SUMMARY OF TOP 10 LISTS

COP 4910 – Frontiers in Information Technology
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(NOTE: Items with "***" have multiple entries)

1   Introduction

This document contains the names and descriptions of all Top 10 technologies submitted by task force members for ABC Widget Company. Parenthetical citations were left within descriptions (where they existed) but reference lists were not copied into this document due to time constraints. If you want to see the original source(s) for any listings, please let me know.

Technologies have been divided into two sections: 1) those carried over for further research as Favorite 5's and 2) those rejected for various reasons. Many task force members submitted similar technologies. These have been grouped together under a single header with individual member descriptions shown as A., B., C., etc. Generally speaking, no changes or clean up of member descriptions were made. What you see is what was turned in.

Overall the lists were very good in terms of content. Format was something different. Many of you failed to include a table of contents and/or section numberings for your 10 technologies. Remember format and professional appearance count. Many of you also did not include references or use an appropriate format for your citations.

Regarding the Favorite 5, I tried to reduce the number of duplicates somewhat. For example, six members suggested grid computing but I asked only two of you to further research the topic. Items not held over in the Favorite 5 where rejected for various reasons. Some technologies were just too consumer oriented (e.g., Digital Video Recorder, Wearable Technology). Some could not be readily deployed by an IT department (e.g., Micro Fuel Cells, Plastic Transistors). Although these may be important technologies, they are things that would be components within products/services purchased by ABC Widget Company but not necessarily something that could be implemented directly. Other items were rejected merely because the member's Top Ten list contained five more appropriate technologies. If you have any questions about why a technology was rejected, please feel free to ask.

2   Technologies Kept as Favorite Five

2.1   10 Gigabit Ethernet Technology ***

A.   The 10 Gigabit Ethernet is the technology to replace Gigabit Ethernet networks. This technology will improve not only regular networks but specially the backplane of blade servers and server clusters. (Computer World)

B.   There are two new technologies that could make 10 G Ethernet cheaper. Both technologies will use copper instead of fiber making 10 G Ethernet affordable to companies. The first of the two, known as 10GBase-CX4, uses four twin axial copper cable pairs. It is much cheaper than the standard 10 G Ethernet that uses fiber but it is limited by a range of only 15 meters.   The other, known as 10GBase-T which is not due out for a couple of years, will use twisted pair cabling and allow a range of 100 meters. Even though it allows a greater range than the 10GBase-CX4 it will be at a greater disadvantage in the market because it will be in category 6 rather than category 5which is the cabling that most sites are using now.

C.   Current 10Gbit high-speed interconnect cable is based on expensive optical fiber, and as our computer resource needs grow this cost will increase network equipment costs. There are two new standards that use the cheaper copper cabling that will help lower this cost: 10GBase-CX4 and 10GBase-T. The first is almost through the certification stages and will be available in the near future, but the technology is limited to 15 meter wire lengths using current Cat 5 cable. This will limit its use to close proximity equipment. With 10GBase-T, the wire can be up to 100 meters, but the extra distance may require Cat6 cable. For those locations requiring new cabling and high speed connections, 10GBase-T will be an ideal solution over fiber (for runs less than 100 meters.) (ComputerWorld. Copper Tops 10 Gigabits.)

D.   This technology is used to connect switches together with speeds of up to 10gigabits. 10-Gigabit Ethernet came out a little while ago, but has recently gone down in price so more and more companies are buying into the technology.

2.2   3D Desktop – Project Looking Glass ***

A.   This innovation is changing the way we see and use desktops from here on out. The technology allows us to view application in a 3D environment and manipulated as 3D objects. The looking glass will allow users to switch virtual desktops by clicking around the right edge of the screen. One also has the option of writing notes right on the web page and reorganize your screen within the 3D space provided. This shall only create more possibilities to overlay interactive information and controls onto real-time backgrounds and lead to better and quicker decision making.

B.   Project Looking Glass is Sun Microsystems' latest innovations by its Advanced Software Technology. It is a new 3D OS from Sun Microsystems. (Sun Microsystems)

C.   Sun Microsystems are working on a desktop that allows users to move items around in a three-dimensional manner. Users can move items up close or push others farther to the back. This will allow users more freedom to organizer the files they are working on for faster productivity.

2.3   3-D Interfacing (Web Browser)

Different software for browsing three-dimensional Web sites are becoming available for businesses that will offer products and shopping experiences in a 3-D universe. The user navigates within virtual malls, cities and product lines. A user can grab an item he or she may want to purchase and rotate it within all degrees of freedom to inspect it before making a decision.

2.4   64 Bit Processors ***

A.   The AMD ATHLON 64 processor is the world's first Windows Compatible 64-bit processor. This new 64 bit processing permits operating systems and software to process and access more data then ever before. Not only will this system allow for 64 bit applications to run,

but 32 and 64 bit applications simultaneously. AMD's newest processor will definitely give Intel some competition and force Microsoft to speed up its release of a 64 bit Windows.

B.   Advanced Micro Devices (AMD) has produced one of the most important processors on the market. Unlike Intel's 64 bit processors that can only run 64 bit applications, the AMD Opteron platform supports both 64 bit applications and legacy 32 bit applications. Codenamed "Sledgehammer" the Opteron is able to appeal to consumers who want a fast server to run their 32 bit applications while providing them with the flexibility to upgrade the software as needed. One of the nicest features of the processor is that the Opteron can run both 64 bit and 32 bit applications simultaneously making transition phases during the upgrade process extremely smooth.

C.   "Sixty-four bits holds the promise of new performance, new architectures, new compilers, and a new balance of power in CPU realpolitik. A clean break with the old, a new chance for the new." (Extremetech)

D.   AMD has come out with a mobile version of its 64-bit Athlon model processor. It consumes less power and allows 64-bit processing on laptops and other mobile devices.

E.   Today's computers primarily run on 32-bit processors. In the coming years, computers will shift to more powerful 64-bit processors. The processors allow computers to use more RAM which will allow them to run larger applications faster (Overview: 64-bit Processor Technology, 2003). This allows computers to use more than 4GB of RAM which is the maximum for 32-bit processors (Overview: 64-bit Processor Technology, 2003).

2.5   64-Bit Windows XP Edition

The success of any department within a business relies on large amounts of memory and performance of their computer system. The capabilities of this software range from greater memory systems, windows compatibilities, productivity tools and virtual memory. Access to the information systems and integration of applications is the key element this software can offer to

workstations who utilize 32-bit systems. Windows XP 64-bit creates high performance programs and functions that are used everyday in the develop environment within workstations.

2.6 Application Web Services

An application service provider for businesses allowing companies to rent software for a monthly fee. More ideal for the small businesses that cannot afford to purchase high price software. Companies' can spent a fraction of the cost and just use the applications when they are required.

2.7 Audio Mining ***

A.   Audio Mining is the process of extracting and indexing the words in an audio file and then using that index to search the file for specific words or phrases, also called audio indexing. (Word Spy)

B.   In today's world the mentioning of potential threats is not taken loosely when it comes to public security. Its effectiveness is comparable to threats in the business world as well. With the use of audio mining technology, one can monitor and retrieve specific information through recorded or live video footage, radio and television broadcasts, telephone conversations, call center dialogs, and help desk recordings. The process consists of combining speech recognition and language processing to transcribe the content of video or audio broadcasts into computerized text information. The use of this information can be used to deal with customer complaints, job related transactions over the phone, and indexing live broadcasts to monitor breaking events. Audio mining technology is a vital source of information retrieval.

2.8 Autonomic Computers ***

A.   Autonomic Computers are computers that can think for themselves. These computers   will have the ability to perform self-diagnostics, which will allow users to concentrate on their jobs instead of maintaining the computer (Spooner, 2002).

B.   This is the emergence of a computing technology just beginning to be seen in the auto deployment of operating system patches. The purpose of this technology is to allow computers on an enterprise level to self diagnose problems and alert IT staff with more precise troubleshooting information. With current networks, even the most simple, there is a great deal of human intervention. There are two levels of this technology, predictive and autonomic.

C.   This technology field has been in development for many years, but is finally starting to see some true progress in the software to implement it. There are many functions to this initiative, but at its heart it is a system that will automate many of the routine computing functions and attempt to recover from many types of unusual situations or failures without the need for operator intervention.   This will free up our valuable IT personnel to focus their duties on software design and implementation instead of spending time performing routine tasks, such as database restoration or network equipment maintenance. Some of the solutions expected within the next few years by Gartner include network load balancing, resource chargeback to user groups, and self-healing software and hardware. IBM is currently working on implementing many of these features into its WebSphere product, including systems that automatically adjust to varying workload levels to achieve maximum efficiency. (ComputerWorld. The Once and Future IT.)

2.9   Autonomous Media

Sure, everyone would like to have AI around * except, of course, for the paranoid or skeptical. It isn't an easy thing to develop, so one might settle for the next best thing-- IA. Intelligent agents often are found on the web, using cookies to remember things about specific users, and act as an interface to that site (or whatever)'s data and utilities. They aren't going to become self-aware anytime soon, but they can make things a lot easier for you, and for those who are a bit less computer savvy.

2.10 Bayesian Machine Learning

Computers can use Bayesian probability mathematics to deduce likely relationships between concepts, without being explicitly taught. In other words, computers can learn conceptual relationships on their own by using the principles of Bayesian statistics.

2.11 Big Media Objects

The biggest issue on the internet today is speed. People cannot download a satisfying amount of information fast enough. Video is too large to be on-demand, text limits what users want and images aren't as efficient as they could be; thanks to mixing RSS and BitTorrent's platforms, users may be able to "subscribe" to a list of things that they find interesting and find it easily accessible from anywhere, anytime. Combining RSS' "feed" model with BitTorrent's distributed distribution model (I believe that makes sense), the information a person wants can automatically send itself and be ready for consumption in the morning.

