub-programs stored within a browser or elsewhere in your computer especially to support special types of files you may click on. If you click on a link, and your computer does not currently have the plug-in needed for the file you clicked on, you are usually prompted with

an opportunity to get the plug-in. Most plug-ins are free, and easy and safe to install on your computer; follow the instructions you are given.

The main way in which browsers differ is in the convenience features they offer for navigating and managing the Web and all the URLs you may want to keep track of. Netscape and Internet Explorer both offer the ability to e-mail documents, download them to diskette, print them, and keep track of where you've been and sites you want to "bookmark

1.3 What is the World Wide Web and what makes it work?

The WWW incorporates all of the Internet services above and much more. You can retrieve documents, view images, animation, and video, listen to sound files, speak and hear voice, and view programs that run on practically any software in the world, providing your computer has the hardware and software to do these things.

When you log onto the Internet using Netscape or Microsoft's Internet Explorer or some other browser, you are viewing documents on the World Wide Web. The current foundation on which the WWW functions is the programming language called HTML. It is HTML and other programming imbedded within HTML that make possible Hypertext. Hypertext is the ability to have web pages containing links, which are areas in a page or buttons or graphics on which you can click your mouse button to retrieve another document into your computer. This "clickability" using Hypertext links is the feature which is unique and revolutionary about the Web.

How do hypertext links work? Every document or file or site or movie or soundfile or anything you find on the Web has a unique URL (uniform resource locator) that identifies what computer the thing is on, where it is within that computer, and its specific file name. (More explanation on the structure of URLs.) Every Hypertext link on every web page in the world contains one of the URLs. When you click on a link of any kind on a Web page, you send a request to retrieve the unique document on some computer in the world that is uniquely identified by that URL. URLs are like addresses of web pages. A whole cluster of internationally accepted standards (such as TCP/IP and HTML) make possible this global information retrieval phenomenon that transcends all political and language boundaries.

1.4 Getting Connected to the Internet

To access the Internet by computer, you need a computer, a modem or other telecommunications link, and software to connect to an Internet Service Provider (links to more about ISPs). If you are not affiliated with the University or wish a private ISP, here is a site where you can find ISPs of all kinds by area code or zip code. This type of technical information is beyond the scope of this tutorial and of the Teaching Library Workshops.

TV Set-Top Boxessuch as SONY's "Web-TV" are emerging as an alternative to PCs and MACs for viewing the Internet. You may wish to consult Yahoo's links, including opinions, on WebTV computer hardware technology.

Confused by all this jargon? See GLOSSARY of WWW and Netscape Jargon. Want help and instructions? The Teaching Library offers free drop-in classes on the Internet, WWW, Netscape, and finding information using the Internet. Click here for Schedule of Teaching Library Courses

1.4.1 The Internet (excerpt from "The Whole Internet User's Guide and Catalog")

The Internet was born about 20 years ago, trying to connect together a U.S. Defense Department network called the ARPAnet and various other radio and satellite networks. The ARPAnet was an experimental network designed to support military research--in particular, research about how to build networks that could withstand partial outages (like bomb attacks) and still function. (Think about this when I describe how the network works; it may give you some insight into the design of the Internet.) In the ARPAnet model, communication always occurs between a source and a destination computer. The network itself is assumed to be unreliable; any portion of the network could disappear at any moment (pick your favorite catastrophe--these days backhoes cutting cables are more of a threat than bombs). It was designed to require the minimum of information from the computer clients. To send a message on the network, a computer only had to put its data in an envelope, called an Internet Protocol (IP) packet, and "address" the packets correctly. The communicating computers--not the network itself--were also given the responsibility to ensure that the communication was accomplished. The philosophy was that every computer on the network could talk, as a peer, with any other computer.

These decisions may sound odd, like the assumption of an "unreliable" network, but history has proven that most of them were reasonably correct. Although the Organization for International Standardization (ISO) was spending years designing the ultimate standard for

computer networking, people could not wait. Internet developers in the US, UK and Scandinavia, responding to market pressures, began to put their IP software on every conceivable type of computer. It became the only practical method for computers from different manufacturers to communicate. This was attractive to the government and universities, which didn't have policies saying that all computers must be bought from the same vendor. Everyone bought whichever computer they liked, and expected the computers to work together over the network.

At about the same time as the Internet was coming into being, Ethernet local area networks ("LANs") were developed. This technology matured quietly, until desktop workstations became available around 1983. Most of these workstations came with Berkeley UNIX, which included IP networking software. This created a new demand: rather than connecting to a single large timesharing computer per site, organizations wanted to connect the ARPAnet to their entire local network. This would allow all the computers on that LAN to access ARPAnet facilities. About the same time, other organizations started building their own networks using the same communications protocols as the ARPAnet: namely, IP and its relatives. It became obvious that if these networks could talk together, users on one network could communicate with those on another; everyone would benefit.

One of the most important of these newer networks was the NSFNET, commissioned by the National Science Foundation (NSF), an agency of the U.S. government. In the late 80's the NSF created five supercomputer centers. Up to this point, the world's fastest computers had only been available to weapons developers and a few researchers from very large corporations. By creating supercomputer centers, the NSF was making these resources available for any scholarly research. Only five centers were created because they were so expensive--so they had to be shared. This created a communications problem: they needed a way to connect their centers together and to allow the clients of these centers to access them. At first, the NSF tried to use the ARPAnet for communications, but this strategy failed because of bureaucracy and staffing problems.

In response, NSF decided to build its own network, based on the ARPAnet's IP technology. It connected the centers with 56,000 bit per second (56k bps) telephone lines. (This is roughly the ability to transfer two full typewritten pages per second. That's slow by modern standards, but was reasonably fast in the mid 80's.) It was obvious, however, that if they tried to connect every university directly to a supercomputing center, they would go broke. You pay for these

telephone lines by the mile. One line per campus with a supercomputing center at the hub, like spokes on a bike wheel, adds up to lots of miles of phone lines. Therefore, they decided to create regional networks. In each area of the country, schools would be connected to their nearest neighbor. Each chain was connected to a supercomputer center at one point and the centers were connected together. With this configuration, any computer could eventually communicate with any other by forwarding the conversation through its neighbors.

This solution was successful--and, like any successful solution, a time came when it no longer worked. Sharing supercomputers also allowed the connected sites to share a lot of other things not related to the centers. Suddenly these schools had a world of data and collaborators at their fingertips. The network's traffic increased until, eventually, the computers controlling the network and the telephone lines connecting them were overloaded. In 1987, a contract to manage and upgrade the network was awarded to Merit Network Inc., which ran Michigan's educational network, in partnership with IBM and MCI. The old network was replaced with faster telephone lines (by a factor of 20), with faster computers to control it.

The process of running out of horsepower and getting bigger engines and better roads continues to this day. Unlike changes to the highway system, however, most of these changes aren't noticed by the people trying to use the Internet to do real work. You won't go to your office, log in to your computer, and find a message saying that the Internet will be inaccessible for the next six months because of improvements. Perhaps even more important: the process of running out of capacity and improving the network has created a technology that's extremely mature and practical. The ideas have been tested; problems have appeared, and problems have been solved.

For our purposes, the most important aspect of the NSF's networking effort is that it allowed everyone to access the network. Up to that point, Internet access had been available only to researchers in computer science, government employees, and government contractors. The NSF promoted universal educational access by funding campus connections only if the campus had a plan to spread the access around. So everyone attending a four year college could become an Internet user.

The demand keeps growing. Now that most four-year colleges are connected, people are trying to get secondary and primary schools connected. People who have graduated from college know what the Internet is good for, and talk their employers into connecting

corporations. All this activity points to continued growth, networking problems to solve, evolving technologies, and job security for networkers.

1.4.2 What Makes Up the Internet?

What comprises the Internet is a difficult question; the answer changes over time. Five years ago the answer would have been easy: "All the networks, using the IP protocol, which cooperate to form a seamless network for their collective users." This would include various federal networks, a set of regional networks, campus networks, and some foreign networks.

More recently, some non-IP-based networks saw that the Internet was good. They wanted to provide its services to their clientele. So they developed methods of connecting these "strange" networks (e.g., Bitnet, DECnets, etc.) to the Internet. At first these connections, called "gateways", merely served to transfer electronic mail between the two networks. Some, however, have grown to translate other services between the networks as well. Are they part of the Internet? Maybe yes and maybe no. It depends on whether, in their hearts, they want to be. If this sounds strange, read on--it gets stranger.

1.4.3 Who Governs the Internet?

In many ways the Internet is like a church: it has its council of elders, every member has an opinion about how things should work, and you can either take part or not. It's your choice. The Internet has no president, chief operating officer, or Pope. The constituent networks may have presidents and CEO's, but that's a different issue; there's no single authority figure for the Internet as a whole.

The ultimate authority for where the Internet is going rests with the Internet Society, or ISOC. ISOC is a voluntary membership organization whose purpose is to promote global information exchange through Internet technology. (If you'd like more information, or if you would like to join, contact information is provided in the "For More Information" section, near the end of this document.) It appoints a council of elders, which has responsibility for the technical management and direction of the Internet.

The council of elders is a group of invited volunteers called the Internet Architecture Board, or the IAB. The IAB meets regularly to "bless" standards and allocate resources, like addresses. The Internet works because there are standard ways for computers and software applications to talk to each other. This allows computers from different vendors to

communicate without problems. It's not an IBM-only or Sun-only or Macintosh-only network. The IAB is responsible for these standards; it decides when a standard is necessary, and what the standard should be. When a standard is required, it considers the problem, adopts a standard, and announces it via the network. (You were expecting stone tablets?) The IAB also keeps track of various numbers (and other things) that must remain unique. For example, each computer on the Internet has a unique 32- bit address; no other computer has the same address. How does this address get assigned? The IAB worries about these kinds of problems. It doesn't actually assign the addresses, but it makes the rules about how to assign addresses.

As in a church, everyone has opinions about how things ought to run. Internet users express their opinions through meetings of the Internet Engineering Task Force (IETF). The IETF is another volunteer organization; it meets regularly to discuss operational and near-term technical problems of the Internet. When it considers a problem important enough to merit concern, the IETF sets up a "working group" for further investigation. (In practice, "important enough" usually means that there are enough people to volunteer for the working group.) Anyone can attend IETF meetings and be on working groups; the important thing is that they work. Working groups have many different functions, ranging from producing documentation, to deciding how networks should cooperate when problems occur, to changing the meaning of the bits in some kind of packet. A working group usually produces a report. Depending on the kind of recommendation, it could just be documentation and made available to anyone wanting it, it could be accepted voluntarily as a good idea which people follow, or it could be sent to the IAB to be declared a standard.

If you go to a church and accept its teachings and philosophy, you are accepted by it, and receive the benefits. If you don't like it, you can leave. The church is still there, and you get none of the benefits. Such is the Internet. If a network accepts the teachings of the Internet, is connected to it, and considers itself part of it, then it is part of the Internet. It will find things it doesn't like and can address those concerns through the IETF. Some concerns may be considered valid and the Internet may change accordingly. Some of the changes may run counter to the religion, and be rejected. If the network does something that causes damage to the Internet, it could be excommunicated until it mends its evil ways. .

1.5 New Standard Protocols

When I was talking about how the Internet started, I mentioned the International Standards Organization (ISO) and their set of protocol standards. Well, they finally finished designing it. Now it is an international standard, typically referred to as the ISO/OSI (Open Systems Interconnect) protocol suite. Many of the Internet's component networks allow use of OSI today. There isn't much demand, yet. The U.S. government has taken a position that government computers should be able to speak these protocols. Many have the software, but few are using it now.

It's really unclear how much demand there will be for OSI, notwithstanding the government backing. Many people feel that the current approach isn't broke, so why fix it? They are just becoming comfortable with what they have, why should they have to learn a new set of commands and terminology just because it is the standard?

Currently there are no real advantages to moving to OSI. It is more complex and less mature than IP, and hence doesn't work as efficiently. OSI does offer hope of some additional features, but it also suffers from some of the same problems which will plague IP as the network gets much bigger and faster. It's clear that some sites will convert to the OSI protocols over the next few years. The question is: how many?

1.6 International Connections

The Internet has been an international network for a long time, but it only extended to the United States' allies and overseas military bases. Now, with the less paranoid world environment, the Internet is spreading everywhere. It's currently in over 50 countries, and the number is rapidly increasing. Eastern European countries longing for western scientific ties have wanted to participate for a long time, but were excluded by government regulation. This ban has been relaxed. Third world countries that formerly didn't have the means to participate now view the Internet as a way to raise their education and technology levels.

In Europe, the development of the Internet used to be hampered by national policies mandating OSI protocols, regarding IP as a cultural threat akin to EuroDisney. These policies prevented development of large scale Internet infrastructures except for the Scandinavian countries which embraced the Internet protocols long ago and are already well-connected. In 1989, RIPE (Reseaux IP Europeens) began coordinating the operation of the Internet in Europe and presently about 25% of all hosts connected to the Internet are located in Europe.

At present, the Internet's international expansion is hampered by the lack of a good supporting infrastructure, namely a decent telephone system. In both Eastern Europe and the third world, a state-of-the- art phone system is nonexistent. Even in major cities, connections are limited to the speeds available to the average home anywhere in the U.S., 9600 bits/second. Typically, even if one of these countries is "on the Internet," only a few sites are accessible. Usually, this is the major technical university for that country. However, as phone systems improve, you can expect this to change too; more and more, you'll see smaller sites (even individual home systems) connecting to the Internet.

1.7 Is IP Characteristic?

We further choose to define the Internet as being those networks that use IP to permit users to use both the communication services and at least TELNET and FTP among the interactive services we have listed. This requirement for IP has been questioned by some on the basis that there are now application gateways for other protocol suites such as Novell Netware that permit use of such services. This kind of application gateway is actually nothing new, and is not yet widespread. We choose to think of such networks, at least for the moment, as yet another layer of the onion, outside the core and consumer layers of the Internet.

Others have objected to the use of IP as a defining characteristic of the Internet because they think it's too technical. Actually, we find far fewer people confused about whether a software package or network supports IP than about whether it's part of the Internet or not.

Some people point out that services like WWW, Gopher, FTP, TELNET, etc. could easily be implemented on top of other protocol suites. This is true, and has been done. However, people seem to forget to ask why these services developed on top of IP in the first place. There seems to be something about IP and the Internet that is especially conducive to the development of new protocols. We make no apologies about naming IP, because we think it is important.

There is also the question of IP to where? If you have a UNIX shell login account on a computer run by an Internet access provider, and that system has IP access to the rest of the Internet, then you are an Internet user. However, you will not be able to use the full graphical capabilities of protocols such as WWW, because the provider's system cannot display on a bitmapped screen for you. For that, you need IP to your own computer with a bitmapped screen. These are two different degrees of Internet connectivity that are important to both end users and marketers. Some people refer to them as text-only interactive access and graphical

interactive access. Some people have gone so far as to say you have to have graphical capabilities to have a full service Internet connection. That may or may not be so, but in the interests of keeping the major categories to a minimum, we are simply going to note these degrees and say no more about them in this article. However, we agree that the distinction of graphical access is becoming more important with the spread of WWW and Mosaic.

1.8 Definitions

BACK / FORWARD

Buttons in most browsers' Tool Button Bar, upper left. BACK returns you to the document previously viewed. FORWARD goes to the next document, after you go BACK.

If it seems like the BACK button does not work, check if you are in a new Netscape window; some Web pages are programmed to open a new window when you click on some links. Each window has its own short-term search HISTORY. If this does not work, use GO to select the page you want (some Web pages are programmed to disable BACK).

BLOG or **WEB LOG**

A blog (short for "web log") is a type of web page that serves as a publicly accessible personal journal (or log) for an individual. Typically updated daily, blogs often reflect the personality of the author. Blog software usually has archives of old blogs, and is searchable. Frequently blogging software is used by web pages providing excellent information on many topics, although very frequently the content is personal and requires VERY careful evaluation.

BOOKMARK/FAVORITES

Way in Netscape to store in your computer direct links to sites you wish to return to. The equivalent in Internet Explorer (IE) is called a "Favorite." To create a bookmark in Netscape, click on BOOKMARKS, then ADD BOOKMARK. Or left-click on and drag the little bookmark icon (in Netscape 4.6 and higher, to the right of the word BOOKMARK) to the place you want a new bookmark filed. To visit a bookmarked site, click on BOOKMARKS and select the site from the list.

The equivalent in Internet Explorer to Netscape's Bookmarks is called "Favorites."

You can download a bookmark file to diskette and install it on another computer. To do this in Netscape, select BOOKMARKS, then EDIT BOOKMARKS, then, in the

FILE menu, select SAVE AS. To do this in IE, select from the main browser tool bar FILE, then Import and Export... and follow directions for exporting to a file. Import (part of the same IE program) allows you to bring a Netscape Bookmark file into IE as Favorites.

BROWSE

To follow links in a page, to shop around in a page, exploring what's there, a bit like window shopping. The opposite of browsing a page is **searching** it. When you search a page, you find a search box, enter terms, and find all occurrences of the terms throughout the site. When you browse, you have to guess which words on the page pertain to your interests. Searching is usually more efficient, but sometimes you find things by browsing that you might not find because you might not think of the "right" term to search by.

BROWSERS

Browsers are software programs that enable you to view WWW documents. They "translate" HTML-encoded files into the text, images, sounds, and other features you see. Microsoft Internet Explorer (called simply IE), Netscape, Mosaic, Macweb, and Netcruiser are examples of browsers that enable you to view text and images and many other WWW features. They are software that must be installed on your computer. For more information about browsers, consult the introductory pages of the Teaching Library tutorial. See also LYNX, a browser often used from slow modems because it does not display images, colors, or sound, but lets you perform most basic WWW functions and see the content.

CACHE

A cache temporarily stores web pages you have visited in your computer. A copy of documents you retrieve is stored in cache. When you use GO, BACK, or any other means to revisit a document, Netscape first check to see if it is in cache and will retrieve it from there because it is much faster than retrieving it from the server. If memory allocated to cache in your computer becomes full, Netscape discards older documents.

You can change the size of cache, although larger cache may affect other operations and is limited by the amount of memory on your computer. To change cache size, select Options, then Network Preferences, then Cache.

CASE SENSITIVE

Capital letters (upper case) retrieve only upper case. Most search tools are not case sensitive or only respond to initial capitals, as in proper names. It is always safe to key all lower case (no capitals), because lower case will always retrieve upper case. Which search engines have this?

CGI

"Common Gateway Interface," the most common way Web programs interact dynamically with users. Many search boxes and other applications that result in a page with content tailored to the user's search terms rely on CGI to process the data once it's submitted, to pass it to a background program in JAVA, JAVASCRIPT, or another programming language, and then to integrate the response into a display using HTML.

COOKIE

A message from a WEB SERVER computer, sent to and stored by your browser on your computer. When your computer consults the originating server computer, the cookie is sent back to the server, allowing it to respond to you according to the cookie's contents. The main use for cookies is to provide customized Web pages according to a profile of your interests. When you log onto a "customize" type of invitation on a Web page and fill in your name and other information, this may result in a cookie on your computer which that Web page will access to appear to "know" you and provide what you want. If you fill out these forms, you may also receive e-mail and other solicitation independent of cookies.

DOMAIN, TOP LEVEL DOMAIN (TLD)

Hierarchical scheme for indicating logical and sometimes geographical venue of a web-page from the network. In the US, common domains are .edu (education), .gov (government agency), .net (network related), .com (commercial), .org (nonprofit and research organizations). Outside the US, domains indicate country: ca (Canada), uk (United Kingdom), au (Australia), jp (Japan), fr (France), etc. Neither of these lists is exhaustive. See also DNS entry.

DOMAIN NAME, DOMAIN NAME SERVER (DNS)ENTRY

Any of these terms refers to the initial part of a URL, down to the first /, where the domain and name of the host or SERVER computer are listed (most often in reversed order, name first, then domain). The domain name gives you who "published" a page, made it public by putting it on the Web.

A domain name is translated in huge tables standardized across the Internet into a numeric IP address unique the host computer sought. These tables are maintained on

computers called "Domain Name Servers." Whenever you ask the browser to find a URL, the browser must consult the table on the domain name server that particular computer is networked to consult.

"Domain Name Server entry" frequently appears a browser error message when you try to enter a URL. If this lookup fails for any reason, the "lacks DNS entry" error occurs. The most common remedy is simply to try the URL again, when the domain name server is less busy, and it will find the entry (the corresponding numeric IP address). For more information, see "All About Domain Names."

DOWNLOAD

To copy something from a primary source to a more peripheral one, as in saving something found on the Web (currently located on its server) to diskette or to a file on your local hard drive. More information.

EXTENSION or FILE EXTENSION

In Windows, DOS and some other operating systems, one or several letters at the end of a filename. Filename extensions usually follow a period (dot) and indicate the type of file. For example, this.txt denotes a plain text file, that.htm or that.html denotes an HTML file. Some common image extensions are picture.jpg or picture.jpeg or picture.bmp or picture.gif

FAVORITES

In the Internet Explorer browser, a means to get back to a URL you like, similar to Netscape's Bookmarks.

FIELD SEARCHING

Ability to limit a search by requiring word or phrase to appear in a specific field of documents (e.g., title, url, link). See LIMITING TO FIELD.

FIND

Button in Netscape Tool Button Bar at top. Searches for word(s) keyed in document in screen only. Useful to locate a term in a long document. Can be invoked by the keyboard command, Ctrl+F.

