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ENGLISH FOR MASTER'S STUDENTS: Professional Reading

**Учебно-методическое пособие
по практической работе**

для студентов направлений магистратуры
01.04.02 «Прикладная математика и информатика»,
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От авторов

Настоящее учебно-методическое пособие является составной частью УМКД **English for Master's Students** для студентов направлений магистратуры 01.04.02 «Прикладная математика и информатика», 09.04.01 «Информатика и вычислительная техника», 09.04.04 «Программная инженерия», 11.04.04 «Электроника и наноэлектроника».

Оно содержит профессионально-ориентированные тексты, рекомендованные для чтения при подготовке к устной части экзамена - презентации по профессиональной тематике.

Тексты пособия отобраны с учетом их информативности и соответствия последним достижениям науки и техники.

В приложении даны практические рекомендации по подготовке презентации.

Л.Е. Лычковская, О.А. Смирнова

Text 1

Computer Hardware Engineer Job Description

Computers are rapidly advancing day-by-day, and the ones spearheading this progress are computer hardware engineers. Read this article if you are eager to learn more about this exciting job profile.

Did You Know?

Between 2012 and 2022, the demand for computer hardware engineers is expected to grow at the rate of 7%.

Computers have become the mainstay of modern times. There is no organization, no business, no job, and indeed hardly any home where computers aren't used. Life, as we know it today, would be entirely impossible without these innovative and extremely useful machines.



However, while using computers, we must not forget about the real brains behind these artificial ones; namely, computer engineers. They are the ones who work behind the scenes, day in and day out, to design and develop the best computers.

Building a complex machine such as a computer is no simple feat, and hence, this task has been divided into two, giving rise to two types of computer engineers – software engineers and hardware engineers. Each of these specializes in a particular aspect of computer system development.

In the following section, we shall explore the job description of a computer hardware engineer. Go through it to find out if you have what it takes to work on the frontiers of computing technology and make a career for yourself in this exciting field of engineering.

Job Description

Computer hardware engineers, also referred to simply as hardware engineers, specialize in the physical aspect, that is, the hardware of a computer system. They are responsible for researching, designing, testing, and developing computers and related peripherals, including the processors, circuit-boards, memory devices, networking units, routers, *etc.*

The following is a list of a few of the main duties that a computer hardware engineer is typically expected to carry out.

- 1) The hardware engineer guides the team members in a project, including the designers, engineers, marketing and sales department, *etc.*, throughout the development of the product.

- 2) He is responsible for designing and developing the important components of a computer system, including the CPU, motherboard, ALU, microprocessors, *etc.*
- 3) He works on designing the external peripherals of a computer system, such as printers, routers, disk-drives, *etc.*
- 4) He studies the specifications and requirements of a project, and effectively plans the design process. He has to decide on the power supply requirements, system dimensions, testing procedures, and the details of the development of hardware prototype. At the same time, he has to consider the cost constraints in the product development.
- 5) A hardware engineer conceptualizes a new hardware, and works on creating the blueprint of the same.
- 6) He builds the prototype of a new product, and tests it to ensure proper functioning. He uses various software testing tools that allow him to run simulations, to better assess the working of the product.
- 7) He works on perfecting the prototypes, making them compatible to the existing system. He carries out extensive testing and analysis to ensure that the newly developed product is market-ready.
- 8) He is responsible for the testing and verification of the newly developed hardware, to ensure that they conform to the various testing norms and specifications.
- 9) A hardware engineer monitors the working of equipment in its typical work-environment, and notifies any hardware-related issue(s) to the design and development team. He may sometimes even be required to carry out these modifications.
- 10) He oversees the manufacturing process of a new computer hardware, and even works on updating the older existing ones in order to make them compatible with a newly developed software.
- 11) He is expected to keep all the design and development related data well-documented, so that it can be referred to in the event of future modifications or developments.
- 12) He is required to keep his knowledge-base updated with the latest technological advancements along with engineering trends.

Educational Requirements

The basic requirement for those aspiring to become computer hardware engineers is a Bachelor's degree in computer engineering. A similar degree in computer science or electrical engineering may also be acceptable.

For certain fields and specialized job profiles, having a Master's degree is essential. Hardware engineers are expected to have thorough knowledge of hardware devices like processors, electronic circuits, computer equipment, and computer programming, which they can obtain by completing necessary engineering programs.

Lastly, the basic knowledge of management and administration is necessary, comprising skills like strategic planning, resource management, leadership techniques, and other managerial skills.

Additional Requirements

To make a successful career in this field, one needs to develop the right skills. The skill-set includes a good programming ability, understanding and troubleshooting a problem, scientific problem-solving ability, logical reasoning, and solution-finding ability.

An aspiring computer hardware engineer also needs to also have certain soft skills in his bag. He should have good communication skills (verbal and non-verbal), pay attention to details, be inquisitive, be a good team player, *etc.*

Employment Scope

Trained hardware engineers are in demand in a variety of fields. A recent survey has shown that 39% of hardware engineers are employed in the manufacturing sector, 38% in professional, technical services, and scientific research, and 23% in other industries such as IT and government organizations. Experienced engineers can even head their own start-ups.

Future Projections

The growth in the employment rate for hardware engineers in the coming years is projected to be slower than other occupations. This largely due to the fact that more innovation is expected to take place in the software domain. However, computer hardware engineers should still be less affected as compared to other production related occupations. Also, the increase in hardware start-up firms, especially the ones specializing in devices having computer chips embedded in them, such as household appliances, medical instruments, high-end automobiles, *etc.*, can lead to more jobs becoming available for hardware engineers. Regardless of the projections for the future, quality engineers having a higher knowledge level and expertise can always expect to land the best jobs.

Thus, computer hardware engineering is an exciting and challenging field, having ample opportunities for one to be able to make a respected career in. It involves considerable amount of hard work, with many hardware engineers typically working for around 40 hours a week, on an average. However, at the end of the day, the knowledge gained and the fact that one gets to work on cutting-edge computing technology, makes this a rewarding career option.

Source: <http://www.buzzle.com/articles/computer-hardware-engineer-job-description.html>

Text 2

Importance of CASE Tools



Computer Assisted Software Engineering or CASE tools are designed to enhance programs that aid the development cycle of the system. The tools assist software engineers and dedicated programmers through preliminary investigation and system analysis.

Computer Assisted Software Engineering is an application that is directed towards the enhancement of any computing machine. The process is a quality driven step towards improvisation of design and installation features for software development. Whenever a new system is installed, the implementation integrates a number of related and different tasks. The process has to be efficiently organized, and it is for this very reason that CASE tools are developed. With the help of CASE, the installation process can be automated and coordinated within the developed and adopted system life cycle.

CASE tools are largely marketed and understood as:

1. Investigation, analysis and design, or Front-End CASE
2. Implementation and installation, or Back-End CASE

CASE tools are developed for the following reasons:

1. Increase the speed during system development
2. Quicker installation
3. Enhanced analysis and design development
4. Reduced coding and testing time
5. Efficient transfer of information between tools
6. Optimum use of available information
7. Create and manipulate documentation
8. Enrich graphical techniques and data flow

Use of CASE tools enables the programmer to process diagrams and improvise project management software designs. The implementation makes it possible to access data dictionaries and specialist packages. With enhanced features, it is possible to edit and update multiple design versions to add quality to the adopted version. The timely use of the powerful development tools to complete and upgrade cycle documents helps a great deal in error checks and test case generation. They have progressed from applications that aid documentation analysis on the computer to intelligent user interfaces that are reusable.