2.12 Biometric Identification/Security ***

A. Fingerprints and retinal scans are becoming a new way of allowing access to users instead of passwords. Using an algorithm based on specific physical fetchers of the users unique fingerprints, the algorithm is more complex to hack then a standard text password. Biometric Identification can be used not only to allow access to restricted areas, but also allowing access to account and file information.

B. "A biometric identification system identifies a human from a measurement of a physical feature or repeatable action of the individual (for example, hand geometry, retinal scan, iris scan, fingerprint patterns, facial characteristics, DNA sequence characteristics, voice prints, and hand written signature)."(Hipaa Basic)

C. With the importance of security in today's information-filled world, biometric identification is increasing in appeal. Biometrics measures an individual's unique physical or behavioral characteristics to recognize or authorize their identity. To date, signature and voice

identification are the most developed verification systems. There are many more that can be developed though, including fingerprints, hand geometry, iris, retina, and face verification methods. Privacy is an issue that continually arises with the use of biometrics, and there have been instances when people have refused to use it. There may also be a concern about whether the database has the correct information in it. One thing is for sure, it promises that a person will never face the problem of forgetting their password or key card somewhere else (10).

D.   Biometrics aren't a new technology; the emerging technology involved here is the ideas that organizations and governments are putting into the field and the tools being used to bring them to life. Biometrics is a generalized term used to describe the use of physical appearance, whether it be your gait or your face, for identification purposes. With the world facing security issues of more import than ever before, everyone wants security * and biometrics are more difficult to fool than anything else.

2.13   Blade Servers ***

A.   Blade servers are compact server cards that plug into a chassis and typically share a common backplane and power source. Blade servers are the ideal choice for great performance on a limited space. (Computer World)

B.   These are much smaller and are boasted to provide more computing power per cubic foot. However, they can get very hot and will need a way to be cooled. Also, it is not inexpensive to use blade servers, as you will need to purchase the other hardware that supports it.

2.14   Blue Laser Optical Storage Discs ***

A.   Another successor to the DVD involves using an optical disc using blue lasers instead of red lasers which read the data. Blue lasers have shorter optical wavelengths, and can read and write data faster and in a much smaller space than red lasers (Anthes, 2004). Sony is

developing a new standard called Blue-Ray, which hold approximately 25GB of data (Anthes, 2004). Other formats include the HD-DVD which can hold 15GB of data (Anthes, 2004).

B.   Blue Laser Technology may be the next thing after DVD and CD's. Blue laser technology permits much more data in the same space and also reads and writes information faster than does red laser which is the technology that DVD and CD's use. The difference in the amount of information that can be stored on a DVD size disc when you use blue laser technology is amazing. Sony announced that a DVD size disc that used blue laser stores 25 GB while a regular DVD that uses red laser stores 4.7 GB. And like every new technology when it first emerges, it is expensive when you compare it to the present cost of a DVD or CD.

C.   Current backup systems utilizing optical storage are limited in size and speed by the current use of Red-Laser technology. Recent developments by Sony and other vendors developing Blue-Laser storage systems are set to update the standard. These new systems will allow us to store more of our data on the extremely compact and reliable optical media by increasing the size from 9.1GB to 30GB or more per disk. This will equate to a price per GB savings of over 80%. The various vendors are still working on several competing standards, but one technique that is using dual-layer disks has achieved over 50GB per disk.   In addition to increased capacity, the new system also has faster disk read and write times. (ComputerWorld. Optical storage sings the blues)

2.15   Business Exchange Technology

In the current information technology environment the electronic data interchange (EDI) is very common. But with the greater speed and available of the Internet the need to convert from EDI to a more efficient transport method is necessary. The answer is the Extensible Business Reporting Language (XRBL). This transport allows greater availability of data exchange between programs and databases through the Internet.

2.16   Convert Dead Bits to Live Structure

When paper documents are scanned today, the structure cannot be edited as on paper. Technology coming from Microsoft Research Labs allows documents to be scanned in and keep the original meaning of the document (Simard 2004). These documents are read in based on text, font, and pictures which gives a user more freedom in editing the documents (Simard 2004).

2.17   Data Mining ***

A.   Data Mining is the ability to find, manipulate, and change information in a database through automated measures. Businesses can use data mining to analyze large amounts of information in databases to help procure information necessary to make decisions. [8] This is a software technology.

B.   As databases grow, sometimes there are hidden facts within them. Using software that can recognize patterns and relationships, a data mine is able to create rules that allow for the prediction of data. This technology can be well used in fraud detection, credit analysis and customer profiling.

2.18   Database Software

Online banking, shopping, & gaming are just a click away. Why leave your home to do any of these things? With the creation of Database Systems and Software users can access their information easily online. Be it looking at your bank statements or re-accessing a shopping account to view your past purchases, database systems and software make it easy. No longer do we have to rely on a human writing private information about you down and storing it in a massive warehouse. Now Database Software lets you store information easily on computer systems for everyday use.

2.19   DDR2 Technology

Samsung's DDR2 memory is really going to outperform is predecessor.   Adding functions like OCD (off-chip-driver calibration) to achieve optimal driver strength and ODT (on-die termination) to increase signal integrity.   In addition, a special control method has been created to increase buss efficiency.   And to top it all off, DDR2 doubles the external memory bandwidth of DDR and uses 28% less power.   This is a hot new technology that will be playing a major role in the future development of memory.

2.20   Digital Printing

Digital printing is the newest technology for mass printing.   There are many benefits of this technology, but the costs are quite heavy.   At $200,000 to $1,000,000 not even the average corporation will be purchasing these.   Digital printing is able to print on virtually any material and uses toners and lasers in a similar fashion to conventional laser printers.   The difference is the scale and quality of the printing jobs.   Although they do print full color, they are not photo quality and usually print in the 400 – 800 dpi range.   Most of the companies that own these printers do contract work for smaller printing companies that need full color work and timely turnaround on their print jobs.   The setup time for these jobs is often only a few days due to the fact that the new technology doesn't require plates or film to be created (normal turnaround time for conventional printing presses can be a couple of weeks).

2.21   Disaster Recovery

Tape drives in the modern computing age are no longer good enough. Their slow rate of recovery and prohibitive high costs at larger capacities are bringing their lifetime to a near certain close. Research of this technology would cover the various coming hardware solutions that are destined to replaced aged archival tapes.

2.22   Distributed Storage

The idea of distributed storage addresses the need to eliminate dependencies on particular machines or systems for data.   The idea is similar to music and file-sharing protocols, but extends to all types of data.   Files and their distributed hash tables are scattered about the internet, making for high-availability and protection from data loss.

2.23   Dual Core Processors ***

A.   This technology allows for more performance by adding parallelism to the processor. Allowing multiple programs to be run at the same time. Intel plans on having these chips out by 2005.

B.   Intel is creating a processor with 2 cores on 1 chip. This technology is moving fast and is being given high priority. It is, in fact, being put ahead of the chips that are supposed to be released in the near future.

2.24   Electronic Perception Technology

Electronic Perception Technology is a 3D electronic perception of images created in mobile devices. One application of this technology projects a keyboard on a table. The user is then able to type text on the table and enter it into the device.

2.25   Enterasys IDS (DIR)

The Enterasys Company has just started developing a new type of Intrusion Detection System called Dynamic Intrusion Response or DIR. This new technology is capable of using intrusion detection tools to automatically detect and react to suspicious network traffic. This can be used to authenticate user access and prevent any unauthorized users access to the system. This new software technology is sure to have a big effect in the security field.

2.26   Evolution 2

Evolution 2 is a program that allows users of Linux desktops linked to the Novell site to manage email, public folders and many other tasks on Microsoft Exchange Servers.

2.27   File Sharing Networks

Almost everyone has used Kaza or Limewire to download music. And you probably know or heard of someone being pursued by the authorities for violating copy write laws. A new network is being developed to protect file sharing lovers. These networks will assign multiple ip address to users to hide there identities. This technology can be used as a double edged sword to hide the identities of virus writers or even worse terrorists.

2.28   First CAD Search System

Engineers have created a search engine that searches databases for three dimensional items, such as parts. A lot of times, engineers spend their time looking for a part because they want to reuse it. Also, CAD is used to help design a part, but then it is stored away and forgotten with no way to look for it. This search system will reduce time since the person can either sketch what they are looking for or select parts that are like the one they are looking for and then receive a list of parts that are similar to the one for which they are looking.

2.29   Fractal Image Compression

This is a new type of image compression that allows for a much greater degree of compression than current methods. Fractal Compression uses geometric mathematics to represent one area of an image by comparing it to another region (Boughton, 2000).

2.30   Froogle

Froogle, a unique new search engine, which utilizes Google's search technology by concentrating on purchase items only. In addition, Froogle ranks stores based on several factors related to your search. You can even refine your search with a specific dollar amount you wish

to spend or brand of product you desire. It is one of the quickest and easiest ways to find information on the internet.

2.31   Grid Computing ***

A.   A form of seamless computing that spans across many smaller desktop computers to give the appearance of one supercomputer. With the many computers connected to the Internet, those that are in idle are seen as an unused resource. Grid computing is said to be the new form of Distributed computing. [Grid]

B.   Grid computing involves sharing free resources on networked computers. Using grid computing the average computer user would have access to computer power comparable to a super computer. This technology will allow computers to work together on a problem (Boyd, 2003).

C.   Grid computing is the utilization of many existing computational resources, such as processors and storage devices, to distribute a network of computational power for sharing among business and scientific organizations. By using the power of many thousands or millions of networked computers, very large, and complex problems can be solved in a fraction of the time it will take for a single computer processor. An example is the SETI at home project.