FRESHNESS

How up-to-date a search engine database is, based primarily on how often its spiders recirculate around the Web and update their copies of the web pages they hold, and discover new ones. Also determined by how quickly they integrate new sites that web authors send to them. Two weeks is about as good as most search engines do, but some update certain selected web sites more frequently.

FRAMES

A format for web documents that divides the screen into segments, each with a scroll bar as if it were as "window" within the window. Usually, selecting a category of documents in one frame shows the contents of the category in another frame. To go BACK in a frame, position the cursor in the frame an press the right mouse button, and select "Back in frame" (or Forward).

You can adjust frame dimensions by positioning the cursor over the border between frames and dragging the border up/down or right/left holding the mouse button down over the border.

FTP

File Transfer Protocol. Ability to transfer rapidly entire files from one computer to another, intact for viewing or other purposes.

FUZZY AND

In ranking of results, documents with all terms (Boolean AND) are ranked first, followed by documents containing any terms (Boolean OR) are retrieved. The farther down, the fewer the terms, although at least one should always be present.

GO

Button in Netscape Menu Bar at top. Provides list of recent sites you visited, retained for the current session only. Click on any site in the list to return to the site. For a more permanent marker, make a BOOKMARK.

HEAD or HEADER (of HTML document)

The top portion of the HTML source code behind Web pages, beginning with <HEAD> and ending with </HEAD>. It contains the Title, Description, Keywords fields and others that web page authors may use to describe the page. The title appears in the title bar of most browsers, but the other fields cannot be seen as part of the body of the page. To view the <HEAD> portion of web pages in Netscape, click VIEW, Page Source. In Internet Explorer, click VIEW, Source. Some search engines will retrieve based on text in these fields.

HISTORY

Available by using the combined keystrokes CTRL + H, a more permanent record of sites you have visited/retrieved than GO. You can set how many days your Netscape retains history in Edit | Preferences, and in Internet Explorer in Tools | Internet Options ? General.

HOST

Computer that provides web-documents to clients or users. See also server.

HTML

Hypertext Markup Language. A standardized language of computer code, imbedded in "source" documents behind all Web documents, containing the textual content, images, links to other documents (and possibly other applications such as sound or motion), and formatting instructions for display on the screen. When you view a Web page, you are looking at the product of this code working behind the scenes in conjunction with your browser. Browsers are programmed to interpret HTML for display.

HTML often imbeds within it other programming languages and applications such as SGML, XML, Javascript, CGI-script and more. It is possible to deliver or access and execute virtually any program via the WWW.

You can see HTML in Netscape by selecting the View pop-down menu tab, then "Document Source." If you download a document as "Source," the file will contain HTML markup codes and can be viewed in Netscape and other browsers.

HYPERTEXT

On the World Wide Web, the feature, built into HTML, that allows a text area, image, or other object to become a "link" (as if in a chain) that retrieves another computer file (another Web page, image, sound file, or other document) on the Internet. The range of possibilities is limited by the ability of the computer retrieving the outside file to view, play, or otherwise open the incoming file. It needs to have software that can interact with the imported file. Many software capabilities of this type are built into browsers or can be added as "plug-ins."

INTERNET (Upper case I)

The vast collection of interconnected networks that all use the TCP/IP protocols and that evolved from the ARPANET of the late 60's and early 70's. An "internet" (lower case i) is any computers connected to each other (a network), and are not part of the Internet unless the use TCP/IP protocols. An "intranet" is a private network inside a company or organization that uses the same kinds of software that you would find on the public Internet, but that is only for internal use. An intranet may be on the Internet or may simply be a network.

IP Address or IP Number

(Internet Protocol number or address). A unique number consisting of 4 parts separated by dots, e.g. 165.113.245.2

Every machine that is on the Internet has a unique IP address. If a machine does not have an IP number, it is not really on the Internet. Most machines also have one or more Domain Names that are easier for people to remember.

ISP or Internet Service Provider

A company that sells Internet connections via modem (examples: aol, Mindspring - thousands of ISPs to choose from; not easy to evaluate). Faster, more expensive Internet connectivity is available via cable, DSL, ISDN, or web-TV. Often these companies also provide Web page hosting service (free or relatively inexpensive web pages -- the origin of many personal pages).

JAVA

A network-oriented programming language invented by Sun Microsystems that is specifically designed for writing programs that can be safely downloaded to your computer through the Internet and immediately run without fear of viruses or other harm to our computer or files. Using small Java programs (called "Applets"), Web pages can include functions such as animations, calculators, and other fancy tricks. We can expect to see a huge variety of features added to the Web using Java, since you can write a Java program to do almost anything a regular computer program can do, and then include that Java program in a Web page. For more information search any of these jargon terms in the PC Webopedia.

JAVASCRIPT

A simple programming language developed by Netscape to enable greater interactivity in Web pages. It shares some characteristics with JAVA but is independent. It interacts with HTML, enabling dynamic content and motion.

KEYWORD(S)

A word searched for in a search command. Keywords are searched in any order. Use spaces to separate keywords in simple keyword searching. To search keywords exactly as keyed (in the same order), see PHRASE.

LIMITING TO A FIELD

Requiring that a keyword or phrase appear in a specific field of documents retrieved. Most often used to limit to the "Title" field in order to find documents primarily about one or more keywords. (Can be used for other fields. See the table summarizing search tools features.)

LINK

The URL imbedded in another document, so that if you click on the highlighted text or button referring to the link, you retrieve the outside URL. If you search the field "link:", you retrieve on text in these imbedded URLs which you do not see in the documents.

LINK "ROT"

Term used to describe the frustrating and frequent problem caused by the constant changing in URLs. A Web page or search tool offers a link and when you click on it, you get an error message (e.g., "not available") or a page saying the site has moved to a new URL. Search engine spiders cannot keep up with the changes. URLs change frequently because the documents are moved to new computers, the file structure on the computer is reorganized, or sites are discontinued. If there is no referring link to the new URL, there is little you can do but try to search for the same or an equivalent site from scratch.

LISTSERVERS

A discussion group mechanism that permits you to subscribe and receive and participate in discussions via e-mail. For more information see the Beyond General Web Searching Listservers section or attend Part III of these Web courses.

LYNX browser

Lynx is a "browser" program like Netscape or Internet Explorer that can access information on World Wide Web, but without access to images, film, or sound. It is used often from slow modems to eliminate the need to wait to download images and other features. Lynx allows you to read the text of any WWW document, and to select hypertext links in these documents. You can use Lynx to go to any WWW document, to fill out forms available on WWW, to print and save files and perform many other tasks. For information on how to use Lynx, see Lynx Basics.

META-SEARCH ENGINE

Search engines that automatically submit your keyword search to several other search tools, and retrieve results from all their databases. Convenient time-savers for relatively simple keyword searches (one or two keywords or phrases in " "). See Meta-Search Engines page for complete descriptions and examples.

NESTING

A term used in Boolean searching to indicate the sequence in which operations are to be performed. Enclosing words in parentheses identifies a group or "nest." Groups can

be within other groups. The operations will be performed from the innermost nest to the outmost, and then from left to right.

NEWSGROUP

A discussion group operated through the Internet. Not to be confused with LISTSERVERS which operate through e-mail. For more information see the Beyond General Web Searching Usenet Newsgroups section.

PERSONAL PAGE

A web page created by an individual (as opposed to someone creating a page for an institution, business, organization, or other entity). Often personal pages contain valid and useful opinions, links to important resources, and significant facts. One of the greatest benefits of the Web is the freedom it as given almost anyone to put his or her ideas "out there." But frequently personal pages offer highly biased personal perspectives or ironical/satirical spoofs, which must be evaluated carefully. The presence in the page's URL of a personal name (such as "jbarker") and a ~ or % or the word "users" or "people" or "members" very frequently indicate a site offering personal pages.

PACKET, PACKET JAM

When you retrieve a document via the WWW, the document is sent in "packets" which fit in between other messages on the telecommunications lines, and then are reassembled when they arrive at your end. This occurs using TCP/IP protocol. The packets may be sent via different paths on the networks which carry the Internet. If any of these packets gets delayed, your document cannot be reassembled and displayed. This is called a "packet jam." You can often resolve packet jams by pressing STOP then RELOAD. RELOAD requests a fresh copy of the document, and it is likely to be sent without jamming.

PDF or .pdf or pdf file

Abbreviation for Portable Document Format, a file format developed by Adobe Systems, that is used to capture almost any kind of document with the formatting in the original. Viewing a PDF file requires Acrobat Reader, which is built into most browsers and can be downloaded free from Adobe.

PHRASE

More than one KEYWORD, searched exactly as keyed (all terms required to be in documents, in the order keyed). Enclosing keywords in quotations " " forms a phrase

in AltaVista, , and some other search tools. Some times a phrase is called a "character string."

PLUG-IN

An application built into a browser or added to a browser to enable it to interact with a special file type (such as a movie, sound file, Word document, etc.)

POPULARITY RANKING of search results

Some search engines rank the order in which search results appear primarily by how many other sites link to each page (a kind of popularity vote based on the assumption that other pages would create a link to the "best" pages). Google is the best example of this.

+REQUIRE or -REJECT A TERM OR PHRASE

Insert + immediately before a term (no space) to limit search to documents containing a term. Insert - immediately before a term (no space) to exclude documents containing a term. Can be used immediately (no space) before the " " delimiting a phrase.

Functions partially like basic BOOLEAN LOGIC. If + precedes more than one term, they are required as with Boolean AND. If - is used, terms are excluded as with Boolean AND NOT. If neither + no - is used, the default if Boolean OR. However, full Boolean logic allows parentheses to group and sequence logical operations, and +/- do not. Which search engines have this?

RANKING RESULTS

The order in which search results appear. Each search tool uses its own unique algorithm. Most use "fuzzy and" combined with factors such as how often your terms occur in documents, whether they occur together as a phrase, and whether they are in title or how near the top of the text. Popularity is another ranking system.

SCRIPT

A script is a type of programming language that can be used to fetch and display Web pages. There are may kinds and uses of scripts on the Web. They can be used to create all or part of a page, and communicate with searchable databases. Forms (boxes) and many interactive links, which respond differently depending on what you enter, all require some kind of script language. When you find a question marke (?) in the URL of a page, some kind of script command was used in generating and/or delivering that page. Most search engine spiders are instructed not to crawl pages from scripts, although it is usually technically possible for them to do so (see Invisible Web for more information).

SCROLL (DOWN, UP, LEFT, RIGHT)

Moving up or down within a document in your screen. Use scroll bar at right. Click on arrow down or arrow up. Drag the scroll button down or up. Or click on the page up or page down icons at the bottom of the bar. If you need to scroll left or right, use the scroll bar at the bottom.

SERVER, WEB SERVER

A computer running that software, assigned an IP address, and connected to the Internet so that it can provide documents via the World Wide Web. Also called HOST computer. Web servers are the closest equivalent to what in the print world is called the "publisher" of a print document. An important difference is that most print publishers carefully edit the content and quality of their publications in an effort to market them and future publications. This convention is not required in the Web world, where anyone can be a publisher; careful evaluation of Web pages is therefore mandatory. Also called a "Host."

SERVER-SIDE

Something that operates on the "server" computer (providing the Web page), as opposed to the "client" computer (which is you or someone else viewing the Web page). Usually it is a program or command or procedure or other application causes dynamic pages or animation or other interaction.

SHTML, usually seen as **.shtml**

An file name extension that identifies web pages containing SSI commands.

SITE or WEB-SITE

This term is often used to mean "web page," but there is supposed to be a difference. A web page is a single entity, one URL, one file that you might find on the Web. A "site," properly speaking, is an location or gathering or center for a bunch of related pages linked to from that site. For example, the site for the present tutorial is the top-level page "Internet Resources." All of the pages associated with it branch out from there -- the web searching tutorial and all its pages, and more. Together they make up a "site." When we estimate there are 5 billion web pages on the Web, we do not mean "sites." There would be far fewer sites.

SPIDERS

Computer robot programs, referred to sometimes as "crawlers" or "knowledge-bots" or "knowbots" that are used by search engines to roam the World Wide Web via the Internet, visit sites and databases, and keep the search engine database of web pages

up to date. They obtain new pages, update known pages, and delete obsolete ones. Their findings are then integrated into the "home" database.

Most large search engines operate several robots all the time. Even so, the Web is so enormous that it can take six months for spiders to cover it, resulting in a certain degree of "out-of-datedness" (link rot) in all the search engines. For more information, read about search engines.

SPONSOR (of a Web page or site)

Many Web pages have organizations, businesses, institutions like universities or nonprofit foundations, or other interests which "sponsor" the page. Frequently you can find a link titled "Sponsors" or an "About us" link explaining who or what (if anyone) is sponsoring the page. Sometimes the advertisers on the page (banner ads, links, buttons to sites that sell or promote something) are "sponsors." WHY is this important? Sponsors and the funding they provide may, or may not, influence what can be said on the page or site -- can bias what you find, by excluding some opposing viewpoint or causing some other imbalanced information. The site is not bad because of sponsors, but you they should alert you to the need to evaluate a page or site very carefully.

SSI commands

SSI stands for "server-side include," a type of HTML instruction telling a computer that serves Web pages to dynamically generate data, usually by inserting certain variable contents into a fixed template or boilerplate Web page. Used especially in database searches.

STEMMING

In keyword searching, word endings are automatically removed (lines becomes line); searches are performed on the stem + common endings (line or lines retrieves line, lines, line's, lines', lining, lined). Not very common as a practice, and not always disclosed. Can usually be avoided by placing a term in " ".

STOP

Button at end of Netscape's Tool Button Bar. Use to stop downloading of a document.

STOP WORDS

In database searching, "stop words" are small and frequently occurring words like and, or, in, of that are often ignored when keyed as search terms. Sometimes putting them in quotes " " will allow you to search them. Sometimes + immediately before them makes them searchable. See Table of Search Engine features.

SUBJECT DIRECTORY

An approach to Web documents by a lexicon of subject terms hierarchically grouped. May be browsed or searched by keywords. Subject directories are smaller than other searchable databases, because of the human involvement required to classify documents by subject.

SUB-SEARCHING

Ability to search only within the results of a previous search. Enables you to refine search results, in effect making the computer "read" the search results for you selecting documents with terms you sub-search on. Can function much like RESULTS RANKING. Which search engines have this?

TCP/IP

(Transmission Control Protocol/Internet Protocol) -- This is the suite of protocols that defines the Internet. Originally designed for the UNIX operating system, TCP/IP software is now available for every major kind of computer operating system. To be truly on the Internet, your computer must have TCP/IP software. See also IP Address.

TELNET

Internet service allowing one computer to log onto another, connecting as if not remote.

THESAURUS

In some search tools, the terms you choose to search on can lead you to other terms you may not have thought of. Different search tools have different ways of presenting this information, sometimes with suggested words you may choose among and sometimes automatically. The terms are based on the terms in the results of your search, not on some dictionary-like thesaurus.

TITLE (of a document)

The official title of a document from the "meta" field called title. The text of this meta title field may or may not also occur in the visible body of the document. It is what appears in the top bar of the window when you display the document and it is the title that appears in search engine results. The "meta" field called title is not mandatory in HTML coding. Sometimes you retrieve a document with "No Title" as its supposed title; this is caused when the meta-title field is left blank.

In Alta Vista and some other search tools, title: search also matches on the "meta" field, which contains document descriptors not displayed on the Web. See also LIMITING TO A FIELD.

TRUNCATION

In a search, the ability to enter the first part of a keyword, insert a symbol (usually *), and accept any variant spellings or word endings, from the occurrence of the symbol forward. (E.g., femini* retrieves feminine, feminism, feminism, etc.) Which search engines have this?

URL

Uniform Resource Locator. The unique address of any Web document. May be keyed in Netscape's OPEN or Netscape's LOCATION / GO TO box to retrieve a document. There is a logic the layout of a URL:

Anatomy of a URL:

USENET

Bulletinboard-like network featuring thousands of "newsgroups." For more information see the Beyond General Web Searching discussion group section.

WORD VARIANTS

Different word endings (such as -ing, -s, es, -ism, -ist,etc.) will be retrieved only if you allow for them in your search terms. One way to do this TRUNCATION, but few systems accept truncation. Another way is to enter the variants either separated by BOOLEAN OR (and grouped in parentheses). In +REQUIRE/-REJECT non-Boolean systems, enter the variant terms preceded with neither + nor -, because this will allow documents containing any of them to retrieved.

XHTML

A variant of HTML. Stands for Extensible Hypertext Markup Language is a hybrid between HTML and XML that is more universally acceptable in Web pages and search engines than XML.

XML

Extensible Markup Language, a dilution for Web page use of SGML (Standard General Markup Language), which is not readily viewable in ordinary browsers and is difficult to apply to Web pages. XML is very useful (among other things) for pages emerging from databases and other applications where parts of the page are standardized and must reappear many times. See XHTML.

Chapter Two

Hypertext Markup Language (HTML)

2.1 Introduction to HTML?

HTML, or HyperText Markup Language is designed to specify the logical organisation of a document, with important hypertext extensions. It is not designed to be the language of a WYSIWYG word processor such as Word or WordPerfect. This choice was made because the same HTML document may be viewed by many different "browsers", of very different abilities. Thus, for example, HTML allows you to mark selections of text as titles or paragraphs, and then leaves the interpretation of these marked elements up to the browser. For example one browser may indent the beginning of a paragraph, while another may only leave a blank line.

HTML instructions divide the text of a document into blocks called elements. These can be divided into two broad categories -- those that define how the BODY of the document is to be displayed by the browser, and those that define information `about' the document, such as the title or relationships to other documents. The vocabulary of these elements and a description of the overall design of HTML documents is given in the rest of Section 2. The Last part of the section also describes standard naming schemes for HTML documents and related files.

The detailed rules for HTML (the names of the tags/elements, how they can be used) are defined using another language known as the standard generalized markup language, or SGML. SGML is wickedly difficult, and was designed for massive document collections, such as repair manuals for F-16 fighters, or maintenance plans for nuclear submarines. Fortunately, HTML is much simpler!

However, SGML has useful features that HTML lacks. For this reason, markup language and software experts have developed a new language, called XML (the eXtensible markup language) which has most of the most useful features of HTML and SGML

HTML is the lingua franca for publishing hypertext on the World Wide Web. It is a non-proprietary format based upon SGML, and can be created and processed by a wide range of tools, from simple plain text editors - you type it in from scratch- to sophisticated WYSIWYG authoring tools. HTML uses tags such as <h1> and </h1> to structure text into headings, paragraphs, lists, hypertext links etc. Here is a 10-minute guide for newcomers to HTML. W3C's statement of direction for HTML is given on the HTML Activity Statement. See also the page on our work on the next generation of Web forms, and the section on Web history.

2.2 What HTML is today

The standards for HTML are currently being developed by a worldwide industry consortium known as the W3C. This work was carried out previously by the IETF. The W3C places several requirements on HTML:
"The document format should be, as far as practical, backwards compatible with existing HTML documents. It should support both paged and scrolling layout models...A simple, scaleable document format that can be used for information exchange on virtually any platform."

The W3C goes on to list the proposed range of these platforms, which include:

- Graphical User Interfaces, such as Windows, Macs and X11/Unix
- Text only systems, such as VT-100 terminals
- Text to Speech devices
- Rendering to Braille

2.3 Mission of the HTML Working Group

The mission of the HTML Working Group (members only) is to develop the next generation of HTML as a suite of XML tag sets with a clean migration path from HTML 4. Some of the expected benefits include: reduced authoring costs, an improved match to database & workflow applications, a modular solution to the increasingly disparate capabilities of browsers, and the ability to cleanly integrate HTML with other XML applications. For further information, see the Charter for the HTML Working Group.

Note. The HTML Working Group Charter has been renewed in August 2002.

2.4 The Development of HTML

Berners-Lee developed and defined the HTML language, which was created and defined using SGML, during the development cycle for the first Web browser/editor from October to December 1990. The first version of the browser initially ran only on the NeXT platform and was only processing text files, but it was a start. Berners-Lee later put the code and specifications for the project (including HTML) on the Internet in the summer of 1991. During the next few years the system introduced by Berners-Lee caught on in the Internet community - and the 'web' of documents available was steadily growing. A common library of code was available to programmers to easily create the needed capabilities to access web documents. Browsers quickly became available for a wide variety of platforms. As the number of implementations grew, the variety did also. The HTML language originally specified by Berners-Lee had developed and extended far beyond its initial form and no real standard had yet been developed. For a further discussion of how the first HTML standard finally developed, please see the HTML 2.0 history page.

2.5 The Success of HTML

In hindsight, the following quote by Berners-Lee from the original CERN proposal shows how far things have progressed in less than a decade:

"In 10 years, there may be many commercial solutions to the problems above, while today we need something to allow us to continue."

The WWW and HTML solutions that Berners-Lee created have evolved into that solution. HTML is now becoming the primary document format of choice not only on the Web, but also elsewhere in both personal and commercial uses. Despite its current limitations, HTML has become the most popular and widely used rich text format ever.

2.6 Elements in HTML Documents

The HTML instructions, along with the text to which the instructions apply, are called HTML elements. The HTML instructions are themselves called tags, and look like

<element_name> -- that is, they are simply the element name surrounded by left and right angle brackets.

