

Computer Upgrade

Investigate the possibility of upgrading your personal computers
Focus on major components
Produce a report

Objective

To investigate the possibility of upgrading my personal computer.

My family's personal computer was bought 4 years ago. We always encounter problems with it. For example, our system always do not respond properly, it stops responding after opening a few programs; In gaming, although the display quality was set to the lowest, the speed of the game play is still unacceptable; "Excess use of storage" warning was always encounter, many data needed to be deleted to reduce the use of storage; DVD playback is not smooth and blurry display etc.

Thus, we plan to upgrade the computer to meet the family members' requirement.

Requests:

For father, he wants to have TV capture and replay function in the new system for the LIVE football matches. He also wants a smooth DVD playback with clear display.

For brother, he always wants to have high quality and full speed three-dimensional online gaming. He would like a larger display-size.

For sister, she needs a stable computer system for paper work and browsing the internet, she also wants to listen to high quality pop music.

For mother, all she needs is a slim and beautiful monitor. She wants a smaller size monitor to reduce the use of the space.

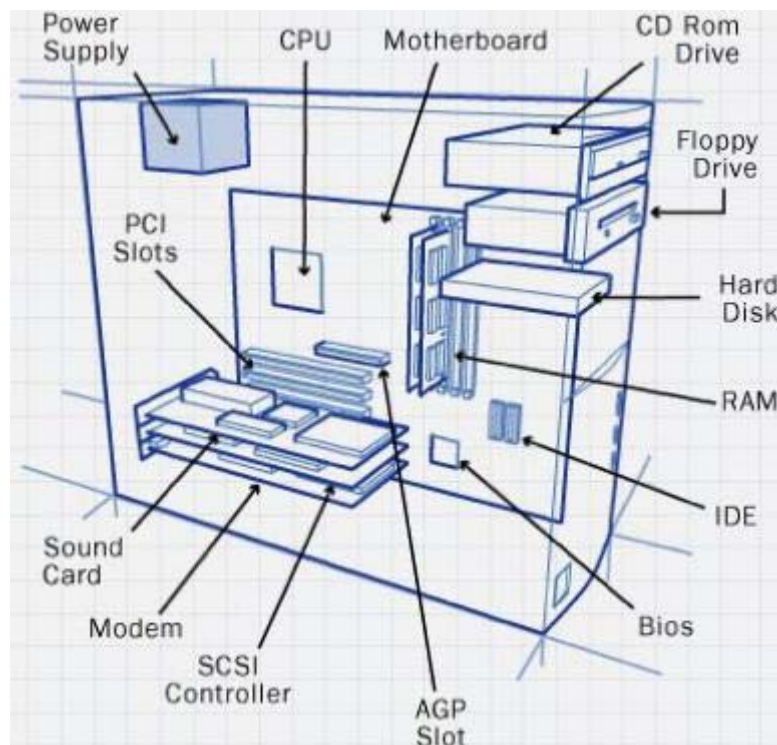
For me, I would like to have video editing in the new system. The videos will be transferred from a new digital video recorder. I also need to record the videos in a CDs, thus, they can be played in a normal VCD player.

On the whole, we need a multimedia system with modern technology. However, our budget is only around \$7500. So we must make full use of each part of the computer to meet the requirement.



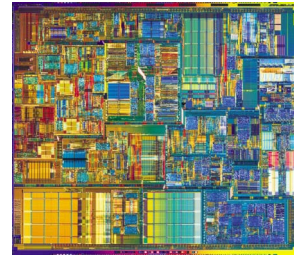
Analysis

Before upgrading, we should learn about the main components of typical desktop computers and how they work together.



Central Processing Unit (CPU)

It is also called processor or microprocessor. It is the “brain” of the computer system which contain the logical unit that performs the instructions of a computer's programs (software).



Nowadays, we use MHz or GHz to represent the speed of a CPU. The higher the GHz (or MHz), the higher speed of the CPU. In addition, some new CPU include extended instructions which can improve its performance if the software is supported.

Random Access Memory (RAM)

It is a kind of memory in computer. It is a very fast storage which keep the data currently in use (temporary). It



connects directly to the microprocessor, thus, it is much faster to read from and write to than the other kinds of storage in a computer. However, RAM loses its data when the computer is turned off. Therefore, data will be loaded once again after the PC is turned on, usually from the hard disk.

Thus, a computer stability is greatly depend on the amount of RAM can be used as more RAM can hold more data temporary.

Hard disk

It is a large capacity permanent storage device. It provides relatively quick access to large amount of data. Information such as programs and documents are kept in there.

The units of the capacity we usually use are GB and MB. So, we should by a larger GB hard disk in order to store more information.