D.   In order to effectively manage the growing number of sales and product inventory we will see with future growth, it will be vital to provide a robust computer system capable of processing this workload. One approach that will provide a scalable solution to this problem is grid computing. This system uses a collection of separate computer systems connected together in a "grid" to form a highly efficient and fast processing system. Though it is still in the development phases, it is expected to be ready for use in the supply chain environment within 5 years. This timeframe is for a complete solution, and IBM is currently working on adapting their WebSphere Application Server to balance the workload of several applications across a grid architecture. (ComputerWorld. Grids Extend Reach)

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E.   This technology implements grid protocols that enable CPU's, applications, databases and even simulations to be interconnected across the internet. This would allow any computer to tap in to a massive collection of information and resources (10).

F.   Distributed storage may be a reality today, but why stop there. With grid computing, one can distribute processing, network use and of course storage. While it may seem as if you're working with only one computer, one, with the grid computing model, can construct a sort of "super computer" out of old workstations lying around the house. While it may not be that simple at the moment, the evolution of grid computing beyond ideas and flow-charts into workable models has the technology industry wondering what to do with all of those old, surplus workstations.

2.32   GWindows

GWindows is a technology that Microsoft is currently working on. Its purpose is to introduce a computer vision algorithm, whereby a set of cameras will monitor hand motions and then act appropriately. It will also use voice recognition to carry out users' commands, thus eliminating the need for a keyboard and mouse. There is currently no release date for this technology, but it promises to be an impressive step forward in enhancing the every day operation of computers (7).

2.33   High Speed 4, 8, and 10Gbit Fiber Channel Switches for Storage Area Networks

As our data storage needs increase, the speed to access that data by our various servers and applications is also steadily increasing. To help alleviate this impending access bottleneck, the newly approved 10Gbit fiber channel switch technology will soon enter mainstream production. This technology will provide a much faster data transfer over our current 2Gbit speed. It will also provide a more efficient use of our network resources by requiring fewer ports to connect our systems. This technology is still in the certification stages, so in the interim there

is also 4Gbit equipment already in production, and 8Gbit will be ready very soon. Utilizing each speed increase as it becomes available will speed up access as needed, and as we acquire the newer technology the slower speed equipment can be moved to a different function as the design is scaled up to full speed. (ComputerWorld. SANs Come Up to Speed.)

2.34 Holographic Discs

Currently DVDs are the standard for storing large amounts of data on optical discs. This may change in the coming years with the introduction of holographic discs. Developed by InPhase Technologies, these discs are capable of storing 200 gigabytes of data and writing data four times faster than DVDs (Hadenius, 2004, p. 22). This technology used holographic storage, which stores data in three dimensions and will be available later next year (Hadenius, 2004, p. 22).

2.35 HyperTransport Technology

HyperTransport, designed by AMD is a unique chip-to-chip (chip-to-bus) communication system which provides up to 22.4 Gigabytes per second. This system which will most likely replace multi level busses with its increased bandwidth, low latency, low power consumption and excellent scalability. This is sure to be an interesting and highly detailed technology.

2.36 IBM Electronic Common Technical Document Viewer

IBM Electronic Common Technical Document Viewer is an xml application that creates an index file to provide information about electronic submissions that enable processes for batch print documents, searching documents, and downloading submissions in its entirity.

2.37 IBM Shrinks Middleware

IBM's technology can now be run on any platform and is less dependent on desktop applications. This will create more flexibility with their software.

2.38 IBM Tivoli Access Manager for Microsoft .Net

IBM Tivoli Access Manager for Microsoft .Net enables Tivoli Access Manager to be accesed from a .Net environment to enhance power and flexibility of security solutions. Some of the technological functions of this application include access to administration and authorizaton processes in addition to evaluation of .Net membership roles.

2.39 InfiniBand

InfiniBand regulates the communication between processor(s) and I/O devices. With its promise of a faster speed connection, it is expected to gradually replace the PCI devices that are used in computers today. This internal data-flow system offers a throughput of 2.5 gigabytes per second, which is much faster than many of the current bus architectures. Much like a network transmits information in packets, InfiniBand transmits a "message" as a collection of data packets. This architecture uses a serial bus connection, which can carry multiple channels of data rather than the standard parallel bus used in many servers and office computers, which can only use parallel channels. With the combined development of Compaq/HP, IBM, Intel, Microsoft, and Sun Microsystems, InfiniBand should significantly improve the capabilities of tomorrow's computers (11).

2.40 Intrusion Detection System / Intrusion Prevention System ***

A.   IDS: "A system that tries to identify attempts to hack or break into a computer system or to misuse it. IDSs may monitor packets passing over the network, monitor system files, monitor log files, or set up deception systems that attempt to trap hackers." IPS: "The definition of IPS that we are going to use is any device (hardware or software) that has the ability to detect attacks, both known and unknown, and prevent the attack from being successful."(Security Focus)

B.   There are many versions of this technology, QuickSpec by SafeNet is one newly released version.   IPS is more proactive than the more common IDS.   While IDS is more

passive, IPS takes a more active role in the security of the network. This technology is useful for preventing security attacks on a system. [1]

2.41   Java Tool to Convert Oracle Forms

Oracle is a world wide leader in the development of database software solutions. The offer two tools called oracle forms and reports. These tools as there name suggests lets developers create custom forms and reports. A form is equivalent to a GUI in the windows environment. All this comes at a heavy price. A new software solution is now available that will take any preexisting form and convert it to Java code. This will allow developers to maintain the form in Java which is free.

2.42   JDBC

Java Database Connectivity (JDBC) is a Java API that allows Java programs to manipulate SQL-compliant database. Object Oriented Database Connectivity is similar to JDBC in the fact that they both use object oriented languages, but JDBC is different in that it only allows Java as its developmental language. The goal of this call-level interface is to allow Java programmers access to data within a SQL database. JDBC permits use of the standard library routines to connect to the database and then send SQL statements to manipulate or return whatever data is required (3).

2.43   Longhorn ***

A.   Longhorn is Microsoft's version of a 64-bit OS. Supposedly it has been rebuilt from the ground up, with security and a "create once and use multiple times" applications. It gets this by using object-oriented programming very similar to Java.

B.   Since the late 80s early 90s, Microsoft has redefined the home computer industry. Almost every household in the world has at least one computer. The simple to use Operating System (OS) has allowed anyone at any age level to enjoy home computing. As time passed and

the users of Microsoft's Operating System, dubbed Windows, grew, so did the need for better security for the average Joe/Jane. Hackers ran ramped across the internet. Viruses, worms, and Trojan horses corrupted the web. The main focus of these hackers is the Microsoft OS. No matter how much Microsoft fought to stop these attacks by releasing patch after patch, it didn't seem to help. Some users of the Microsoft system did not know how or just did not feel like doing updates. When their system crashed the blame was put on Microsoft. In 2005 Microsoft will release a new OS that will handle all these situations. The OS Microsoft has dubbed "Longhorn" will deal with these threats on without the users interfacing with the system using new technology. "The new technologies will allow Windows to detect irregular system behavior--in terms of network traffic, memory usage, and system calls, for example--and responds to them automatically." (PCWorld.com)

C.   Our server needs continue to grow, and Microsoft is constantly at work improving and refining their server software. The upcoming version, code named Longhorn, will offer greater hardware support and take advantage of upcoming technologies like PCI Express and diskless blades, and will scale much better than current versions for mainframe use. One of the important features allowing this use is the ability to remove all unnecessary software "modules" not needed for a particular server to function. This will allow much more secure and reliable operation for specific machines, such as a dedicated DNS or web server. This reduced code will also allow us to purchase less expensive machines to do simpler tasks but still operate with the same server OS interface across the board, simplifying administration. (NetworkWorldFusion. Microsoft rolls out five-year server roadmap, pegs Longhorn Server.)

2.44   Microphotonics

This technology uses crystals to direct the flow of light in such a way that optical circuits can be created. These crystals form a perfect mirror in which light can be broken up into different wavelengths. Circuits created using these crystals are used to replace the electronic

circuits within a router. This process dramatically increases the speed of networking devices and allows for more efficient optical fibers (MicroPhotonics).

2.45   Millipede System

The old becomes new again. "Millipede uses thousands of sharp molecular-size tips to punch indentations representing individual bits into a thin plastic film" (PC World). Millipede can store about 20 times more information then the conventional optical discs. [Millipede]

2.46   More Pleasant and Positive Computers

In a recent study computers with voice synthesizers have been programmed to give compliments to users during slow network times. The result has increases a more positive user attitude throughout the workday. A more positive work attitude as also increased user productivity.

2.47   MRAM ***

A.   Magnetic Random Access Memory is a new technology developed by IBM. It will allow the computer to boot faster, and use less power, which will save energy. Also MRAM has the possibility of store more data, and improve the data transfer.

B.   Today's RAM, or random access memory, in computers is volatile and loses it memory when the system turns off. A new technology is coming out called MRAM, or Magnetic Random Access Memory, which does not lose its memory when turned off which benefits laptops and other devices (Arensman, 2004, p. 68). It is also faster and more durable than flash memory used in digital cameras and other hand held devices (Arensman, 2004, p. 68).

C.   MRAM is a technology that uses magnetic charges to store information within memory. This differs from the current widely used, DRAM, which uses electrical charges to store bits of information in memory. MRAM is much more efficient and may allow computer systems to start instantaneous without having to wait for boot up (Bonsor).

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D.   This is a type of ram that will be able to retain what is stored on it if the power is lost. It uses magnetic charges instead of the current use of electrical charges. This advantage will allow computers to start up instantaneously, as well as, prevent data loss. (TechTarget,2001).