Most elements mark blocks of the document for particular purpose or formatting: the above <element_name> tag marks the beginning of such as section. The end of this section is then marked by the ending tag </element_name> -- note the leading slash character "/" that appears in front of the element name in an end tag. End, or stop tags are always indicated by this leading slash character.

For example, the heading at the top of this page is an H2 element, (a level 2 heading) which is written as:

<H2> 2.1 Elements in HTML </H2>.

2.6.1 Empty Elements

Some elements are empty -- that is, they do not affect a block of the document in some way. These elements do not require an ending tag. An example is the <HR> element, which draws a horizontal line across the page. This element would simply be entered as

<HR>

2.6.2 Upper and Lower Case

Element names are case insensitive. Thus, the the horizontal rule element can be written as any of <hr>, <Hr> or <HR>.

2.6.3 Elements can have Attributes

Many elements can have arguments that pass parameters to the interpreter handling this element. These arguments are called attributes of the element. For example, consider the element A, which marks a region of text as the beginning (or end) of a hypertext link. This element can have several attributes. One of them, HREF, specifies the hypertext document to which the marked piece of text is linked. To specify this in the tag for A you write

2.7 HTML Document Structure

HTML documents are structured into two parts, the HEAD, and the BODY. Both of these are contained within the HTML element -- this element simply denotes this as an HTML document.

The head contains information about the document that is not generally displayed with the document, such as its TITLE. The BODY contains the body of the text, and is where you place the document material to be displayed. Elements allowed inside the HEAD, such as TITLE, are not allowed inside the BODY, and vice versa.

2.7.1 Example of Document Structure

```
<HTML>
 <HEAD>
  <TITLE> Environmental Change Project </TITLE>
 </HEAD>
 <BODY>
  <h1> Environmental Change Project </h1>

  Welcome to the home page of the Environmental Change Project.
  This project is different from other projects with similar
  names.  In our case we actually wish to change the
  climate.  For example, we would like hot beaches in Northern
  Quebec, and deserts near Chicago.

  <p>So how will we do this.  Well we do the following
  <ul>
  <li><A HREF="burn.html">Burn</A> more forests.
  <li>Destroy the
     <A HREF="http://who.zoo.do/ozone.html">Ozone</A> layer.
  <li>Birth more <A HREF="ftp:foo.do.do/cows.gif">cows</a>
  </ul>

 </BODY>
```

</HTML>

2.8 Naming Scheme for HTML Documents

When your HTML browser (Netscape Navigator, Internet Explorer, Opera, lynx etc.....) retrieves a file, it must know what type of data it has received in order to know what to do with it. Hypertext (that is, HTTP) servers explicitly tell the browser the type of the data being sent. In other cases, such as when the browser is using FTP to access a remote file, or when the browser is reading a file from your local disk (such as when you are editing pages prior to publishing them to a Web server), the browsers "guesses" the data type from the filename extension -- that is the part after the dot in the filename. For example, HTML files are identified by names such as name.html, where the .html extension indicates an HTML document.

Four letter extensions are common. This is not a problem with UNIX computers or Macintoshes, since these machines place no restriction on the filename. DOS and Windows 3.1 machines are unfortunately restricted to a three letter extension. Generally the extension is truncated to three letters (i.e. .html becomes .htm).

Here are some of the standard extensions, and their meanings:

.html (also .htm)
HTML document, containing text and HTML mark-up instructions.

.txt
A plain text file. The browser presents the file as a block of text and does not process it for mark-up instructions. Browsers generally treat unknown types of data as a text file.

.gif
A GIF format image file.

.xbm
An X-Bitmap (black&white) image file.

.xpm
An X-Pixmap (colour) image file.

.jpeg (also .jpg)
A jpeg-encoded image file.

.mpeg (also .mpg or .mpe)

An mpeg-encoded video file.

.qt

A (Macintosh) QuickTime-format video file

.avi

A (Microsoft) AVI-format video file

.au

An aiff-encoded audio (sound) file.

.Z

A compressed file - compressed using the adaptive Lempel-Ziv coding. This compression/decompression program are commonly found on UNIX computers.

.gz

A compressed file - compressed using the GNU gzip program. This program is common on UNIX computers and is available on PCs and Macintoshes.

2.8.1 MIME Types and File Data Formats

The World Wide Web actually uses MIME types (Multipurpose Internet Mail Extension) to define the type of a particular piece of information being sent from a Web server to a browser. A browser in turn determines, from the MIME type, how the data should be treated. Each browser has a configuration (menu or file) that maps the types of the data to particular functions. A browser can handle many types of data itself (e.g. HTML documents, GIF images) while other types are passed to auxiliary programs, such as image viewers, movie or sound players, plugins, and so on.

HTTP servers send MIME contents-types header messages ahead of every file they deliver to a browser. This header explicitly tells the browser what type of data is being sent. Thus a server must have a way of telling the type of data it is sending. Usually the server has a configuration file that relates filename extensions to the appropriate MIME type. For example, the MIME type for HTML documents is text/html. Thus, if a browser reqests that a server send the file blobs.html, the server first looks up the MIME type corresponding to the .html extension. The server then sends a message to the browser saying that data of content-type text/html is being sent, after which the server sends the actual data.

Other servers, such as FTP servers, do not send this MIME type information. In this case, the browser "guesses" the MIME type, based on the filename extension. Thus each browser must be configured with a list that relates typical extensions to the "most likely" type of data. This is also how a browser determines the type of files accessed locally of the computer.

2.9 What is XHTML?

The evolution of HTML has essentially stopped. Instead, HTML is being replaced by a new language, called XHTML. XHTML is in many ways similar to HTML, but is designed to work with the new eXtensible Markup Language, or XML, that will soon serve as the core language for designing all sorts of new Web applications, in which XHTML will be only one of many "languages." But, XHTML is designed to work with these other language, so that different documents, in different languages, can be easily mixed together.

For this to work, the rules for writing HTML documents had to change. These rules are simple, and are as follows:

1. **All tag and attribute names must be in lowercase.** Thus, you can't write
   <A HREF="foo.html">...</A>
   but must instead write this in lowercase, as :
   ...

2. **"Empty" tags must be written with an extra slash at the end.** An empty tag is one like <br> or <img src="foo.html"> that doesn't have a </br> or <img> to end it. In XHTML, such tags must be written as: <br />, and .

3. **You can never omit an end tag.** With HTML, you could sometimes leave off an end tag, as in
   <p> ..... paragraph text
   <p> ..... more paragraph text
   With XHTML, you must always put in the end tag, so that the preceding must be written as:

 ..... paragraph text

 ..... more paragraph text

4. **Attributes must always have a value.** In HTML you can sometimes omit atttibute values, as in

   <hr size="2" noshade>

   in XHTML, this would need to be written as:

   <hr size="2" noshade="noshade" />

5. **Attributes values must always be quoted..** In HTML you can sometimes omit the quotes,as in

   <hr size=2>

   in XHTML, this would need to be written as:

   <hr size="2" />

That's about it -- there are a few more subtle details, but essentially if you follow the above rules, then the documents you write are acceptable as XHTML. Thus it's easy to write up Web pages using the XHTML format -- they will work with today's HTML browsers, and are easily upward-compatible for the next-generation of Web browsers.

2.10 What is CSS?

HTML or XHTML only divide a document up into paragraphs, lists, headings and so on, but does not really say how these things should look. Rather, a browser generally makes some assumptions about how things should look -- and we're then stuck with those choices.

This could be changed given a way of controlling how different markup elements (like headings, paragraphs, etc) look. This is the role of CSS. Cascading Style Sheets, or CSS, is a language, separate from HTML or XHTML, designed for specifying the layout or formatting properties of the various HTML elements in a document. For

example, a CSS statment like the following

```
body { font-family:     Arial,helvetica,sans-serif;
    color:          black;
    background-color: white;
   }
```

means that, inside the **BODY** of a document, the desired font is Arial, the desired text color is black, and the desired background color for the page is white. More complicated rules let you control underlining of links, the placement of background images, the widths of margins, the colors of borders around paragraphs or headings, etc. as an example, the page you are viewing has an "attached" style sheet to control how it looks. THis stylesheet is includded into this document using a special link element of the form:

2.11 HTML language (codes)

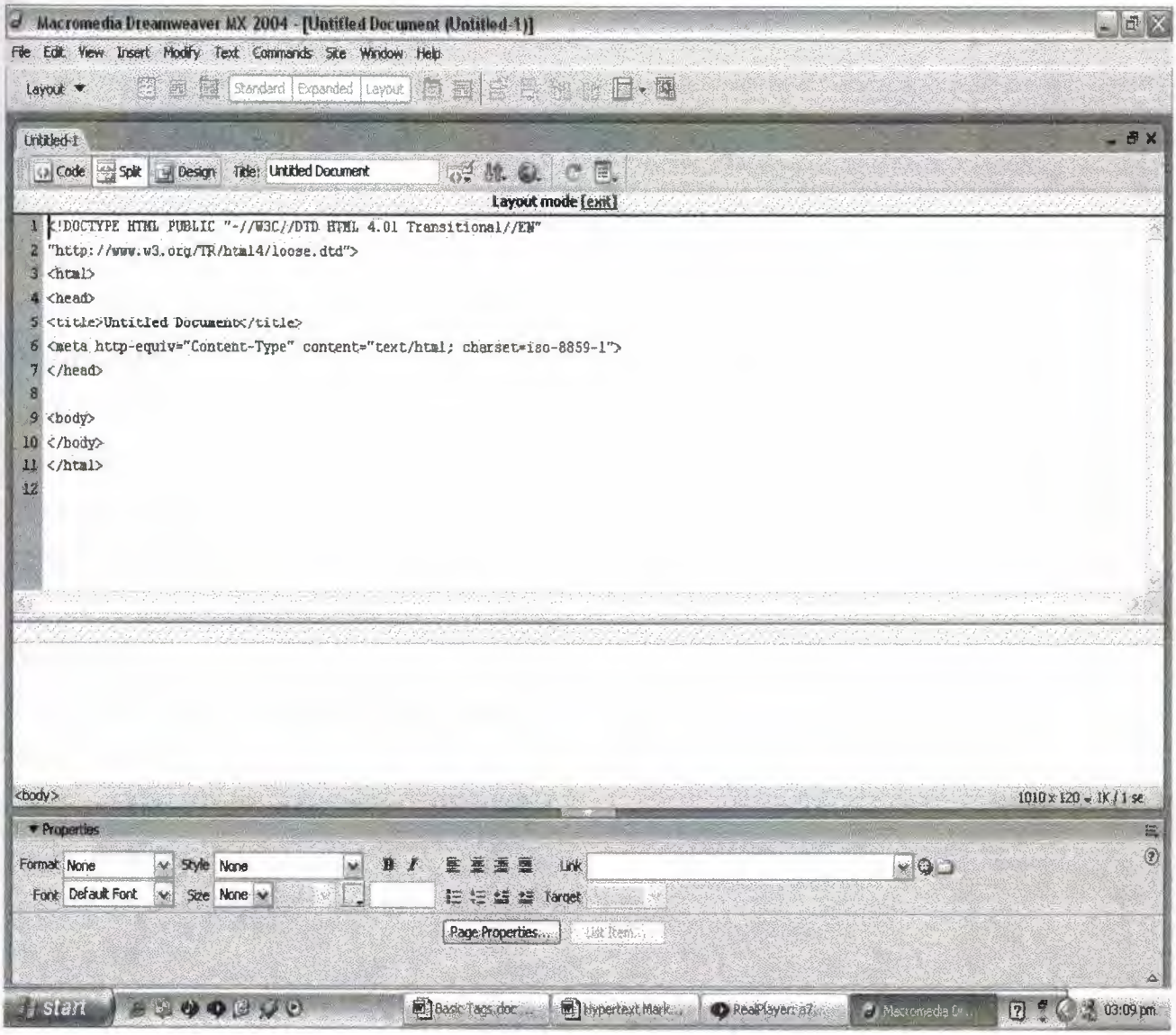

fig.2.1 HTML using
Macromedia Dreamweaver MX 2004

In fig 1 it shows that how and where the HTML user going to write the codes using macromedia dream waver mx 2004 (MDW),it is one of the best programes in the internet programing.

And now the to show some of HTML's codes and what does it means.

Basic Tags

<html></html>

Creates an HTML document

<head></head>

Sets off the title and other information that isn't displayed on the Web page itself

<body></body>

Sets off the visible portion of the document

Header Tags

<title></title>

Puts the name of the document in the title bar

Body Attributes

<body bgcolor=?>

Sets the background color, using name or hex value

<body text=?>

Sets the text color, using name or hex value

<body link=?>

Sets the color of links, using name or hex value

<body vlink=?>

Sets the color of followed links, using name or hex value

<body alink=?>

Sets the color of links on click

Text Tags

<pre></pre>

Creates preformatted text

<hl></hl>

Creates the largest headline

<h6></h6>

Creates the smallest headline

Creates bold text

<i

></i>

Creates italic text

<tt></tt>

Creates teletype, or typewriter-style text

<cite></cite>

Creates a citation, usually italic

Emphasizes a word (with italic or bold)

Emphasizes a word (with italic or bold)

Sets size of font, from 1 to 7)

Sets font color, using name or hex value

Links

Creates a hyperlink

Creates a mailto link

Creates a target location within a document

Links to that target location from elsewhere in the document

Formatting

Creates a new paragraph

Aligns a paragraph to the left, right, or center

Inserts a line break

<blockquote>

</blockquote>

Indents text from both sides

<dl></dl>

Creates a definition list

<dt>

Precedes each definition term

<dd>

Precedes each definition

Creates a numbered list

Precedes each list item, and adds a number

Creates a bulleted list

A generic tag used to format large blocks of HTML, also used for stylesheets

Graphical Elements

<img src="name">

Adds an image

<img src="name" align=?>

Aligns an image: left, right, center; bottom, top, middle

<img src="name" border=?>

Sets size of border around an image

<hr>

Inserts a horizontal rule

<hr size=?>

Sets size (height) of rule

<hr width=?>

Sets width of rule, in percentage or absolute value

<hr noshade>

Creates a rule without a shadow

</TD< tr>

Tables

<table></table>

Creates a table

<tr></tr>

Sets off each row in a table

<td></td>

Sets off each cell in a row

<th></th>

Sets off the table header (a normal cell with bold, centered text)

Table Attributes

<table border=#>

Sets width of border around table cells

<table cellspacing=#>

Sets amount of space between table cells

<table cellpadding=#>

Sets amount of space between a cell's border and its contents

<table width=# or %>

Sets width of table — in pixels or

percentage of document

width

as a

<tr align=?> or <td align=?>

Sets alignment for cell(s) (left, center, or right)

<tr valign=?> or <td valign=?>

Sets vertical alignment for cell(s) (top, middle, or bottom)

<td colspan=#>

Sets number of columns a cell should span

<td rowspan=#>

Sets number of rows a cell should span (default=1)

<td nowrap>

Prevents the lines within a cell from being broken to fit

Frames

<frameset></frameset>

Replaces the <body> tag in a frames document; can also be nested in other framesets

<frameset rows="value,value">

Defines the rows within a frameset, using number in pixels, or percentage of w idth

<frameset cols="value,value">

Defines the columns within a frameset, using number in pixels, or percentage of width

<frame>

Defines a single frame — or region — within a frameset

<noframes></noframes>

Defines what will appear on browsers that don't support frames

Frames Attributes

<frame src="URL">

Specifies which HTML document should be displayed

<frame name="name">

Names the frame, or region, so it may be targeted by other frames

<frame marginwidth=#>

Defines the left and right margins for the frame; must be equal to or greater than 1

<frame marginheight=#>

Defines the top and bottom margins for the frame; must be equal to or greater than 1

<frame scrolling=VALUE>

Sets whether the frame has a scrollbar; value may equal "yes," "no," or "auto." The default, as in ordinary documents, is auto.

<frame noresize>

Prevents the user from resizing a frame

For functional forms, you'll have to run a CGI script. The HTML just creates the appearance of a form.

Forms

<form></form>

Creates all forms

<select multiple name="NAME" size=?></select>

Creates a scrolling menu. Size sets the number of menu items visible before you need to scroll.

<option>

Sets off each menu item

<select name="NAME"></select>

Creates a pulldown menu

<option>

Sets off each menu item

2.12 Frequently Asked Questions (FAQ)

So you have reached a stumbling block in the tutorial? Do not worry! It happens often!

Perhaps yours is a question that has come up before. You may also want to review the introductory comments about the tutorial, the tag summary, or the reference list.

Where is the download archive?

In January 1998, we changed the download format for the Windows versions of the tutorial from .ZIP files (which many people were unable to properly decompress) to an executable (.EXE) file. See the most current links for downloads from our page at:

http://www.mcli.dist.maricopa.edu/tut/download.html

"I thought I should be doing the tutorial off line, but then can't access my pages because my web browser keeps trying to dial up my PPP. How do you run it off line for Web page design?"

Most web browsers have a Preferences or Options menu where you put the address of your favorite "home" page--that is, every time you launch the browser, it attempts to connect to this site. Some browsers have an option where you can specify it to start with a blank or empty page. Another approach is to cancel the connection when your modem tries to dial. Another idea (which you can do easily when you finish our tutorial) is to create your very own Home Page that sits on the hard drive. Use your web browser to Open... or Open Local... and find the page. Use your mouse to copy the address or file path indicated in the URL field (usually near the top of a browser window) and then paste it into the area of your Preferences/Options that says "Home Page". This way, when ever the web browser starts, you see your custom page with all the links you like, and you do not have to wait or even connect to an Internet server.

I've created my web pages, but why can't anyone else see them on the Internet? What's the URL to my hard drive?"

When you create your web pages, think of them as being able to see out to the entire Internet world (when you are connected to the network). BUT the entire world cannot see back into your computer since it does not have a WWW address on the Internet. If you want to publish on the Internet, you must first locate an Internet Service provider that rents space on its World Wide Web server. If you are at a school or a large company, contact your network administrators. You may want to contact the company

that provides your access to the Internet and ask if they rent web server space. If you are shopping for a net provider, try MecklerMedia's Provider List or WebISPList. Another option is to use the free web page hosting service offered by Geocities or you can search for other free services sing the tools at Freewebspace.net

"I've created my web pages on my desktop computer -- how do I get them to a WWW server"

So you have arranged somehow to get web server space! Generally, WWW servers are UNIX computers and you will have to find a utility to transfer files from your desktop computer to the WWW server. If you do not have a program, search the ShareWare.com for a "ftp" utility. If the WWW server you will use is a Macintosh or Windows-based computer, you may be able to transfer the files over your local network. This is one question you will have to ask of whomever is providing you access to the WWW server.

"I've updated my web pages but do not see the changes in my web browser. Why?"

First, double-checked that you have Saved your HTML file from your text editor. The try using the Reload option in your web browser. Or, the browser may be looking at another copy of the HTML file; in the browser, use Open File... to read in the intended document.

"Why don't I see the text in my <title>....</title> tag on my Web page?"

Recall from lesson 1 that the <title>....</title> tag is part of the information in the HEAD of your HTML file; only the BODY is displayed on the page. The text in the title tag should appear on the menubar of your web browser and it is how the browser will track your pages from its navigation/history menus. It's not uncommon to write what appears to be redundant HTML:

```
<html>
<head>
<title>New Products from Zippy Communications</title>
</head>

<body>
```

<h1>New Products from Zippy Communications<h1>.

</body>

</html>

The same text is used twice -- once for the web browser to identify the page and once in the <h1> tag to put the same title on the page.

"When I load my web pages into my web browser, why do I see odd characters at the top of the screen."

If you are using a word processing program to create your HTML files, be sure that you are saving them as plain text (ASCII) format -- these characters are hidden formatting codes. For Windows users, do not use the Write application -- it will add a bothersome "1" at the top of the screen. Your best bet is to start out by using the simplest text editor possible -- the Windows NotePad or TeachText/SimpleText for the Macintosh. Once you know the basic tags, then go looking for a program to help with the shortcuts.

"Why do I see an icon with a question mark rather then my inline image?"

This icon means that your web browser could not locate the image file. first check to see that it is in the same folder/directory that you reference in the <img src= "..."> tag. Next make sure the spelling of the file name exactly matches the file name written in the <img src= "..."> tag

"Why do I see an icon with a broken corner rather then my inline image?"

In this case, the external file is a format not recognized by your web browser. Make sure that the file is in the GIF format.

Could you please help with a tag that makes all HTML commands inside the tag text/ignored?

Bad news first...

There is no such tag. Even if you use <pre>...</pre> tags, your browser will interpret any HTML as... HTML.

Good news next...

All you need to do is substitute the "special characters" (see lesson 9) to replace all occurences of the < and > characters:

- Replace all "<" with "<"
- Replace all ">" with ">"

This will display them as the characters and not interpret them as HTML.

"How can I make the downloading function work? Is it just to specify where my zip-file is, the path to it? Or do I have to make a FTP server on our server. Is that all there is to it or is there some other magic working behind the scene on your server that I need to be aware of to make it work on our server?
No magic necessary. Just build your <a href=....[] > links to point at the file. Even when you access files locally (like from your hard drive, your web browser will know how to handle the files. For Windows files, .zip and .exe files are pretty standard. Macintosh files on the other hand should always be compressed as BinHex (.hqx). Most web servers are preset to transmit files who's names end in these extensions.

