- Building Personal Computer Systems –

(User 1)

The user is a basic Office Worker.

They need to be able to write text-based documents such as letters. An office worker needs to be able to make letters depending on where they are employed. Some accounting is needed as an office worker and emails which would be required as an office worker because typically, you would need to be able to send emails and send work documents about the job they have took on. An example would be if you are a security salesman who is based at home, you might need to send a report of how many sales you have made.

Computer Components	Cost Of Components	Office Worker	
		Size/Speed	
RAM	£50.00	4GB	
Hard Disk	£50.00	120GB	
Graphics Card - GPU	Nill	Intergrated	
Sound card	£50.00	Low	
Fan	£20.00	Basic	
CPU	£50.00	2.5GHz	
Motherbored	£30.00	Low-End	
PSU	£50.00	200V	
Printer	£40.00		
Optical Drives	£60.00		
Scanner	£50.00		Total Cost
Speakers	£20.00		£470.00

The components needed for an office workers personal computer have a very low specification in quality. The components that are required wouldn't cost as much as they would if the specification was high and needed better internal components.

The amount of Random Access Memory (RAM) an office worker would need for their computer would be about 2GB-4GB because they wouldn't have many programs running since they are only working with e-mails, accounts and documents. The hard disk would need more storage because they are storing large files and using programs such as word processing. They wouldn't really need a special graphics card since they wouldn't be playing computer games or watching videos as an office worker, they would only need a small integrated video card that come built in to the motherboard.

The office worker might, additionally, use an external device such as a printer to print documents which they might need on their job; they might also need a scanner to import documents onto the personal computer. The office worker would have a small CPU usage so the CPU requirement would be low; the user may only need 2.5GHz with today's personal office computers. The office worker might also need to have speakers so they can, hear sound of a received e-mail, respond to an e-mail faster than they typically would if they didn't have speakers and if they are using video conferencing for meetings ; respond to what they say. A office workers personal computer might also need a PSU (power supply unit) but the power may vary on how long they use the computer for and how much the system needs; the system might only need 200v because of the power the components need.

(User 2)

The user is an Office Worker dealing with multimedia.

Depending on where the office worker is employed they will need certain specification, typically, an office worker dealing with multimedia content will need a higher specification because they will be dealing with larger amounts of data.

Computer Components	Cost Of Components	Office Worker	Multimedia
		Size/Speed	
RAM	£50.00	8GB	
Hard Disk	£100.00	250GB	
Graphics Card - GPU	£90.00	1GB	
Sound card	£40.00		
Fan	£20.00	Basic	
CPU	£100.00	3.5GHz	
Motherbored	£40.00		
PSU	£50.00	200V	
Printer	£40.00		Optional
Optical Drives	£60.00		Optional
Scanner	£50.00		Optional
Speakers	£20.00		Optional
Total Cost		**£660**	

If the user is dealing with more data, it will need somewhere to be saved/stored they will need more hard drive space because the files they will be dealing with will be larger which therefore needs some where to go. An office worker dealing with multimedia content would need at least 8GB RAM (random access memory) because they will be using a variety of different programs such as video-editing software, additionally, they might also require a better graphics card rather than an integrated card; especially if they are dealing with game designing or producing videos. The user will also need a sound card in their personal computer to listen to multimedia sounds and good quality external speakers to hear them. The user will need a good CPU (central processing unit), about 3.5GHz, because then they could process the large amounts of data they are dealing with on the random access memory, typically, a computer with a high specification would need a fan to cool down all the components but most devices that need cooled down, with ICT in today's world, might not need another fan in their personal computer. An office worker dealing with multimedia content might need an optical drive if they wish to import sound files from a disc.

-Planning to build a personal computer-

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Office worker requirements

The Office Worker will be using a certain amount of different types of software. The basic Office workers will be dealing with word processed documents possibly to store names, emails regularly and spreadsheets for addresses and will be producing a large amount of word processed documents which means they are going to need a larger hard drive to store all there files. They will need a small amount of CPU because they will only be processing small programs that don't take up to much usage because the computer will be dealing with less instructions since less calculations will need to be taken place. Not much of RAM (Random Access Memory) will be important for this computer, a small amount, because the computer will need a less temporarily storage since they are probably going to have less programs running at once.

Multimedia Office Worker Requirements

The Multimedia office worker will be using various different types of software along with the ordinary office worker software as well. Both office workers are dealing with word processed documents possibly to store names, emails regularly and spreadsheets for addresses, the multimedia office worker will be producing a large amount of word processed documents which means they are going to need a larger hard drive to store all there files and probably a lot more CPU, compared to the basic office worker, because the computer will be dealing with more instructions since more calculations will need to be taken place. Alot of RAM (Random Access Memory) would be important for this computer, a large amount, because the computer will need a lot more temporarily storage since they are probably going to have a lot more programs running at once, not only that, the office worker will be creating larger file sizes which therefore requires more RAM and CPU. The Multimedia office worker might need a high-end graphics card (GPU) mainly because the multimedia office worker will be dealing with more multimedia including graphics.

To build my PC (Personal Computer) I will need a combination of software, hardware and peripheral devices. Firstly, to build my PC I will need a case; this will be to protect all the components that are going to be inside my PC, I'm going to need a PSU (power supply unit) to power my PC, a motherboard, which has USB ports, will be my main component which will allow me to connect the other components together, I will also need RAM (random access memory), which is short term memory the computer will be able to use when processing data, I'm going to need a graphics card especially if I'm going to be dealing with multimedia, I will need a fan to cool down the components which output heat and a CPU (central processing unit) so the computer can do certain calculations to do tasks.

Secondly, I'm going to need, some peripheral devices such as, a monitor which will be used to show you the operating system and the software, I'm going to need a keyboard so I can input data into the computer, I will need a mouse so I can select certain programs and do different functions on the operating system, I'm going to need speakers so I can hear sound on my computer and finally I will need various wires to connect all the peripheral devices and computer together, for example I'm going to need a VGA cable to connect the monitor to the screen, a power lead to power the monitor.

Thirdly, I will need some software, the first would be the operating system, I will need this to perform tasks and operate programs, I'm going to need office suite programs such as word processor and spread sheets so the user can work with word processed documents, I'm going to need software which establishes the links between the peripheral devices.

Additionally, I'm going to need some tools to put all the components together. I'm going to need a chip inserter, which is needed to apply pressure when inserting a chip into a computer, I will need a chip extractor to extract a chip, I'm going to need a Torx screwdriver just in case the PC requires special screws, I will need Tweezers just in case I need to pick up small components, I'm going to need a slotted or crosshead screwdriver to do screws up, I will need a heat compound to help quick transfer of heat.

If you want to upgrade your RAM, your PC needs to have certain compatibly; you need to know if there will be a slot for your upgraded RAM, you need to know if the processor is fast enough and if the operating system is right. If you're increasing your RAM you might need a chip on the motherboard. If you want to upgrade your processor you might need a certain connection on the motherboard, some PC's might not have the same connection. You might want a certain Operating system which can actually fit onto your hard disk; your computer might not have the right amount of space on its hard disk. The software needs to be compatible with the operating system there's no good having software which doesn't work on a operating system because it's basically useless, unless you use software to emulate the software from another operating system.

For personal safety you might need to make some precautions, you need to make sure the power is turned off before you change anything, you need to make sure that the components are waist height on a table or you could strain your back, you also need to have a light because there's no good in having no light, you're more likely to cause problems because you can't see, you could have a fire extinguisher just in case of a fire. When it comes to safety you will need to make sure the wires aren't in the way because that can cause problems and you could trip.

Your components need to be safe because that could not only be a problem for the PC but a problem for the person making the PC, having faulty components could be a problem especially if they having power running through them. When dealing with your components its best to not wear dangling jewellery because they could get stuck in the components and even break them, it's also best tie your hair back because you could have the same problem with your hair.

When dealing with the components make sure you have your tools in the same place , and not all over the place having everything organised will help because then you won't forget or lose your tools, you don't want to go losing your tools inside the PC after its built because It could do some damage. Make sure you keep water away from the components, try to avoid not having water in the same room as the components.

Don't eat food near the building of the computer because you don't want a half-eaten sandwich inside your computer, and crumbs can damage the components. Try to store all the components in anti-static bags to avoid static, before they are needed and also try to use some sort of anti-static wristband or mats. If you take the components out of the bag try your best to keep the components on the top of the bags.