E.   MRAM is the latest in random access memory technology. MRAM stands for magnetoresistive random access memory and uses fluctuations in magnetic fields to store information, which differs from conventional types of memory that use electrical charges to store information. The advantages of MRAM are simple: MRAM is capable of higher storage capacity, shorter access and write times and less power consumption. MRAM is also non-volatile and does not need a continuous source of power to retain its data.   This feature alone makes MRAM extremely desirable as it could easily replace hard drives and allow for virtually instantaneous retrieval of the data stored within.   MRAM works on the principal of measuring the resistance of a metal sandwiched by a magnetic field.   Currently IBM, Motorola, and Honeywell are developing MRAM. There are 7 other major companies that have invested in the research, and propose that there could be a version of MRAM on the market as soon as the second half of 2004.

F.   MRAM is much faster than flash drives and DRAM. It is "non-volatile" which means that it retains memory after the power is disconnected. It is also very energy efficient, which makes it cost efficient as well. [7]

2.48   MySQL Cluster

MySQL Cluster is the latest in data base technology.   MySQL claims 99.999% (less that 5 minutes of downtime per year) availability due to the integration of parallel server architecture. There is no single point of failure in the system due to the distributed parallel architecture (this is completely dependant on the architecture of the systems that are running MySQL).   The database is designed to run entirely in main memory to decrease IO bottlenecks and can handle

thousands of transactions per second.   Due to its distributed nature, failover time to redirect the requests to other servers is generally under a second and the transaction information is automatically propagated throughout the network.   The database nodes are also able to automatically and dynamically recover from failures without any additional configuration.

2.49   Nanotransistors

Nanotransistors will change how we see computer chips. It is an organic carbonic tube that will allow a creation of a chip so small and powerful that it will be almost invisible for the human eye to see. This new technology will permit the creation of fast and cheap computers.

2.50   Nanotube for Cooling

Purdue University Researchers have come up with a new way to cool heat caused by computer processors.   Bursts of air from carbon nanotubes cool the chips to prevent the computers from overheating. The tubes could be used to cool smaller processor chips that would allow faster chips to be place in laptop computers.

2.51   Nanowire Film ***

A.   Nanowires will be the technology of the future. A component thousand times smaller than a human hair, but with an incredible capability of storing data. The promises for it are unbelievable. It will allow computers to be very cheap. Nanowire film will allow the creation of disposable computers in the future.

B.   Scientists have created memory cells on the molecular level that can hold about 40 GB per square centimeter. The nanowires are about half the size of the "smallest known virus." Not only do they reduce size, but each cell is capable of holding 3 bits of information instead of just 1. This is achieved by having 8 different electronic states. The drawback right now is that the information is only stored for about 600 hours, but they are working on increasing that lifespan.

2.52   Neural Implants

It seems more like science fiction than science fact * putting computer chips into your brain to allow you to command your computer with your thoughts. It's closer than most people think, however, and several companies are putting everything they have into developing this technology. While this may not be available to just anyone anytime soon, several organizations are attempting to develop neural interfaces for stroke victims and others who suffer from paralysis * allowing them to control robotic limbs with a thought as they used to command their own.

2.53   Neural-Network Technology

Neural Network Technology is a new innovation based on the operations of the human brain. Just as the brain learns by experience, the idea behind this technology is to have computers learn by experience as well. [2]

2.54   NTI Secure Toolkit

NTI Secure Toolkit is a credible encryption software created in compliance with laws by congress that require businesses to secure sensitve information. Upon initialization of the Toolkit, two programs are setup. NTI Guard is the first programming that encrypts files. The second program, NTI Access, works in compliance with NTI Guard to provide secure backdoor acces to the encrypted files. Recipients of the encrypted file need only a password for access. A copy of the software is not necessary.

2.55   OEM – Ready Router

OEM technology will be the future of VPN and SOHO/SMB routing. This new software product has lots of advantage to offer such as plataform flexibility, flexible features and a simple user interface. And best of all it will available in the market very soon.

2.56   OLED ***

A.   Organic light-emitting diodes might some day replace LCD's and CRT's. OLED's have brighter and sharper color than LCD's and CRT's. OLED's and LCD's share a common ground in processes, but they also differ in that LCD's have a fluorescent backlight while OLED's emit their own light. This difference can make the OLED's thickness half that of an LCD since the OLED doesn't require a backlight. The downside to the OLED technology is it s short life. The average OLED will last about 8000 hours which in a computer monitor that is always turned on will not be cost efficient.

B.   OLED is a technology used to display images on a panel. "OLED technology consists of extremely thin layers of organic material applied on a substrate such as glass. When stimulated by an electrical charge, these materials emit light" (Eastman Kodak Company, 2003).

C.   OLEDs are brighter and more energy efficient than the regular LEDs. They use a mixture of carbon, nitrogen, oxygen and hydrogen, hence why they are considered organic. OLEDs work well for flat-panel screens and other technical devices using diodes to emit lighting. [7]

D.   This technology is going to improve the quality of a display over the current LCD and CRT computer display devices. The OLED is similar to the current LCD technology, but differs because it doesn't have a backlight like the LCD uses. Rather, it operates by providing the light at each pixel. This leads to a brighter, crisper, and more colorful image. It also shares the other advantages of LCD displays over CRTs, such as smaller footprint, lower radiation, and much lower power consumption. The current life cycle of OLEDs is still too low to allow large screen deployment, but with further development this could be invaluable to our product design teams. (ComputerWorld. Displays Go for Sharper Image.)

2.57   OODBMS or ODBMS

Object-Oriented Database Management Systems (OODBMS), or Object Database Management Systems (ODBMS) are an increasingly popular model for storing data. They are considered a wise choice when there is a business need, high performance, and complex data. This model allows the use of an object-oriented language to develop a database, creating data as objects. Among the benefits of this system are the tables are automatically related and there is inheritance used within the database. Another benefit is that there is less code, which means there will be less processing time, yielding better performance. Many websites have begun using this type of database in the background due to its flexibility and easy use with XML (4).

2.58   Optical Storage technology

Optical Storage Technology is based on blue lasers unlike current data storage which uses red lasers. Blue lasers operate on shorter wavelengths; therefore, they can write more data in the same amount of space and read it faster. [4]

2.59   P2P – (Peer to Peer Networking)

Everyone at some point or another has joined a site that allows them to download and item, be it music, movies, software, etc. These sites, which have become big business in the halls of Congress, are called Peer to Peer sites or P2P for short. Peer to Peer sites allow users from all over the world a way to connect and share data of any sort. The major issue is that music, movie, and software companies find that users on P2P sites are sharing hacked data. In the past the only law governing hacked data said that users cannot sell licensed software. With the creation of P2P sites, users did not sell or buy software. They simply gave it away for free to anyone who connected to their network and downloaded it. With this loop hole in the law P2P sites began to appear in mass on the internet. Users had an unlimited supply of data they could access at anytime. Seeing this as a major issue, Congress begin a might battle that would rock the P2P community for years to come.

2.60   PCI Express ***

A.   PCI express is a new technology that uses point-to-point serial buses, high bandwidth and low latency. Also it permits easy implementation and smaller connectors. PCI Express eventually will replace all the parallel buses system.

B.   The PCI-X is an upgrade to PCI, the standard I/O technology used today. PCI-X technology increases bus capacity of the conventional PCI bus bandwidth, by extending the 66MHz standard to 133MHz performance using either a 32-bit or 64-bit bus. The intention of this technology is to support high-bandwidth applications with "enhanced performance in storage area networks (SANs), enterprise computing, and voice and data communication systems". This technology shall integrate with existing technologies within the systems to improve expansion of the I/O bus structures. The chip supports different configurations within the systems' preexisting configuration of PCI or PCI-X mode on either bus in any combination.

2.61   Pentium 4 Extreme Edition (HT technology)

Available at only two speeds (3.2 GHz and 3.4 GHz) the Pentium 4 EE is a power to be reckoned with. Designed for systems that require high performance, the P4 EE has an advanced 800 MHz system bus and 2MB of L3 cache. And with its new Hyper-threading technology, enables the user to run two applications in parallel utilizing the processors ability to simultaneously execute two software program threads. This allows the user to run these two applications without sacrificing any system performance. This system based on Intel NetBurst microarchitecture delivers high performance and power to those who need to use the most advanced software applications.

2.62   Portal Technology

The portal technology has created a personalized version of software that has single access to the web. The goal is to connect the people to business applications through support systems. With the use of web browser based access, people can log on to sites and retrieve

information a lot faster. In turn this technology helps create more productivity and efficiency through a business process. This technology has created open demands for access to information and increased market opportunities for businesses.

2.63   Quantum Cryptography ***

A.   Advancements in this field have enabled this technology to become a reality. Quantum Cryptography allows entities to exchange information with absolute security. Any attempt by anyone to intercept the communication of the secret encryption keys is detected due to the laws of Quantum physics. With the advancement in CPU speeds current cryptography methods are in jeopardy. The future of e-commerce and e-government rely heavily on quantum communications (10).

B.   Quantum Cryptography is a new way to encrypt data over a network connection. It uses properties of light to encode bits. Much like today's encoding it also uses secret and public keys to encode documents (BBC News, 2003).

2.64   RD3D

The RD3D laptop might look like your average laptop, but it differs in that it has 3-D capabilities. The 3-D capability comes from being able to give off light in different angles which allows the person looking at the display to see different images. This 3-D notebook brings a second matrix that doesn't come into play until the user presses the 3-D button. RD3D will be used mostly by people in the automotive, pharmaceutical and chemical fields. The good news is that RD3D laptops are not much more than a regular laptop with the same attributes.

2.65   Secure Mobile Chips

Intel is starting to release microprocessors that securely lock stored data for use in PDA's and cell phones (Knight, 2004). This will help against computer hackers and viruses (Knight, 2004). It also works as an anti-piracy measure against illegal sharing of digital music and movies

(Knight, 2004). This technology is also available for protecting files in desktop computers (Knight, 2004).