"How do you create a counter that shows how many times someone has visited your page?"
Counters require programs that run from a web server, which is really beyond the scope of just "Writing HTML." There are scads of information for counters at the Yahoo Access Counters page as well as free ones at the FreeSite. See also Web Counter to add web page "hit-o-meters".

"How can I disable right-mouse clicks (to hide source HTML)?"
There is no 100% way to completely hide your code. To make your web pages available on the web, the HTML must be exposed. There are some tricks you can try that may prevent most attempts, ones that disable the response to right-mouse clicks. See the list of examples from a search on Google. Note that this works only on version 4.0 and later browsers, and will not affect a user on an Apple / Macintosh computer.

I downloaded the Windows Zip archive and when I click on the Start link it cannot find locate file TUT/INDEX.HTM. Why?

We no longer provide the downloads in .ZIP format and have made it into a hopefully easy to use .EXE file. See the links from the download page.

I can't get the volc.html file to load on my browser? I'm using Internet Explorer, is there anything I need to do?

With all the browsers out there, we had to write the directions to be generic. Here is how you open a local file in Microsoft Internet Explorer:

1. Select **Open...** from the **File** menu.
2. This allows you to type in a URL or provide the file path to a local file (the latter is what you want to do). The easiest way is to click the **Browse** button and use the dialog box to select the volc.htm file on your hard drive.
3. The easiest way is to arrange your desktop so that adjacent to the Explorer window you can see the folder/directory window that contains your HTML documents -- you can then just click, drag the icon for your file and drop it into the Explorer window.

"This tutorial is great! Can I make copies?"

Yes, you can download the entire tutorial and use at your location. However, you must make sure that you give credit to the Maricopa Center for Learning and Instruction and the Maricopa Community Colleges. You may NOT sell it for profit or alter the content without permission.

How can I have a sound play when my page opens?"

Generally, we recommend against doing this. To the viewer it can arrange from annoying to obtrusive. You should provide the viewer the **choice** to hear a sound.

But if you insist... use the <embed> tag to point to a sound file (AIFF, WAV, or MIDI formats):

```
<center>
<embed src="sounds/groovy.wav" WIDTH=144 HEIGHT=60 autostart=true>
</center>
```

Can I make a web page on webTV"

cannot say I have first hand knowledge, but others have written us and said it was ossible. You can find the answers (and more) from the webTV Resources site a ollection of resources collected by webTV users.

While webTV is primarily a **viewing** technology for the web, with some patience and ome pointers, you may be able to use it as a creation tool. In our opinion, though, if his is anything other than a hobby, get a real tool for the job.

'How can I force the text not to wrap at the edge of the browser window?"

There are some page designs where you may not want the text content to wrap-- notably a large table of data perhaps in a <pre>...</pre> or perhaps a timeline where you would like the user to use the scroll bar to navigate through content laid out in horizontal layout.

There is a subtle variation of the line break tag, namely the No Break tag <nobr>...</nobr> which tells the browser to not wrap whatever is inside, which could be text, pictures, or any content. The usage would be something like:

<nobr>
<h1>Come Scroll with me, away to the right, as I list
out all of the long answers to the
meaning of life accessible only to those that can scroll,
scroll, scroll...</h1>
</nobr>

Another example is a framed page where the lower frame contains a horizontal scrolling list of links to images.

"How do I get rid of the underlining of hyperlinks?"

Historically this was not an option- it was an option for the person viewing your set to set in their web browsers. However, the features available to browsers that support Cascading Style Sheets (version 4.0 browsers) can accomplish "un-underlined" links.

CHAPTER THREE
DATABASES USING ASP

3.1 The need for ASP

Microsoft's Active Server Pages (ASP) with IIS 3.0 offers the web developer flexible, easy to use, scaleable methods to interact with ODBC compliant databases for an Internet site or Intranet application. In this article the basic methods that are needed to interact with a database are illustrated - namely, adding, editing and deleting records.

Using ASP highly interactive pages can be developed independent of the type of browser that will be used to access these pages - from Lynx to Internet Explorer 3.0. ASP encompasses the capabilities of both JavaScript and VBScript with the added bonus that components can be easily added to extend the Internet/intranet application. Using ASP as part of your development not only means that you can initially develop in Microsoft's Access and scale up to a Microsoft SQL Server 6.5 database; but that you can access other vendor databases that are ODBC compliant. Its faster that using Visual Basic and the WinCGI interface - it will be interesting to compare performance with IDC and the use of an ISAPI filter to access a ODBC database. Needless to say, anyone who likes programming in Visual Basic is going to have a ball using ASP.

In addition using Chili!ASP the functional equivalent of Microsoft's Active Server engine, can be used on a range of NT based Web servers, including Netscape, Lotus, O'Reilly's, and some UNIX servers.

On the other hand ASP lacks the platform portability that PERL (Note that with advent of Chili!ASP its not true anymore), enjoys along with vast resources available to PERL programmers on the Internet but its is much easier to learn and develop in. When this The exception handling in VBScript leaves a bit to be desired - which would be critical if say there was an error inserting data into a database. I did not use the debugger in the development of the code and found that most of the run time errors were due to the fact

that I had variables spelled wrongly or I did not include the "=" sign as part of a variable when it was embedded in HTML.

The code is to used as a reference example, not a robust application. Conditions such as trying to delete or edit records when there are no records in the database have not been dealt with. The code was developed on Windows NT 4.0, with MS Access 7 as the database. You will need the 32 Bit ODBC Drivers for Microsoft Access 7.

To illustrate how you can put ASP to work on your web pages I am going to show you how to use ASP to interact with a database that contains user information. The example covers the basic methods that would be needed by anyone working with a database. You will be able to add, edit and delete entries into this database.

Why bother with ASP at all, when HTML can serve your needs? If you want to display information, all you have to do is fire up your favorite text editor, type in a few HTML tags, and save it as an HTML file. Bingo, you're done! But wait – what if you want to display information that changes? Supposing you're writing a page that provides constantly changing information to your visitors, for example, weather reports, stock quotes, a list of your girlfriends, etc, HTML can no longer keep up with the pace. What you need is a system that can present dynamic information. And ASP fits the bill perfectly.

3.2 What is ASP ?

In the language of Microsoft, Active Server Pages is an open, compile-free application environment in which you can combine HTML, scripts, and reusable ActiveX server Components to create dynamic and powerful Web-based business solutions. Active Server Pages enables server side scripting for IIS with native support for both VBScript and JScript.

Active Server Pages (ASPs) are Web pages that contain **server-side scripts** in addition to the usual mixture of text and HTML tags. Server-side scripts are special commands you put in Web pages that are processed before the pages

are sent from the server to the web-browser of someone who's visiting your website. When you type a URL in the Address box or click a link on a webpage, you're asking a web-server on a computer somewhere to send a file to the web-browser (also called a "client") on your computer. If that file is a normal HTML file, it looks the same when your web-browser receives it as it did before the server sent it. After receiving the file, your web-browser displays its contents as a combination of text, images, and sounds.
In the case of an Active Server Page, the process is similar, except there's an extra processing step that takes place just before the server sends the file.
ASP is also an abbreviation for application service provider.

An Active Server Page (ASP) is an HTML page that includes one or more scripts (small embedded programs) that are processed on a Microsoft Web server before the page is sent to the user. An ASP is somewhat similar to a server-side include or a common gateway interface (CGI) application in that all involve programs that run on the server, usually tailoring a page for the user. Typically, the script in the Web page at the server uses input received as the result of the user's request for the page to access data from a database and then builds or customizes the page on the fly before sending it to the requestor.

ASP is a feature of the Microsoft Internet Information Server (IIS), but, since the server-side script is just building a regular HTML page, it can be delivered to almost any browser. You can create an ASP file by including a script written in VBScript or JScript in an HTML file or by using ActiveX Data Objects (ADOs) program statements in the HTML file. You name the HTML file with the ".asp" file suffix. Microsoft recommends the use of the server-side ASP rather than a client-side script, where there is actually a choice, because the server-side script will result in an easily displayable HTML page. Client-side scripts (for example, with JavaScript) may not work as intended on older browsers.

3.3 Active Server Pages 3.0

Before the server sends the Active Server Page to the browser, it **runs** all server-side scripts contained in the page. Some of these scripts display the current date, time, and other information. Others process information the user has just typed into a form, such as a page in the website's guestbook. And you can write your own code to put in whatever dynamic information you want. To distinguish Active Server Pages from normal HTML pages, Active Server Pages are given the ".asp" extension.

3.3.1 What Can We Do with Active Server Pages?

There are many things you can do with Active Server Pages.

- You can display date, time, and other information in different ways.
- You can make a survey form and ask people who visit your site to fill it
- out, send emails, save the information to a file, etc
- You can have a database which people can access via the web.
- People can get information from the database as well as update or insert information into it.
- You can password-protect certain sections of your site, and make sure that only authorized users can see that information.
- The possibilities are virtually endless. Most of that you see on web pages nowadays can be easily done using ASP.

3.3.2 Server-Side Scripts

Server-side scripts typically start with <% and end with %>. The <% is called an **opening tag**, and the %> is called a **closing tag**. In between these tags are the server-side scripts. You can insert server-side scripts anywhere in your webpage - even inside HTML tags.

3.4 Running ASP

Since the server must do additional processing on the ASP scripts, it must have the ability to do so. The only servers which support this facility are Microsoft Internet Information Services & Microsoft Personal Web Server. Let us look at both in detail, so that you can decide which one is most suitable for you.

3.4.1 Internet Information Services (IIS)

This is Microsoft's web server designed for the Windows NT platform. It can only run on Microsoft Windows NT 4.0, Windows 2000 Professional, & Windows 2000 Server. The current version is 5.0, and it ships as a part of the Windows 2000 operating system.
IIS (Internet Information Server) is a group of Internet servers (including a Web or Hypertext Transfer Protocol server and a File Transfer Protocol server) with additional capabilities for Microsoft's Windows NT and Windows 2000 Server operating systems. IIS is Microsoft's entry to compete in the Internet server market that is also addressed by Apache, Sun Microsystems, O'Reilly, and others. With IIS, Microsoft includes a set of programs for building and administering Web sites, a search engine, and support for writing Web-based applications that access databases. Microsoft points out that IIS is tightly integrated with the Windows NT and 2000 Servers in a number of ways, resulting in faster Web page serving.

A typical company that buys IIS can create pages for Web sites using Microsoft's Front Page product (with its WYSIWYG user interface). Web developers can use Microsoft's Active Server Page (ASP)technology, which means that applications - including ActiveX controls - can be imbedded in Web pages that modify the content sent back to users. Developers can also write programs that filter requests and get the correct Web pages for different users by using Microsoft's Internet Server Application Program Interface (ISAPI) interface. ASPs and ISAPI programs run more efficiently than common gateway interface (CGI) and server-side include (SSI) programs, two current technologies. (However, there are comparable interfaces on other platforms.)

Microsoft includes special capabilities for server administrators designed to appeal to Internet service providers (ISPs). It includes a single window (or "console") from which all services and users can be administered. It's designed to be easy to add components as snap-ins that you didn't initially install. The administrative windows can be customized for access by individual customers.

3.4.1.1 Installing IIS

If you are running Windows XP Professional on your computer you can install Microsoft's web server, Internet Information Server 5.1 (IIS) for free from the Windows XP Pro installation CD and configure it to run on your system by following the instructions below: -

1. Place the Windows XP Professional CD-Rom into your CD-Rom Drive.

2. Open 'Add/Remove Windows Components' found in 'Add/Remove Programs' in the 'Control Panel'.

3. Place a tick in the check box for 'Internet Information Services (IIS)' leaving all the default installation settings intact.

4. Once IIS is installed on your machine you can view your home page in a web browser by typing 'http://localhost' (you can substitute 'localhost' for the name of your computer) into the address bar of your web browser. If you have not placed your web site into the default directory you should now be looking at the IIS documentation.

5. If you are not sure of the name of your computer right-click on the 'My Computer' icon on your desktop, select 'Properties' from the shortcut menu, and click on the 'Computer Name' tab.

6. Your default web directory to place your web site in is 'C:\Inetpub\wwwroot', but if you don't want to over write the IIS documentation found in this directory you can set up your own virtual directory through the 'Internet Information Services' console.

7. The 'Internet Information Services' console can be found in the 'Administration Tools' in the 'Control Panel' under 'Performance and Maintenance', if you do not have the control panel in Classic View.

8. Double-click on the 'Internet Information Services' icon.

Figure 3.1: Administrative tool

9. Once the 'Internet Information Services' console is open you will see any IIS web services you have running on your machine including the SMTP server and FTP server, if you chose to install them with IIS.

10. To add a new virtual directory right click on 'Default Web Site' and select 'New', followed by 'Virtual Directory', from the drop down list.

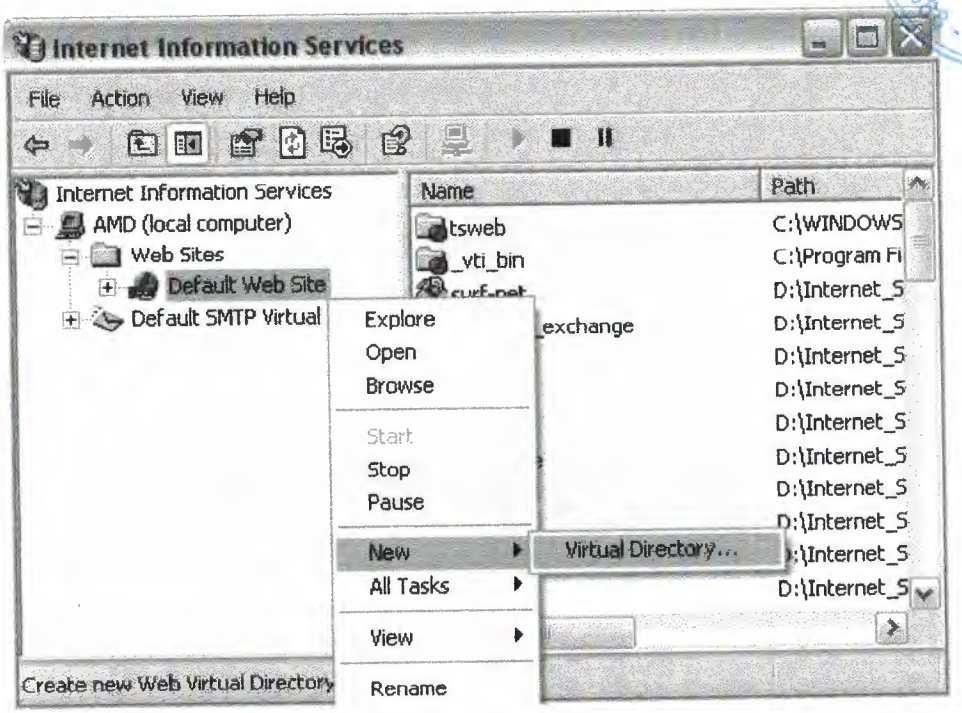

Figure 3.2: Internet Information Services

11. Next you will see the 'Virtual Directory Creation Wizard' from the first screen click the 'next' button.

12. You will then be asked to type in an 'Alias' by which you will access the virtual directory from your web browser (this is the name you will type into your web browser after 'localhost' to view any web pages you place in the directory).

13. Next you will see a 'Browse...' button, click on this to select the directory your web site pages are in on your computer, after which click on the 'next' button to continue.

14. On the final part of the wizard you will see a series of boxes, if you are not worried about security then select them all, if you are and want to run ASP scripts then check the first two, followed by the 'next' button.

15. Once the virtual directory is created you can view the web pages in the folder by typing 'http://localhost/aliasName' (where 'aliasName' is, place the alias you called the

virtual directory) into the address bar of your web browser (you can substitute 'localhost' for the name of your computer if you wish).

3.4.1.2 Internet Information Services F.A.Q.

Q: I want to upgrade my IIS 5 server to IIS 6. How do I?

A: You can't upgrade to IIS 6 without upgrading from Windows 2000 to Windows 2003 server. It is easy to think that Microsoft enforces this rule arbitrarily and could allow you to install IIS 6 on Windows 2000 with just a few bits of code changed, but that is not so. IIS 6 is a complete overhaul and is not an "add on program" like Microsoft Office that can be installed on several platforms. It includes integration with new features, accounts, and drivers that do not exist in Windows 2000 and cannot exist without a sizeable overhaul of the operating system. The good news is that IIS 6 is a much, much better web server than it would be if it could be installed on Windows 2000. The bad news is that you have to upgrade to Windows 2003 Server to get it.

Q: How do I install IIS 6 on Windows XP?

A: See the above answer with the addition that you can't directly upgrade from XP to 2003.

Q: Where do I download IIS 5? Where do I download IIS 6?

A: No version of IIS 5 or IIS 6 can be downloaded. They are installed using Add/Remove Windows Components

Q: How do I install IIS 5 on XP Home Edition?

A: IIS is not available on the home edition. If you need a web server to develop ASP.net applications, look into the Web Matrix

Q: What limits are on the XP Pro version of IIS (IIS 5.1)?

A: There are several. The most significant is that you cannot create more than one website and it is limited to 10 connections. Why? It's a client operating system not intended to act as a server. IIS is provided to serve as a development platform, not act as a server. To get unlimited websites and connections, you need to invest in a server operating system. You can buy the Windows 2003 Server Web Edition for less than $400 online at various places.

You can find a pretty extensive article on this here:

Q: What limits are on the Windows 2003 Server Web Edition?

A: It is essentially a Windows 2003 Server intended to act as a web server and nothing else. You can run most applications on it, but can't turn it into a SQL server, domain controller, or Exchange server. It supports an unlimited number (limited by system resources) of websites and http connections, but it is limited to 10 UNC style connections (\\servername\share). This limitation is built in to prevent people from using the Web Edition as inexpensive file server. Perhaps the most severe limitation is 2GB of RAM and 2 CPUs. You can find information on the limits of the various 2003 servers at **Q: Are there any ways to get all of the operating systems without paying for each one separately?**

A: MSDN is your friend. You can have all of the Microsoft operating systems for $1,199 (http://msdn.microsoft.com/subscriptions/pricing/default.asp) along with a year of updates. This is an outstanding value for developers who need a bona fide server operating system to develop and test their wares.

3.4.2 Personal Web Server

This is a stripped-down version of IIS and supports most of the features of ASP. It can run on all Windows platforms, including Windows 95, Windows 98 & Windows Me. Typically, ASP developers use PWS to develop their sites on their own machines and later upload their files to a server running IIS. If you are running Windows 9x or Me, your only option is to use Personal Web Server 4.0.

3.5 Beginning ASP

Here a few quick tips before you begin your ASP session!
Unlike normal HTML pages, you cannot view Active Server Pages without running a web-server. To test your own pages, you should save your pages in a directory mapped as a virtual directory, and then use your web-browser to view the page.

3.5.1 Steps for Installation

- From the CD, run the SETUP.EXE program for starting the web-server installation.
- After the installation is complete, go to

Start > Programs > Microsoft PWS > Personal Web Manager.
and click the "Start" button under Publishing.

- Now your web-server is up & running.

3.5.2 Creating Virtual Directories

After you have installed the web-server, you can create virtual directories as follows:

- Right-Click on the folder that you wish to add as a virtual directory.
- Select "Properties" from the context-menu.

- In the second tab titled "Web Sharing," click "Share this folder," then "Add Alias". (If you do not see these options enabled, your web-server is not properly running. Please see the steps above under "Installation.")

3.6 Accessing your webpage

Now that your server is completely configured and ready to use.
Start your web-browser, and enter the following address into the address-bar.
http://localhost/
You should see a page come up that tells you more about Microsoft IIS (or PWS, as the case may be)

3.6.1 Localhost

Let us first see, what we mean by a hostname. Whenever you connect to a remote computer using it's URL, you are in effect calling it by its hostname. For example, when you type in
http://www.google.com/
you are really asking the network to connect to a computer named www.google.com. It is called the "hostname" of that computer.
localhost is a special hostname. It always references your own machine. So what you just did, was to try to access a webpage on your own machine (which is what you wanted to do anyway.) For testing all your pages, you will need to use localhost as the hostname. By the way, there is also a special IP address associated with localhost, that is
127.0.0.1
So you could as well have typed:
http://127.0.0.1/
and would have received the same page.
To access pages in a virtual directory called myscripts for example, you should type in:

http://localhost/myscripts/

in the address bar. I hope the concept is now clear …

3.7 The Database

So lets start with the database - I used MS Access to develop the database .

3.7.1 DSN

Once you have designed you database the next step will be to create a DSN entry, UserDB1. To do this:

- Click on your "Start" Button, and go to Control Panel under Settings.
- Click on "32 ODBC", select "System DSN"
- Click "Add" to add a DSN entry, and then on "Microsoft Access Drive". If "Microsoft Access Driver" does not appear on the list, you possibly have not installed Microsoft Access 7's, 32 bit ODBC drivers.

3.7.2 Connecting to the Database

So far we have developed a basic database and added a DSN entry in order that the database be accessed using ODBC - nothing to really write home about. ASP offers two methods to access the database. In the first each access to the database would have first connect to the database; once the connection has been established SQL statements can be used to manipulate data; once completed, all related objects are closed. There are a number of illustrations using this technique in the samples provided with the Active Server Pages. The snippet of code illustrates a connection to a database with "ADOSamples" as the DSN, obtaining a recordset based on a SQL query. Once the script has done with the data, the recordset and the connection to the database are closed.