Test Description	Expected outcome	Actual outcome	Corrective Action
Hard drive has been connected correctly. check hard drive in operating system device manager	No reported errors in POST or device manager data reads from written to hard drive	No reported errors	-
Check the power connections between the monitor. make sure the monitor is connected to the display card, change I/O address on network card if applicable.	System will boot from hard disk drive or booted from floppy disk .	The system booted from the hard disk drive.	-
Check the voltage on the back of the PSU (power supply unit) and make sure the power supply unit is correctly setup and it working	The power supply units fan will start spinning correctly.	The fan was spinning correctly	-
Install RAM with static wristband correctly carefully.	Check to see if its with a memory diagnostic tool	The RAM wasn't compatible with the motherboard	I removed the incompatible RAM and installed the the correct type of RAM
Check expansion cards, press down firmly on expansion card. do not touch gold bars.	On the device manager it will say its installed		-

		It said it was installed correctly	
Check that the computer connects to Wi-Fi by checking your modem is turned on and the ADSL cable is connected to the landline.	The computer should say that its connected to the network and you can get internet.	The computer said it was connected to the internet	-
Check that the CPU is working correctly	check if there's processors in task manager	The processors were in task manger and it said the CPU type in properties.	-
Check to see if the sound works on the computer, check all cables including the jack and make sure the volume is turned up on the computer also make sure I have all the drivers installed just incase they are needed.	you should be able to hear all sounds unless the volume is turned down	I could hear all the sounds	-
Check to see if the motherboard is working, you should be able to hear a beep when turning on the computer. Which indicates the motherboard is working	The motherboard should working correctly and all the components should be connected	I heard a beep after installing the motherboard with all the componenets	-
Check to see if the optical drive is working by several disks	The device should be detected on device manager and the discs should show up on the computer, you should be able to successfully burn and edit , clear.	The optical drive wasn't working the disk drive wouldn't open	I changed the optical drive and it worked correctly, I tested it by installing the operating system using a disk
Connection of the printer	The printer flashes green	Had to install the printer software on the computer and connect the printer	-

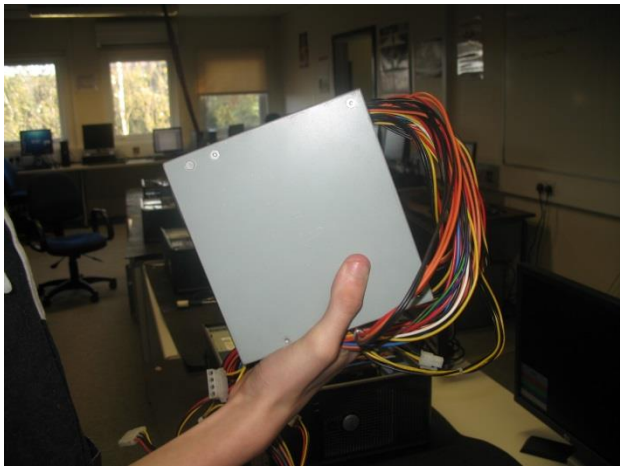
Results of performance software		
Processor Usage	**32%**	

Test description	Expected outcome	Actual outcome

Speed Of Application	**Downloaded: 6.2 sec** **Default: 2 sec**		
Memory Usage	**1.73GB**		
Is there new RAM on the system	New amount of RAM displayed in computers properties	There was a different amount of RAM displayed in the computers properties	-
Does the alternative optical drive work correctly	The alternative optical drive should read media of disc	The optical drive didn't eject the tray and wasn't working correctly	Optical drive wasn't connected to the power supply.
Does the optical drive work correctly after corrective action	The alternative optical drive should read media of disc	The optical drive can read and write data to a rewritable disc	-

I prepared the case and got started installing the PSU. First of all I made sure that I had the anti-static wristband on because I didn't want to ruin any of the components. Even though I didn't need a antistatic band I still used it because there were components around which I was going to use.

Here's the image of the PSU I installed.



I installed the PSU by sliding it into the computers case. I carried on installing the PSU after connecting the motherboard. The PSU was not yet connected because it had nothing to connect to which is why I just left the PSU inside the case until I installed the motherboard. After the motherboard was installed I started connecting the cables to the motherboard. I connected all the cables to the motherboard correctly.

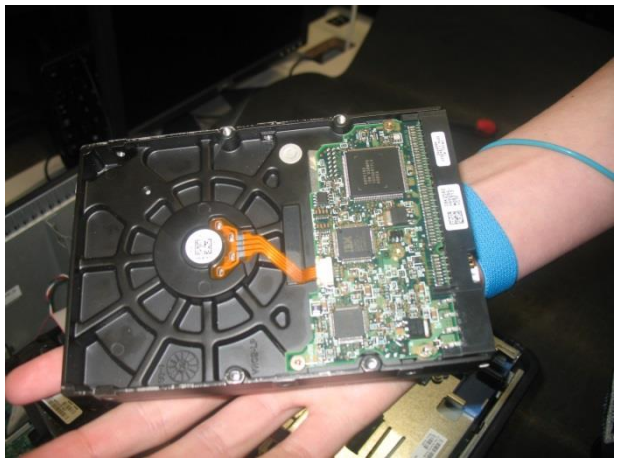
Task 1 P4

Here's the image of the optical drive I installed.

I then got started adding the optical drives. I did this by grabbing the optical drive and sliding it into the drive bay. Once again I didn't connect this to the motherboard until the it was installed. I left it there until I installed the motherboard just like with what I did with the PSU. After the installing the motherboard, I then connected all the cables from the optical drive to the motherboard.

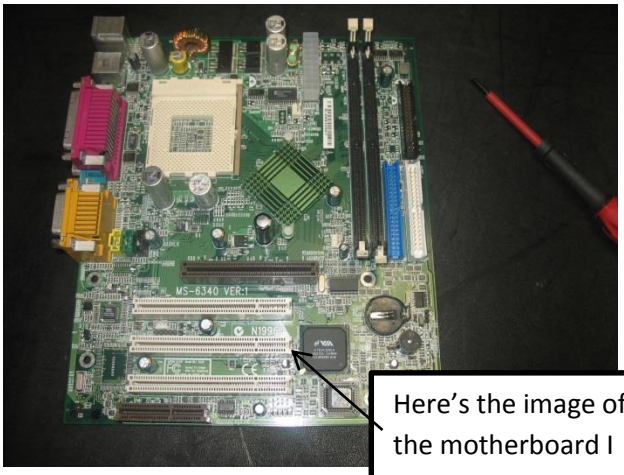
I then got started installing the hard drive.

Here's the image of the Hard Drive I installed.

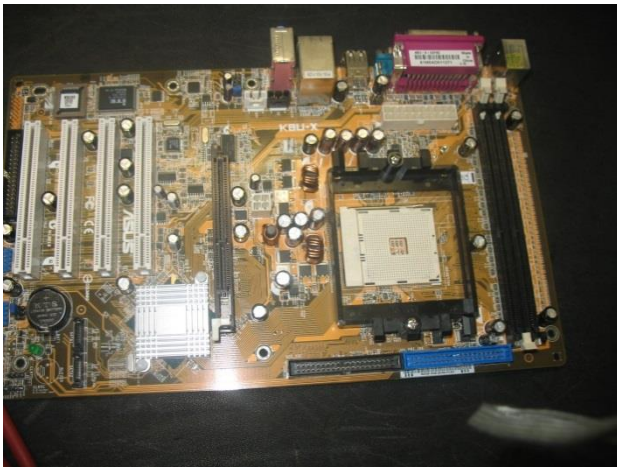


I located myself to the drive bay and sided the hard drive into the slot. Once the motherboard was installed, I then made the hard drive the master by connecting the cables which came with the hard drive to the first slot on the hard drive. I then connected the cables onto the motherboard. I then secured the hard drive to the drive bay by lining up the screw holes and adding screw to connect then to make them securely.

I choose between these two motherboards to see which one would be the most compatible with the components that I had. The RAM wasn't compatible with the brown motherboard so I decided to use the green motherboard since it would be a lot easier to use.

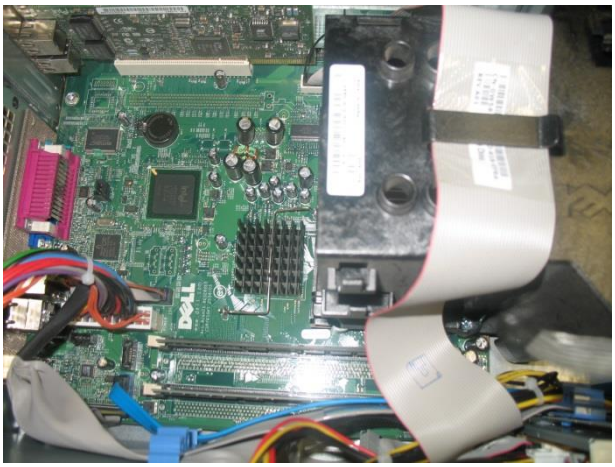


Here's the image of the motherboard I installed.