The decrease in the cost factor related to dedicated hardware has been counter-balanced with a subsequent increase in the cost of software. The labor intensive software needs to be consistently developed for optimum use. The slightest error can result in a costly consequence for the business or private user. The tools resolve issues related to development and maintenance of the adopted application. They not only alter the time frame for each phase, but also help to spread out the cost factor involved. They are largely invested in by dedicated software engineers for better analysis and design.

The code involved is generated automatically, resulting in timely and dramatic reduction in the cost involved in maintenance. The centralized repository is empowered with all the details of the components within the system. This enables suitable, and once again, timely generation of designs and codes. CASE tools guarantee consistency and conformance to upgrades, while developing interactive workstations to enhance an internet business. They not only speed up development, but also generate space and the scope for replication of process precision. With the reduced cost, maintenance and productivity become more cost-effective and practical.

It is very important when selecting a tool to look for the following qualitative features:

1. Easy-to-understand CASE tool specifications
2. Proper allocation of time and resources possible within the development environment guaranteed
3. Coordination between the tool specifics and requirements of the organizational infrastructure
4. Guaranteed level of upgradation of information technology within departments
5. Compatibility between personalities implementing the tools and their relative expertise

CASE tools are designed to enhance and upgrade the computing system adopted and used. This is very important with regards to the dependence on a computer-based environment for business and/or personal pursuits. It is an important part of various business growth strategies.

Source: <http://www.buzzle.com/articles/importance-of-case-tools.html>

Text 3

Computer Networking



Most of us are participants in the computer networking phenomenon without being aware of its details and basics. The below article is a brief overview of how it all works.

A computer network is a system of networks where computers are interconnected via peer-to-peer connection or client-server connection to share data, information and resources. Networking is the engineering discipline which concerns itself with the communication between computer systems and devices. It is not an independent science since it extensively derives most of its theoretical and practical aspects from other communications technology disciplines like telecommunications, information technology, computer science and computer engineering. It can be called a sub-discipline of these four major disciplines. Let us take a brief look at its basics and get to understand how it all works.

Computer Network Types

There are four major types of computer networks:

LAN or Local Area Network which is a network of computers within a very small area, say one building. Its most distinguishing characteristics are high data exchange rates, very small geographic area coverage and no requirement for leased telecommunication lines.

MAN or Metropolitan Area Network which is a network covering a larger area than LAN, say a network of all computers within a city. A MAN may be owned and operated by a single organization but is used by a larger number of individuals and organizations. MAN may also be used in cable television.

WAN or Wide Area Network which covers a larger geographic area than either LAN or MAN. WAN offers four connection options - leased lines, circuit switching, packet switching and cell relay.

Wireless LAN/WAN is the wireless variant of the LAN or WAN and is related to telecommunications network where the nodes are interconnected without the use of wires or cables. Wireless networking is usually implemented using remote information transmission systems which use electromagnetic frequency for the network carrier and such an implementation generally occurs at the layer of the network.

Computer Networking Methods

Peer-to-Peer Networking: In this method, computers can be directly connected to each other and files and network information can be accessed directly by connecting to another computer. However, for this to take place, it is necessary that the computer from which the data needs to be accessed is turned on. For instance, if Computer B

requires the X-files from Computer A, it cannot do so if Computer A is turned off. The computers involved in a peer-to-peer network must be similar and run workstation operating systems.

Setting up a Peer-to-Peer Network:

Start with installing the appropriate operating system. Shut down all the participant computers and the router (optional) and turn on just one computer which would be used to set up the router.

Follow the instructions for setting up the router. These instructions may come as a manual or as a CD. After your router is configured, turn off both, the router and the computer.

Connect each participating computer to the router using a separate RJ-45 cable for each connection and turn on the router. Turn on the computers after a few seconds of turning on the router. Soon, you will get a pop up indication of network detection.

If setting up a wireless connection, you would need to connect a wireless router to one computer and configure the router following the configuration instructions.

Install wireless network cards on all other computers. Turn on the router and computers as mentioned above. Because of the wireless network cards, the other computers won't be required to be physically connected to the router.

Client-Server Networking: Under this form of networking, all the information and files are centralized on the server and any computer can access any information at any time, irrespective of the source computer's power status. For instance, extending the above example, Computer B can access the X-files of Computer A even if the latter is turned off. The files would be present on the server! One of the biggest advantages of this kind of networking is that there is network security as the computers are accessing all the data and information via the server, and not directly. The server computer is the single point of contact for all the client computers. Due to centralization of data, information and resources, client-server networking provides centralized backup facilities, Internet facilities and the assurance of Internet monitoring.

Setting up a Client-Server Network:

First of all, you need a server. You can either purchase one or use an existing computer as a server. If you're using an existing computer as server, make sure it has a 133 MHz or higher speed processor, a minimum RAM of 128 MB, up to 2 GB of free hard disk space, CD-ROM or DVD- ROM drive and hardware that supports console redirection.

Install a server operating system on the server computer and follow instructions for such installation very closely. The final step of installation would probably show you a dialog box confirming successful active directory installation. Your server is now a domain controller and ready for client access. Once the domain is created, client computer accounts can be created and added to it.

Source: <http://www.buzzle.com/articles/computer-networking.html>

Text 4

Advantages and Disadvantages of Computer Networks



Computer networking is a vital part of any organization these days. This article will dwell upon the major advantages and disadvantages of computer networks.

A computer network is a set of electronically connected computers which can share information and resources among themselves. There are communication protocols that define how this sharing should take place. Like every other technological prospect, computer networks come with its set of advantages and disadvantages.

Advantages of Networks

File Sharing

The major advantage of a computer network is that it allows file sharing and remote file access. A person sitting at one workstation that is connected to a network can easily see files present on another workstation, provided he is authorized to do so. This saves him/her the hassle of carrying a storage device every time data needs to be transported from one system to another. Further, a central database means that anyone on that network can access a file and/or update it. If files are stored on a server and all of its clients share that storage capacity, then it becomes easier to make a file available to multiple users.

Resource Sharing

Resource sharing is another important benefit of a computer network. For example, if there are twelve employees in an organization, each having their own computer, they will require twelve modems and twelve printers if they want to use the resources at the same time. A computer network, on the other hand, provides a cheaper alternative by the provision of resource sharing. All the computers can be interconnected using a network, and just one modem and printer can efficiently provide the services to all twelve users.

Inexpensive Set-Up

Shared resources mean reduction in hardware costs. Shared files mean reduction in memory requirement, which indirectly means reduction in file storage expenses. A particular software can be installed only once on the server and made available across all connected computers at once. This saves the expense of buying and installing the same software as many times for as many users.

Flexible Handling

A user can log on to a computer anywhere on the network and access his files. This offers flexibility to the user as to where he should be during the course of his routine. A network also allows the network administrator to choose which user on the network has what specific permissions to handle a file. For example, the network administrator can allot different permissions to User A and User B for File XYZ. According to these permissions, User A can read and modify File XYZ, but User B cannot modify the file. The permission set for User B is read-only. This offers immense flexibility against unwarranted access to important data.