2.66   Self-Healing Database Software

IBM and Oracle are working on a new type of Database software that will detect and alert Database Administrators if a problem is about to occur. The software can monitor the database needs for things like more memory space and can email the Administrator to take action before the issue becomes a problem. The software can also fine-tunes the databases configuration depending on the number of users currently using the database. [Self]

2.67   Serial ATA Technology

This technology focuses its reliability on serial data transfer that shall become the dominant interface for hard disks. Serial ATA has taken the place of parallel ATA standards because of their inflexibility and reliability within serial technologies.   Serial ATA will be utilized in high-capacity server and networked-storage environments, because of its connection capabilities through multiple ports to be condensed into a single controller. The connection process is simple and reliable and shall provide better airflow through systems. Ultimately this technology shall help vendors change the way they develop storage systems.

2.68   Shadow Copies

Shadow Copies is a new feature in Windows 2003 Server that recovers deleted or corrupted files. This feature is beneficial for many reasons: It allows the user to recover the document painlessly and most specifically without relying on IT administrators to recover the file or having to rebuild the file.

2.69   SoC/IP – System-on-a Chip/ Intellectual Property

System-On-Chip technology is the latest emerging silicon technology that provides integration of both processes and functions on the chip itself. The chips are optimized for

specific applications and have higher performance and functionality than conventional chips that provide processing, but must be "told" what functions to process by external applications.

2.70   Software Assurance

A computer language and programming tool that aids in the design and development of error free software. This technology enables programmers to model and test applications before the actually write it. Software assurance will improve the quality of programs and may improve the process behind the development of software itself (10).

2.71   Anti-SPAM Technologies – General ***

A.   With business so extremely reliant on e-mail the need to filter out unwanted mail becomes extremely necessary.   There are a number of software solutions in this area of technology but most of them are reactive. The ones that would be of particular interest are those that share information between each other to reduce Spam on more of a proactive and offensive manner.

B.   "Block XP" is a new software created by Microsoft that will aid in the control of spam through e-mails. This service shall personally filter through individual emails and dispense of any unwanted mail immediately. This will offer businesses to spend less time deleting spam from their inbox and control unwanted emails from vendors. The threat of viruses entering into the systems is crucial to any business as well as the security of information. This technology can help redefine the e-mail infrastructure and content integrity issues when it comes to bulk mail.

C.   While it may seem somewhat vague, there are several companies out there, Microsoft included, who are attempting to keep unwanted email out of your inbox. Spam continues to grow as never before, always finding some way around your strictest rule sets and filters. Bonded sender, trust certificates, pre-determined "risk level" assignment and more are methods for dealing with incoming Spam. Hopefully, someone will figure this one out soon.

2.71.1 Barracuda Spam Firewall

The amount of unwanted email, or spam, that we are receiving every day is quickly increasing. A new product from Barracuda Networks aims to simplify this process and offload the work from our other email systems into a separate rack mounted system. The top of the line unit, the Spam Firewall 600, supports 25 million email messages per day and handles over 25,000 active email users. It utilizes highly effective Bayesian filtering and seamlessly connects to Microsoft Exchange using LDAP. With the continuing demands of our workforce to utilize email as efficiently as possible, it will be vital to eliminate as much clutter from their systems as possible and a dedicated hardware/software solution such as this will soon be mandatory. (Barracuda Networks. Barracuda Products.)

2.71.2 SPAM - Bayesian Filters

Bayesian filters are primarily used as spam filters. These filters rely on Bayesian logic to determine if the email being received is spam based on some basic characteristics. Although the logic has been around since the 18th century, the filters have only recently become incredibly accurate.   The most common early filters relied on a scoring system to determine if the email was spam.   The filter then looked at the emails based on a set group of characteristics.   The problem with this approach is that the filter requires increased manually configuration.   Thus, depending on the amount of configuration, the content scoring filters might still allow spam through the filter if under configured, or conversely block legitimate emails if over configured. The Bayesian filter scores emails too and recognizes Spam by examining the words, phrases, headers, html and meta information. It analyzes "good" mail against "bad" mail to obtain the probability that the email is spam. The more emails that the filter encounters, the better the probability becomes that the filter will correctly identify legitimate emails and disregard illegitimate emails.   The Bayesian filters are self-learning and require very little manual tweaking.

2.71.3 SPAM - Challenge/Response Technology

Challenge/response technology might be the new technology that puts spammers out of business.   This new anti-spam software may be the one that stops millions of innocent users from receiving annoying spam mail   It works by requiring that the sender first authenticate him or herself before any mail is actually sent out.   According to a Press Release on October 20, 2003 made by Tolly Group who did a study on Challenge/Response tech. and other anti-spam technologies that use filtering, found that challenge response technology is effective 100%. Other filtering technology effectiveness vary from 25%-80%.

2.71.4 SPAM - No Spam at Any Speed

No Spam at Any (CPU) Speed, a work in progress for Microsoft, will block spam with the use of cryptography.   The idea is that the sender's computer will have to solve a cryptographic puzzle to get to a receiver's inbox. The computer's processor is responsible for the execution of the process, not the user. If the sender does not have the puzzle generator, a link to download it will be provided in a message that is automatically sent. The puzzle will take 10 seconds to solve, and because there are 80,000 seconds in a day, only 8,000 messages can be sent out from that computer (9).

2.72   SpecOps and Project David

SpecOps has developed fascinating software that they have dubbed "Project David" that enables windows based programs to run on Linux operating systems.   This software, developed in the Philippines, is open source and is designed to help boost the Linux operating system into the mainstream computer market.   The program is about 80 MB in size and runs on any computer with the Linux.   The company hopes to sell more than 30,000 copies of their software in 3 years after its commercial release.   The software is known as a WES (windows environmental software). Seeing as Linux is an inexpensive alternative to other OS's, David

may be the software that is needed to "enable users to run their favorite programs with the look-and-feel they are familiar with" and convert to this alternative OS.

2.73 Storage Area Networks

There are now new fiber switches and buses than can increase the speed of storage area networks to 4 G verses the current 1 G or 2 G standard. Also, the 10 G competitor already exists. However, the 4 G product is at an advantage because it is backward compatible with its predecessor (1 G or 2 G). If you go to the 10 G product, you would have to change all the other equipment that is not compatible as well. Definitely not cost effective for any corporation.

2.74 Synthetic Jet Ejector Arrays

Synthetic Jet Ejector Arrays are devices made to move air to/from devices that need to be cooled. These jets work by vibrating the air, which cause the air to move in a turbulent fashion. The fact that the devices can be made very small gives them an advantage over current cooling methods (Miller, 2004).

2.75 Tablet PCs – (next generation of laptops)

Tablet PCs are slowly being integrated into big business. The technology used to create these new age laptops are the wave of the future. With a laptop users can access the web, check email, and keep sensitive data. The only problem with laptops is the fact that the system just got too cumbersome. You had to open and close the laptop and in pressing times that you needed to take notes you found yourself in a bind. Tablet PCs take care of this issue. Not only can the unit be used as a laptop the screen can be turned into a digital notepad for quick note taking.

2.76 Terabyte Chips

With the increase of information being stored and processed, computers will be moving into the next level of processor speeds. A Terabyte is approximately 1024 gigabytes. However

with the increase in the size of the processors there will also have to be an increase in transfer rates of data to the processors.

2.77   Ultra Wideband

Ultra Wideband is a new technology which offers many advantages to users. UWB offers faster speeds, greater bandwidth, lower costs and lower energy usage than common Wi-Fi. Another advantage UWB presents is the ability to send multiple packets to different computers at the same time. [7]

2.78   Universal Translation

The goal of universal translation is to provide fast, accurate and real-time electronic translation for people speaking different languages. The focus has shifted away from translating words, which are ambiguous, to translating phrases, which leaves less probability for ambiguity.

2.79   Virtual Desktops

Operating systems have emerged so much since windows 3.11. The arrival of windows XP is proof of that. But have things really changed since then. You are still looking at one screen at a time. You must tab threw screens to do any real multitasking. The workspace you have is truly dictated by the size of your monitor. Everything is two dimensional when it comes to desktops. A new technology has emerged that puts an end to all this. Looking glass produced by sun microsystems is a virtual desktop that allows you to use as much of your desktop as you need in a three dimensional spectrum. This changes the way we typically think about desktops. You are now able to open 5 windows all at once and work on each one at the same time without tabing. This saves time which in turn increases efficiency.

2.80   Virtual Office

Today the Internet offers high speed of communication and data exchange. The need for employees beyond production lines to be present together on-site is no longer necessary. Using

VPN technology, an employee no longer has to be in the same physical location of other employees to be effective. This saves on overall office cost, space and helps promote a relaxed yet efficient work environment.

2.81   Visual Search Engines

Google can't be beat these days; it's the staple search engine to which most of the internet turns (or relies on) to find information. Emerging now, however, is a different method for presenting information retrieved to the end-user. While a search on Google may provide a lot of information that you may not find useful, no matter how strictly it adheres to your original request, with visual search engines, one would be able to view a high-level query as an object with associated categories. For example, if you search for "Video games," you would receive a video game high-level results page, along with graphic representations for pages with information on parental ratings, new games coming out, stores that sell games, etc. rather than receiving everything on one page, leaving you to sort it out.

2.82   Voice Authentication ***

A.   This technology will allow field personnel to communicate with our computer systems utilizing their voice instead of a computer terminal. Once it is fully developed, it will greatly reduce the need for live call centers to field requests such as ordering, order status requests, and virtually any other remote access need. In addition to remote data access, it will also give us another method of security and identity verification without the need for additional and loss prone hardware (such as a key fob). Though it is already in use in some firms, further research and development is needed to make it more accurate and standardized to ease implementation and cross-platform connectivity. (ComputerWorld. Voice Authentication: Making Access a Figure of Speech.)