Motherboard

It is the main circuit board that all other internal components connect to. The CPU and RAM can be directly found on it. The other

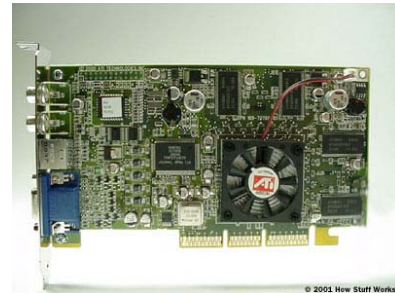
parts are usually connected to it through a secondary connection.

The chipset is the heart of the motherboard since it controls and determines how fast and which type of processor, memory, and slots can be used. Thus, we should choose an appropriate chipset for a particular CPU. Recent motherboard designs also may include additional chips to support USB, sound card and network adapter.

Graphics Card

This translates image data from the computer into a format that can be displayed by the monitor.

For the modern graphics card, it includes a 3D graphics accelerator chip-set which make use of special kind of DDRSDRAM. It is plugged into AGP (Accelerated Graphics Port) on the motherboard to enhance the performance by widening the bandwidth of the graphics hardware connection to a PC. Therefore, in order to play 3D games in high quality, a strong and advanced 3D accelerator chip-set with more RAM is needed.



Monitor

It is a computer display. It displays information from computer. Currently, the choices are mainly between CRT and LCD technologies. LCD monitors are newly invented with slimmer size and brighter display. CRT monitors are usually bigger but cheaper.

Operating System (OS)

This is a basic software that allows the user to communicate with the computer. It usually has a graphical user interface (GUI) for interactive access. It manage the resource of the computer.



Comment on the old computer

Below is the old computer configuration:

CPU	Intel Pentium II 233 MHz
Motherboard	440LX chip-set Motherboard with USB 1.1x2
RAM	64MB PC-66 SDRAM

Hard Disk	IBM 4GB Ultra ATA 33 5400rpm
Monitor	14' CRT Shadow Mask
Graphics Card	Nvidia Riva 128 with 4MB SDRAM 1x AGP
Sound Card	S3 Sonic Vibes PCI sound card
DVD-ROM Drive	2x DVD-ROM
Floppy Drive	3.5' 1.44MB Drive



OS: Windows 98

Except the 4GB hard disk and the floppy drive are still reusable, all the others component is not suitable for the new computer system and needed to be upgraded.

The old 233 MHz CPU is too slow for running latest software.

This motherboard cannot new type of CPU.

RAM and hard disk is too low in storage. The stability and storage capacity provided from them cannot afford running the latest software.

The graphics card's 3D accelerator chip-set is too old with too few RAM. Most of the modern 3D games cannot be run.

The DVD-ROM is too slow for DVD reading and the sound card is no longer support by the manufacturer for many years, thus, it does not support new operating system.

Remarks: The old hard disk can be installed in the new system for the backup use.

Design

For the upgraded system, the configuration is as below:

CPU	AMD ATHLON XP 2100+ (0.13)	\$718
Motherboard	MSI KT3V (KT333 chip-set)	\$510
RAM	SAMSUNG PC2100-512MB DDR266 SDRAM	\$620
Hard Disk	MAXTOR 6Y060L0 60GB Ultra ATA 133 7200rpm	\$645
Monitor	SONY SDM-S51B 15' LCD Display	\$2,300

Graphics Card	LEADTEK WINFAST A250LE-VIVO (Nvidia Geforce 4 Ti4200 with 128MB DDRSDRAM, 4x AGP)	\$1,300
Sound Card	CREATIVE SOUND BLASTER LIVE DE 5.1 (SE)	\$255
DVD-ROM Drive	LITEON 16X DVD-ROM	\$285
CD-Rewriter	LITEON CDRW 482448	\$398
Speaker	2.1 speaker with subwoofer	\$250

Total: \$7281

Comprehensive description:

CPU- AMD ATHLON XP 2100+:

As video encoding and 3D gaming needs a high-speed processor, ATHLON XP 2100+ will be a good choice. It has 1733 MHz which is surely enough for running any latest software without any problem. It also has 3DNow!™ Professional Technology (72 instructions, full SSE compatibility) which improved integer math calculations for video encoding. Its improved data movement for Internet plug-ins and other streaming applications is great for video playback. Its SIMD integer and floating point additions offer excellent 3D gaming speed.



RAM –512MB DDR SDRAM:

Video editing and Real time TV capture require a lot of RAM as the system would hold a large amount of data in high speed temporary. Thus, 512MB Double data rate SDRAM would be a good choice. Because it has a large capacity and it has higher performance compared to the old SDRAM. It can surely provide a stable system for normal paper work.

Hard Disk - MAXTOR 60GB:

This multimedia system requires a large storage capacity. For example, the installation of 3D games. It usually needs a GB per game; the videos saved for replaying football matches. This kind of high quality video files can be very large; also, the video saved from DV for editing need a large temporary storing space, etc. Therefore, this Maxtor 60GB hard disk is suitable. It is enough for storing games, videos and many MP3 music files. Moreover, it has a high spinning speed (7200rpm) and high bandwidth connection (ULTRA ATA 133) to the motherboard. It can transfer up to 133MB/s!