Increased Storage Capacity

Since there is more than one computer on a network which can easily share files, the issue of storage capacity gets resolved to a great extent. A standalone computer might fall short of storage memory, but when many computers are on a network, the memory of different computers can be used in such a case. One can also design a storage server on the network in order to have a huge storage capacity.

Disadvantages of Networks

Security Concerns

One of the major drawbacks of computer networks is the security issues that are involved. If a computer is a standalone computer, physical access becomes necessary for any kind of data theft. However, if a computer is on a network, a hacker can get unauthorized access by using different tools. In case of big organizations, various network security software needs to be used to prevent theft of any confidential and classified data.

Virus and Malware

If even one computer on a network gets affected by a virus, there is a possible threat for the other systems getting affected too. Viruses can spread on a network easily, because of the inter-connectivity of workstations. Moreover, multiple systems with common resources are the perfect breeding ground for viruses that multiply. Similarly, if malware gets accidentally installed on the central server, all clients in the network that are connected to that server will get affected automatically.

Lack of Robustness

If the main file server of a computer network breaks down, the entire system becomes useless. If there is a central linking server or a bridging device in the network, and it fails, the entire network will come to a standstill. In case of big networks, the file server should be a powerful computer, which often makes setting up and maintaining the system doubly expensive.

Needs an Efficient Handler

The technical skills and know-how required to operate and administer a computer network is considerably high. Any user with just the basic skills cannot do this job. Also, the responsibility that comes with such a job is high, since allotting username-passwords and permissions to users in the network are also the network administrator's duties. Similarly, network connection and configuration is also a tedious task, and cannot be done by an average user who does not have advanced knowledge of computers and/or networking.

Lack of Independence

Since most networks have a centralized server and dependent clients, the client users lack any freedom whatsoever. Centralized decision making can sometimes hinder how a client user wants to use his own computer.

Computer networks have had a profound effect on the way we communicate with each other today, and have made our life easier. From the World Wide Web to your local office LAN, computers have become indispensable in daily life, and networks have become a norm in most businesses. If networks are designed and configured keeping in mind its pros and cons, they are the best piece of facility you could ever have.

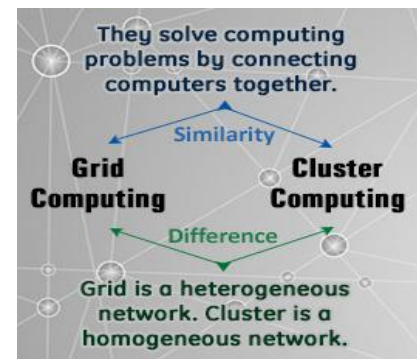
Source: <http://www.buzzle.com/articles/advantages-and-disadvantages-of-computer-networks.html>

Text 5

Differences and Similarities between Grid and Cluster Computing

Grid and cluster computing are the two paradigms that leverage the power of the network to solve complex computing problems. But they are implemented in different ways. This article explains these concepts and points out the similarities and differences between them.

When we want to solve a computing problem that requires resources more than one computer can handle, we need to connect it with other computers and get the job done. Also, we do not come across such problems always. We need a dynamic way to connect the computers only when required. This helps us to achieve optimum utilization of resources. Grid and cluster computing are two such methods that help us to nail down mammoth computing tasks by connecting computers together. In this article, we delve on the differences and similarities between these two strategies.



What is Grid Computing?

Grid computing is that technology in which we utilize the resources of many computers in a network towards solving a single computing problem at the same time, i.e., in parallel.

How it is done

Thousands of computers are employed in the process. All the devices that have computing power like desktops, laptops, tablets, mobiles, supercomputers, mainframes, servers, and meteorological sensors are connected together to form a single network. They are all connected together using the Internet. A software that is capable of dividing the program over many computers is used for this purpose. This entire infrastructure of connected computers is called a grid.

How it helps

When we are solving a problem that requires a lot of CPU processing or access to a huge repository of data, we use grid computing. If you want to solve a computing problem, you just have to log in to the Internet, and you can avail all the computing power you need to solve it. You don't have to worry from which part of the world it comes from. Just know that the required power and storage capacity is there, awaiting your perusal. Although the grid connects several different platforms, it can be accessed from a single web browser. The problem that needs to be solved is not within the capacity of a single computer. Hence, we harness the idle capacity of other computers and solve it.

An Example

SETI (Search for Extraterrestrial Intelligence) @Home is a popular grid computing project. In this project, PC users from all over the world voluntarily give their idle CPU cycles and thus collaborate in analyzing signals coming from the outer space so that we can get evidence of extraterrestrial life (aliens). The grid so formed performs an important task and also saves money and utilizes optimum resources.

What is Cluster Computing?

In cluster computing, we connect a group of 2 or more computers in such a way that they work in combination as one computing unit towards solving a common computing problem.

How it is done

Similar computing components are connected together using a fast Local Area Network.

How it helps

This approach is useful in parallel processing, load balancing, and fault tolerance.

In parallel processing, we utilize the processing power of two or more CPUs at the same time to achieve a common computing goal. As explained earlier, in cluster computing, we do just that.

In fault tolerance, we have a system that is robust enough to handle hardware or software failures. Even if one node fails, the operation can be completed by other nodes. The computing power of the cluster gets affected when one system is at fault, but nevertheless, other systems are still available to perform the operation.

In load balancing, we distribute computing tasks over the cluster such that one single machine is not burdened with heavy processing that it can't do.

Examples

Oracle Parallel Server is an example of a database cluster. Beowulf is another high-performance cluster.

The Similarities

Both the techniques involve solving computing problems that are not within the scope of a single computer by connecting computers together.

These two techniques want to increase efficiency and throughput by networking of computers.

These two techniques save money because they achieve optimum utilization of resources.

The Differences

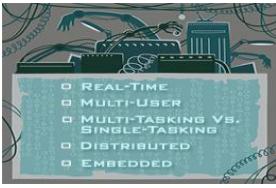
Grid Computing	Cluster Computing
Composed of	
It is a heterogeneous network. Different computer hardware components (desktops, laptops, mobiles, etc.) running various kinds of operating systems are connected together in a grid.	It is a homogeneous network. Similar hardware components running a similar OS are connected together in a cluster.
Geographical Span	
They are distributed over a LAN, MAN, or WAN. They can be geographically separated.	They are within the same location or complex.
How They are Connected	
The computers are connected over the Internet.	The computers are connected using fast local area networks.
The Aim	
The aim is to make use of idle computing power in grid computing.	The aim is to combine the resources of several computers so that they function as a single unit.
Management of Resources	
Every node in a grid behaves like an independent entity. This means it manages its resources by itself.	The resources of all the nodes in a cluster are centrally managed by a resource manager.
The Problems it Solves	
It aims at solving complex problems of astrophysics, science, trade, and commerce.	It aims at solving problems of database or WebLogic application servers.

Source: <http://www.buzzle.com/articles/differences-and-similarities-between-grid-and-cluster-computing.html>

Text 6

Different Types of Operating Systems

Operating systems that create a link between users and the applications form the core of computer systems. An OS dissociates the programs from the hardware and simplifies resource management. Let us look at the different types of operating systems and know how they differ from one another.