The first post-startup request is made to the web server for any *.asp file in an application causes the Global.asa to be read. So the moment a request is made to any *.asp in the directory in which the intranet application is stored a connection is established with the DSN UserDB1. Following that the default document, in this case default.asp is processed.

In ASP based applications the programming logic, variables and HTML can be maintained in a single file. Commonly used functions across an ASP application can be in one file, that be included in different pages using the "include" statement. With regards

to the logic of the example I have used a simple state space model to determine the state of the ASP page - i.e. is an addition, deletion or update taking place or not. The information of the current state of the page is dictated by the contents of the form element named "Action". The value the element "Action" is obtained from the form in VBScripts

with the statement in..

For developers familiar with Microsoft's Internet related products ASP will possibly the way to go to develop intranet applications - especially if you are a Visual Basic Programmer. In a couple of months visual tools will be available that will give ASP a more robust development environment.

3.7.2.1 Creating the guest book database

To create a database your first need to open Microsoft Access and choose 'Blank Access Database' from the starting menu. You will be prompted for a name for the database and where you want it saved. Call the database 'guestbook.mdb' and save it in the same directory as the web page connecting to the database is going to be.

You should now see the main Access dialog box, from here select 'Create table in design view'.

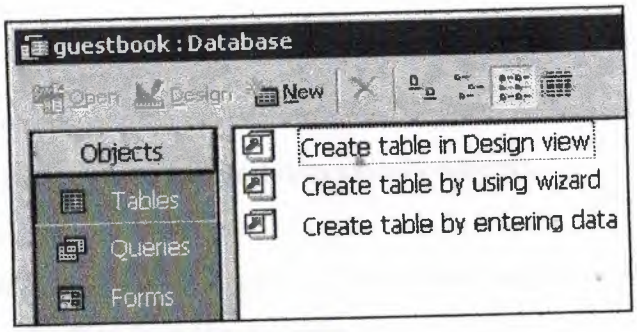

Figure 3.3: Guest Book

You now need to create 3 fields for the database and select there data types.

Field 1 needs to be called 'ID_no' and have the data type of 'AutoNumber'. Also set this field as the primary key.

Field 2 needs to be called 'Name' and have the data type of text.
Field 3 needs to be called 'Comments' and also has the data type of text, but this time you need to change the default field size of 50 to 100 characters under the 'General' tab in the 'Field Properties' box at the bottom of the screen.

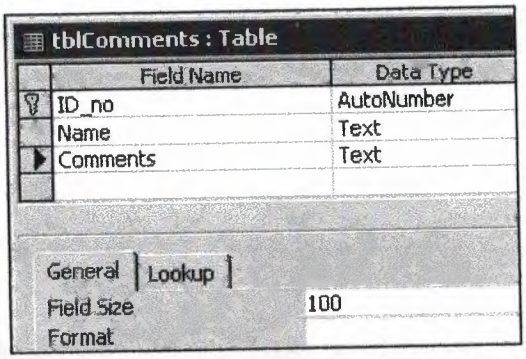

Figure 3.4: Database Table

Once all the field's have been created and the data types and primary key set, save the table as 'tblComments'.

Now the table has been created you need to enter some test data into the table. You can do this by double-clicking on the new table (tblComments) in the main dialog box. From here you can enter some test data. I would recommend entering at least 3 pieces of test data.

If you are having trouble creating the database then you can download this tutorial containing the Access Database with test data already entered.
Connecting to the Guestbook Database:
Now that the database is created and test data entered we can get on with creating the web page to display the data from the database.

First we need to start web page, open up your favourite text editor and type the following HTML.

<html>
<head>

```
<title>My First ASP Page</title>
</head>
<body bgcolor="white" text="black">
```

Next we can begin writing the ASP to connect to the database. First we need to create the variables that we are going to use in the script.

```
<%
'Dimension variables
Dim adoCon        'Holds the Database Connection Object
Dim rsGuestbook   'Holds the recordset for the records in the
database
Dim strSQL        'Holds the SQL query to query the database
```

Next we need to create a database connection object on the server using the ADO Database connection object.

```
'Create an ADO connection object
Set adoCon = Server.CreateObject("ADODB.Connection")
```

Now we need to open a connection to the database. There are a couple of ways of doing this either by using a system DSN or a DSN-less connection. First I am going to show you how to make a DSN-less connection as this is faster and simpler to set up than a DSN connection.

To create a DSN-less connection to an Access database we need tell the connection object we created above to open the database by telling the connection object to use the 'Microsoft Access Driver' to open the database 'guestbook.mdb'.

You'll notice the ASP method 'Server.MapPath' in font of the name of the database. This is used as we need to get the physical path to the database. Server.MapPath returns the physical path to the script, e.g. 'c:\website\', as long as the database is in the same folder as the script it now has the physical path to the database and the database name.

```
'Set an active connection to the Connection object using a DSN-less connection
adoCon.Open "DRIVER={Microsoft Access Driver (*.mdb)}; DBQ=" &
Server.MapPath("guestbook.mdb")
```

If on the other hand you want to use a slower DSN connection to the database then you will need to replace the line above with the one below. Also if you don't know how to setup a system DSN you will need to read my tutorial on, Setting up a System DSN.

```
'Set an active connection to the Connection object using DSN connection
adoCon.Open "DSN=guestbook"
```

Next create an ADO recordset object which will hold the records from the database.

```
'Create an ADO recordset object
Set rsGuestbook = Server.CreateObject("ADODB.Recordset")
```

To query a database we need to use SQL (Structured Query Language). In the next line we initialise the variable 'strSQL' with an SQL query to read in the fields 'Name' and 'Comments' form the 'tblComments' table.

```
'Initialise the strSQL variable with an SQL statement to query the database
strSQL = "SELECT tblComments.Name, tblComments.Comments FROM
tblComments;"
```

Now we can open the recordset and run the SQL query on the database returning the results of the query to the recordset.

```
'Open the recordset with the SQL query
rsGuestbook.Open strSQL, adoCon
```

Using a 'Do While' loop we can loop through the recordset returned by the database while the recordset is not at the end of file (EOF). The 'Response.Write' method is used to output the recordset to the web page. The 'MoveNext' method of the recordset object is used to move to the next record in the recordset before looping back round to display the next record.

```
'Loop through the recordset
Do While not rsGuestbook.EOF

    'Write the HTML to display the current record in the recordset
    Response.Write ("<br>")
    Response.Write (rsGuestbook("Name"))
    Response.Write ("<br>")
    Response.Write (rsGuestbook("Comments"))
    Response.Write ("<br>")
```

```
'Move to the next record in the recordset
    rsGuestbook.MoveNext

Loop
```

And finally we need to close the recordset, reset the server objects, close the server side scripting tag, and close the html tags.

```
'Reset server objects
rsGuestbook.Close
Set rsGuestbook = Nothing
Set adoCon = Nothing

%>
</body>
</html>
```

Now call the file you have created 'guestbook.asp' and save it in the same directory folder as the database, don't forget the '.asp' extension.

And that's about it, you have now created a connection to a database and displayed you Guestbook in a web page, now to find out how add comments to the Guestbook through a web form read the next tuorial on, Adding Data to an Access Database.

If you find that you are getting errors connecting to the database then please read through the Access Database Errors FAQ's, practically make sure you have the correct 'ODBC Drivers' installed on your system and if you are using the, 'NTFS file system', make sure the permissions are correct for the database and the directory the database in.

3.8 How can I create an SQL Server Database

3.8.1 Introduction

The driving force behind Active Server technologies is data access. In order to develop a truly dynamic web site developers need to allow users to access data on demand.

Luckily, with Microsoft's Active Server Pages, this is exceedingly easy to do. This article for ASP beginners details how to connect to a SQL Server 7.0 database using ActiveX Data Object (ADO) and Open Database Connectivity (ODBC).

In order to illustrate the process of connecting to a data source with ASP, we will need to do three things:

- Create a database
- Create an ODBC data source name (DSN)
- Create an ASP page

3.8.2 Creating an SQL Server Database

First we need a database. Since this article isn't about database design, we will create a very simple SQL Server database -- one table! We'll name this database 15Seconds, and we will name our table t_articles.

To create the database:

1. Open SQL Server 7.0 Enterprise Manager (Start (Programs (SQL Server 7.0 (Enterprise Manager).
2. Expand the Enterprise Manager tree, selecting the SQL Server to which you would like to add the database, until you see the "Database" node.

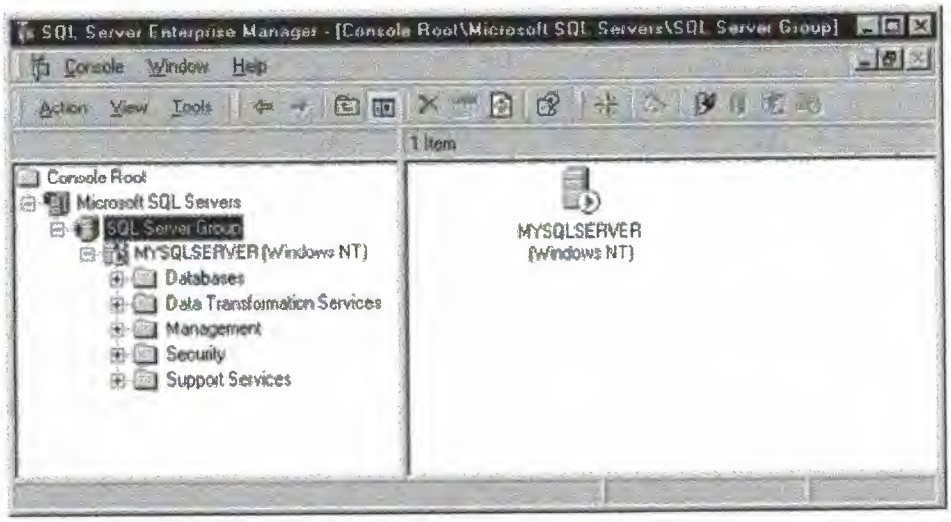

Figure 3.5: SQL Server

3. Right click on the "Database" node and select "New Database. . ."
4. On the "Database Properties" dialog box, enter "15Seconds" in the "Name" field.

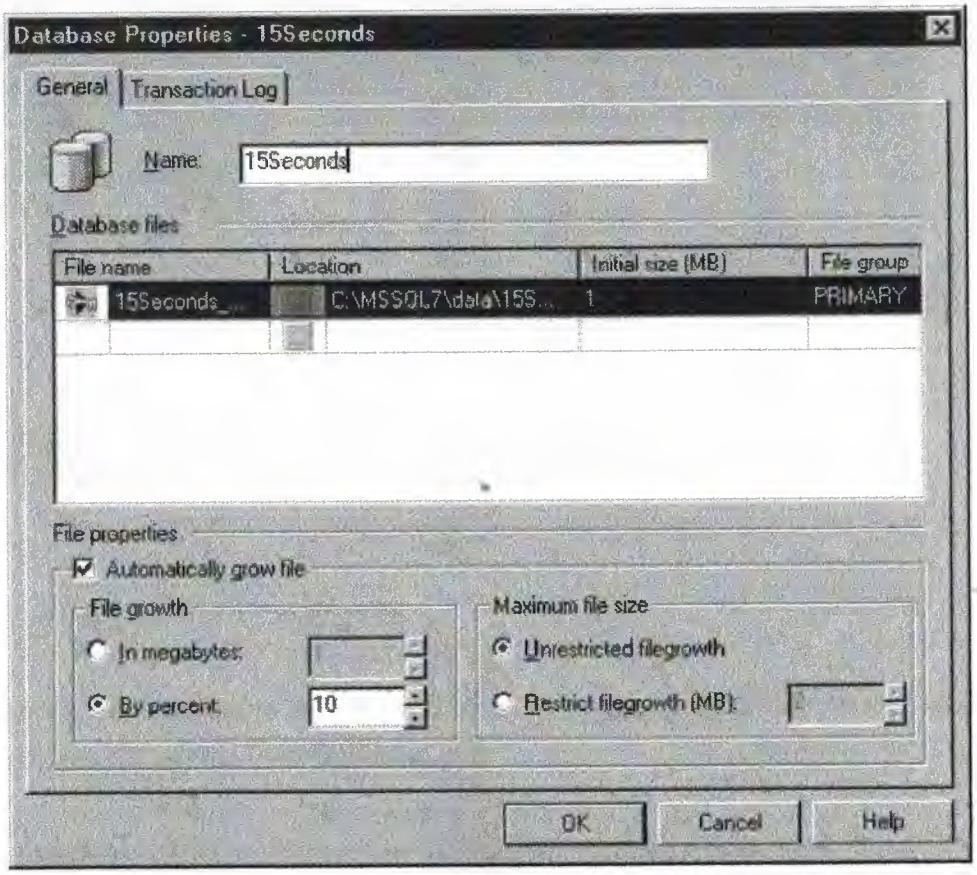

Figure 3.6: Data base Properties

5. Click the "OK" button.

We now have a database named "15Seconds" to which we can add our table.

To create the table, t_articles, perform the following:

1. In Enterprise Manager, expand the "Database" node.
2. Right click on the "15Seconds" node.
3. Select "New."
4. Select "Table. . . ."
5. On the "Choose Name" dialog, Enter "t_articles" in the "Enter a name for the table:" textbox.
6. Click the "OK" button.
7. On the "Add Table" dialog box, enter the following information (see Figure 3):

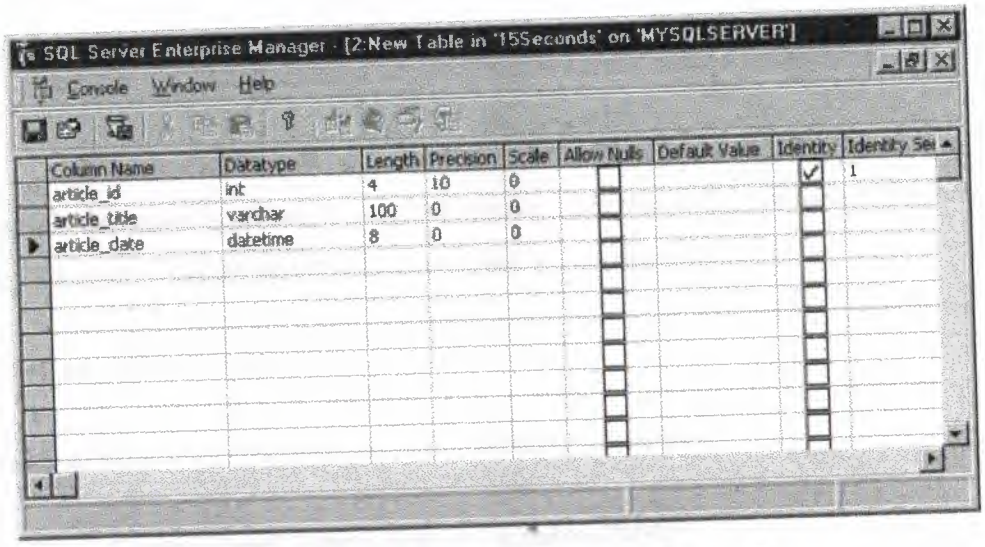

Figure 3.6: SQL Server Enterprise Manager

8. Close the "New Table" dialog box.

Now we have a database and table. Let's add some sample data. We'll add one record. To add data to t_articles, perform the following:

1. In Enterprise Manager, expand the "15Seconds" database node.
2. Double click on "Tables."
3. On the right side of Enterprise Manager, right click on "t_articles."

4. Select "Open Table."
5. Select "Return all rows."
6. On the "Data in Table 't_articles'" enter the following data (see Figure 4):

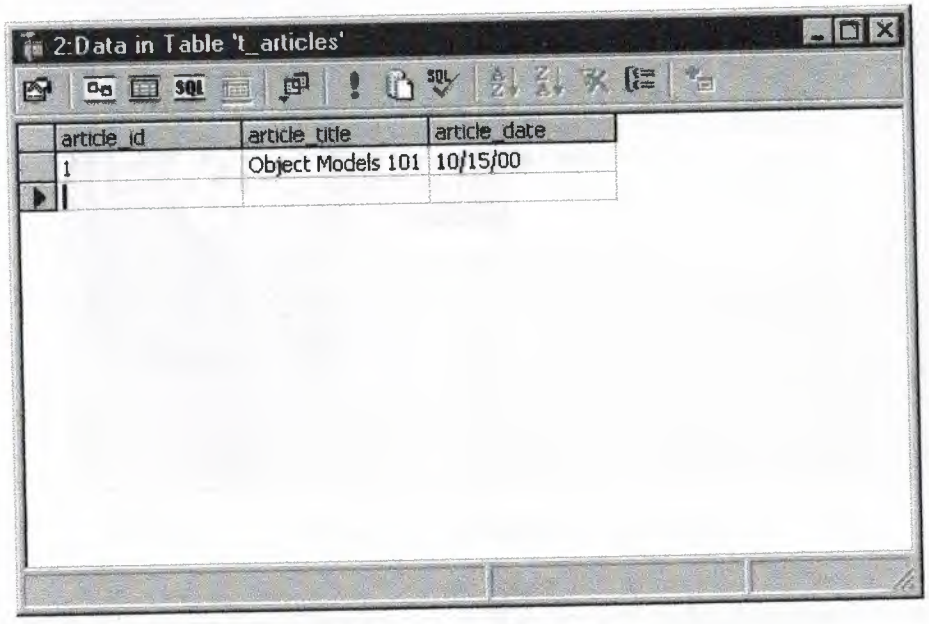

Figure 3.7: Data in table

So, there is the entire database. Pretty impressive, huh? Now that we have a database and a table, we need to create an ODBC connection to our database.

Creating an ODBC Connection

To create an ODBC connection, perform the following tasks:

1. Open Control Panel (Start (Setting (Control Panel).
2. Double click on the "Data Sources (ODBC)" icon in the Control Panel.
3. Select the "System DSN" tab on the "ODBC Data Source Administrator" dialog box.
4. Click the "Add" button.
5. On the "Create New Data Source" dialog box (see Figure 5), highlight "SQL Server" and click "Finish."

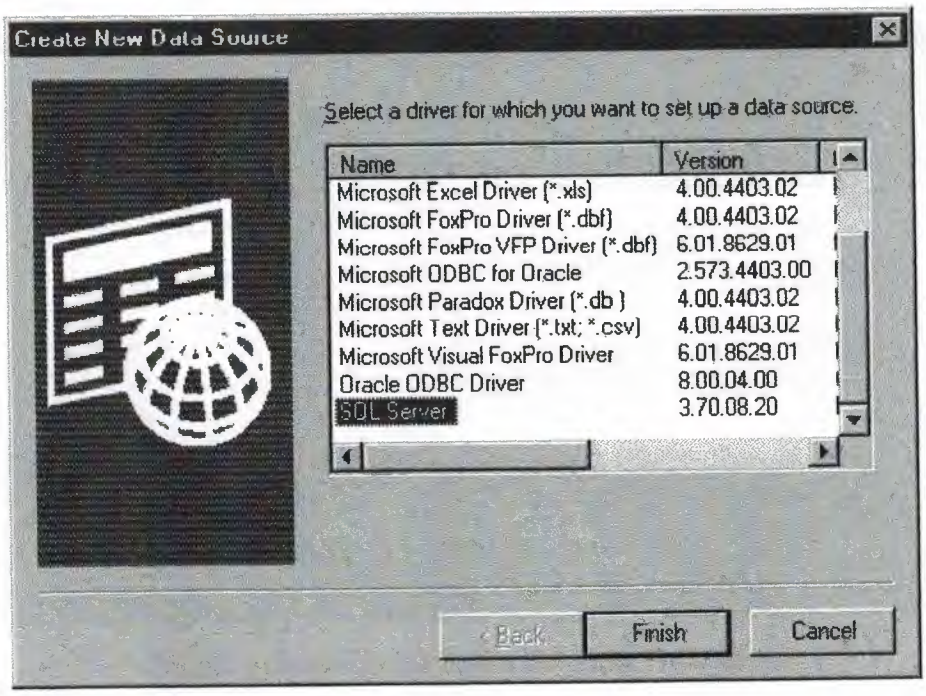

Figure 3.8 creating new database

6. On the "Create a New Data Source to SQL Server" dialog box (see Figure 6):

• Enter "15Seconds" in the "Name" field. This is not the name of the database, but the name for the DSN. I kept it the same just for simplicity, however, this is not good practice for security reasons.

• In the "Description" field, enter a brief description for the DSN. I entered "15Seconds Sample DSN."

• From the "Server" drop-down box, select the SQL Server to which you would like to connect. Since, my instance of SQL Server resides on the same machine where I am creating the DSN, I selected "(local)."

• Click the "Next" button.