I connected the motherboard to the case by securely installing the standoffs. I placed screws in the screw holes and tighten them up. I made sure that the motherboard was securely tight.

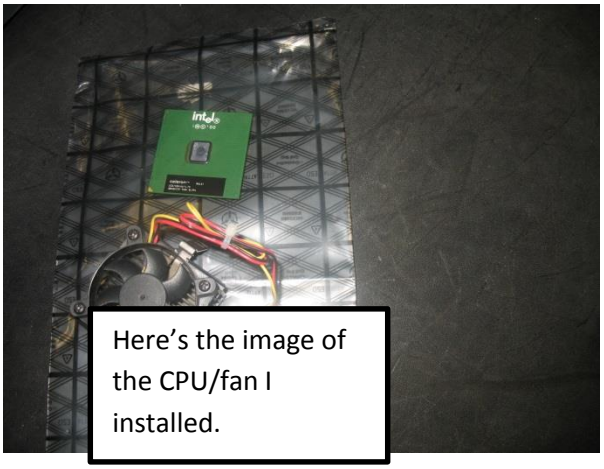
I then connected the motherboard to the PSU and the hard drive along with the optical drives. I did this because I left them waiting for the motherboard inside the system.



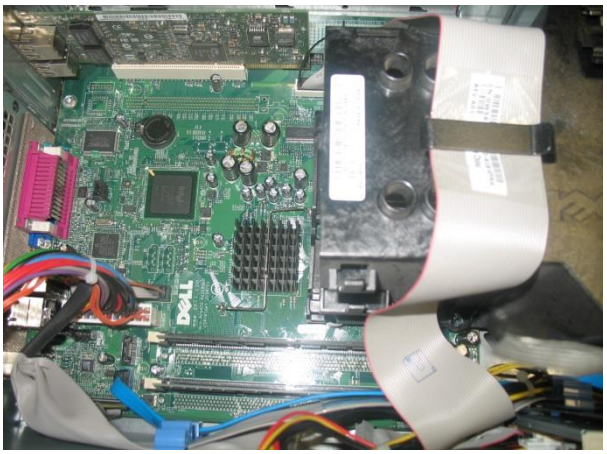
I then got started installing the CPU (central processing unit)

I checked with the teacher and asked if the CPU was compatible.

The CPU was compatible so got started by finding the locating of the slot for the chip on the motherboard. I then placed the Processor in the socket. I did this by getting the end of the chip and matching it up to the socket on the motherboard then firmly pressing the processor down.



Here's the image of the CPU/fan I installed.



I installed the CPU fan. I made sure that the processor was installed and perfectly flat. I then connected the left connector bracket to the left side and done the same with the other sides. I pulled the small leavers all the way back and pushed the brackets down until it clicked into place.

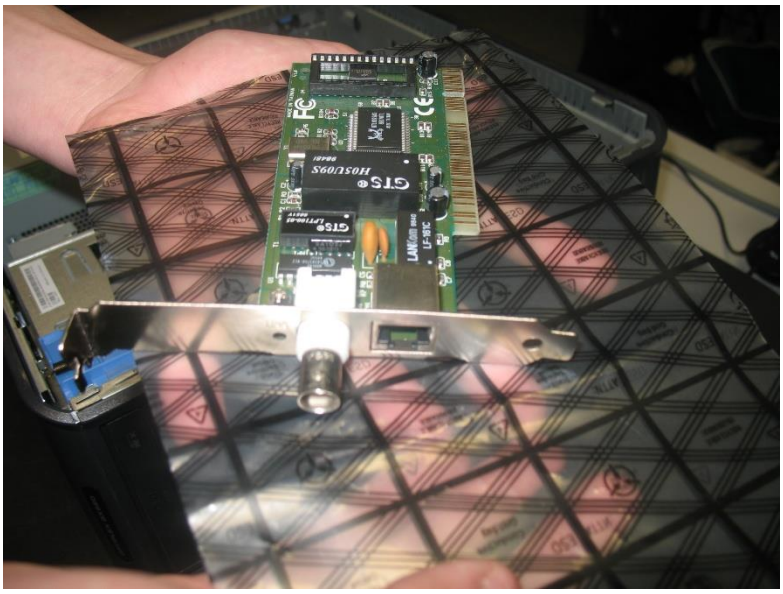
I plugged in the wire of the CPU successfully.

I then got started on installing the RAM (random access memory) I grabbed the RAM and located myself to the slots for the RAM. Wearing my anti-static band, I slowly lined up the RAM with the slot with the slip inside the slot.

I pressed down firmly on the RAM and pushed both clips onto each side of the RAM. I applied pressure until it clicked.

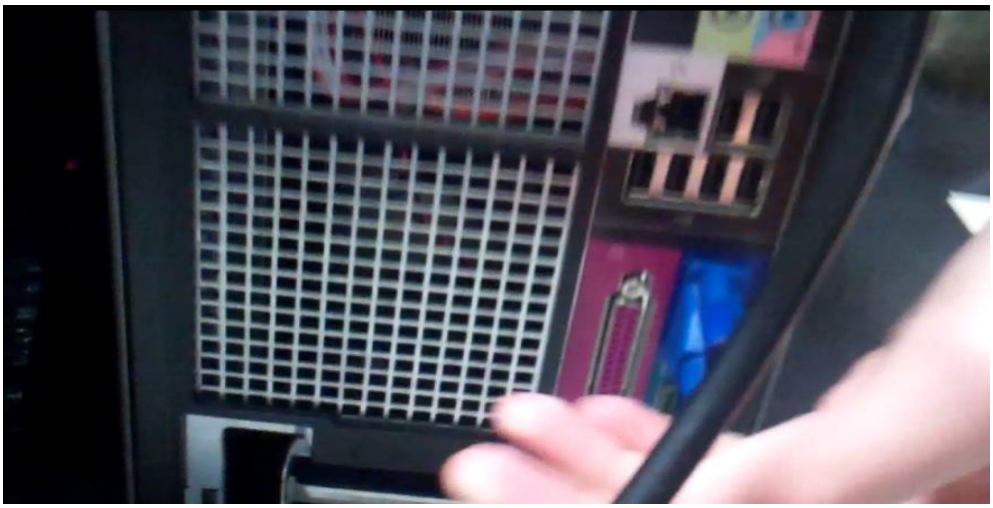
Task 1 P4

Here's an image of the graphics card I installed



I got started installing the graphics card. I noticed that this graphics card wouldn't go on this motherboard because it wasn't t compatible with the motherboard. So I had to use another graphics card instead. I pressed the compatible graphics card down firmly in line with the slot. I made sure that the graphics was correctly in the slot or the computer wouldn't start. I checked to see if the graphics card required any power supply cables since some graphics card require this. Later on when I booted the computer I made sure that I installed the right graphics card drivers, after the installation I restarted the computer.

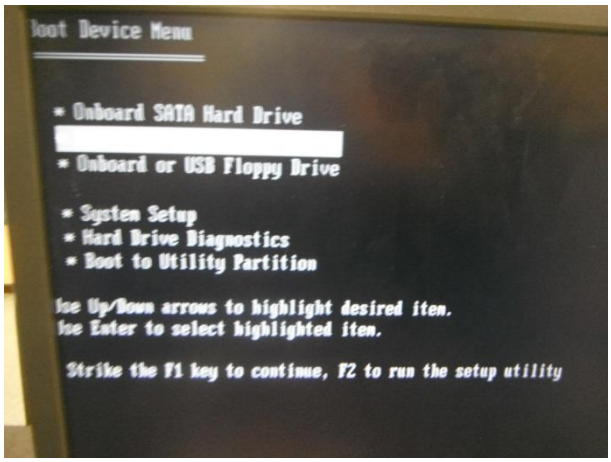
Task 1 P4

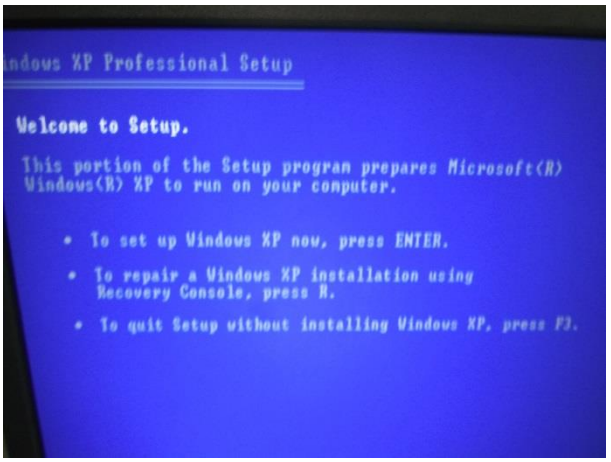


I installed the monitor into the computer with a VGA cable. I screwed each side of the cable into the VGA port. I then plugged in the monitor to give it power. I pressed the button to switch the monitor on. The button flashed green, which means it's working.