B.   Voice authentication works by comparing a person's distinct harmonic and resonant frequencies to that already stored. A technology like this is useful when large groups of people have to be authenticated. This technology can help alleviate calls that were previously handled by call centers, therefore decreasing the cost of paying a customer service representative to handle that call. There is a downside to voice authentication and that is that it may not always be accurate. A person's voice may vary with health or emotion, or maybe a bad storm may cause alterations in a person's voice.

C.   Authorization is critical to a company to make sure that sensitive information is going where it was intended. Voice Authentication can be used when access to computers is not available and a company needs to know if the identity a person gives is correct (Gilhooly, 2004). It works by capturing a person's voice and then comparing it to a voice print created when the person was enrolled (Gilhooly, 2004). This system is helpful in large organizations where large amounts of people need to be authenticated (Gilhooly, 2004).

D.   Voice authentication technologies promise users secure, simplified access to IT systems. This technology allows businesses to authenticate any callers before giving them access to secure systems. [3] This is a software technology.

2.83   VPGN

Everyone in the computer industry knows what a Virtual private network is. But have you heard of VPGN. VPGN is a new concept that is in development that will effect the gaming industry in a whole new way. The way VPGN works is that a customer purchases a gaming console, than subscribes to VPGN by paying a monthly fee. This will allow the customer to download games that are not offered by certain retail stores. The games will be stored on there consoles using some type of encryption. These types of consoles don't have a cdrom as other typical gaming consoles. This helps prevent the pirating of software.

2.84　W-CDMA

Wideband Code Division Multiple Access is a new technology that allows for large video and email attachments over a wireless network.

2.85　Web Services

The current web services security model gives a certain degree of protection. The security model process doesn't exist in the applications that use it; therefore the process is able to change without affecting the actual application itself. McDonald appreciates the architecture of web services because they say web service separates the client from the database and both from the security model. Although we are probably very far from being completely secure over the internet, web services is a start.

2.86　White Boards – (Digital Teaching for Modern Classrooms)

The major issue in schools today concerns over crowding, it seems virtually impossible for teachers to individually work with students to enhance their learning experience due to massive population growth. The question was then asked "How can a teacher have a class of 30+ students, teach effectively, and keep an eye on any disruptions in the class." The answer came in the form of white boards. With a white board the instructor can now stand anywhere in the classroom with a small wireless school pad and communicate with his/her students effectively. When the instructor writes on the pad it will automatically be displayed on the blackboard via projector. No longer will any teacher be chained to the front of their classroom. Now the instructor can "be at a student's desk while pointing out something on the board, or write problems and make notes while standing at the back of the classroom." (gtcocalcomp.com)

2.87　Worms That Exploit Worms

We all know the devastation a worm can cause to a computer system. A worm differs from a virus in that a worm is spread due to a vulnerability in usually the operating system.

Whereas a virus needs the intervention of a user to spread. We all have heard about the recent worm that effected Microsoft Windows operating system called the Sasser worm. Worms are not something new, they have been around since the famous morris worm. However a new bread or hybrid worm has emerged. This worm uses a vulnerability in an existing worm to spread. The most recent and probably the first is know as dapper. Dapper exploits a vulnerability in the Sasser worm to spread.

3 Technologies Not Kept for Favorite Five

3.1 Advanced Password Recovery Software Toolkit

Advanced Password Recovery Software Toolkit application enables agencies to recover passwords on files created through many software applications for computer users. The goal is not to aid hackers in gaining private information, rather passwords are cracked to aid clients in special forensic investigations.

3.2 AIBO (Evolution of Electronic Pets)

New technologies mean new toys for everyone in the household to use. From the robotic vacuum to the automated coffee maker, small luxuries have made life very soothing for everyone. But why should it stop with household items? Sony never saw this as a stopping point for technology. In the early 00's the first robotic dog was released to the public. Wonderfully dubbed "AIBO" the electronic pet sold out of stock in Japan but never really made a big hit in the United States. Yet with strong determination and four years, Sony has once again re-released "AIBO" but this time it is totally revamped. The might pooch comes with digital A.I. (artificial intelligence). It has feelings and reacts to how you treat it. Packaged with other features this dog refused to go unheard. Slowly but surely AIBO began appearing in the US. Now if you have enough money to afford it AIBO is an ideal replacement for someone with a busy schedule and no time for a real pet.

3.3 Body Brush

Body Brush is a 3D painting that mappes human body language into real time paintings. This innovation simply records body gestures, motion, and energy as attributes to generate a human painting.

3.4   Cool 'n' Quiet Technology

Developed by AMD, this new technology effectively lowers power consumption while simultaneously reducing system noise. Available in the new Athlon 64 bit processor, you can now achieve maximum performance, piece of mind, and energy efficiency. Cool 'n 'Quiet technology works in conjunction with the CPU, motherboard and Bios.

3.5   Credit Cards with Voice Recognition

Beepcard is creating a credit card that has voice recognition to help reduce fraud. It will ask the user for a password before being used. The credit card is expected to be the same size as a regular credit card.

3.6   Database and Application Integration

With multiple users accessing the same data, it becomes a very difficult task to be sure all of this data is synchronized. This was not a very troublesome job when only a single server existed within a company. Now that a company has many servers the job of making the data consistent between them is quite daunting. The ability of this technology is to have data that is updated at one server location automatically updated across many servers.

3.7   Digital Content Protection

System used to protect against piracy. Heavily used now on DVDs. (ExtremeTech)

3.8   Digital Tracking Systems

What started as a trend for finding lost pets has turned into a solution for finding missing children. This solution, named "Digital Angel", was developed by Applied Digital Solutions, Inc. This system was first used on animals as a means of keeping a tab on your pet(s) if they were to ever get lost. The tracker is a harmless microchip that is embedded under the skin and wirelessly return data on its host. The microchip may be pricey but its attributes are astounding. After a successful run with pets the company moved on to tracking people. "A demonstration,

which was conducted by Dr. Peter Zhou and Dr. Keith Bolton, showed how Digital Angel "can be used to monitor a person's key body functions -- such as temperature and pulse -- and transmit that data wirelessly, on a real time basis, along with the accurate location of the person, to a web-enabled ground station or monitoring facility," according to a press statement." (WorldNet Daily)

3.9   Digital Video Recorders

In the high-tech world of burst transmission and high speed connectivity, VCR's are way out of date. The VHS tape is all but gone, save for the few people who refuse to join the new millennium. In its place rises the DVR (Digital Video Recorder), a great addition to the future of technology. The DVR's main purpose is to remedy all of the problems that the VCR had and provide you with more options.   DVR's can record television programs just as a VCR does, but it does not use any VHS tapes. Instead all information is stored in the hard drive of the DVR, which can be played back at anytime. Another feature that DVR's have over VCR's is that it can be programmed to skip commercials. No more fast forwarding any VHS tapes to skip past a few boring ad. The DVR automatically stops at commercial breaks and resumes when the television programs begin again. One more addition to DVR's is the ability to fast forward, rewind, and pause live television broadcasts. How it does this is through a delay in picture. The DVR saves the show while it is being played and replays a short time after. This is truly the direction emerging technology is headed in.

3.10   Divx/DVD Players

In the beginning there was Beta tapes, then along came VHS (Video Home System), which marked the end of Beta tapes. VHS came with better quality and was very cost effective to produce. VHS had its run for years until DVD (Digital Video Disc) came in and slowly over took the competition. While VHS tapes are still in use they come a dime a dozen. DVD movies

are the cornerstone of video media in today's world. With the incorporation of the internet and file sharing, DVD's had a new foe. AVI's (Audio Video Interleaved) are small compact audio/video files that reside on your computer. A DVD can use up to 4.7 gig discs that cost two dollars a disc and unless you owned a DVD burner, which costs around $150 - $300, you had to buy the movie in the store for astronomical prices. AVI's took care of that problem by allowing you to hold a 4.7 gig movie on a 700meg CD with perfect DVD clarity. All you needed was a regular CD burner, which costs around $59.99 - $99.99, and recordable CD's that come a dime a dozen. The major movie companies such as FOX, Warner Brothers, and Universal Pictures have filed law suits over the distribution of these files and processes. Yet some companies have decided not to fight the changing times and have changed their products to handle both DVD's and AVI's. This was the beginning of the Divx/DVD Player. Now you can burn the movies AVI's off your computer and view them on your home theatre system through these players. The players sold in hot commodity in Europe and have just recently reached the United States. Only time will tell if these players will put DVD's in the retirement pile with Beta's and VHS.

3.11   Enterprise Service Bus Architecture

This software technology uses web services and message passing to create an organized structure of available network services. This technology allows applications to exist simply as services thus eliminating the complexity of integrating systems (Krill).

3.12   E-Paper

It isn't, exactly, digital paper; it is, in some respects, simply a screen onto which you can project a PDF or image to avoid having to print it out. The difference between e-paper and digital paper, however, is that you can pick up a piece of e-paper, fold it into four squares and put it into your pocket until you're ready to project something else onto it. Because of its flexibility in many

areas, using e-paper, one could download your newspaper onto it, put it into your pocket, and read it on the subway * having it update regularly so you don't miss any breaking news.

3.13   Extreme Ultraviolet Lithography

Ultraviolet Lithography is a way to print circuit patterns onto silicon. It will allow circuits to be made with features as small as 32 nanometers using xenon gas and microscopic reflectors (Metz, 2003).

3.14   EZ Connect

EZ Connect is a simple wireless card bus adapter, which is capable of increase the speed and security necessary for all wireless user nowadays. Also it is capable of support all kind of multimedia and streaming video operation extremely fast. Another advantage is that EZ Connect can handle WEP encryption and WPA.

3.15   Fiber Optic Internet

Using fiber optic cables, scientists sent 6.7 GB of data from California to the Netherlands in less than 1 minute. That's at a rate of about 923 MB per second! However, for personal and business use, the computers will need to be upgraded to match the high speed.