An operating system is a software component of a computer system that is responsible for the management of various activities of the computer and the sharing of computer resources. It hosts several applications that run on a computer and handles the operations of computer hardware. Users and application programs access the services offered by the operating systems, by means of system calls and application programming interfaces. Users interact with a computer operating system through Command Line Interfaces (CLIs) or Graphical User Interfaces known as GUIs. In short, an operating system enables user interaction with computer systems by acting as an interface between users or application programs and the computer hardware. Here is an overview of the different types of operating systems.

Real-time Operating System: It is a multitasking operating system that aims at executing real-time applications. Real-time operating systems often use specialized scheduling algorithms so that they can achieve a deterministic nature of behavior. The main object of real-time operating systems is their quick and predictable response to events. They either have an event-driven design or a time-sharing one. An event-driven system switches between tasks based on their priorities while time-sharing operating systems switch tasks based on clock interrupts. Windows CE, OS-9, Symbian and LynxOS are some of the commonly known real-time operating systems.

Multi-user and Single-user Operating Systems: Computer operating systems of this type allow multiple users to access a computer system simultaneously. Time-sharing systems can be classified as multi-user systems as they enable a multiple user access to a computer through time sharing. Single-user operating systems, as opposed to a multi-user operating system, are usable by only one user at a time. Being able to have multiple accounts on a Windows operating system does not make it a multi-user system. Rather, only the network administrator is the real user. But for a Unix-like operating system, it is possible for two users to log in at a time and this capability of the OS makes it a multi-user operating system.

Windows 95, Windows 2000, Mac OS and Palm OS are examples of single-user operating systems. Unix and OpenVMS are examples of multi-user operating systems.

Multi-tasking and Single-tasking Operating Systems: When a single program is allowed to run at a time, the system is grouped under the single-tasking system category, while in case the operating system allows for execution of multiple tasks at a time, it is classified as a multi-tasking operating system. Multi-tasking can be of two types namely, pre-emptive or co-operative. In pre-emptive multitasking, the operating system slices the CPU time and dedicates one slot to each of the programs. Unix-like operating systems such as Solaris and Linux support pre-emptive multitasking. If you are aware of the multi-threading terminology, you can consider this type of multi-tasking as similar to interleaved multi-threading. Cooperative multitasking is achieved by relying on each process to give time to the other processes in a defined manner. This kind of multi-tasking is similar to the idea of

block multi-threading in which one thread runs till it is blocked by some other event. MS Windows prior to Windows 95 used to support cooperative multitasking.

Palm OS for Palm handheld is a single-task operating system. Windows 9x supports multi-tasking. DOS Plus is a relatively less-known multi-tasking operating system. It can support the multi-tasking of a maximum of four CP/M-86 programs.

Distributed Operating System: An operating system that manages a group of independent computers and makes them appear to be a single computer is known as a distributed operating system. The development of networked computers that could be linked and made to communicate with each other, gave rise to distributed computing. Distributed computations are carried out on more than one machine. When computers in a group work in cooperation, they make a distributed system.

Amoeba, Plan9 and LOCUS (developed during the 1980s) are some examples of distributed operating systems.

Embedded System: The operating systems designed for being used in embedded computer systems are known as embedded operating systems. They are designed to operate on small machines like PDAs with less autonomy. They are able to operate with a limited number of resources. They are very compact and extremely efficient by design. Windows CE, FreeBSD and Minix 3 are some examples of embedded operating systems. The use of Linux in embedded computer systems is referred to as Embedded Linux.

Mobile Operating System: Though not a functionally distinct kind of operating system, mobile OS is definitely an important mention in the list of operating system types. A mobile OS controls a mobile device and its design supports wireless communication and mobile applications. It has built-in support for mobile multimedia formats. Tablet PCs and smartphones run on mobile operating systems. Blackberry OS, Google's Android and Apple's iOS are some of the most known names of mobile operating systems.

Batch Processing and Interactive Systems: Batch processing refers to execution of computer programs in 'batches' without manual intervention. In batch processing systems, programs are collected, grouped and processed on a later date. There is no prompting the user for inputs as input data are collected in advance for future processing. Input data are collected and processed in batches, hence the name batch processing. IBM's z/OS has batch processing capabilities. As against this, interactive operating requires user intervention. The process cannot be executed in the user's absence.

Online and Offline Processing: In online processing of data, the user remains in contact with the computer and processes are executed under control of the computer's central processing unit. When processes are not executed under direct control of the CPU, the processing is referred to as offline. Let's take the example of batch processing. Here, the batching or grouping of data can be done without user and CPU intervention; it can be done offline. But the actual process execution may happen under direct control of the processor that is online.

Operating systems contribute to simplifying human interaction with the computer hardware. They are responsible for linking application programs with the hardware, thus achieving easy user access to computers. Ever imagined a computer without an OS? It wouldn't be so user-friendly then!

Source: <http://www.buzzle.com/articles/different-types-of-operating-systems.html>

Text 7

Open-source Software vs. Proprietary Software

Have you ever found yourself staring at the computer screen real intently reading the words "please enter product key"? It probably needs a license for the continuation of the game. Read this article to know the differences between open-source software and proprietary software. Open-source software (OSS) is a computer software that is available free of cost. It can be modified by anyone at any time. It comes with certain conditions, i.e., if a developer modifies the code, he has to share the updated version of the software openly. He is not the proprietor of the software that is still retained by the original author according to copyright laws. It is the most prominent example of open-source development, and often compared to user-generated content or open-content movements. A report by the Standish Group (from 2008) states that the acceptance of open-source software resulted in \$60 billion in savings.



Proprietary software or closed-source software requires a fee to activate the license of the given software. Complementary terms include shareware, freeware, and commercial software. Some free software packages are also simultaneously available under proprietary terms. Proprietary software is activated via clickwrap licensing or shrinkwrap licensing. Clickwrap licensing indicates that you agreed to a set of terms and conditions before installing the software. Shrinkwrap licensing is a contract in which the buyer accepts the terms of the software by opening its shrinkwrapped package. Examples include MySQL, Sendmail, and ssh (Secure Shell).

Open-source Software

Open-source Initiative (OSI) was established in 1998 by Eric Raymond and Bruce Perens. They are the premier advocates of open-source software. It is a general-type of software that makes the source code available to the public for study, modification, and distribution. This is an advantage of open-source software, although it forbids this in principle to ensure the access of the major software updates by the developers. Developers have used the alternative terms Free/open-source Software (FOSS) or Free/Libre/open-source Software (FLOSS) consequently, to describe open-source software which is also free software. Examples of open-source products are the Apache HTTP Server, Internet browsers Mozilla Firefox and Google Chrome, and the full office suite LibreOffice.

The industries interested in investing in open-source software are cloud and virtualization, content management, mobile technology, and security. Over the next few years, government, education, and healthcare are expected to be the three industries experiencing the most impact from open-source software.