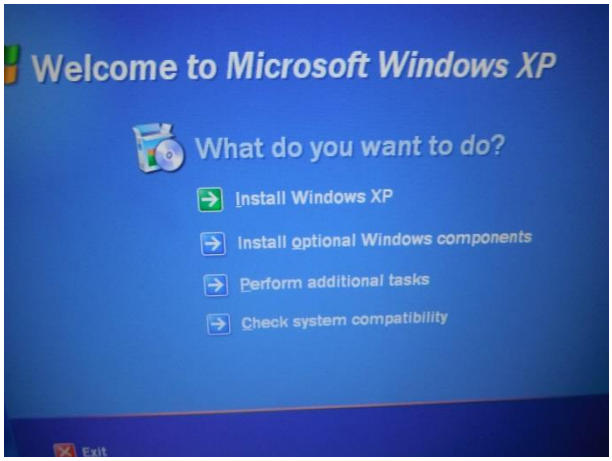
I got started on booting up the computer to get it ready for the installation of the operating system but at the same time I tested the monitor. I also plugged in the keyboard and mouse along with the monitor.

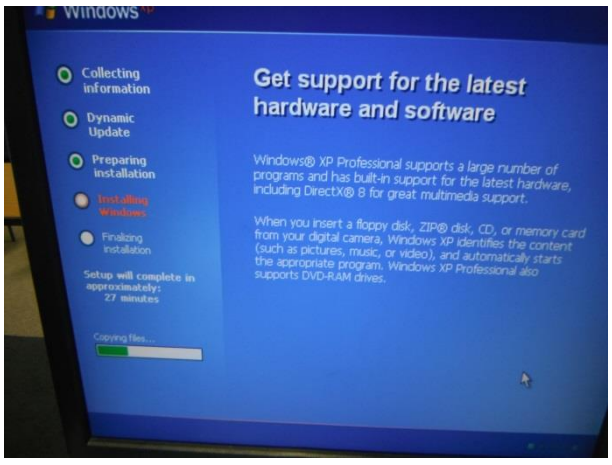
Task 1 P4



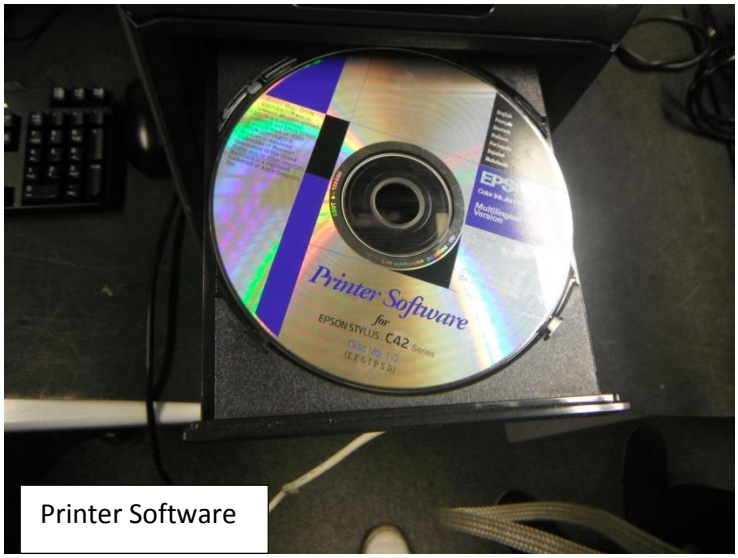


Once I got the computer up and running with all the components installed. I then went ahead and started installing the operating system. I checked to make sure the system was compatible with Windows XP In the end I installed Microsoft Windows XP Professional as the operating system. I followed the installation correctly. I selected the disk from the boot device and loaded the Microsoft setup. I typed in the product key and followed the installation. I didn't use the custom installation since I wasn't overwriting a new windows folder I was creating a new one. After I installed the operating system I made sure that all the devices were installed correctly.





Task 1 P4



Printer Software

I place the Printer software disc inside the computers optical drive. I was getting ready to install the printer software and the printer itself.

I installed the printer by plugging in all the cables and installing the printer software

Task 1 P4

Test Description	Expected outcome	Actual outcome	Corrective Action
Hard drive has been connected correctly. check hard drive in operating system device manager	No reported errors in POST	No reported errors	-
Check the power connections between the monitor. make sure the monitor is connected to the display card, change I/O address on network card if applicable.	System will boot from hard disk drive or booted from floppy disk .	The system booted from the hard disk drive.	-
Check the voltage on the back of the PSU (power supply unit) and make sure the power supply unit is correctly setup and it working	The power supply units fan will start spinning correctly.	The fan was spinning correctly	-
Install RAM with static wristband correctly carefully.	Check to see if its with a memory diagnostic tool	The RAM wasn't compatible with the motherboard	I removed the incompatible RAM and installed the the correct type of RAM
Check expansion cards, press down firmly on expansion card. do not touch gold bars.	On the device manager it will say its installed	It said it was installed correctly	-
Check that the computer connects to Wi-Fi by checking your modem is turned on and the ADSL cable is connected to the landline.	The computer should say that its connected to the network and you can get internet.	The computer said it was connected to the internet	-
Check that the CPU is working correctly	check if there's processors in task manager	The processors were in task manger and it said the CPU type in properties.	-
Check to see if the sound works on the computer, check all cables including the jack and make sure the volume is turned up on the computer also make sure I have all the drivers installed just incase they are needed.	you should be able to hear all sounds unless the volume is turned down	I could hear all the sounds	-

Check to see if the motherboard is working, you should be able to hear a beep when turning on the computer. Which indicates the motherboard is working	The motherboard should be working correctly and all the components should be connected	I heard a beep after installing the motherboard with all the componenets	-
Check to see if the optical drive is working by several disks	The device should be detected on device manager and the discs should show up on the computer, you should be able to successfully burn and edit , clear.	The optical drive wasn't working the disk drive wouldn't open	I changed the optical drive and it worked correctly, I tested it by installing the operating system using a disk
Connection of the printer	The printer flashes green	Had to install the printer software on the computer and connect the printer	-

Results of performance software	
Processor Usage	**32%**
Speed Of Application	**Downloaded: 6.2 sec** **Default: 2 sec**
Memory Usage	**1.73GB**

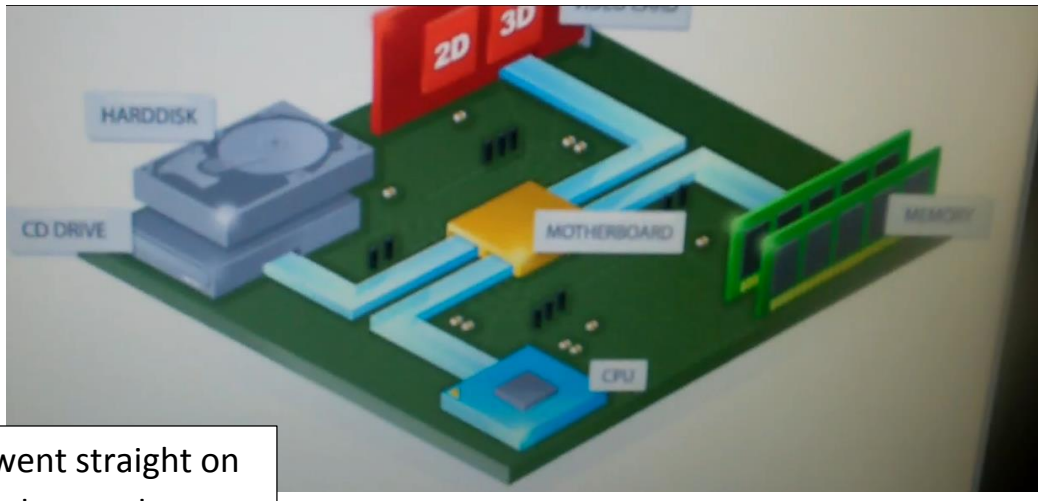
Testing Alternative Hardware

Test description	Expected outcome	Actual outcome	Corrective action
Is there new RAM on the system	New amount of RAM displayed in computers properties	There was a different amount of RAM displayed in the computers properties	-
Does the alternative optical drive work correctly	The alternative optical drive should read media of disc	The optical drive didn't eject the tray and wasn't working correctly	Optical drive wasn't connected to the power supply.
Does the optical drive work correctly after corrective action	The alternative optical drive should read media of disc	The optical drive can read and write data to a rewritable disc	-