3.16   Flexible Display

Flexible display is a new technology that will become visible in many of the everyday items that people use and wear. Some of the anticipated practical applications of this new technology will be used in newspapers, roadmaps, logos on clothing, displays in watches, and even on credit cards. Typically, display screens are thought to be breakable, but with this flexible, foldable technology, that concern can be left behind (5).

3.17   Fuel Cells

During the early years of the space program, NASA began developing an alternative power source called fuel cell technology. Energy and heat are released when oxygen and

hydrogen are made into water using an electrochemical conversion device (1). There has been a lot of research conducted by Japanese firms, such as Samsung, Toshiba, and Sony with the intention of not only powering cars and houses, but also laptops, cell phones, and other devices that have been requiring additional power due to the increasing in their functionality (2).

3.18 General Packet Radio Services

General Packet Radio Services (GPRS), a communication service, is similiar to the internet but otherwise known as a mobile internet. Used in compliance with the mobile phone, the GPRS works best with lengthy packets or bursty data flow and enables web users to chat or web surf at top speed data transmissions of 170 Kbps although the most networks operate around 15 - 60 Kbps.

3.19 Haptic Technologies

Everyone uses two senses when browsing the internet * sight and sound. You listen to music, read your news, or watch video streams with both. One would assume that, as it's that sort of medium, these two senses are what you're limited to. Haptic technology, however, utilizes the sense of touch. Of course, there may be some industries more interested than others in transmitting the sensation of touch, but who would decline to feel wind on their face virtual sky-diving?

3.20 HotSwap Client Tool

HotSwap Client Tool or dynamic class redefinition capability uses JVM to aid in testing or debugging an application in JDK 1.4 and later. This application simply attaches to the JVM and makes inquiries to it. At the least, a user is able to use it to diagnose bugs ultimately elimination disruption and reducing turnaround time.

3.21   Imaging Software

There are three new software imaging programs named FRED, FRAT and PIPR. FRED was used to help draw conclusions with the shuttle Columbia accident. It is used to follow unfamiliar objects in videos taken at launch time. The FRAT program produces clear images from ones that were not readable. FRAT is considered faster and more dependable than other imaging software. The PIPR program comes up with patterns. In other words, it can look at the past and predict the future. These programs can and are being used in the medical field.

3.22   Information Security

With the Internet being so easily available now the need for business to protect them from outside intrusion is extremely important. Solutions in this technology span from hardware and software to simple procedures that can be followed. Since the focus here would be on the technology involved, the discussion and research would be more focused on the hardware and software solutions soon to be available.

3.23   Ingate® Firewall Software

Ingate firewalls are the world's first SIP or Session Initiation Protocol capable firewalls. This allows for interoperability with instant messaging, a/v conferencing, VoIP or any other SIP based program. Now all messages or meeting are now automatically encrypted using this unique SIP signaling system.   This system recently only available in hardware is now available in software form, newest versions with support for Microsoft Live Communications server.

3.24   Intel Centrino Technology

Using the Pentium M processor, Centrino is a unique new notebook technology. Specifically designed for mobile wireless networking, Centrino provides maximum performance while delivering extended battery life. In addition to being power efficient, it supports leading

wireless security software and hardware as well as the support for the latest access point providers to allow for longer connected sessions.

3.25   Intel Dothan Pentium-M Mobile CPU

A.   This technology by Intel will allow our mobile workforce to operate at a greater efficiency by raising the cost-to-performance level. These chips, which use a smaller die size then current models, run more efficiently than previous models. This improvement will cut down on their power consumption, which will allow lighter laptop computers for easier travel when used with smaller batteries. If more time is needed, they can also provide up to 30 minutes longer use before needing to be recharged when used with current batteries. In addition to battery life, there is also an increase in the operating speed and on-chip cache. This will speed up the systems and lower the time needed to process orders and perform other valuable computing processes. As the technology is improved, future changes will increase the speed even further while keeping the price at the same or lower level.

B.   Intel is releasing a second generation Pentium M processor known as the "Dothan". This processor is very similar to the original Centrino in its native Wi-Fi capabilities, but is Intel's answer to the call for an ever faster mobile processor. The new processor will have a total of 2 MB of external cache, 140 million transistors and will use Intel's latest 90nm process technology. Intel clams an extensive performance increase and an average of 30 minutes of extended battery life.   Intel is also upgrading the chipset architecture of the Centrino (named "Alviso") to support a 533 Mhz front side bus. Intel expects the chip to be released during the second half of 2004.

C.   Intel recently unveiled its new mobile processor chip called the Dothan.   It promises to boost performance while using less power all using Intel's 90-nm processing.

3.26 Intellectual Property Management Tool

This technology allows businesses to be able to manage intangible, intellectual property. [5] This is a software technology.

3.27 Interplanetary Internet (IPN)

The Interplanetary Network (IPN) will be the backbone of interconnected hubs in our solar system. The hubs or nodes are currently existing and future satellites, space-stations and planets in our solar system. All the planets and existing satellites and spacecraft in our solar system have already been assigned Internet addresses.

3.28 Iomega

Iomega is an external USB 2.0 CD-RW drive. And it can be shared between multiples computers and multiple operational system. The Iomega CD-RW packet comes with all the hardware and software necessary to execute functions such as capture photos, presentations and data.

3.29 Linux OS

A.   Red Hat Desktop has a Linux OS for companies that want something more secure than Windows. It will also be less expensive than Windows upgrade and use. This will not be aimed at the consumer market, only major organizations.

B.   SuSE Linux 9.1 - Novell released a 64-bit OS for Linux systems. SuSE Linux 9.1 Personal and SuSE Linux 9.1 Professional are both based on the 2.6 Linux kernel and run on the Intel 64-bit and the AMD 64-bit processors, as well as supporting the regular 32-bit processors.

C.   The Linux operating system was built based on the notion of free software. All the source code is available for everyone to view, modify , and redistribute. Linux has many advantages that other operating systems do not. The first and maybe the most attractive is that Linux is free. You can download it off the net and you will not be breaking any laws. The second

is that its a true multitasking operating system tried and tested. The third is that all the source code is available for everyone to look at, and play with. Forth, the Linux operating system is not vulnerable to viruses. So why is this operating system the most popular you ask the reason is that its not as user friendly as windows, or a mac. This has been changing with every new release. In fact some claim that Linux is now ready to compete with the big boys.

3.30   Magic Pen

Microsoft developed magic Pen. The name of this product says   everything about the product. It is a ordinary pen with normal ink used on regular paper which can transfer all the data from the paper to a digital content, which can be download now or later to the computer, and will allow the user to edit or modify it as he/she wants.

3.31   Memory Stores Three Bits in One

NASA has been working on a way to increase data storage by storing three bits of memory in space of one byte. The process uses nanowires that are coated with an organic compound. When current is applied to the wires its conductivity can be adjusted to eight levels of binary ranging from 000 to 111.

3.32   Messaging Applications

With modern communication, the more classic way of exchanging ideas between associates is becoming outdated. The advent of powerful e-mail and instant messaging technologies allows more information to be shared in less time. Some of the server solutions available even combine the two technologies to almost make them one in the same.

3.33   Micro Fuel Cells

This technology is emerging to seemly replace conventional batteries used to power electronics. Laptops, cell phones and other electronics are demanding more and more power to

operate. Micro fuel cells offer increased power, smaller size, are environmentally safe and are much more efficient then lithium ion batteries (Hockaday).

3.34 Microfluidic Optical Fibers

Microfluidic optical fibers are an improvement over standard glass fiber-optic threads. Instead of a solid glass fiber, a molecularly small bore in the center of the fiber is filled with a fluid that makes the fiber more flexible and less prone to breakage. The best part is that the fluid can be controlled with great precision to adjust the fibers' properties for error correction and bandwidth levels.

3.35 Microsoft .NET

This technology enables mixed platforms, multiple services and various sources of data all to be interconnected under one umbrella. The .NET architecture will allow businesses internal and remote systems to easily interact allowing more flexibility and increased diversity (Momentum).

3.36 MiniSD Cards

Both SanDisk and Lexar Media have announced that they will be offering a new storage device called miniSD cards. They plan to release them in Japan before going worldwide. These cards will be half the size of a normal MMC card and will be able to fit into the same sized slots with the use of an adapter (8).

3.37 Modifying Your Xbox

We all have heard of Atari, Nintendo, Sega, Sony play station, and Xbox. These gaming consoles all have different specifications and features. Some better than others. One gaming console in particular can be considered the granddaddy of them all. The Xbox is not any old gaming console. Its probably the best computer system you can buy for 200 dollars that can also play video games. To be able to use your Xbox as a P.C you need to circumvent certain security

measures that have been set in place by Microsoft. Moding is a term that people use to describe the process of changing factory settings, usually at the hardware level to unlock certain functionality in a particular device.

3.38   Multicasting

As users continue to migrate towards high-speed internet connections the transmission of data to and from one server to each of its clients create unnecessary replications of the same data. This is where multicasting is utilized to transmit a single data stream to several clients simultaneously, without creating wasteful duplication of data and taking up network capacity. The use of the multicasting technology shall help businesses transmit a single packet of information from one destination to hundreds of destinations at one time. Once the information is broadcasted to multiple sites then you can track the recipients of the information. This is a great tool for marketing and generating information quickly and efficiently on the net.

3.39   Music Table

The Music Table is an innovative learning tool for young children. This device incorporates musical phrases on pattern cards to aid in the learning processes. With the absence of wires from computers or the frustration of learning to play a musical instrument, the whole body is involved in the processes by encouraging the user to intuitively flip back and forth between different musical representations.

3.40   Mykeyi

Mykeyi is a USB port security device developed by deciBells. Mykeyi allows extra security because it authenticates a user over the Internet or extranet in terms of identity, which creates a name password authorization.