Advantages

- The main advantage is that it's available free of cost. Businesses can use this to their advantage.
- All the major fixes to the software are solved by experts who distribute the relative code via patches.
- OSS reduces the cost of marketing and logistics.
- Modular systems allow the interface to be updated or add new tools to it.
- Open-source software is used as a key enabler for cloud computing.
- It does not adhere to commercial pressure, as that reduces the quality of the software.
- A study of the Linux code revealed 0.17 bugs per 1,000 lines of code, compared to proprietary software which scores 20 - 30 bugs per 1,000 lines.
- One can download different customized versions of the same software.

Disadvantages

Not all OSS initiatives are successful; for example, Eazel and SourceXchange.

- Key programmers quit coding and move on to better paying establishments.
- Unlike proprietary software, you won't find the answers so easily on a public forum.
- Documentation for end-users is done poorly.
- Customer support, comparatively, isn't available as promptly for users.

Proprietary Software

Proprietary software or closed-source software grants a license to use the software under certain conditions, and is restricted from studying, modifying, or sharing. Examples of proprietary software include Windows, Apple, Adobe Flash Player, Google Earth, and some versions of UNIX.

The end result is that the user doesn't buy the software, but the right to use the software. Source code is not available for users to protect the programs from malicious hackers, as it is considered to be a trade secret among the manufacturers. The fees from sales and licensing of commercial software are the primary source of income for companies that sell this software.

Reference Source License (Ms-RSL) and *Limited Public License (Ms-LPL)* are proprietary software licenses where the source code is made available. Free software that depends on proprietary software is considered 'trapped' by the *Free Software Foundation*. In India, one and a half million laptops were pre-loaded with screen savers of a minister. The author of the software included a malicious feature that would 'crash' the device if the laptop owner attempted to change, remove, or modify this.

Complementary terms include shareware, freeware, and commercial software. Commercial software, or sometimes *payware*, is computer software that is produced

for sale or that serves commercial purposes. Commercial packages can be proprietary software or free/open-source software. Microsoft Corporation uses 'commercial software' to describe their business model, but is also mostly proprietary. Proprietary software that comes for no cost is called freeware. Proprietary software may also have licensing terms that limit the usage of that software to a specific set of hardware. Apple has such a licensing model for Mac OS X, an operating system which is limited to Apple hardware.

Advantages

- It is packaged and distributed in a comprehensive and modular format.
- The software offers a stable system support if it fails or malfunctions.
- The software is safe and guaranteed to be safe from dubious threats like programming bugs and viruses, thus providing ease of mind for the user.
- It is easier to install and use, as the production is planned and extensive research is carried out to ensure users purchase only the best.
- Furthermore, free updates and latest information on the software are usually provided to the user.

Disadvantages

- It is usually costly, and has closed standards that hinder further development.
- With proprietary software, you are reliant on the program's developer for all updates, support, and fixes. Updates may be slow in coming, depending on the size of the development team, and it may take some time to address security holes or other problems. In addition, if the primary developer goes out of business, you may have no further updates or support, unless another company buys out the project.
- Proprietary software systems rely on the development team for identifying problems, or worse, security loopholes discovered in the wild. Some proprietary developers notoriously rely on 'security through obscurity', attempting to quash information about security weaknesses in order to prevent outsiders from utilizing them.
- What you see is what you get with a proprietary software package; you simply license it as it is.
- Any improvements would usually require fees, which is often expensive.
- Users are not allowed to describe and share the software as that is licensed.

When deciding between open-source software vs. proprietary software, it is critical to consider the risks and assess the internal and external limits of the organization. The aforementioned issues can then be used as a guide to make a collective, informed decision.

Source: <http://www.buzzle.com/articles/open-source-software-vs-proprietary-software.html>

Text 8

History of Artificial Intelligence



A brief history of artificial intelligence starting from 800 B.C. up to the present day is presented in short. Interesting facts about the development of artificial intelligence can be found in this article.

Man has always been trying to develop machines that make his day-to-day work easier. New techniques are developed on a continual basis to improve the functioning of already existing one. With advancements in science

and technology, machines are taught to handle more complicated tasks; in short they are made more intelligent than the previous forms. Artificial intelligence is nothing but inducing intelligence into machines externally. The history of artificial intelligence can be traced back to the period of 800 B.C. Egypt. The Egyptians had constructed a statue of Amun that could move its hands up and down. One can say that the statue of Amun served as an inspiration to make further progress in the field of artificial intelligence.

The huge database of information and knowledge that we have gathered over years through research and technological advancement is being used in creating superior machines. Speech recognition, playing chess, driving vehicles without human intervention, etc., are different tasks that robots and other machines perform.

Simple Mechanical Machines

The first mechanical digit calculating machine was developed by Pascal in the year 1642. It was improved by Leibniz in 1673 to create 'Step Reckoner', a machine capable of performing additional functions of multiplication and division. Later, in the 18th century, many different mechanical toys were developed. Vaucanson's mechanical duck and Von Kempelen's mechanical chess player are the best examples of such toys.

Formal Logic

The concept of formal logic was popularized by Bertrand Russell in the beginning of 20th century. Alfred North Whitehead too, presented his research on this topic through a book called 'Principia Mathematica'. It was also during this period that Karel Capek coined the term, robot. Development of electronic computer later in the 40s decade made it easy to manipulate numbers and symbols.

Logic Theorist

It is a computer program written by Allen Newell, J.C. Shaw and Herbert Simon in 1955. By this time, the availability of computers had enabled scientists to work more efficiently in the field of artificial intelligence. The problem solving skills possessed by human beings were induced into computers by means of this program.

Dartmouth Conference

John McCarthy is said to be the father of AI. He played a significant role in bringing together people interested in artificial intelligence. McCarthy organized the Dartmouth conference in 1956. This conference proved to be the beginning of a new era in the field of artificial intelligence. The word, artificial intelligence was officially accepted by participants of this conference. Notable personalities who were part of the Dartmouth Conference included Marvin Minsky, Nathan Rochester (IBM) and Claude Shannon. Other scientists who attended this conference were Oliver Selfridge, Ray Solomonoff, Arthur, Trenchard More, Herbert Simon and Allen Newell. The Logic Theorist program developed by Allen Newell and Herbert Simon was introduced to scientists during this conference.

LISP Programming Language

Development of the LISP programming language by John McCarthy was a major advancement in artificial intelligence in the later half of 20th century. The electronic computer, 701 developed by IBM was another important development of this period.

Expert Systems

These are the modern developments which took place in the field of artificial intelligence. The activity of creating expert systems was supported by governments of many countries. The expertise and knowledge base of human beings can be applied to problem-solving through the use of computer programs. Such computer programs are known as expert systems. These systems are however, used to solve only certain, specific problems.

Intelligent Agents

Intelligent agents are mechanisms which apply information gathered from their environment in solving problems. It has been observed that machines incorporating intelligent agents in their design function efficiently. The VaMP car that crossed the 158 km/hr speed limit without human assistance is one of the best examples of this technology. A computer that plays chess is also one of the examples of application of intelligent agents.

Advancements in artificial intelligence and especially neural networks have increased the possibility of developing highly efficient and intelligent robots. In the context of all these developments, activity of studying the pros and cons of artificial intelligence also is important. However, even after all these advancements, studies and experiments, the question of whether machines can develop common-sense through artificial intelligence remains unanswered.