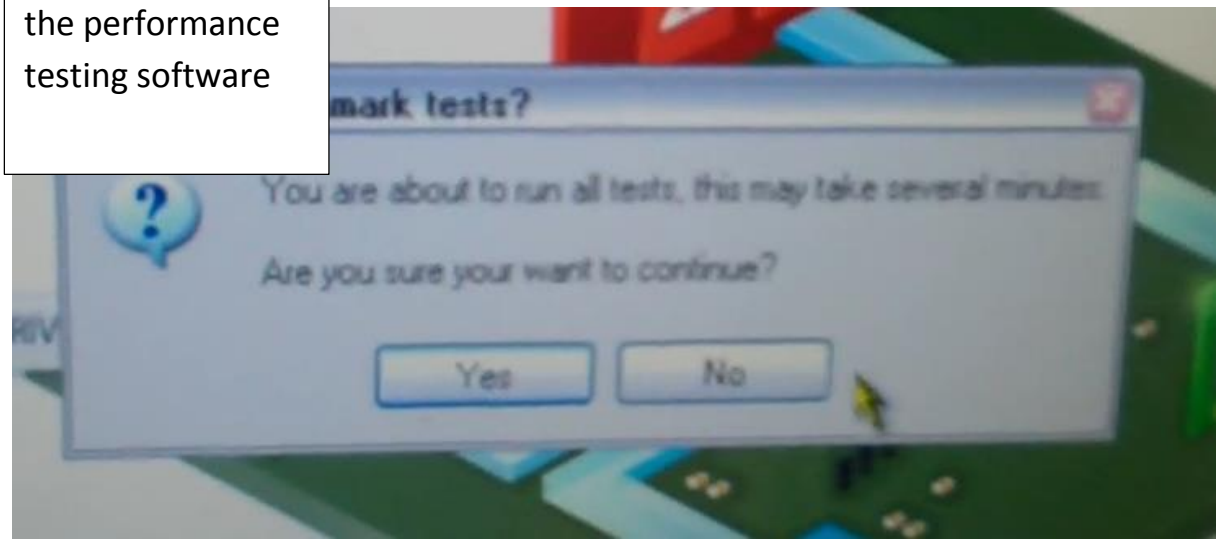
Testing the system

After building my computer and installing the operating system I decided to use performance testing software. To see the memory usage and the processor usage along with the speed in which the applications open.

I ran my performance testing software and as you can see I got an image of all the components on the motherboard which can affect the performance in some way.

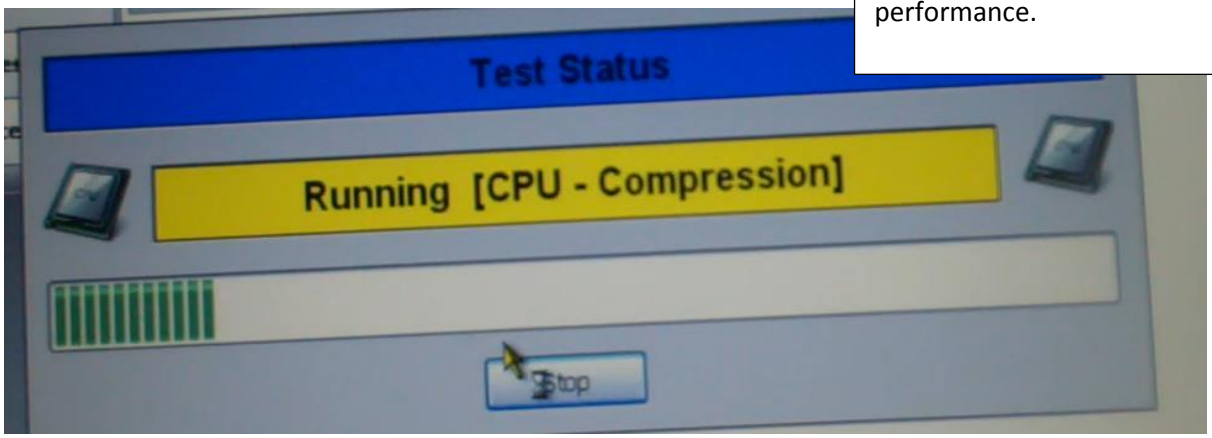


I went straight on and started to run the performance testing software

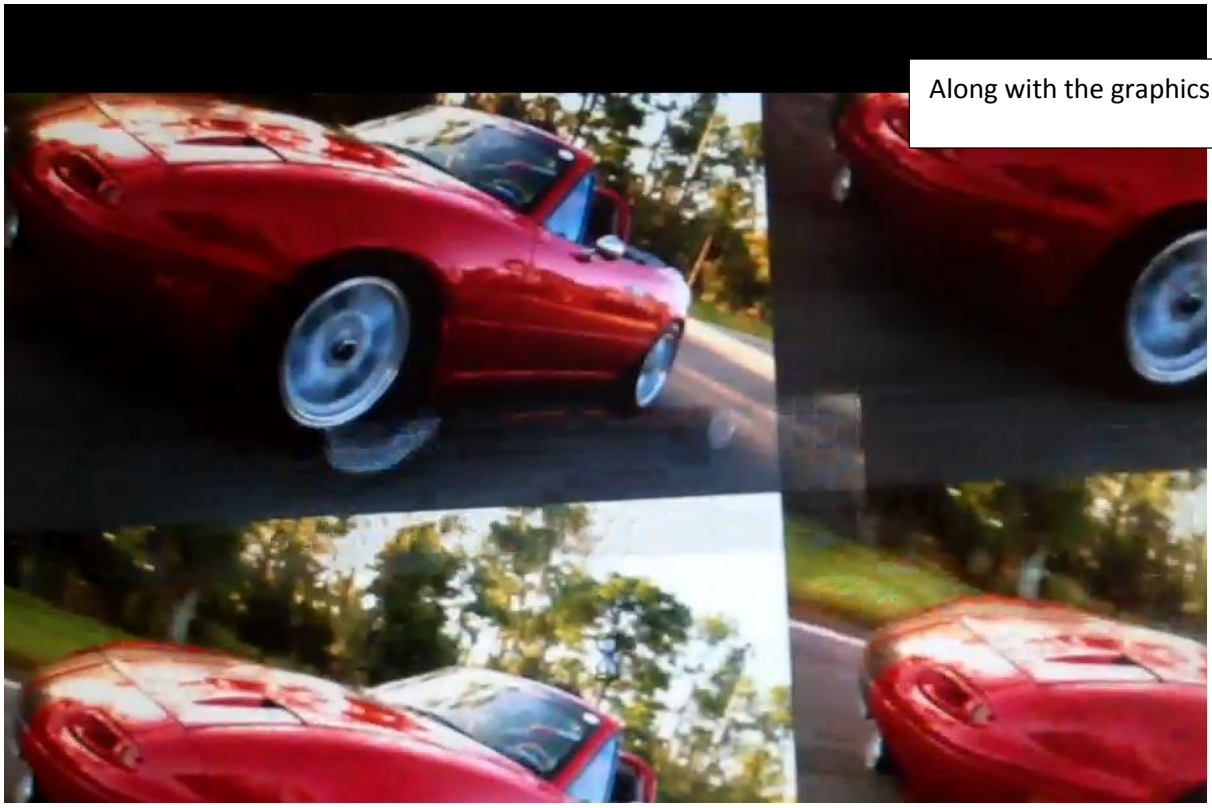


Task 2 P6

It started its tests and the first test was testing for the CPU usage and performance.