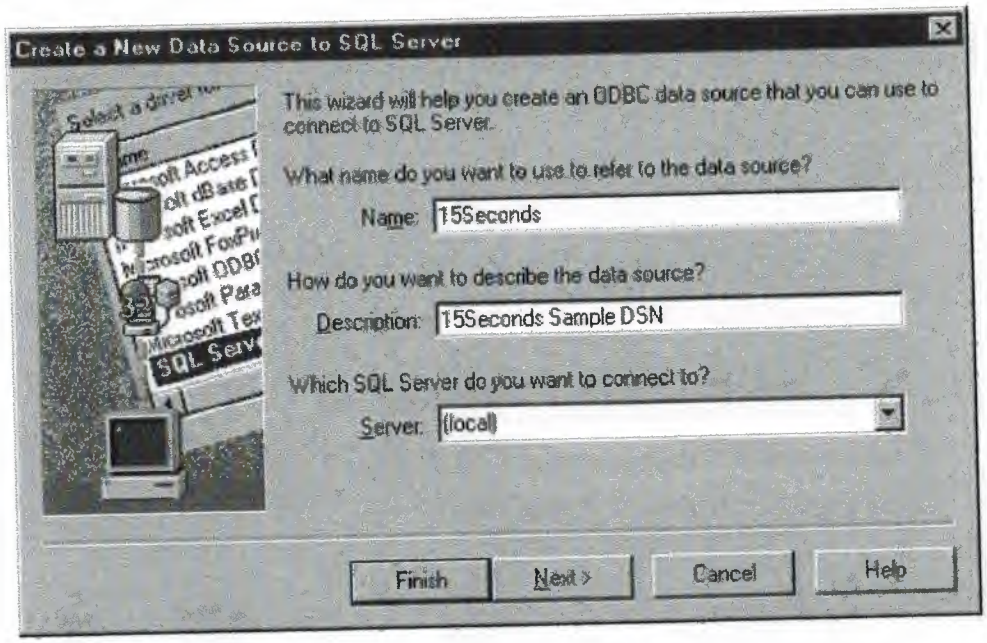

Figure 3.9: create a new data source to SQL server

7. On the second "Create a New Data Source to SQL Server" (see Figure 7) dialog box:

   • Select the "With SQL Server authentication using a login ID and password entered by the user" radio button to indicate that database security with be implemented by SQL Server rather than Windows NT.

   • Select the "Connect to SQL Server to obtain default settings for the additional configuration options" checkbox.

   • In the Login ID textbox, enter "sa."

   • Leave the "Password" textbox empty.

   • Click the "Next" button.

   Note: I used "sa" for login ID with a blank password for convenience. This is the default SQL Server administrator account. Again, this is not a good idea for security reasons.

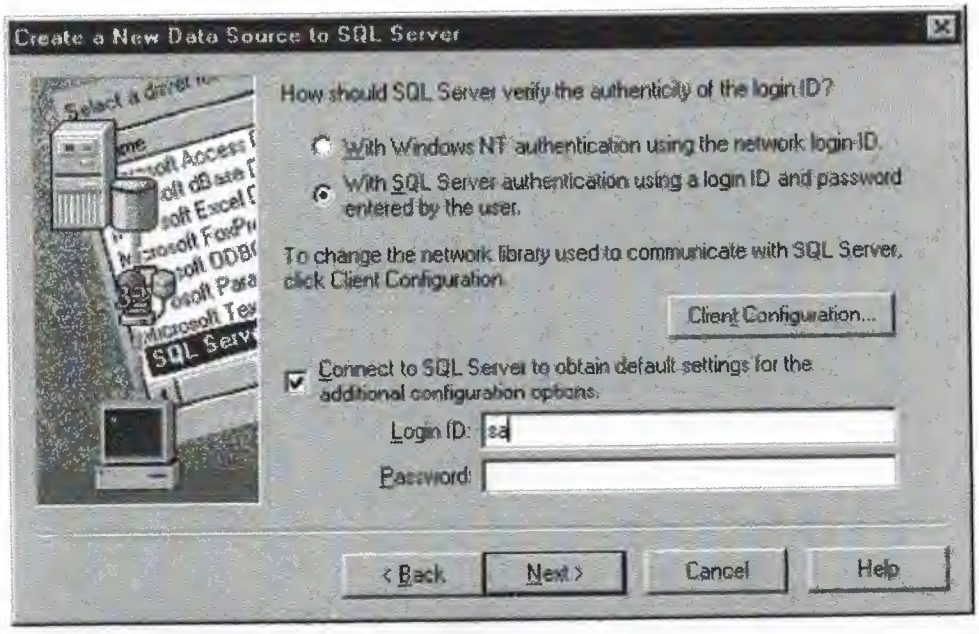

Figure 3.10

8. On the third "Create a New Data Source to SQL Server" dialog box (see Figure 8): • Select the "Change the default database to" checkbox and select "15Seconds" from the accompanying select box.

   • Click the "Create a New Data Source to SQL Server" button.

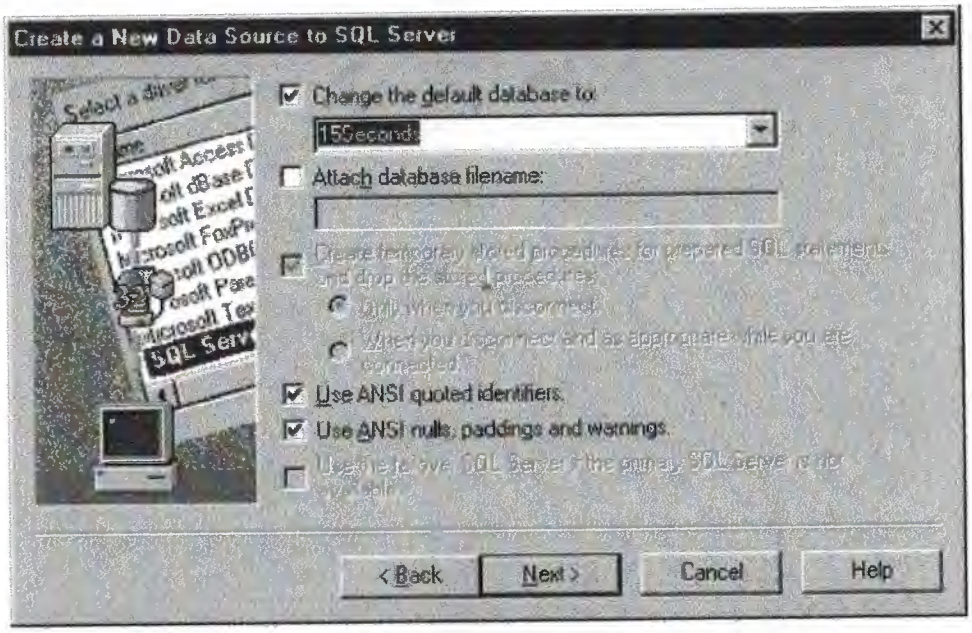

Figure 3.11:

9. On the fourth "Create a New Data Source to SQL Server" dialog box (see Figure 9): • Click the "Finish" button.

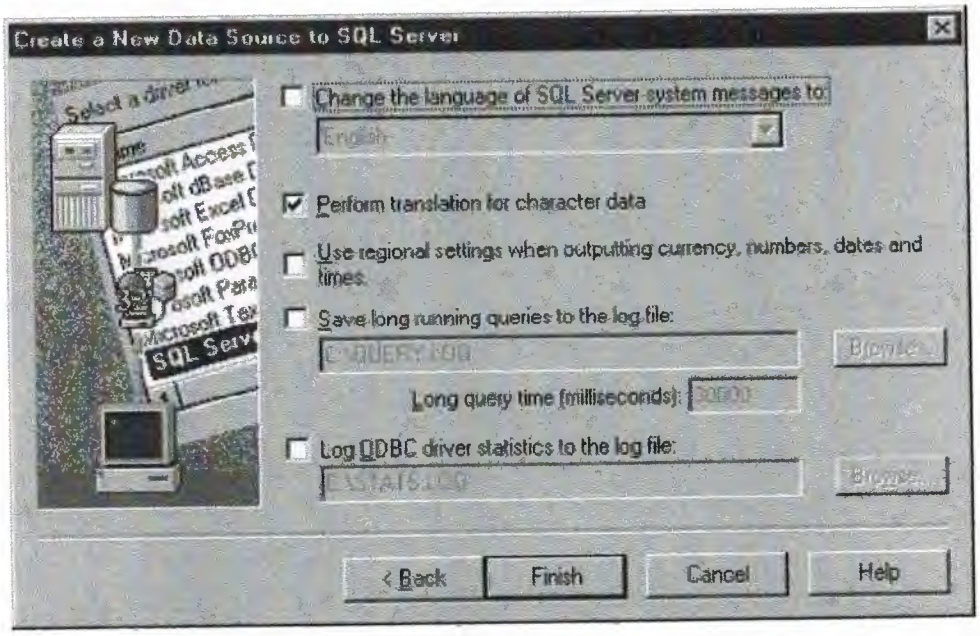

Figure 3.12:

10. On the "ODBC Microsoft SQL Server Setup" dialog box (see Figure 10), do one of the following: • Click the "Test Data Source. . . " button to ensure that the ODBC connection has been created successfully.

• Click the "OK" button to complete the ODBC DSN setup process.

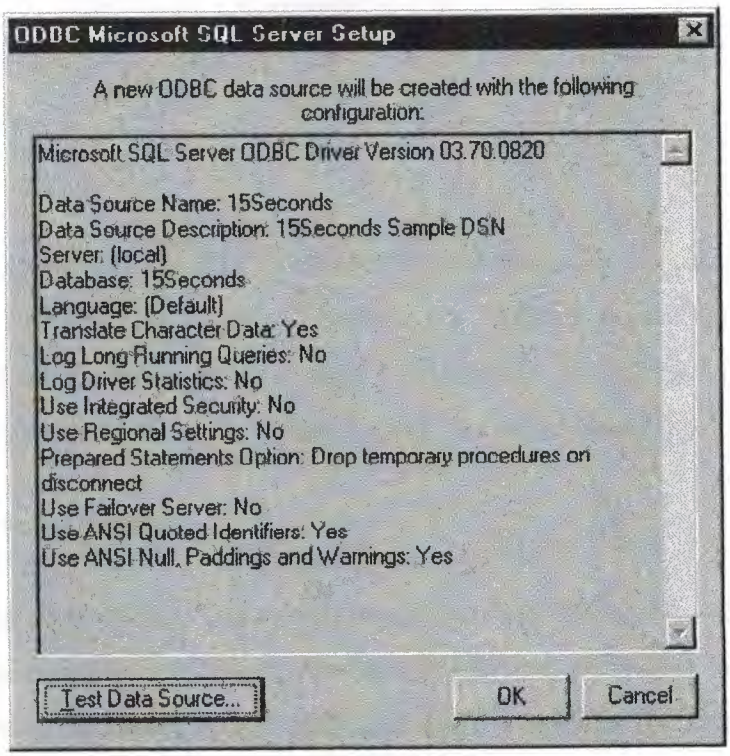

Figure 3.13: ODBC Microsoft SQL server setup

We have a database, a table, some data and an ODBC DSN. The next step is to create an ASP page to access the data.

3.8.3 Conclusion

This article details how to connect to the data source using ASP. Data access with ASP, at its core, is very simple. However, there are many ways to improve and build upon the provided example. Try using OLE DB rather than ODBC, or incorporating eXtensible Markup Language (XML) into your data access processes.

3.9 Summary

In this chapter the role of using ASP for web development of databases is described and the use of ASP for connecting, manipulating and managing records through the internet is shown.

Chapter Four

Electronic Commerce (e-Commerce)

Introduction

s paper provides a brief introduction to electronic commerce. It discusses the nature of ctronic commerce, considers its scope and impact, and outlines several examples. It then ntifies a number of open issues and the actors responsible for addressing those issues. ally, it gives a brief overview of the G-7 Pilot Project "A Global Marketplace for SMEs".

What is electronic commerce?

ie possible definition of electronic commerce would be: "any form of business transaction which the parties interact electronically rather than by physical exchanges or direct physical ntact". However, while accurate, such a definition hardly captures the spirit of electronic mmerce, which in practice is far better viewed as one of those rare cases where changing eds and new technologies come together to revolutionise the way in which business is nducted.

odern business is characterised by ever-increasing supply capabilities, ever-increasing obal competition, and ever-increasing customer expectations. In response, businesses roughout the world are changing both their organisations and their operations. As illustrated figure 1, they are flattening old hierarchical structures and eradicating the barriers between ompany divisions. They are lowering the barriers between the company and its customers nd suppliers. Business processes are being re-designed so that they cross these old oundaries. We now see many examples of processes that span the entire company and even rocesses that are jointly owned and operated by the company and its customers or suppliers.

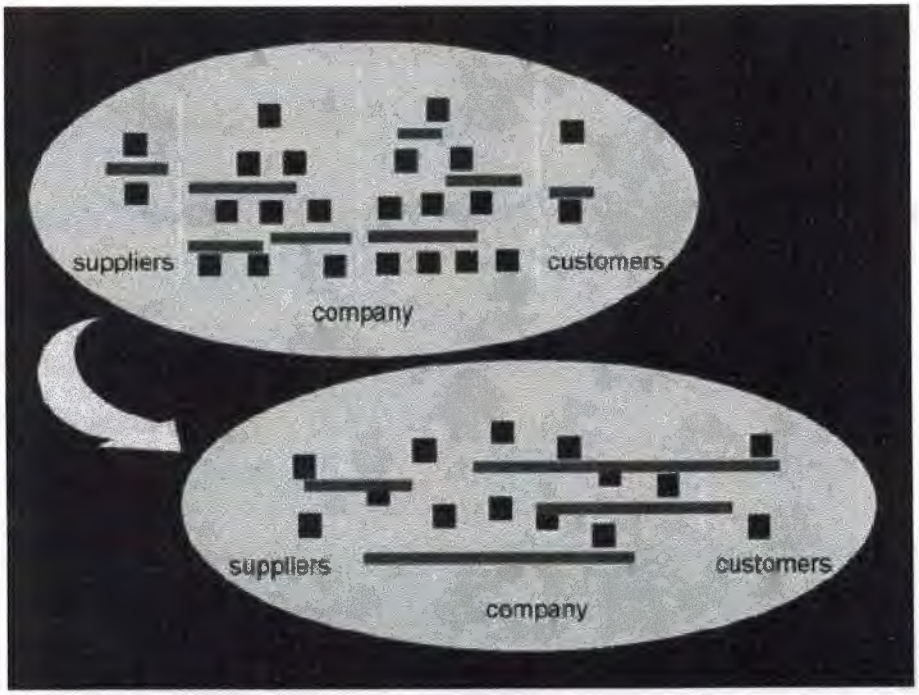

Figure 4.1: Changing business organisations and processes

Electronic commerce is a means of enabling and supporting such changes on a global scale. It enables companies to be more efficient and flexible in their internal operations, to work more closely with their suppliers, and to be more responsive to the needs and expectations of their customers. It allows companies to select the best suppliers regardless of their geographical location and to sell to a global market.

One special case of electronic commerce is electronic trading, in which a supplier provides goods or services to a customer in return for payment. A special case of electronic trading is electronic retailing, where the customer is an ordinary consumer rather than another company. However, while these special cases are of considerable economic importance, they are just particular examples of the more general case of any form of business operation or transaction conducted via electronic media. Other equally valid examples include internal transactions within a single company or provision of information to an external organisation without charge.

Electronic commerce is technology for change. Companies that choose to regard it only as an "add on" to their existing ways of doing business will gain only limited benefit. The major benefits will accrue to those companies that are willing to change their organisations and business processes to fully exploit the opportunities offered by electronic commerce.

.3 Categories of electronic commerce

As shown in figure 2, electronic commerce can be sub-divided into four distinct categories:

- business-business
- business-consumer
- business-administration
- consumer-administration

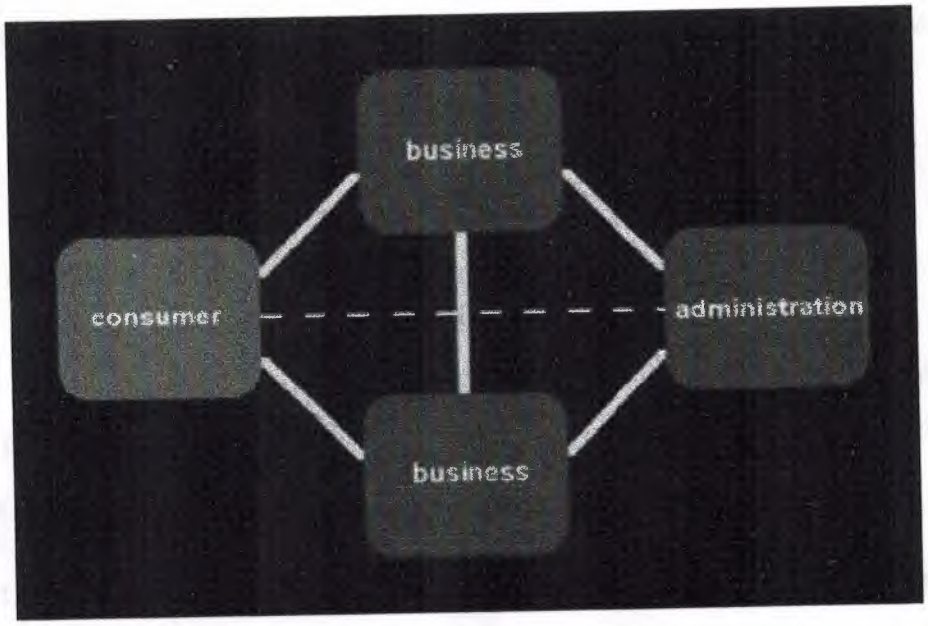

Figure 4.2: Categories of electronic commerce

An example in the business-business category would be a company that uses a network for ordering from its suppliers, receiving invoices and making payments. This category of electronic commerce has been well established for several years, particularly using Electronic Data Interchange (EDI) over private or value-added networks.

The business-consumer category largely equates to electronic retailing. This category has expanded greatly with the advent of the World Wide Web. There are now shopping malls all over the Internet offering all manner of consumer goods, from cakes and wine to computers and motor cars.

ne business-administration category covers all transactions between companies and overnment organisations. For example, in the USA the details of forthcoming government rocurements are publicised over the Internet and companies can respond electronically. urrently this category is in its infancy, but it could expand quite rapidly as governments use eir own operations to promote awareness and growth of electronic commerce. In addition to ublic procurement, administrations may also offer the option of electronic interchange for ich transactions as VAT returns and the payment of corporate taxes.

he consumer-administration category has not yet emerged. However, in the wake of a rowth of both the business-consumer and business-administration categories, governments ay extend electronic interaction to such areas as welfare payments and self-assessed tax eturns.

.4 Impact of electronic commerce

lectronic commerce is not some futuristic dream. It's happening now, with many well-stablished success stories. It's happening world-wide - while the USA, Japan and Europe are eading the way, electronic commerce is essentially global in both concept and realisation. It's appening fast. And, with the maturing of EDI and the rapid growth of Internet and the World Vide Web, it's accelerating.

he impact of electronic commerce will be pervasive, both on companies and on society as a vhole. For those companies that fully exploit it's potential, electronic commerce offers the ossibility of breakpoint changes - changes that so radically alter customer expectations that hey re-define the market or create entirely new markets. All other companies, including those hat try to ignore the new technologies, will then be impacted by these changes in markets and ustomer expectations. Equally, individual members of society will be presented with entirely ew ways of purchasing goods, accessing information and services, and interacting with ranches of government. Choice will be greatly extended, and restrictions of geography and ime eliminated. The overall impact on lifestyle could well be comparable to, say, that of the growth in car ownership or the spread of the telephone.

.5 The scope of Electronic Commerce

Electronic Commerce as a general concept covers any form of business transaction that is conducted electronically, using telecommunications networks. Such transactions occur between companies, between companies and their customers or between companies and public administrations.

Electronic Commerce encompasses a broad range of activities. The core component is addressing the commercial transaction cycle. Electronic Commerce includes electronic trading of physical goods and services and of electronic material. Upstream and downstream of the transactions it also includes the advertising and promotion of products and services, the facilitation of contacts between traders, the provision of market intelligence, pre- and post-sales support, electronic procurement and support for shared business processes.

ELECTRONIC COMMERCE IMPACTS UPON A LARGE NUMBER OF BUSINESS ACTIVITIES
• marketing, sales and sales promotion • pre-sales, subcontracts, supply • financing and insurance • commercial transactions: ordering, delivery, payment • product service and maintenance • co-operative product development • distributed co-operative working • use of public and private services • business-to-administrations (concessions, permissions, tax, customs, etc) • transport and logistics • public procurement • automatic trading of digital goods • accounting • dispute resolution

The whole of the commercial transaction, including ordering, transport and delivery, the invoicing and payment cycle can be supported electronically. dealing with public authorities electronically for customs and tax affairs, and in statistics is already well developed.

However, a number of issues such as security, IPR protection, legal questions and procedures still have to be addressed as part of the electronic commerce business environment.

A distinction should be made between electronic trading of physical goods and services and electronic trading of information-based contents that can be delivered directly through the network (images, voice, text, software...).

The electronic trading of physical goods and services represents an evolution of present ways of trading, capitalising on new possibilities offered by technology to improve efficiency in terms of lower costs, effectiveness in terms of widening market potential and better meeting customers' needs as well as providing a means for enhanced product and service innovation, notably through customer-supplier interaction . This form of electronic commerce is expected to have a great impact on competitiveness and a limited impact on employment.

The trading of electronic material (software, video, music, images, multimedia works, games, etc.) represents a revolutionary new way of trading, for which the full commercial transaction cycle can be conducted simultaneously via the same network (including delivery), implying specific requirements regarding the proper integration of payment, IPR control, etc. Depending on the solutions that will be successful in the market place, traded "electronic goods" could create totally new markets and revolutionise some industries (such as publishing). This highly innovative form of electronic commerce is expected to have an important impact on competitiveness and create employment.