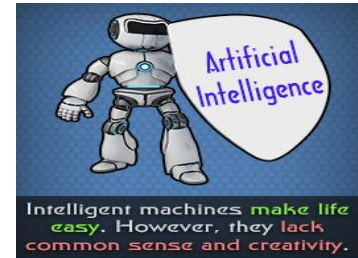
Source: <http://www.buzzle.com/articles/history-of-artificial-intelligence.html>

Text 9

Pros and Cons of Artificial Intelligence

Artificial intelligence (AI) is the intelligence of machines. It is about designing machines that can think. Researchers also aim at introducing an emotional aspect into them. How will it affect our lives?

Artificial intelligence can help alleviate the difficulties faced by man but intelligent machines can never be human. Intelligence is best defined as the ability of an individual to adapt his/her behavior to new circumstances. Human intelligence is not a single ability but is rather a composition of abilities like learning, reasoning, problem solving, perception, and understanding of language.



Since ancient times, people have been thinking of designing machines that will replicate human intelligence. The concept of thinking machines appears in Greek myths like the 'Talos of Crete'. John McCarthy coined the term, 'artificial intelligence' in 1956. He defines artificial intelligence as the science and engineering of making intelligent machines. AI researchers hope to develop intelligent machines, which can perceive, learn and reason like humans. General intelligence is their long-term goal. By general intelligence they mean to incorporate other aspects like social intelligence, judgment, common sense, robotics, and self-awareness into machines. Researchers dream of bringing into machines, factors such as wisdom and the ability to feel, which only humans possess.

Pros:

- ▶ With artificial intelligence, the chances of error are almost nil and greater precision and accuracy is achieved.
- ▶ Artificial intelligence finds applications in space exploration. Intelligent robots can be used to explore space. They are machines and hence have the ability to endure the hostile environment of the interplanetary space. They can be made to adapt in such a way that planetary atmospheres do not affect their physical state and functioning.
- ▶ Intelligent robots can be programmed to reach the Earth's nadirs. They can be used to dig for fuels. They can be used for mining purposes. The intelligence of machines can be harnessed for exploring the depths of oceans. These machines can be of use in overcoming the limitations that humans have.
- ▶ Intelligent machines can replace human beings in many areas of work. Robots can do certain laborious tasks. Painstaking activities, which have long been carried out by humans can be taken over by the robots. Owing to the intelligence programmed in them, the machines can shoulder greater responsibilities and can be programmed to manage themselves.
- ▶ Smartphones are a great example of the application of artificial intelligence. In utilities like predicting what a user is going to type and correcting human errors in spelling, machine intelligence is at work. Applications like Siri that act as personal assistants, GPS and Maps applications that give users the best or the shortest routes to take as well as the traffic and

time estimates to reach there, use artificial intelligence. Applications on phones or computers that predict user actions and also make recommendations that suit user choice are applications of AI. Thus, we see that artificial intelligence has made daily life a lot easier.

- ▶ Fraud detection in smart card-based systems is possible with the use of AI. It is also employed by financial institutions and banks to organize and manage records.
- ▶ Organizations use avatars that are digital assistants who interact with the users, thus saving the need of human resources.
- ▶ Emotions that often intercept rational thinking of a human being are not a hindrance for artificial thinkers. Lacking the emotional side, robots can think logically and take the right decisions. Sentiments are associated with moods that affect human efficiency. This is not the case with machines with artificial intelligence.
- ▶ Artificial intelligence can be utilized in carrying out repetitive and time-consuming tasks efficiently.
- ▶ Intelligent machines can be employed to do certain dangerous tasks. They can adjust their parameters such as their speed and time, and be made to act quickly, unaffected by factors that affect humans.
- ▶ When we play a computer game or operate a computer-controlled bot, we are in fact interacting with artificial intelligence. In a game where the computer plays as our opponent, it is with the help of AI that the machine plans the game moves in response to ours. Thus, gaming is among the most common examples of the advantages of artificial intelligence.
 - ▶ AI is at work in the medical field too. Algorithms can help the doctors assess patients and their health risks. It can help them know the side effects that various medicines can have. Surgery simulators use machine intelligence in training medical professionals. AI can be used to simulate brain functioning, and thus prove useful in the diagnosis and treatment of neurological problems. As in case of any other field, repetitive or time-consuming tasks can be managed through the application of artificial intelligence.
- ▶ Robotic pets can help patients with depression and also keep them active.
- ▶ The greatest advantage of artificial intelligence is that machines do not require sleep or breaks, and are able to function without stopping. They can continuously perform the same task without getting bored or tired. When employed to carry out dangerous tasks, the risk to human health and safety is reduced.

Cons:

- ▶ One of the main disadvantages of artificial intelligence is the cost incurred in the maintenance and repair. Programs need to be updated to suit the changing requirements, and machines need to be made smarter. In case of a breakdown, the cost of repair may be very high. Procedures to restore lost code or data may be time-consuming and costly.
- ▶ An important concern regarding the application of artificial intelligence is about ethics and moral values. Is it ethically correct to create replicas of human beings? Do our moral values allow us to recreate intelligence? Intelligence is a gift of nature. It may not be right to install it into a machine to make it work for our benefit.

► Machines may be able to store enormous amounts of data, but the storage, access, and retrieval is not as effective as in case of the human brain. They may be able to perform repetitive tasks for long, but they do not get better with experience, like humans do. They are not able to act any different from what they are programmed to do. Though this is mostly seen as an advantage, it may work the other way, when a situation demands one to act in way different from the usual. Machines may not be as efficient as humans in altering their responses depending on the changing situations.

► The idea of machines replacing human beings sounds wonderful. It appears to save us from all the pain. But is it really so exciting? Ideas like working wholeheartedly, with a sense of belonging, and with dedication have no existence in the world of artificial intelligence. Imagine robots working in hospitals. Do you picture them showing the care and concern that humans would? Do you think online assistants (avatars) can give the kind of service that a human being would? Concepts such as care, understanding, and togetherness cannot be understood by machines, which is why, how much ever intelligent they become, they will always lack the human touch.

► Imagine intelligent machines employed in creative fields. Do you think robots can excel or even compete the human mind in creative thinking or originality? Thinking machines lack a creative mind. Human beings are emotional intellectuals. They think and feel. Their feelings guide their thoughts. This is not the case with machines. The intuitive abilities that humans possess, the way humans can judge based on previous knowledge, the inherent abilities that they have, cannot be replicated by machines. Also, machines lack common sense.

► If robots begin to replace humans in every field, it will eventually lead to unemployment. People will be left with nothing to do. So much empty time may result in its destructive use. Thinking machines will govern all the fields and populate the positions that humans occupy, leaving thousands of people jobless.

► Also, due to the reduced need to use their intelligence, lateral thinking and multitasking abilities of humans may diminish. With so much assistance from machines, if humans do not need to use their thinking abilities, these abilities will gradually decline. With the heavy application of artificial intelligence, humans may become overly dependent on machines, losing their mental capacities.

► If the control of machines goes in the wrong hands, it may cause destruction. Machines won't think before acting. Thus, they may be programmed to do the wrong things, or for mass destruction.

► Apart from all these cons of AI, there is a fear of robots superseding humans. Ideally, human beings should continue to be the masters of machines. However, if things turn the other way round, the world will turn into chaos. Intelligent machines may prove to be smarter than us, they might enslave us and start ruling the world.