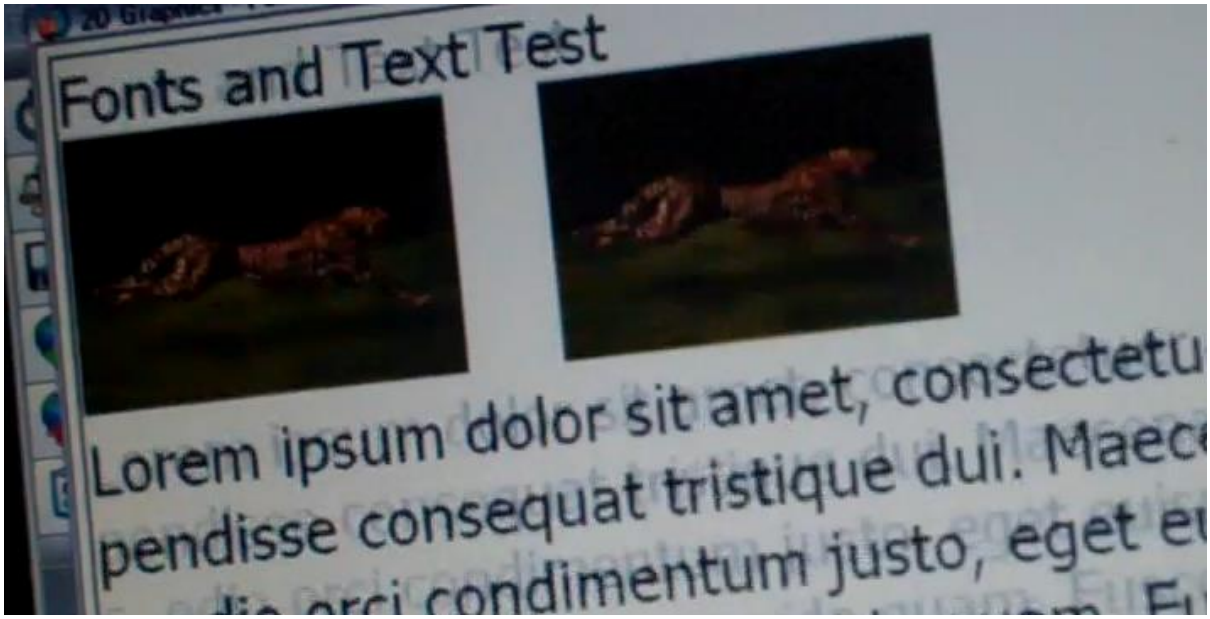


Along with the graphics



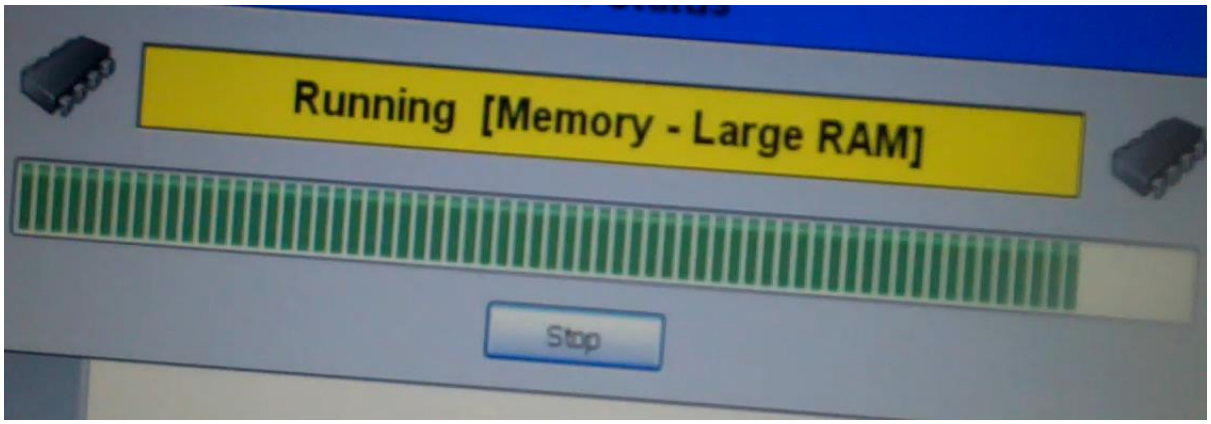
Task 2 P6

The performance software started experimented with fonts and text to see the performance.



There were many tests to find out the performance

Task 2 P6



The average CPU usage was 32%

The memory mark was really low, it was 165.2

The CPU mark was 298.1

The CD drives mark for reading megabytes per second was 0.278 and the mark for writing data (megabytes per second) was 0.765

The average memory usage was 1.73GB

The overall passmark rating was 365.1

Computer with new hardware

I carried out the same tests but for the PC with alterations. The passmark was a lot higher than the original

The average CPU usage was 32%

The memory mark was a lot higher because of the alterations, it was now 370.2

The CPU mark was 298.1

The CD drives mark for reading megabytes per second was 0.765 and the mark for writing data (megabytes per second) was 1.107

The average memory usage was 1.73GB

The processor is like the brain of the computer. All the information goes to the processor and "processes" what needs to be done, for example if you opened a file on a program it would have to go through the processor first, if you move the cursor it will go through the processor. There are many processors available including single core processors and multi-core processors. All these processors are all different in performance. The single core processor is basically a processor with only one core, meaning it can only start one operation at a time, it can however start one new operation before the next one is completed.

I would say that the single core processor is a lower specification than, in this instance a processor like a multi-core. A multi-core processor can have up to 7 cores which makes the processor a lot better in performance because you can run multiple instructions the same time on different branches.

Processors can be separated in performance, you can get 32-bit or 64-bit processors which vary in performance. If your processor is 64-bit it would be able to handle more RAM (Random Access Memory) if your processor was 32-bit it wouldn't be able to handle as much RAM as the 64-bit version would mainly because the 64-bit version assist the RAM.

The processor I have chosen for the Office worker is a 32-bit single core processor mainly because they wont be processing many instructions because they will only be working with text-based documents, emails and spreadsheets. I think this processor will be suitable because it will get the job done and it wont cost as much and the processor the office worker needs doesn't have to be multi-core.

The processor I have chosen for the multimedia office worker is a 64-bit multi-core processor which is suitable because the multimedia office worker will be dealing with some sort of multimedia for example graphics. Imagine the multimedia office worker was a

games tester, they would need a good processor to process the game, the game that they might be playing might request more cores to do calculations on.

Implement and Alternative design Ideas

The Office Worker will need an alternative hard drive to perform tasks more efficiently because the hard drive after a while might get completely filled up to full capacity because of temporary downloads, system restore points and hidden folders made by certain programs. Having an alternative hard drive would help because it would have more memory, without a bigger hard drive the computer definitely won't have much additional left over room and will run slow. The Office worker will also be working with larger file sizes, so either an alternative or secondary hard drive is needed. The secondary hard drive would assist and hold large files to help the primary hard drive to succeed. On the other hand, I could instead use a piece of utility software such as a defragment program or even use disk clean-up tool which would delete unnecessary files but that wouldn't be as effective.

The computer will need an alternative CPU (Central Processing Unit) because components won't communicate fast enough to make the system completely effective for the Office Worker. The CPU will require more cores, mainly so it can communicate faster between different components. This will therefore make the whole system faster in general, it will make the processing of the computer a lot faster and it would benefit the Office worker because of the speed. Whereas if it was just the same it would be ok but wouldn't work as well as one with more cores and it wouldn't benefit the Office worker. On the other hand, I could check a Task manger program and see which programs are hogging up most CPU usage and I could always overclock my system by going to BIOS settings on the start-up of the system.

The Office Worker will need either an upgraded graphics card or add a new separate graphics card. Most graphics in today's world are increasing outstandingly, which means graphics cards are becoming better and better. So for the latest multimedia you might need a better graphics card or an extra card. You will definitely see a performance increase if you add an extra graphics card especially if the graphics that you're dealing with can't keep up with the new enhanced graphics in today's world. On the other hand, you could always update your graphic card drivers or change the application settings to run the software better. Large multimedia software also needs larger RAM which the Office Worker doesn't have, which means the Office Worker will need to upgrade their RAM. After installing new RAM the user will see a big difference in performance especially when dealing with multimedia software.

The install sequence which I will be using will be in this order.

1. **Get the case ready then I will put the PSU inside ready to be installed. I decided to do this because it would be hard to install the components without the container which holds everything including the motherboard.**

2. **Then placed the PSU ready inside the computer so I can easily get all the other components inside without breaking any other components; this could happen because the PSU is typically one of the largest components.**

3. **I will get the optical drive ready to be installed because its larger than the other components, maybe not the PSU (which I would've already installed) but the other components such as the CPU and the motherboard.**

4. **Then I would put the largest components in first because it would be awkward to put them in any other order so I slid the Hard Drive inside the case ready to be installed along with the optical drive.**

5. **Then install the motherboard next because I needed to have the base ready to install the other components. I would need to connect all the components such as the PSU, hard drive etc.**

6. **Then I would installed the CPU, Fan and RAM so it wouldn't be awkward installing the graphics card (it would kind of hard installing the CPU and Fan especially with a big graphics card inside the system)**

7. **Then set up the mouse, keyboarded and speakers because they are the easiest to install and because they are peripheral devices.**

8. **I then needed to install the operating system because the computer needs to be functional for the operating system to work. I then do tests**

The PSU, hard drive and optical drive have to be ready inside the case because they need to be connected to the motherboard. If I installed the motherboard first than I would be difficult to slide in the components such as the PSU and additional drives and storage. This is why prepared these components before I installed the motherboard.