EXAMPLES OF SPECIFIC BUSINESS BENEFITS OF ELECTRONIC COMMERCE
• reduced advertising costs • reduced delivery cost, notably for goods that can also be delivered electronically • reduced design and manufacturing cost • improved market intelligence and strategic planning • more opportunity for niche marketing • equal access to markets (i.e. for SMEs vis-a-vis larger corporations) • access to new markets • customer involvement in product and service innovation

Market intelligence such as information on specific markets and countries (market opportunities, business framework, applicable regulations to specific products and services), market surveys and automatic generation of marketing statistics can all be provided electronically and improve the commercial environment, though a number of issues such as privacy need to be addressed.

Contacts between companies can be facilitated by on-line business directories and improved national and regional information relay centres. Contact between companies and consumers can be supported by various means, including on-line advertising and shopping malls. Companies can provide detailed information on their products and services, including technical specification, guidance on use and answers to common questions, supported by comprehensive navigation and search facilities.

Over recent years, efforts to improve business efficiency and responsiveness have increasingly resulted in a "blurring" of the boundaries between interacting companies and customers (see the diagram). Business processes then cross company boundaries, with each company carrying out its own parts of those shared processes. An extreme example occurs with the "virtual enterprise", where each participating company playing its own role in a closely co-operating network of companies addressing a particular market opportunity.

Where companies can jointly form a single virtual enterprise which addresses anything from production of goods and services to distribution and sales, it can be expected that major shifts will happen in the structure of the industries involved. An example of this is the expected impact of tele-shopping (i.e. the possibility to partially by-pass the distribution chain) on the balance of power between consumer goods producers and the retail chain. In this case the traditional boundaries between manufacturing and distribution sectors are becoming less important. Another example of a structural change is observed in the health care industry where electronic commerce is a critical enabling factor for healthcare management companies (HMCs); to become major new intermediaries in the market (between health care providers such as doctors, major health care purchasers, pharmaceutical industry, government agencies).

In this case electronic commerce means the electronic exchange of health care-related information between market players. These HMCs are now so important that recently a process of vertical integration in the pharmaceutical industry started by manufacturers acquiring healthcare companies in order to get access to their huge information databases.

EXAMPLES OF GENERIC BUSINESS STRATEGIES
BASED ON ELECTRONIC COMMERCE

- Electronic Marketplace Presence: sales promotion, interactive TV / Internet shopping
- Efficient Consumer Response Management
- Electronic Trading
- Supply Chain Management
- Vendor Managed Inventory

Electronic commerce also enables sector specific strategies such as Value-Added Banking

Potentially, electronic commerce can provide comprehensive support for shared business processes, regardless of their nature and regardless of the participants being separated by geography and time(zone). (Indeed, it could be argued that such shared business processes are the most general form of electronic commerce and that the other facets identified above are simply special cases of this general form).

The reasoning and examples above re-inforce the argument that electronic commerce is a phenomenon that should be considered from the point of view of several policies and several market sectors.

4.6 Supplier opportunities and customer benefits

As summarised in table 1, electronic commerce offers several opportunities to suppliers and commensurate benefits to customers. These include:

4.6.1 Global presence / global choice

The boundaries of electronic commerce are not defined by geography or national borders, but rather by the coverage of computer networks. Since the most important networks are global in scope, electronic commerce enables even the smallest suppliers to achieve a global presence and to conduct business world-wide.

The corresponding customer benefit is global choice - a customer can select from all potential suppliers of a required product or service, regardless of their geographical location.

supplier opportunity	customer benefit
global presence	global choice
improved competitiveness	quality of service
mass customisation & "customerisation"	personalised products & services
shorten or eradicate supply chains	rapid response to needs
substantial cost savings	substantial price reductions
novel business opportunities	new products & services

Table 4.1: Opportunities and benefits

4.6.2 Improved competitiveness / quality of service

Electronic commerce enables suppliers to improve competitiveness by becoming "closer to the customer". As a simple example, many companies are employing electronic commerce technology to offer improved levels of pre-and post-sales support, with increased levels of product information, guidance on product use, and rapid response to customer enquiries. The corresponding customer benefit is improved quality of service.

4.6.3 Mass customisation / personalised products and services

With electronic interaction, suppliers are able to gather detailed information on the needs of each individual customer and automatically tailor products and services to those individual needs. This results in customised products comparable to those offered by specialised suppliers but at mass market prices. One simple example is an on-line magazine that is tailored for the individual reader on each access to emphasise articles likely to be of interest and exclude articles that have already been read.

4.6.4 Shorten or eradicate supply chains / rapid response to needs

Electronic commerce often allows traditional supply chains to be shortened dramatically. There are many established examples where goods are shipped directly from the manufacturer to the end consumer, by-passing the traditional staging posts of wholesaler's warehouse,

retailer's warehouse and retail outlet. (Typically the contribution of electronic commerce is not in making such direct distribution feasible - since it could also be achieved using paper catalogues and telephone or postal ordering - but rather in making it practical in terms of both cost and time delays.)

The extreme example arises in the case of products and services that can be delivered electronically, when the supply chain can be eradicated entirely. This has massive implications for the entertainment industries (film, video, music, magazines, newspapers), for the information and "edutainment" industries (including all forms of publishing), and for companies concerned with the development and distribution of computer software.

The corresponding customer benefit is the ability to rapidly obtain the precise product that is required, without being limited to those currently in stock at local suppliers.

4.6.5 Substantial cost savings / substantial price reductions

One of the major contributions of electronic commerce is a reduction in transaction costs. While the cost of a business transaction that entails human interaction might be measured in dollars, the cost of conducting a similar transaction electronically might be a few cents or less. Hence, any business process involving "routine" interactions between people offers the potential for substantial cost savings, which can in turn be translated into substantial price reductions for customers.

4.6.6 Novel business opportunities / new products and services

In addition to re-defining the markets for existing products and services, electronic commerce also provides the opportunity for entirely new products and services. Examples include network supply and support services, directory services, contact services (i.e. establishing initial contact between potential customers and potential suppliers), and many kinds of on-line information services.

While these various opportunities and benefits are all distinct, they are to some extent inter-related. For example, improvements in competitiveness and quality of service may in part be derived from mass customisation, while shortening of supply chains may contribute to cost savings and price reductions.

.7 Examples in electronic commerce

here are many well-established examples of electronic commerce in a wide range of industry ectors and a wide range of application areas. A few of these will serve to illustrate the nature f current activity.

.7.1 Retail

os The Internet Bookshop exists only as a site on the World Wide Web - it has no physical utlets. The shop specialises in technical books and currently offers more than 780000 titles. Customers visiting iBS can browse, search using keywords, and obtain detailed information n individual titles, including a descriptive text, bibliographic information, contents list, eviews, and suggested readership. They can order and pay for books, which are then lelivered through publishers' established international delivery channels.

4.7.2 Virtual Vineyards

Like iBS, Virtual Vineyards exists only as a site on the Web. It offers wines and gourmet foods, providing an outlet for a number of small Californian wine producers. There is detailed on-line information on the various wines and foods, and also an on-line query service (using e-mail). Customers can order and pay using either credit cards or electronic cash.

Customer orders are transferred electronically from Virtual Vineyards' San Jose office to their Napa Valley warehouse, along with instructions from printing the shipping label and enclosures (such as tasting notes). The goods are shipped by Federal Express. Customers can track the progress of the delivery on-line by accessing the Federal Express site.

4.7.3 Barclays Bank

Many banks have offered on-line querying of accounts for some time. Following relaxation of controls on the export of security technologies from the USA, Barclays has extended this to a large scale trial offering customers full banking services from their home computers.

7.4 ESI

ectronic Share Information Ltd offers an on-line share information and trading facility. ıstomers can view London Stock Exchange prices and the FTSE 100 index, buy and sell ares on-line via ShareLink, use a range of technical analysis and research tools, obtain ɔmpany profiles and share tips, request automatic notification of share price changes, and ɒtain real-time portfolio valuations. Launched in September 1995, the service now has 5000 registered users and attracts 1.25 million visits per month.

7.5 DIPA

IPA GmbH supplies high quality photographic images. Customers can browse an extensive ıotographic library and order the required images which are then delivered over satellite ıks.

.7.6 Oracle

otential customers can now access Oracle's Web site and browse information on the ɔmpany's products. They can then download free trial versions of various products, or pay n-line and download full versions. Because of potential legal and financial problems, the on-ne purchasing and delivery service is currently limited to United States customers only.

.7.7 Hewlett Packard

lewlett Packard's "Access HP" Web site provides thousands of pages of information, ıcluding general company information, news, world-wide contact points, new product ınnouncements, and details of HP's wide range of products and services.

.7.8 GE Plastics

GE Plastics is an industry leader in the field of engineering plastics. The company's Web site rovides an overview of the company's products, detailed profiles of the properties of each ıaterial, and guidance and recommendations for designing applications using the company's ıaterials. There is also an on-line "Technical Tip Of The Week" contest whereby any visitor an submit a tip for working with GE materials. The company selects the best tips for ıcorporation into its "Past Technical Tips" pages.

7.9 Ford

ord engineering teams world-wide collaborate in the design of new car engines using Ford's ivate network. The design support system is a combination of a real-time videoconferencing stem and a shared "design whiteboard". Any participant in a design conference can draw or rite on the whiteboard, drag objects onto the whiteboard, and edit objects on the whiteboard. ll changes to the whiteboard are immediately visible to all other participants. The object pes supported include CAD drawings, text documents, and video clips.

.7.10 GEN

he Global Engineering network is co-ordinated by Siemens Nixdorf and has participants rom many European countries. GEN is a "marketplace for engineering knowledge", bringing ogether the suppliers of components and sub-assemblies and those who might incorporate hose components or assemblies into their own new products. The suppliers enter detailed echnical information (perhaps including 3D CAD drawings) into the GEN network. Potential customers can then search the supplier information looking for "best fit" components or assemblies, and can experiment with incorporating those components or assemblies into the early stages of their own product designs.

4.7.11 citiusNet

citiusNet is a well-established system for supporting business-to-business electronic commerce. It currently has three major elements - altius, citius and fortius. Altius is an electronic catalogue of industry and office supplies. Citius is a system for handling trading transactions. Fortius supports electronic payment by EDI, and is used not only for payment of goods selected from altius and traded over citius, but also for routine transactions such as pension and insurance payments. citiusNet is a multi-language service that is offered internationally. The systems were developed by DDP from Lyon, France, with the co-operation of various partners from Spain, Belgium, Germany and Italy.

DDP now plans to extend its services to offer general business support ("Intermediation"). DPP will handle all routine operations (banking, administration, pension funds, etc.) on behalf of its subscribers, thus allowing those subscribers to concentrate on their core businesses.

.12 The Times

e Times and the Sunday Times are now published on-line. The complete content of the wspapers is available, and access is free. Using the "Interactive Times" facilities, users of on-line service can tailor the newspaper to their own personal interests and tastes or rform a search for past articles that include specified keywords.

.13 de Kreek

r Jeroen de Kreek, a lawyer from Amsterdam, provides a legal question answering service at is available 24 hours a day. Users of this service are led through a hierarchy of menus that ds them in ultimately formulating their question as a text message. Mr de Kreek then sponds to this question, normally within two hours. The response to the first question is ee, but subsequent questions incur charges.

7.14 Global Tradepoint Network

he Global Tradepoint Network is a huge network of business information, developed under ie UN-supported Electronic Trade Efficiency Programme. By interfacing to established ational databases, the network aims to supply key trading data for countries across the world. uch data might cover, for example, market information, transportation options and prices, surance facilities, credit availability, customs requirements, and import/export regulations. urther, through its "electronic trading opportunities" system, the network serves as a meeting lace for buyers and sellers world-wide. Potential matches between buyers and sellers are dentified by using both geographical details and information on products offered or required, he latter being expressed using the Harmonised Customs Tariff codes. Once a potential natch has been identified, the buyer and seller establish contact directly.

.7.15 Tesco

Tesco operates around 540 supermarkets in the UK. The company has a "sales based ordering" system whereby information on product sales at individual supermarkets, as collected by the checkout scanners, is forwarded electronically to the computers at the company's Store Control Centre. These computers determine the goods needed to replenish the stock at each store, and send this information electronically to the computers at the Tesco depot serving that store. For many products Tesco itself holds no stock, so orders are

nerated automatically and forwarded to Tesco's suppliers using EDI. On delivery to the esco depot, the replacement stock is immediately shipped on to the appropriate stores. ithin 24 hours of an item being sold by the supermarket its replacement is back on the elves. The re-stocking system relies on electronic communication and on close co-operation etween Tesco and its suppliers, who in effect are partners in a shared business process of plenishing products on the supermarket shelves.

8 Levels of electronic commerce

s the above examples help to illustrate, there are various "levels" at which electronic ommerce can be conducted, ranging from a simple network presence to electronic support or processes that are jointly owned and enacted by two or more companies.

Various levels of electronic commerce are shown in figure 3. Such a figure highlights the distinction between national transactions and international transactions. The sources of this distinction are not technical - as already emphasised, electronic commerce is essentially global in concept - but rather legislative. Electronic commerce is more complex at the international level than the intra-national level because of such factors as taxation, contract law, customs payments, and differences in banking practices.

The lower levels of electronic commerce are concerned with a basic network presence, company promotion, and pre- and post-sales support. By using available "off the shelf" technologies, these levels can be both cheap and straightforward to implement, as thousands of small companies can already testify. By contrast, the more advanced forms of electronic commerce pose complex problems that are as much legal and cultural as technological. At these levels there are no "off the shelf" solutions, so companies are forced to develop their own custom systems. Thus at present it tends to be only the larger and richer companies that are pioneering these levels. However, over time the boundary of what is commonplace will gradually move up to encompass the more complex levels of electronic commerce, and further "off the shelf" technologies will be established to support these higher levels, just as they have been for the lower levels.

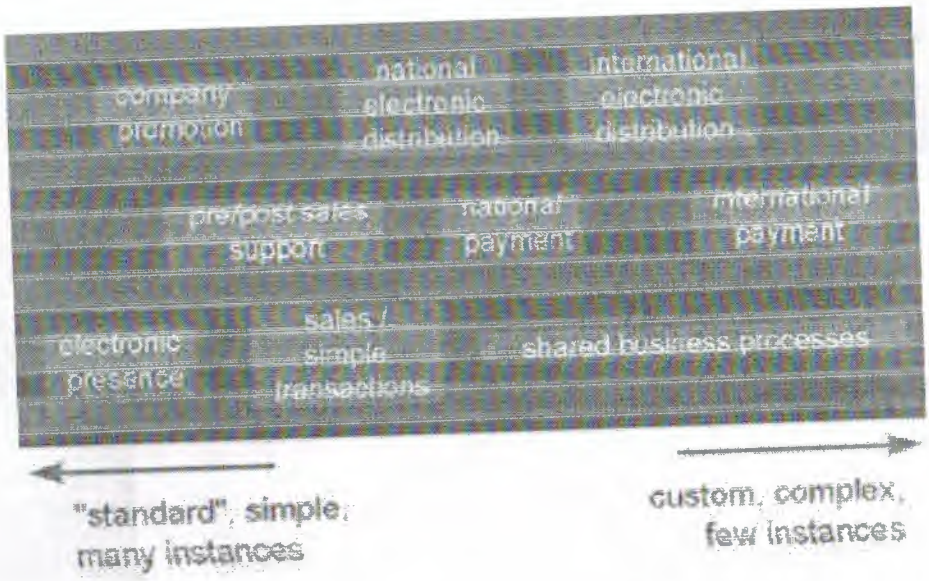

Figure 4.3: Levels of electronic commerce

4.9 The Electronic Commerce Market - supply and demand

Electronic Commerce is already a reality, it is happening now and is expanding fast. To date, many electronic transactions have been conducted within closedcommunities. However, the growth of the Internet has led to a huge level of participation of businesses and consumers in Electronic Commerce outside the boundaries of these communities.

The supply side consists of technologies (ICT including hardware and software infrastructure, generic services, specific applications), the legal and regulatory framework, standards. To this value-added services are provided for integrating electronic commerce solutions into business as well as training and consultancy services for example for business processes adaptation, new marketing approaches and staff retraining. A number of these supply side elements are further analysed in the following sections. The demand side is further analysed in this section.

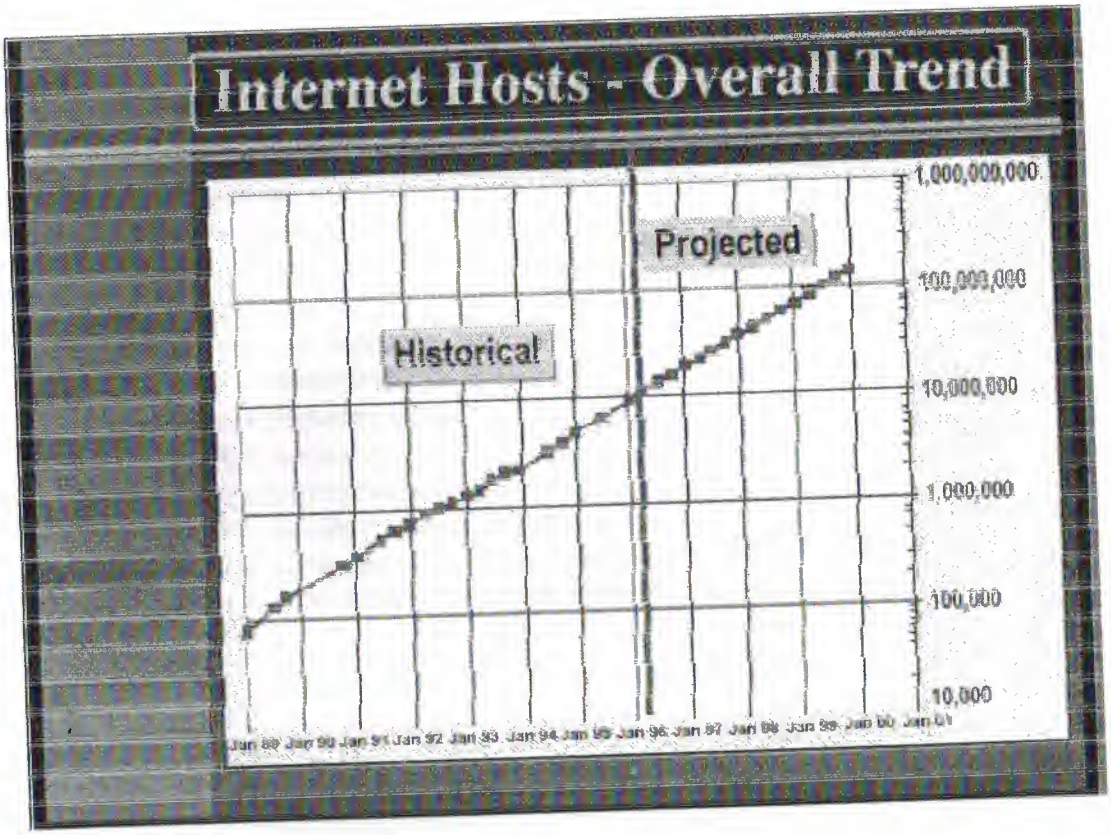

Figure 4.4: Market sizes and trends

The phenomenal growth of Internet, as a major means of business-to-consumer and business-to-business electronic commerce is illustrated in the diagram above. Statistics show that WEB traffic now dominates Internet activity. Demographic statistics of Internet users are gradually becoming available. The Oct 95 CommerceNet-Nielsen survey [CommerceNet-Nielsen 95] in the US and Canada indicates that there is a sizable base of 24 million Internet users in the US and Canada (16 years of age or older) of which 18 million are WWW users. It is notable that access through work is an important factor in Internet usage (and other on-line services) and that even now total Internet usage exceeds that of other on-line services.

In Europe, the number of host machines per inhabitant (host density) shows large differences as is shown in this diagram. The highest density of almost 50 hosts per 1000 citizens is found in Finland (even higher than the density in the US).

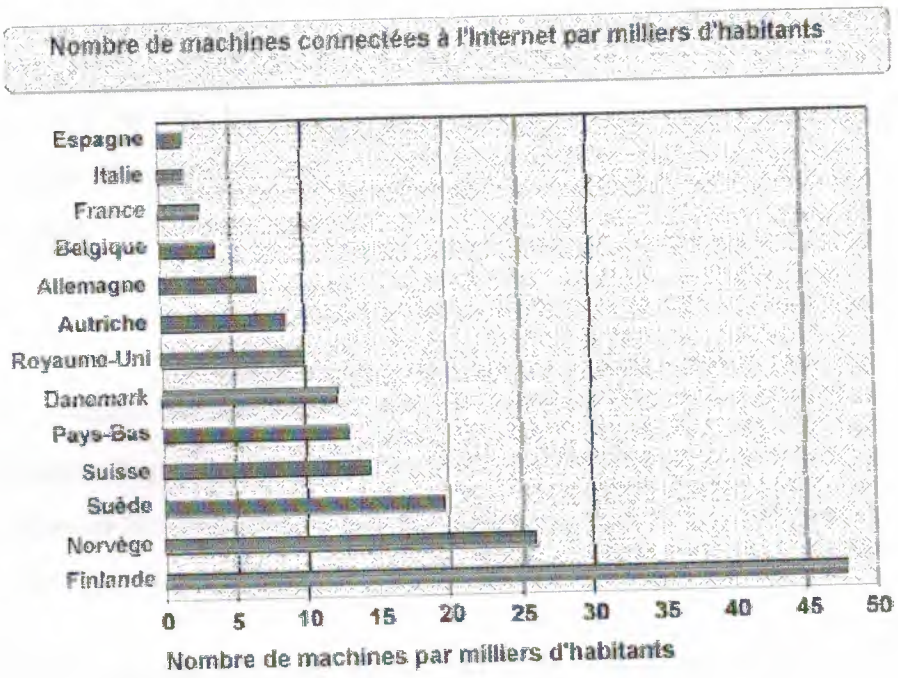

Figure 4.5: Density of hosts in Europe

Awareness amongst consumers of Internet varies widely across countries in Europe, with those who have never heard of Internet as high as 78% in Germany (compared to 20% in the US).