It should be understood that artificial intelligence has several pros but it has its disadvantages as well. Its benefits and risks should be carefully weighed before employing it for human convenience.

Source: <http://www.buzzle.com/articles/pros-and-cons-of-artificial-intelligence.html>

Text 10

Types of Database Management Systems and their Benefits

A database is used to collect, store, and group data. A good database management system (DBMS) ensures an efficient management of the stored data by allowing users and the administrator to access it, while also maintaining data security. This article enlists the different types of database management systems and their benefits.

Simply Put

A database management system or database manager is a set of computer programs that allow users to create and access data, and provide them with ways to retrieve and modify it.

A database organizes related data such that it can be accessed by users. A DBMS is designed to manage this data, which includes managing user access rights for viewing, adding, deleting, and modifying records. IBM's Information Management System (IMS) was one of the first database management systems to be used.

Based on the number of users supported, database management systems can be classified as single-user and multi-user. A single-user database supports only one user at a time, which means that other users have to wait till the first one has finished accessing it. A multi-user database, as its name implies, lets multiple users access the data simultaneously, but with limited rights given to each user.

Database systems can also be classified as centralized and distributed. A centralized database system consists of a CPU which handles multiple storage devices together. While the data is accessed from multiple sites, the database is maintained at a central location. A distributed database has the data distributed over multiple computers or networks. The database may or may not be at a central location. Security is achieved by maintaining a master database with copies of the data on other locations. The data is periodically synchronized so that changes made on one location are reflected on the others.

Flat File

A flat-file model is simple. Each line of text holds a single record usually separated by commas. Other delimiters could also be used. The database can contain records with no link between them. It cannot hold multiple tables like a relational database. A spreadsheet or word processor is used to implement a flat file. Examples of flat file database systems include MS Excel and FileMaker.

Benefits

- ▶ All records are stored at one place. The structure is simple.
- ▶ It works well for small databases and has minimum software and hardware requirements.

Hierarchical

A hierarchical database consists of records that are linked to each other. Every record is a collection of fields, each of which contains a single value. A hierarchical database follows a parent-child relationship. For a better understanding, think of it as an upside-down tree.

A hierarchical database is represented in the form of boxes. The relationships between a parent and a child can be one-to-one or one-to-many. A parent may or may not have an

arrow pointing to the child but a child must have an arrow pointing towards its parent. A hierarchical database can't handle many-to-many relationships like relational databases. Examples of hierarchical database systems include ADABAS (Adaptable Data Base System).

Benefits

- ▶ Since most of the relationships are one-to-one, the database structure is easy to understand even for non-programmers. After finding the first record, you don't need to do an index scan. You just follow the parent pointer directing you towards the next record.
- ▶ As data is stored in a common database, it becomes easier to view it. Modifications, if any, can be made easily in the file by replacing the existing data.
- ▶ It becomes easy for the administrator to maintain the database by changing the records in their respective fields.

Network

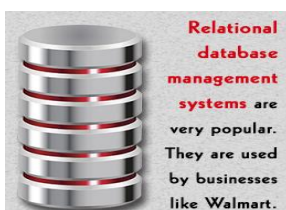
A network database was created for representing complex data more effectively. It is similar to the hierarchical model but in this case, a child can have multiple parents and vice versa. It forms a general graph or a network of hierarchies.

The schema, subschema, and the data management language are the key components of this database. The schema is the conceptual representation of the database while the subschema comprises the data within the database. The data management language defines the data characteristics and structure in order to manipulate the data. It was eventually replaced by the relational model which made it easier to store and change data at the same time. Examples of network database systems include Integrated Data Store (IDS) and Integrated Database Management System (IDMS).

Benefits

- ▶ Like a hierarchical database, the components of a network database can have multiple parent-child relationships. Its capacity to maintain data is more than that of the hierarchical model.
- ▶ Since there's always a link between a parent and a child, the integrity of the data is maintained.
- ▶ The database has to spend less time maintaining records due to the elimination of redundant tables, which improves efficiency and the overall performance.

Relational



A relational database is a collection of data items organized in tables consisting of rows called records and columns called fields from which data can be accessed any time. A relational database can be accessed using query languages such as SQL. Queries are used to create, modify, or retrieve data. Access rights are better managed.

Generally, data is stored in the form of tables. Every table has a primary key column. A primary key is used as a unique identifier for each record. No two records can have the same primary key. The concept of foreign keys is used to establish relations between two or more tables. A foreign key is a field in one table that uniquely identifies a row of another table. It is used for cross-referencing and linking data between tables. Examples of relational database systems include MySQL and Microsoft SQL Server.

Benefits

- ▶ User rights can be restricted depending on what data should be made visible or modifiable to which users. This allows for greater security.
- ▶ With a hierarchical database, you need to access the root and work your way down. As against that, a relational database gives you flexibility of access.
- ▶ Duplication of data is avoided, thus keeping the size of the database down. This reduces its memory requirement and also increases efficiency.

Object-oriented

As the name implies, it's a database consisting of objects as used in object-oriented programming. These databases work well with object-oriented languages such as Perl, C++, Java, Smalltalk, and others.

Similar objects are grouped into a class and every object of a particular class is called its instance. Classes allow a programmer to define data that is not included in the program. Since a class only defines the data it needs to be concerned with, if an object of that class is run, it won't be able to access other data, thus avoiding data corruption and ensuring security. Classes exchange data between themselves through the use of messages called methods. They have a property called inheritance, which means that if a class is defined, a subclass can inherit its properties without defining its own methods. This means that a subclass can implement the same code. This speeds up program development. Examples of object-oriented database systems include Versant.

Benefits

- ▶ Classes allow the grouping of objects having similar features. A superclass can be created combining all classes. This leads to reduced data redundancy and class reusability, thereby allowing easier maintenance of data.
- ▶ The database is capable of storing different types of data such as audio, video, pictures, *etc.*
- ▶ A query language may not be needed, as all the transactions take place by accessing objects transparently.

Multidimensional

A multidimensional database is closely related to online analytical processing which is a part of business intelligence and data warehousing. Online analytical processing (OLAP) makes it easy to extract and view data through different points of view. It can be used to access multidimensional data. Multidimensional databases can be visualized as data cubes that represent different dimensions of the available data. It combines the advantages of

hierarchical and relational databases. Examples of multidimensional databases include Oracle Essbase and Microsoft SAS.

Benefits

- ▶ It answers queries quicker than relational databases because of multidimensional indexing and optimized storage.
- ▶ The output of multidimensional databases has a spreadsheet-like view which is not achievable in case of relational databases.

Object-relational

An object-relational database offers the best of both worlds. It has a relational database combined with object-oriented concepts like objects, classes, inheritance, and polymorphism. It functions in a manner similar to relational databases. Examples include IBM's DB2.

Benefits

- ▶ It can fetch data easily through polymorphism. Reusing the data becomes easier.
- ▶ Since it encompasses the best of relational and object-oriented databases, scalability is not an issue. Huge volumes of data can be stored inside classes.