I installed the CPU, fan and RAM before the graphics card because If I installed the graphics card first it would get in the way. Graphics card are pretty big but are a very sensitive bored.

I installed the performance testing software after the operating system had been installed. I wouldn't be able to install the performance testing software without some sort of platform (operating system) to install it on. If I just put the performance testing software disk inside the computer it wouldn't work.

I installed the printer software after the operating system because the printer software wouldn't work without a platform.

The alternative hard drive would need to be installed in the building of the PC because if the Office Worker is using the other hard drive then the operating system would be installed on that hard drive and it would be a pain installing all the programs that the Office worker needs along with the operating system and the large files which the Office worker is storing.

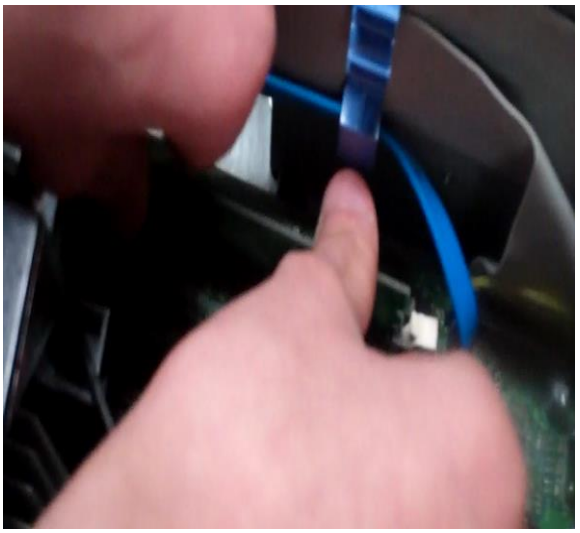
It would be best installing the alternative CPU when building the actual PC but it doesn't really make much difference other than money has just been wasted using the other one when the alternative could of just been used straight up. It would be better installing it when building the PC because then you won't have to mess with heat sink twice.

The Office Worker will need an upgraded optical drive. Most video games in today's world need to be stored on large discs called dual layer. Since the office worker is developing games they might need to have an alternative optical drive to even use dual layer discs. The Office worker will also see a performance increase if they switch optical drives because the alternative optical drive would be able to read and write data a lot faster.

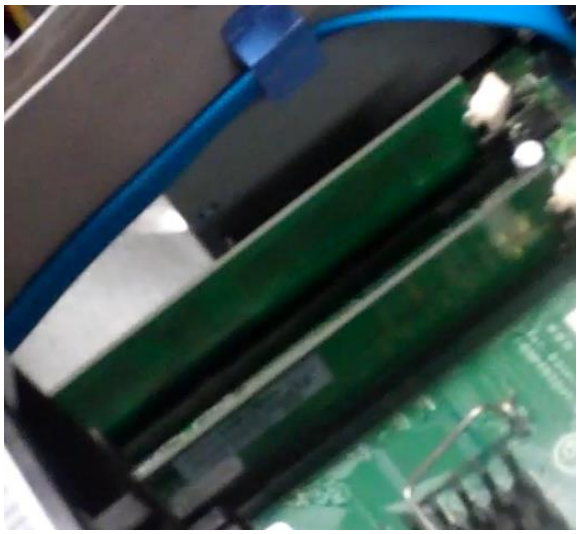
Implement and Alternative Design Ideas

I got started installing the alternative RAM, (Random Access Memory) I added additional RAM into the slot next to the original RAM and made sure that it was firmly down.

Having additional RAM will help the office worker in many ways.



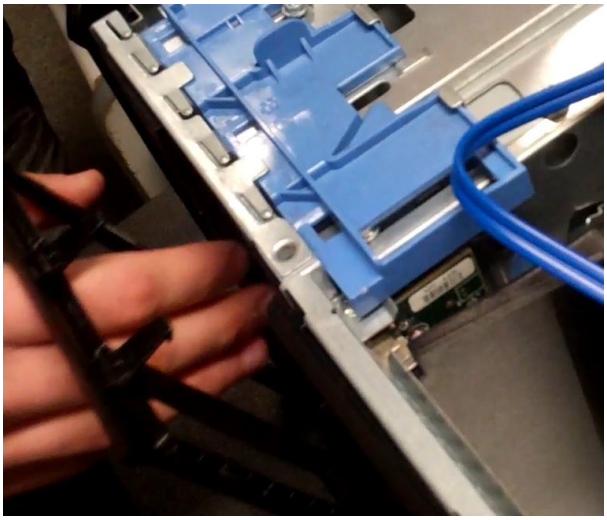
Firstly, the Office worker will be able to run more programs alongside each other for instance if the Office worker is rendering a video he will still be able to run word-processing software alongside and still be able to do simple tasks. Whereas if they didn't have a additional RAM they would have a harder time working there computer especially if they are rendering a video.



Secondly, having additional RAM will help the multimedia office complete its tasks because the system is less likely to lock up and behave strangely because the RAM gives the computer more space to store processes. Whereas if the system didn't have additional RAM its more likely for the system to lock up.

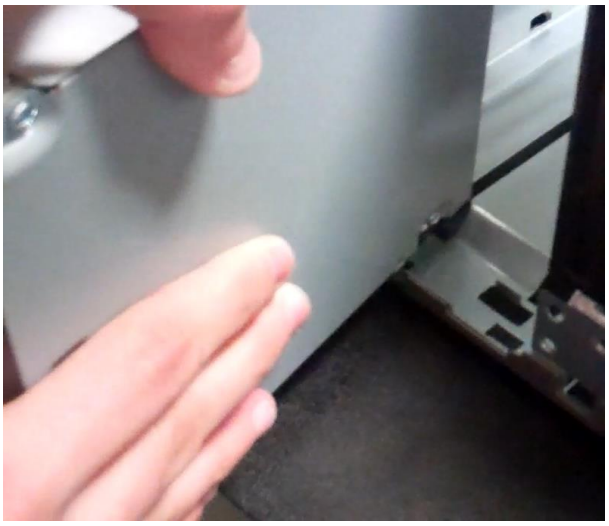
Lastly, an alternative processor may also be necessary this is because you have all this new room for processes but your normal processor might not be able to process it effectively. If a faster processor was installed alongside the system the RAM and processor would work together to make the system faster overall.

Additionally, The RAM would be storing the processes and the processor would be processing them, which will help the system be faster overall.

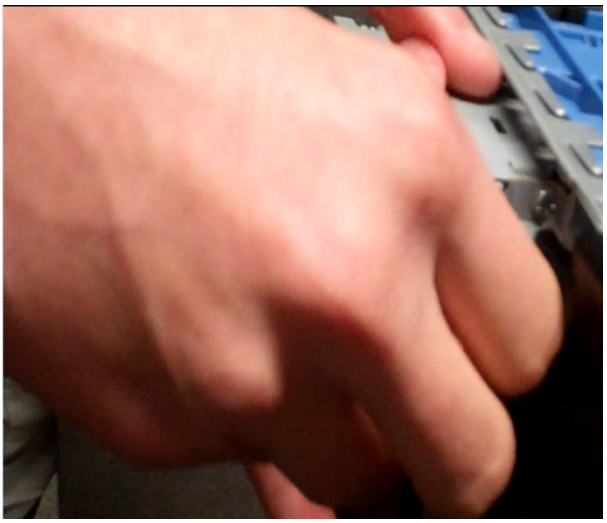


I started installing a new optical drive; I unscrewed the front of the computer so I could take the casing off and install the new optical drive. I repositioned the alternative screws with the computer and slid the new optical drive inside. I tightened the computer and put the front of the case back onto the computer.

Having a new optical drive will help the Office worker outstandingly.



Firstly, if I add an alternative optical drive the Office worker will be able to burn files or data to a disc quicker. Having a faster optical drive will help the Office worker because for instance if they have just rendered a video and they want to burn it to a disc, it would be a lot faster and it wouldn't take as long this is because the alternative optical drive can support 52X whereas the other could only support 8X.



Additionally, the new optical drive speed increment is 4.5 megabytes whereas the standard optical drive is 150kb per second. If the alternative optical drive wasn't installed the Office worker would have to wait a lot longer especially if the file size (which is being burnt to the disc) is large.