3.41   Nano Solar Cells

This technology enables material such as paint or plastic wrap to seemingly become one giant solar panel. Using electrically conductive polymers and semi-conductive inorganic crystals researchers have created a cheap and flexible material that can achieve efficient solar energy. These nano solar cells can be spread out or painted on to virtually any surface allowing for a wide range of applications (10).

3.42   NanoTechnology

NanoTechnology is a division of science involved in manipulating individual atoms and molecules. This technology will allow current circuits to be made much smaller than they are now. NanoTechnolgy will allow computers to become faster and potentially cheaper than they are today. (Jupiter, 2004)

3.43   No Contact Record Players

They are using a particle accelerator to "read" the grooves of old vinyl records. Since needles might damage the old records, this method can read the grooves without damaging the record, as well as clean up the audio. Scratches on the record that affect its play can be removed with this method as well and sound quality can be improved.

3.44   Online Gaming

What started as a fad soon turned into the most unbelievable craze in history. No one ever believed that the gaming industry would grow as large as it is today. This industry began as a small spec that, was thought, would not last. Small games were made for computer systems as a way to draw a young crowd. Soon game systems began to appear and during the 80s software companies began producing games in mass. As time passed and technology advanced games became very profitable. "That gaming console in your living room is more than a toy. It's big business." (PCMag.com) Consoles systems replaced computer systems as the fan base grew.

Kids began spending more time solving games than playing outside. In the early 00s, gaming went to the next level. Now no one had to leave home to play games. By connecting to the internet players could now play against anyone anywhere in the world. Online gaming took the world by storm and is still growing.

3.45 Online I.D. Card

This is being boasted as the "best, most reliable I.D. Card so far available anywhere." These "I.D.'s" are obtained at www.IdentiChek.com and require extensive before you receive your IdentiChekTM Online Certificate.

3.46 OpenEXR

Developed by Industrial Light + Magic (ILM) for use in imaging applications. It was used to make movie effects, using a high dynamic-range image file format developed at ILM.

3.47 Packeteer WAN Compression Software

Packeteer, a Californian based software company, is now offering a software package to help manage traffic across a wide area network (WAN). Packeteer claims a speed increase of up to 10X the normal traffic rate by using special compression. This compression is utilized to throttle the bandwidth and control the bandwidth needed by mission critical data by using traffic management, caching and compression, thus helping companies to save money by not paying for excessive amounts of bandwidth. The desire is to "optimize WAN bandwidth. Companies need to consider making their network "smarter", not just "fatter"".

3.48 Photonic Integration

Photonic Integrated Circuits are very similar devices to their predecessor, the Electronic Integrated Circuit. The main difference between the two is that the newer Photonic Integrated Circuits "generate, manipulate, and detect light rather than electrons." [6]

3.49   Plastic Transistors

Plastic Transistors are made using organic polymers that are printed on various surface. No heat is involved in the process which allows the plastic to be printed on flexible surfaces. This technology will also be cheaper than current silicon transistors (Patch,2003).

3.50   Power Grid Control

Power grid control takes power systems management to the continent-wide level. Currently, individual power plants monitor their own systems for signs of trouble, but the power grid control of the near future will scan entire networks of power grids and substations, making the systems more reliable and predictable.

3.51   Power Planning Software

This software runs on a personal computer and it calculates resistive and inductive voltage changes in on-chip power grids. "The idea is that you use this tool to get the power distribution and any decoupling capacitance you need, and get the block placed correctly before you proceed to layout." In other words the accuracy of this software relies on the accuracy of the inputs within the system itself.

3.52   Radeon X800 (Smartshader HD Technology)

The Radeon X800 features the most powerful VPU ever made, supporting up to 16 pipelines, higher clock speeds and increases image enhancements. No small part of this is done by the SmartShader system, the most advanced pixel-Shader engine ever created SmartShader is the key technology that allows game programmers to create an unlimited amount of visual effects; it incorporates DiretX 9.0 vertex and pixel shaders. This technology is sure to create a big buzz in the computer graphics world.

3.53   Radio Frequency Identification Tags

Traditionally, products are identified using bar codes. This required products being shipped or in a grocery store to have their bar codes read directly with a scanner. With radio frequency identification tags, a container's contents can be identified without line-of-sight scanners (Sliwa, 2003).

3.54   Reverse Engineering

Reverse engineering is the process of taking a finished product and dissecting it to see how it works. After learning how something truly works can one circumvent any security measures that have been set in place. Revers engineering applies to both hardware and software. Reverse software engineering is probably the most famous. All software can be reversed engineered, this is just the nature of the beast. New technology is emerging to stop this trend.

3.55   RSS – Really Simple Syndication

RSS is an XML-type Web content format for maintaining information about news items, weblogs, book revisions and any other highly dynamic content on the Web. Constantly changing news items, document revisions and weblogs are checked for the latest changes and processed appropriately.

3.56   SAMSUNG Memory

Samsung Electronics has created a new type of high-speed mobile memory. The memory can sustain transfer rates of 1 Gbps. In addition to its high speed characteristics, the memory supports extremely low power consumption which makes it ideal for mobile devices such as cell phones, PDA's and handheld gaming consoles. Its low power consumption is made possible by is .10um die technology. Currently Samsung makes the memory in 64 MB to 512 MB sizes and expects to begin mass production during the second half of '04.   The main target for this new

memory will be the third generation cell phones (3G) and will enable 3-D graphics which was previously impossible with the slower 256 Mbps memory.

3.57 Server Virtualization

Not a new concept. "For decades Mainframes have been able to present a virtual machine environment for an OS and the applications running on it. What is new about server virtualization is the ability to run heterogeneous OSs on the same machine. For example, Windows, Linux, and Netware can run on the same machine without being aware of each other's presence." (Network Magazine)

3.58 Simple Object Access Protocol

This protocol, based on XML, is designed to transport information on the Web. SOAP enables automated services based on a shared and open infrastructure. It can use a variety of protocols and formats including HTTP, SMTP and MIME. This protocol also has the ability to support a wide range of applications from simple instant messengers to remote procedure call based systems.

3.59 Software Methodologies and Reuse

The business world has created regulations that center around on-time and on-budget measures. With this in mind the creation of software methodologies and reuse has been quite profitable especially for business owners who must update and keep up with the changes in demand and budgeting at the same time. The process of reusing software and creating better quality ones can only simplify the budgeting process for new software as well as standardizing new developments in technology.

3.60   SSL VPN's

Secure Socket Layer Virtual Private Networks, allow businesses and employees to remotely connect to the network using a web browser. This is easier to use then the old method of having to run an IPSec client on each computer.

3.61   Universal Pen

A Microsoft lab in Beijing, China is working on a new technology which captures handwriting digitally, allowing users to edit computer files directly on paper (Huang, 2004, p. 62). The Universal Pen contains a digital camera, a pressure sensor, Bluetooth, and flash memory (Huang, 2004, p. 63). The camera captures the images written on the page and then transfers the saved images to a computer via Bluetooth when the pen is close to a computer (Huang, 2004, p. 63). The paper has a special watermark to help the sensors on the pen capture the data. After the data is captured and sent to the computer, the formatting of the handwriting can be manipulated using special software (Huang, 2004, p. 63).

3.62   Videoconferencing over IP

While videoconferencing isn't anything new, it has historically taken too much bandwidth and has never been anything near high-quality or extremely reliable. While only 25% of videoconferencing is done over IP now, the other 75% should come around soon. Via IP, the compression is better, the data moves faster and you get a clearer picture with more reliable delivery. We might get to have videophones after all.

3.63   Voice Recognition

Voice Recognition software is a new way to interact with the computer. There are different types of software which perform user/computer interactions such as Nuance Communications which provides enterprise level and speech recognition. Another example of software is Speech Works International, which provides text to speech functions.

3.64   Wearable Technology

An impressive advancement in our lives has been wearable technology. This has been around for quite some time now, and can be seen on policemen, firemen, or anyone with a cell phone or PDA. Wearable technology can be categorized as either Personal Assistants, which are computers that help aid a user in accomplishing a task, or Personal Enhancements, which provide an enhancement to the person wearing it. An example of a Personal Assistant would be a cell phone or the machine at a traffic officer's hip that allows him or her to automatically print out a ticket. A Personal Enhancement can be seen in the use of hearing aids. Recently there have been incredible advancements in both of these categories (6).

3.65   Web Services II / GXA – Global XML Architecture

With the addition of this software technology to your preexisting web services businesses and entities can better incorporate enterprise applications. GXA adds enhanced support for message routing, transactions and security (Mercuri).

3.66   World Wide Media Exchange (WWMX)

The World Wide Media Exchange is an experimental project run by Microsoft Research Labs which allows people to view a centralized index of digital photos taken by their geographical region (WWMX, 2004). It offers the ability to view photos of towns, people's vacations, and even business locations with captions organized by location (WWMX, 2004). The photos are all stored in a large multimedia database (WWMX, 2004).

3.67   XML Switch

"XML switch is designed to handle XML traffic, offloading that processing from servers. The switch includes content-based routing features, which lets users set priorities on important transmissions. So for example, a financial services firm might choose to configure the switch to provide better quality of service for trade orders than for customer address changes. The device

also can encrypt or unencrypt messages, depending on the level of security required."(NWfusion)

3.68   Zeiss Laser Projection

Zeiss, a German company, has created a revolutionary type of display technology call LDT (Laser Display Technology).   This new way of displaying images projects laser beams onto any surface with the exception of light scattering material (mirrors or other shiny surfaces). The laser beam actually writes the picture on pixel at a time and refreshes to create the full video effect.   The other advantages of laser projection are that contrast and saturation are of the highest quality: "Black is really black. No brightened background impairs projection in a planetarium or simulator".   The images show no pixels, are incredibly brilliant and have three-dimensional properties due to the nature of laser light.   In addition to its unparalleled quality, the projector takes up almost no space.