Hybrid

Basically, a hybrid system is a combination of two or more databases. Hybrids are used when one type of database isn't sufficient to handle all the queries. It supports both on-disk and in-memory storage. An in-memory database uses the main memory for data storage, while a disk-resident database uses disk-based storage. In-memory databases rank higher on performance, while on-disk databases are more durable and cost-saving. A hybrid database combines the advantages of the two. Examples include ALTIBASE HDB.

Benefits

- ▶ A hybrid design is meant to reap the advantages of the two or more database types that it is composed of.
- ▶ Retrieving data from memory instead of the disk makes the operations faster. This makes a hybrid database score high on performance.

These were the different types of database management systems. Each type has its own benefits, but deciding the one which is best-suited for a particular organization depends on the nature and amount of data that it needs to handle.

Source:

<http://www.buzzle.com/articles/types-of-database-management-systems-and-their-benefits.html>

APPENDIX

How to Give a Successful Presentation?

An essential task at the pre-preparatory stage is to ask yourself the following questions:

- What is the purpose of my presentation?
- What are the main points that I would like to get across?

Start getting ready for your presentation a few weeks before you are due to speak.

Collect the materials on which you would like to base your presentation.

Make a careful selection from the collected materials.

Here are some tips for the learner to start the presentation process:

- Make the first plan of the presentation (you can modify it later).
- Remember to give your presentation a logical structure:

Introduction - tell the audience what you're going to say

Main Body - say it, developing the above mentioned issue(s).

Conclusions - sum up what you've just said

- Make the first draft of your presentation. Read it carefully. If any of the information is not related to the topic, remove it.
- If there are issues which you cannot express in a precise or clear way, it is probably because you do not really understand them yourself. So it is better not to talk about them.
- Never read from your notes. You should know the material you want to present well enough not to need your notes. If you don't, perhaps you're not ready to give your presentation.
- Keep to the time! Do not exceed the time limit. It is better to shorten the presentation by two minutes than to extend it by two minutes.
- Follow the plan of your presentation! Do not digress! Usually digressions take more time than we think. Successful presenters have "spontaneous digressions" well thought over and well planned.
- Leave time for questions from the audience. Questions may help you to get your message across better.

Some final tips concerning your manner of presentation:

- Speak clearly.
- Make pauses in places which you consider critical for your presentation; this emphasizes the importance of the information you wish to convey to the audience.
- Try to control your body language; avoid excessive gesticulation.
- Maintain eye contact with your listeners but do not focus on one person.
- Don't turn your back to the audience if you want to show something on the screen and don't 'talk to the screen' either.
- Don't stand in the light of a projector covering the screen.
- Don't forget to thank the audience for their attention and encourage them to ask questions. If you are not sure about the answer or if you simply do not know it, don't be afraid to admit that, but suggest the source in which the answer can be found.

The sentences and phrases below follow the logical progression of a well-balanced presentation. This is a list of phrases to help you make a professional presentation in English.

Good presenters always use language (sometimes single words, sometimes phrases) which shows where they are in their presentation. These 'signposts' make it easier for the audience to:

- follow the structure of the presentation
- understand the speaker more easily
- get an idea of the length and content of the presentation.

Welcoming	
Good morning (afternoon, evening) everyone. I'd like to welcome you all here. Thank you all very much for coming today.	- Доброе утро / Добрый день / вечер. Я хотел(а) бы поприветствовать вас всех здесь. - Спасибо, что пришли (на презентацию).
Introducing yourself	
Let me introduce myself; my name is ... and I am	- Позвольте представиться, меня зовут ... и я ...
Introducing your presentation	
The purpose of my <i>presentation / talk</i> today is to In my presentation today I'll be <i>talking about ... / reviewing...</i>	- Цель моей презентации ... - В моей презентации я буду <i>говорить о / делать обзор ...</i>

I'm going to talk about ... Firstly, ..., after that I'll ..., and finally I'll ...	- Я буду говорить о ... - Во-первых, я ... , далее ..., и наконец я ...
Explaining that there will be time for questions at the end	
If you have any questions / there are any questions you'd like to ask, please leave them until the end, when I'll do my best to answer them. Please, feel free to interrupt at any time if you'd like to ask a question. But if you don't mind, I'll deal with questions at the end of my talk.	- Если у вас появятся вопросы, которые вы хотели бы задать, пожалуйста, задайте их в конце презентации, я буду рад(а) ответить на них. - Вы можете прервать меня в любую минуту, если хотите задать вопрос. Но если не возражаете, я отвечу на вопросы в конце своего выступления.
Starting the presentation	
To begin / start with ... Let's start / begin by looking at ... I'd like to begin by . Let's begin. OK, let's get started.	- Начнём с того, что ... - Начнём с просмотра ... - Я хотел(а) бы начать с ... - Давайте начнем. - Хорошо, давайте приступим.
Choosing a section of the presentation	
So, that's an overview of	- Итак, перейдем к заключению ...
Beginning a new section of the presentation	
Now let's move on ... Moving on to the next part, I'd like to ...	- А сейчас перейдем к ... - Рассматривая следующий вопрос, мне бы хотелось ...
Referring to visuals	
I'd like you to take a look at this <i>chart / table / figure</i> , which shows ... If you look at this graph, you'll see ... The figures in this table show ... As you can see from this pie chart ... Just have a look at this chart for a moment.	Я хотел(а) бы, чтобы вы взглянули на <i>эту схему, график, диаграмма, схема, таблица, чертёж / таблицу / этот рисунок</i> , которая (-ый) показывает ... Если вы посмотрите на этот график, то увидите... Цифры в этой таблице показывают... Как вы можете видеть на этой секторной диаграмме... Взгляните на эту диаграмму.

Dealing with difficult questions	
I'll come back to that question later in my presentation.	- Если можно, я вернусь к этому вопросу чуть позже.
If you don't mind, I'll deal with questions at the end of my talk.	- Если вы не возражаете, я отвечу на вопросы в конце выступления.
Concluding and summarising the presentation	
Well, that brings us to the end of the final section. Now, I'd like to summarise by To sum up then, let me ...	- Наконец, мы подходим к последней части презентации. Мне бы хотелось подвести итог Подводя итог, позвольте мне...
Inviting questions	
That brings the presentation to an end. If <i>anyone has any questions / there are any questions, I'll be pleased / I'll do my best to answer them.</i> Now I'm ready to answer your questions. If there are no (more) questions, thank you for your interest.	- Презентация закончена. - Если у кого-либо есть вопросы, я <i>буду рад / постараюсь</i> ответить на них. А сейчас я готов(а) ответить на ваши вопросы. Если вопросов (больше) нет, спасибо за проявленный интерес.
Referring to a previous point made	
As I mentioned earlier	- Как отмечалось раньше
Answering questions	
Sorry, could you say that again, please? If I've understood your question correctly, you would like me to ... I'm sorry. I didn't hear you. Would you mind repeating your question?	Извините, не могли бы вы сказать это еще раз? Если я правильно понял(а) ваш вопрос, вы хотели бы, чтобы я...? Извините, я не расслышал(а). Не могли бы повторить ваш вопрос?
Finishing and thanking	
Thank you for your attention. Finally, I'd like <i>to finish / to end</i> by thanking you (all) <i>for your attention / for coming today.</i>	- Спасибо за внимание. - По окончании презентации я хочу поблагодарить всех за <i>внимание / за то, что вы пришли на презентацию.</i>

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