The broad definition of electronic commerce often leads to incompatible estimates of the size of the potential market. The following overall statistics of US electronic purchases (value in billions of dollars, excluding mail orders) might be useful though:

	1994	2000
TV/cable TV	45	400
Business-to-Business	140	450
Internet	<0.2*	600
Other on-line services	60	200
Share of total commerce	4.5 %	16.2 %

Source: Commerce Dept., Killen & Associates (published in Business Week June 12, 1995 - p.70)

siness is clearly at the heart of electronic commerce, however, there are different racteristics of the various types of interaction (business-to-business, business-to-sumers, business-to-administrations).

- Business-to-consumer:

  A 1995 study by the Gartner Group predicts that consumers will use multiple "information highway channels" for their on-line shopping: interactive TV, Internet, and other on-line systems (such as Compuserve). The WWW users are a key target for business applications as they are upscale, professional, and well educated.

  A detailed analysis of in particular WEB-based business-consumer strategies can be found in [Hoffman 95].

- Business-to-business:

  One of the major technologies which supports business-to-business interactions is electronic data interchange (EDI). EDI involves the exchange of standardised, structured information between organisations, permitting direct communication between computer systems and reducing or eliminating the need for human involvement and the rekeying of information.

  Like many other technologies, EDI has been accepted significantly more slowly than initially anticipated. It is reported that in North-America about 50,000 enterprises have installed EDI systems, and a similar number in Europe. EDI has been perceived as being too complicated, companies did not know how to integrate EDI into their applications, only insufficient standard messages were available and the number of potential partners was relatively low. However, this situation is rapidly changing and the number of companies using EDI has recently risen significantly, also stimulated by public sector initiatives like Clinton's Commerce for Acquisition (ECAT), and the former European Commission's TEDIS programme.

  The introduction of electronic commerce also involves the introduction of new ways of doing business. Resistance to change can also be expected from small and large

organisations alike. For example, in the banking sector the fear for the emergence of new and possibly competing business models could be a determining factor. Some sectors may undergo significant structural changes. These aspects of the emergence of electronic commerce (and their relationship with the Single Market) deserve further study.

- Business-to-administrations:

Government is playing a major role in stimulating the electronic commerce market. In Europe, formidable progress has been made within the IDA programme in a number of fields, notably customs and taxes, statistics and public procurement, in order to establish trans-European telematic networks and systems directly concerning the private sector. Efforts are also being made at a national level, for instance in Sweden, the target is that, by 1999, at least 90% of public procurements will happen electronically. In the United States, the Clinton administration has a target that, by 1997, at least 70% of public procurement at federal level is performed electronically.

4.10 Open issues in electronic commerce

While electronic commerce is growing rapidly, there are several open issues that must be resolved if its full potential is to be realised. These include:

4.10.1 Globalisation

Potentially, global networks could make it as easy to do business with a company on the other side of the world as with one on the next street. However, the communication medium alone, while necessary, is far from sufficient. How do companies in different continents become aware of each others' existence, and the products and services that are offered or required? How can a company gain an understanding of the business traditions and conventions of some country on the opposite side of the globe, particularly when those conventions and traditions are often unwritten? And how can the linguistic and cultural diversity of a global user community best be respected and supported? These and related questions are all part of the broad issue of globalisation - making truly global electronic commerce a practical reality.

0.2 Contractual and financial issues

ppose that a company in Thailand browses the electronic catalogue of a Russian company
l places an electronic order for products that will be delivered electronically and for which
yment will also be made electronically. This simple scenario raises several fundamental
estions that as yet are unresolved. At precisely what point is a binding contract established
tween the companies? What is the legal status of this contract? What body has legal
isdiction over the contract? Given differences in financial regulations and practices, how is
yment made and confirmed? What taxes and customs charges apply to the products? How
e these taxes and charges "policed" and collected? Could the charges and taxes be avoided
the simple expedient of maintaining an electronic "manufacturing" facility in some third
ountry?

10.3 Ownership

articularly for goods that can be distributed electronically, and hence can readily be copied,
ne issue of protecting copyright and intellectual property rights represents a major challenge.

.10.4 Privacy and security

Electronic commerce over open networks demands effective and trusted mechanisms for
privacy and security. These mechanisms must provide for confidentiality, authentication (i.e.
enabling each party in a transaction to ascertain with certainty the identity of the other party),
and non-repudiation (i.e. ensuring that the parties to a transaction cannot subsequently deny
their participation). Since the recognised privacy and security mechanisms depend upon
certification by a trusted third party (such as a government body), global electronic commerce
will require the establishment of a global certification system.

4.10.5 Interconnectivity and interoperability

Realising the full potential of electronic commerce requires universal access - every company
and every consumer must be able to access all organisations offering products or services,
regardless of geographical location or the specific networks to which those organisations are
connected. This in turn demands universal standards for network interconnection and
interoperation.

4.10.6 Deployment

One factor that could limit the emergence of electronic commerce is lack of awareness and
skills. There is a danger that many companies (particularly SMEs) could be left behind and

aced at a disadvantage, simply through being unaware of the possibilities and opportunities. ence, there is an urgent need to promote awareness, to publicise examples of best practice, ıd to provide education and training.

.11 Some Activities in Europe, North America and Asia

urrently most initiatives in electronic commerce limit themselves to national boundaries. lowever, many of these private or mixed private-public initiatives are ultimately pursuing a lobal strategy. Recently there has been a surge of significant initiatives with European rigins with international, national or regional level scope. A number of these initiatives are sted in the overview of European Electronic Commerce Initiatives, established in the context of the G7 Pilot Project "A Global Marketplace for SMEs" which itself is a prime example of a global public activity in electronic commerce.

4.11.1 Major activities in Europe

With the support of various EU programmes a range of projects has been launched in electronic commerce on the basis of Internet and private networks. Within the ESPRIT programme the domain Technology for Business Processes has a focus on supply chain processes, virtual teams, customer service and stock handling processes. The domain of Multi-media Systems focuses on payment systems, intellectual property right and new interfaces. The Integration In Manufacturing domain addresses concurrent engineering, global engineering networks and integrating the virtual enterprise. The domain of Software Technologies in Esprit addresses the Internet and Web infrastructure, including security. In the domain High Performance Networking and Computing the next generation high-speed networking and computing facilities for electronic commerce are being developed. The domain of Open Microprocessor Initiative is successfully involved in developing components for the 'network computer' and mobile electronic commerce. Within the RACE programme small business co-operation and trading services are being piloted, on the basis of advanced communications networks and services. The Telematics Applications programme supports sectoral (e.g. transport) and generic electronic commerce projects for SMEs, to provide those enterprises with an environment to try out telematics.

With the TEDIS programme for EDI development, over the years in Europe an important investment has been made in business-to-business electronic commerce. The experience

ined could be exploited in the wider scope of Electronic Commerce. This experience needs be assessed for its relevance in the Internet environment, with its different technologies and fferent user groups, as well as for its relevance in other areas such as business-to-dministrations electronic commerce. Next to consolidating the investment made in for xample legal and standardisation work an issue to address is the uptake of EDI by SMEs.

he SIMAP project, run by DGXV, is investigating within the context of the IDA programme -mail, EDI and databases for electronic procurement by government. It is aiming to create an verall pan-European procurement environment which will cover the whole procurement life ycle from the notification procedure and dissemination to monitoring and electronic endering. The purpose is to increase the efficiency of notifications of public procurement ontracts, to provide the means for disseminating this information to potential suppliers hroughout the Community, and to create a real and open single market for less expensive qual opportunity participation in public procurement, as one of the priority applications in he Information Society.

Regional electronic commerce developments are being supported through structural and cohesion funds. An example is RegionLink, a for-profit activity which is using Internet echnology to generate economic activity in European regions, amongst others in Spain and he UK. RegionLink is providing the technical facilities (a network of servers), and local business partners are providing the content. Another example is SPAN (Smart Partnerships across Networks) which is aiming to improve the industrial competitiveness of Scottish businesses, and was launched in 1995, offering demonstration projects, multimedia product catalogues and IT advice for SMEs on the Internet. Electronic commerce is supported by providing a catalogue of all Scottish Web sites and a list of yellow pages type entries.

Defence agencies in the UK, Netherlands and France have developed significant CALS and EDI applications compatible with NATO standards. The aerospace industry , in its civil programmes is involved in large scale but proprietary EDI and STEP networks linked with individual aircraft and ESA programmes. AECMA has made a study on migration towards UN/EDIFACT.

In **France**, several invitations to tender occurred in 94-95 aimed at selecting pilot projects in the framework of Information Highways. Sixty of the about 800 (?) proposals addressed the

ronic marketplace involving SMEs. Around 100 proposals received a label issued by the stry of Industry and a significant number of them include Electronic Commerce pilots.

EE is a new French association for electronic commerce and data exchange founded in ch 1996. The founding members are the Club de l'Arche (a private initiative); FRANCE which represents some 130 members, including leading manufacturers; RCATEL (an association of about 100 trade companies); and AFTEL, representing the communications sector. The goals are to organise awareness campaigns, disseminate rmation on applications, best practice etc., stimulate and support pilots and trials to rove online know-how, and offer an open forum for cooperation and the exchange of as. AFCEE's activities are targeted at IT users, technology suppliers, network providers, vernment entities, local bodies, research institutes and universities, related associations and ividuals. Special activities will include workshops, proposals to the French government d the European Commission, the launching of pilot applications and a roadshow, where a chnology truck" will travel through France for demonstrations and hands-on experience.

the **UK,** the DTI launched its Information Society Initiative ISI in February 1996, which cuses on electronic commerce, notably making use of Internet. the involvement of local siness development centres in order to promote electronic commerce towards SMEs is gnificant.

DI services have been routine operations in the retail sector for years with INS-RADACOMS and there are numerous other telecomms services operating in the private ector. American operators have a traditional presence, such as Dun & Bradstreet, GEIS, BM-IN, and the new MSNet.

n **Germany**, EDI has initially developed with direct links and national standards inside closed networks of the Industry, as in the automobile , aerospace or the chemical sectors. The ndustry is now pushing for migration to UN/EDIFACT standards and the development of open EDI services.

The activities of the non-profit organisation DEDIG e.V. - the German EDI association - are concentrating on promotional activities and consultancy/information of interested enterprises (including SMEs). In addition this organisation will act as the initial information point for all

rman users interested in the formation of a German Electronic Messaging User Group. It s undertaken to distribute EEMA User Committee information to all of its members.

platform for Information Networks for SMEs is being driven by Chambers of Commerce d Industry. The "IHK Gesellschaft fuer Informationsverarbeitung mbH (IHK-GfI)", the stem- and software house of the German CCIs and their Association, has launched an ternet-based information network.

Germany the Global Engineering Network (GEN) is sponsored by names such as Siemens-xdorf AG (SNI) and initially being developed in the framework of the ESPRIT IIM ogramme. Its aim is to develop co-operation between companies in the development of dustrial products.

Italy, a plan for Information Networks for SMEs is being driven by the Chambers of ommerce and Industry. The Technology District of Canavese has launched an Internet based etwork for telematic services, including electronic commerce, for SMEs and local public uthorities.

everal banks in **Belgium** have teamed up to provide an electronic banking network with a rong emphasis on a multi-bank approach using common international standards, and on ecurity issues between the customer - bank and customer - customer relationship, and which xpects to connect in 4 years time 60% of all companies in Belgium. The Belgian Chambers f Commerce have recently launched a service to provide Internet access to business in eneral as well as business intermediation services.

n **Sweden** the initiative Swebizz is putting special emphasis on the sales and marketing spects of electronic commerce. It is financed by the Swedish government and membership ees. The main goal is to earn money and improve competitiveness by means of electronic ommerce. Companies expect to get better market information, improve customer elationships, and cut production and administration costs . Pilot actions focus on rules and egulations, standards and business. Swebizz cooperates with CommerceNet.

n **Norway** a government-led Strategic Institute Programme 1996-2000 has been created which emphasises openness: it is based on open standards, accessibility for everyone and uses known technology. The research themes include policy issues, market mechanisms, systems development and pilots.

Austria a government led Initiative called EDI Business Austria has been created to port SMEs in the implementation of new technologies such as EDI and electronic merce. Furthermore an initiative of the nine regional governments called APTA (Austrian form for Telematics Applications) is organising awareness events in electronic commerce, I, Telework, Multimedia and other areas of the Information Society.

ne European initiatives have recently emerged, amongst them EFFECT (European Forum Electronic Commerce and Trade), launched in February 1996, which is a federation of anisations involved in electronic trade without direct enterprise membership such as EDI ums , trade groups, awareness centers, standards bodies.

e public budget for supporting the development of electronic commerce in Europe is hard estimate as there is no integrated support.

11.2 Major activities in North America

the **USA**, the Department of Commerce (DoC) has sponsored the CommerceNet initiative at was started in California by several big ITC companies. Public funding is in the range of million US dollar over 3 years. The idea behind CommerceNet is to develop on-line ectronic commerce over the World Wide Web, and to develop a strong awareness and ublicity campaign towards small business, in the USA and abroad. It is presented as a set of ilot experiments and studies, with strong technical research on the security aspects of ansactions over Internet.

n parallel, and under the co-ordination of the White House, in association with DoD the Federal Electronic Commerce Acquisition Programme is being implemented, aiming to address all types of purchasing transactions. This programme is based on the existence of the FTS 2000 network (Federal Telecommunication Network) which links all federal agencies and a front end service linked to commercial VANs operating in the USA. The application technology is based on CALS (Continuous Acquisition and Life cycle Support) and EDI (ANSX.12).

The private sector has also started many initiatives such as the Netscape Electronic Commerce facilities (including secure transactions), Microsoft Network (MSN), alliances between AT&T and Dun & Bradstreet for business-to-business brokerage (IBEX), AT&T and Hewlett-

ckard, or Novell and some of its licensees. All of these initiatives have been taken on a orld-wide basis.

ivate enterprises are starting to use Internet-based solutions on a large scale. For example, E recently installed its Internet-based open (and secure) tendering system, through which it pects to procure over US$ 1 billion worth of public contracts a year.

Canada, Industry Canada and the private sector formed the Canadian Electronic ommerce Committee several years ago, which is acting as a coordinating body for the eparation of the legal framework, the organization of awareness campaigns and pilot xperiments. It has issued several interesting studies on socio-economic aspects and volvement of citizens. Industry Canada is also associated to the work done in the USA FECA and CommerceNet) under the NAFTA agreements and is the secretary of the EC amework developed by APEC.

ublic Works & General Service (PW&GS) has developed a series of operational EC tools sed inside the Administration (including Defence) known as TRANSAC. For public rocurement, GTIS, the federal telecom agency has installed an EDI gateway allowing the onnection of TRANSAC to the major VANs operating in Canada. The Treasury Board is a nember of the EDIRA committee dealing with EDI Global Naming; several private rganisations are also interested in it, including banks and telecomms companies.

4.11.3 Major activities in Asia

n **Japan**, a very ambitious plan has been developed by MITI and its agency dealing with SMEs by creating the Electronic Commerce Promotion Council. Japan claims to have a udget of US300 M$ ('95 figures) to promote electronic commerce in Japanese society. Japan s developing home pages on the Web for business, migration to UN/EDIFACT from former sectoral national standard and CALS applications. EDI developments are coordinated under the umbrella of the ASIAN EDIFACT Board.

MPT is driving its own policy on electronic commerce, which is based on a technological approach: broadband ISDN, satellite networks and advanced multimedia applications and terminals. Next to Japanese large manufacturers, such as NEC or Sony, important R&D is being performed with IBM, Motorola and Apple. Several national and international pilots are planned in 1996. MPT action relies on the JEMA for the involvement of telecomms services

Japanese Electronic Messaging Association). International priorities are with Asia and C.

ralia is developing a policy towards the use of Internet for EC, multimedia industries S 84 M$ public funding), Fibre To The Home and virtual market for exporting firms deBlazer). The government is installing an electronic procurement programme based on EDIFACT. International priorities are in the APEC zone.

gapore is mainly involved in EDI (UN/EDIFACT) applications which are at the routine l for manufacturing, retail and export (customs). The public sector (Economic elopment Board) and private organisations, as SMA (Singapore Manufacturing ociation) have defined a master plan named EDIMAN, which is now in operation.

2 The actors and their roles

eral of the open issues identified above must be resolved at a global level. Hence, the ors with responsibility for resolving the issues and promoting electronic commerce must lude multi-national bodies. Equally, there is a role for national governments in removing ional barriers and ensuring fair competition, and for sector representatives in promoting areness and best practice. Finally, there are obvious roles for technology suppliers, user mpanies and individual consumers in enabling, adopting and exploiting electronic mmerce. Hence, the actors include all those shown in table 2.

llectively, these actors must perform all the roles shown in table 2. Each actor has some sponsibility for several of the roles and, conversely, each role is shared by several actors.

Actors	**roles**
multi-national bodies	foster the Information Society remove global barriers
national governments	ensure level playing field remove national barriers
sector representatives	promote awareness & adoption provide enabling technologies
tecnology suppliers	re-organise the business

companies	adopt the technologies grasp the opportunities
consumers	

Table 2: Actors and roles

3 The G-7 Pilot Project &quotA Global Marketplace for SMEs"

G7 members launched at the G7 Ministerial Conference on the Information Society, held russels in February 1995, the G7 Pilot Project "A Global Marketplace for SMEs", whose rall objective is to "facilitate increased competitiveness and participation in global trade SMEs by exploiting the opportunities of the Global Information Society". This is not a ect in the traditional sense (it has for example no budget of its own), but rather a coherent rational framework for global co-ordination and co-operation in electronic commerce, ased on SMEs. Three themes have been identified which form the main lines of action:

1. **Global Information Networks for SMEs:** establishing an open environment for SMEs to access and disseminate information for business, using international information networks. To be considered is the role that SME-networks and business development networks can play by giving companies active assistance and guidance in taking up electronic commerce (cfr. the ISI initiative in the UK). This theme is being coordinated by Japan.

2. **SME business requirements - legal, institutional, technical:** ensuring that the 'systemic' issues for the development and uptake of electronic commerce are addressed. These systemic issues span a broad range and include: globalisation (e.g. identification, multi-lingual and multi-cultural issues, etc.), financial aspects (e.g. contracts, payments, billing, taxation, accounting), ownership (e.g. IPR, copyright), privacy & security (including confidentiality, authentication, certification), interconnectivity & interoperability (incl. standards), and deployment (including promotion, awareness, best practice, training). Other issues will be identified as the work progresses. These issues will be addressed through workshops, studies, projects

Conclusion

This introductory paper has emphasised the broad view of electronic commerce as a vehicle for business revolution. It has stressed the importance of taking a global perspective. And it has suggested that the impact of electronic commerce will be pervasive, both on companies and on society as a whole.

Despite a number of open issues that are yet to be resolved, electronic commerce is happening today and happening fast. It is essentially a "bottom up" revolution. Companies world-wide are establishing a basic electronic presence on a global open network, learning from the experience, and gradually becoming more sophisticated in their use of the technologies. While the more advanced levels of electronic commerce present substantial challenges, the more basic levels are now well established and supported by "off the shelf" solutions. The best way of gaining the mastery of electronic commerce that will be vital in tomorrow's markets is to try it today.

and testbeds, and conclusions will be widely disseminated. It is likely that the investigation into business requirements will lead to further studies and recommendations for action in legislative, standardisation, internal market and industrial policy (structural adjustments). This theme is being coordinated by the European Commission.

3. **International Testbeds for Electronic Commerce:** testbeds is aimed at establishing practical electronic commerce systems, with specific industry sectors and context, that could subsequently form the basis for live systems. Such research, technological development, demonstration and deployment projects focus on combining existing technologies and solutions to yield practical systems. These testbeds address the business user's requirements and the barriers to uptake identified in the other activities. They validate the proposed solutions and provide further feedback on business requirements and barriers. They also play a major role as 'showcases' and contribute to promote awareness. The US coordinates theme 3.

Conclusion

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References

(http://www.bookshop.co.uk)

(http://www.virtualvin.com)

(http://www.barclays.co.uk)

((http://www.oracle.com)

http://www.esi.co.uk)

(http://www.ge.com/plastics/index.htm)

(http://www.gen.net)

http://www.asp.net/webmatrix/default.aspx?tabIndex=4&tabId=46

http://www.iisanswers.com/articles/IIS51.htm

www.**asp**101.com
www.**asp**free.com
www.**e**commerce**t**imes.com
www.wilsonweb.com
www.mals-**e**.com
www.15seconds.com/
www.takempis.com/asp1.asp
www.asp.net
www.15seconds.com/issue/971018.htm
www.webopedia.com/TERM/A/Active_Server_Pages.html