Graphics Card – Leadtek Nvidia Geforce 4 Ti4200 w/128MB DDRSDRAM:

For high quality 3D gaming, Nvidia Geforce 4 series will be good. Despite the fast 2D display, it has a high speed 3D engine (Hardware Transform and Lighting-H T&L) and a 4x AGP high speed communication with the CPU (4 times larger bandwidth than the old AGP). It can surely provide a smooth game play for all popular games. It also provides hardware DVD playback acceleration and compensation which increase the DVD playback speed and quality. In addition, this graphics card include a Video Input and Video Output system (VIVO). Video signal from the television can be transmitted to the computer through it and vice versa. Thus, TV capturing in football matches can be come true.



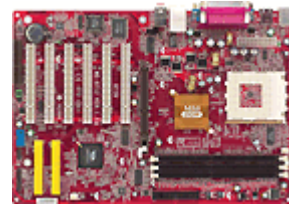
Monitor - SONY SDM-S51B 15' LCD Display:

For slim size monitor, this SONY SDM-S51B 15' LCD Display is a good choice. It is much thinner compared to the same display size (15') CRT monitor. Also, 15' display is more suitable for 3D gaming compare to 14' display. It is black in colour with modern design by Sony. It has a clear display which is suitable for watching DVD.



Motherboard - MSI KT3V (KT333 chip-set):

This KT333 chip-set motherboard supports all CPUs which use “Socket A” and Athlon XP is using “Socket A”. It supports DDR200/266/333 up to 3GB RAM. It provides 6 USB 2.0 ports which enable the PC to connect many Peripheral devices in high speed (up to 480Mbps, 40 times faster than old USB) included digital video recorder, printer and scanner, etc. It has network controller built-in which provides network function such as internet accessing.



Sound Card - CREATIVE SOUND BLASTER LIVE DE 5.1 (SE):

This sound card is from Creative which is famous in its audio products. It has a powerful EMU10K1™ Digital Signal Processor that can bring up high quality sound reproduction with real-time audio and effects. It can connect to Dolby® Digital and multi-channel digital speaker systems to produce cinema quality sound to movies, music, and games with digital 5.1 clarity. So, listening to high quality MP3 music is not a problem with this sound card. In addition, it has MIC and LINE IN plug. Then, the voice signal from television can be transmitted to the computer through LINE IN. Thus, voice from the football matches can be recorded at the same time with video.

DVD-ROM Drive - LITEON 16X:

Its 16X speed is surely enough for any DVD videos playback. It also provide high speed in reading data DVDs and CDs. In addition, its firmware can be changed to ALL CODE edition. It means this DVD-ROM can play any DVD but not limited by the DVD region.

CD Rewriter - LITEON CDRW 482448

This CD Rewriter provides 48x write, 24x rewrite and 48x read to and from discs. Thus, videos from DV can be burned on CD-R in Standard Video CD format. Because its high burning speed, a Video CD can be made within 3 minutes.

Operation System:

Windows XP is suggested. As we need a stable system for video editing, multimedia function and paper work, Windows XP is really suitable. It built-in NT technology which is famous in providing a more “stable environment” comparing to the old Windows 98. It also supports more new hardware and technology so that we do not need to update so many things after the installation of operation system. Moreover, it provided many ready usable software, like Windows Media Player for videos playback; WordPad for word processing; internet browser with broadband connection software etc.



Conclusion and Discussion

In conclusion, most of the configuration in the new computer system meets the user requirement. However, some of them can still be improved. For example, for the TV capturing function, using a TV capture card should be better. Because it can process the image from the input and produce a optimum output. In contrast, VIVO system in graphics card will only convert the signal for computer display, thus the display quality is worse. For the hard disk, 80GB or 120GB one should be better. Therefore, the computer can store more 3D games and more high quality videos. For the display, a larger viewable size is more appropriate for watching DVD videos. For the speaker, 5.1 sound system would be better for DVD audio and 3D gaming. Unfortunately, all of the above improvement need more budget which is impossible.

For the future development, software which is not useful should be deleted to reduce the use of capacity. Unuseful background service should be disabled in system options. This can increase the stability of the system. Recently update the software and drivers in order to fix bugs and get higher performance.



Reference

HK Golden

<http://www.hkgolden.com>

How stuff works

<http://www.howstuffworks.com/>

What is

<http://www.whatis.com>

AMD

<http://www.amd.com>

Intel

<http://www.intel.com>

Sony Style

<http://www.sonystyle.com>

MSI

<http://www.msi.com.tw>

Creative Sound Blaster

<http://www.soundblaster.com>

USB.org

<http://www.usb.org>

S3

<http://www.s3grahpics.com>