Secondly, the alternative optical drive can support dual-layer discs. Which are basically the same as normal discs but can support larger file sizes this is because the disc has two layers. More up to date optical drives can support dual layer discs. Since the Office worker is dealing with multimedia they will probably need an optical drive which supports dual layer this is mainly because the Office worker is dealing multimedia and media file sizes tend to be larger which means that

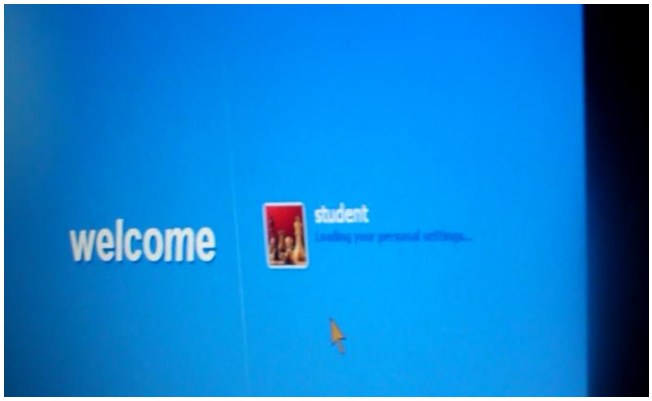
they will need to write larger files to discs. They can only do this if they have a optical drive which supports dual-layer.

Lastly, the alternative optical drive has a class 3 laser rather than a class 2 this can affect the performance and accuracy of the optical drive when reading and writing data.

M3

M3

Testing Alternative design ideas



I checked that the functionality of the system worked correctly after the alterations by firstly, checking that the software on the computer performs there intended tasks correctly. The main piece of software, the operating system booted correctly which was a good sign that the alterations didn't affect the system in any bad way. Pieces of software such as word processing software worked correctly and everything seemed fine in terms of what the software is expected to perform. I checked to see if the RAM was installed by going to the computers properties. I also checked to see if the CD drive was installed correctly by going to device manager.

I also made sure that I could see the new pieces of hardware installed, I did this by checking in the operating systems control panel. I made sure that the computer is fit for purpose by testing to see if I can crash the computer by having multiple programs running the same time like before the RAM seemed to make a lot of difference. The system didn't freeze up like before. The optical drive had changed outstanding because it can read and write data a lot faster and wasn't slow.

The PC is fit for purpose because it allows the user to deal with large amounts of data this is because they have more RAM, the random access memory helped the system a lot because it allowed the user to access more information quickly. If the user still had the same amount of RAM as before, when doing certain tasks the system was more likely to freeze up and not function properly. This is because there wasn't enough RAM there and there were already too many programs loaded into the random memory so having more RAM helped because there was more random memory to load programs into. Now that the new RAM is installed it will allow the user to do even more than just run two programs.

The PC is also fit for purpose because it has got a faster optical drive which is needed since the office worker is developing games. At some stage the office worker will need burn there game to a disc (unless they publishing it on the internet) which typically will need to be done with precision. If they are developing a game which is larger than 4.7GB they are going to need to use dual layer discs which only some optical drives support, upgrading their optical

drive allowed the user to be able to use dual layer discs, burn with precision and also read data or information from disc a lot quicker.

Testing Alternative Hardware

Test Plan (Also in P5 and P3)

Test description	Expected outcome	Actual outcome	Corrective action
Is there new RAM on the system	New amount of RAM displayed in computers properties	There was a different amount of RAM displayed in the computers properties	-
Does the alternative optical drive work correctly	The alternative optical drive should read media of disc	The optical drive didn't eject the tray and wasn't working correctly	Optical drive wasn't connected to the power supply.
Does the optical drive work correctly after corrective action	The alternative optical drive should read media of disc	The optical drive can read and write data to a rewritable disc	-

Testing Alternative Design Ideas

After testing the system for functionality I decided to use performance checking software to see if there was any improvements or changes to the systems performance. The changes that I made, mainly having the alternative RAM, helped the overall performance of the PC because it increased the passmark by 207.1 which is a big increase in performance. The new passmark is 572.7 and the old passmark was 365.1.

In the original tests the overall performance of the PC was a lot slower, the computer couldn't deal with how many programs were running at the same time and couldn't deal with some of the tests that the performance checking software was performing. This issue was mainly to do with the RAM even though the processor was fairly good the RAM made the computer seem very slow. The computer would start relying on virtual memory from the hard disk which is very slow since it would need to read and write from the hard disk every time when needed to fetch data.

Overall the PC now seems a lot faster because the computer can now have programs that take up more RAM and run multiple programs a lot more efficiently without any crashes. When you run a program a portion of that program gets stored into the RAM and the cache if you perform a certain task and it's not in the cache then the system will take a performance hit because they will have to go into the RAM to get the data, if the data is not in the RAM then you take a bigger performance hit because it would have to fetch the data from a hard disk which is a lot slower than RAM. When increasing the RAM it improved the performance because there was more memory for the processor to access and get data from when the data is not in the computers cache.

The alternative optical drive I installed improved the performance of fetching information and data from disks and allowed the user to now use dual layer discs.

To improve the system even further the system might need an alternative processor since the RAM assists the processor, having a better and faster processor would help the performance of the system even more.

Task 3 D1

The RAM stores data waiting to be processed by the computers CPU. The data is stored in binary form of 0 and 1 in memory cells inside the RAM chips. All data which is stored in the RAM is all lost when the computer is switched off. If you don't have much ram it could slow down the processes and applications on the system. The RAM could affect the performance of the fan speed if the fan is designed to go faster depending on the temperature of the system.

The hard disk stores information such as the operating system programs, and files on small fields on the hard disk. The hard disk can affect performance of saving files on different programs for example word processing software. The hard disk could become fried because of the consumption of power then affect the overall system temperature, it also might make it hard for the CPU fan to cope with the really hot Hard disk.

The Graphics Card handles and generates the graphics that get sent to the monitor it's mainly responsible for text and pictures that are displayed on the screen. A graphics card increases performance of videos, games and graphics in the system. Certain programs like games can be unplayable without a high-end graphics card because the game relies on the graphics card to get the job done.

The sound card makes the music sound crisp and enhances the performance and quality. The sound card can make the performance of music a lot better in the system since its enhanced. The sound card could affect programs like music-editing software because the music you will be editing will be high definition and crystal clear making it easier to edit music, which is perfect if you can't really hear the beats you are creating.

The fan cools down the components inside the computer. It could affect performance because it can cool down the output of heat which therefore would allow the system to be overclocked or worked to its full capacity. Some fans can work harder depending on the temperature of the system. The fan doesn't really affect software in anyway but the fan speed can mostly be viewed in the BIOS settings.

The CPU (central processing unit) is like the brain of the computer it performs calculations and logic functions. If the CPU is set to a high clock rate it could affect performance and make it faster but there are some consequences it could make the CPU overheat and burn out especially if the system hasn't got a fan. The CPU can help programs operate faster and perform better.

The motherboard connects all the components inside the computer using electrical circuits. The motherboard can't really affect performance in any way but it can if the BIOS settings are changed to overclock the system then you could possibly have some issues with your CPU.

The (PSU) power supply unit powers the computer, it is essential to getting your computer to work overall. The PSU can affect the overall performance because it might not have enough voltage or might have too much for the computer to deal with, which can cause problems it could burn itself out. The power supply doesn't really help software performance in any way.

The Optical drive reads and writes data from an optical drive. Many factors in a drive can affect performance especially the data transfer. Optical drives can't really help software in any way but the software can help the optical drive by searching for drivers.

D2

Justify Final Plan and constraints that may impact on the plan

I decided to choose alternative RAM because the computer seemed to crash when I ran too many programs. If I upgrade the RAM the system will run more smoothly, whereas if I just left it how it is the office workers might not be able to run multiple tasks and would struggle when using large software since the RAM wouldn't be able to handle the amount of data and the computer would have to use virtual memory instead which is painfully slow.

I also choose to install some alternative RAM because when using the performance checking software the memory mark was very low which straight-forwardly meant that the system is lacking in performance because there isn't enough RAM. It was obvious because data needs to be stored for the processor and if there isn't any RAM it would have to read and write from the hard disk which would be a lot slower.

The RAM will help the multimedia office worker perform their tasks better because since the multimedia office worker is developing games they are going to need to test their games out and because they have a lot of RAM their processor will store a large portion of the program in the RAM to stop any crashes and allow the game to run smoothly.

I decided to choose an alternative Optical drive because the original optical drive was very slow especially when trying to read and write data from a CD. It would take a couple of minutes for the drive to recognise a disc and once it did recognised the CD it would make a loud reading sound and lag up the whole computer this is because the lenses inside the optical drive is weak. Replacing the optical drive will stop the computer from lagging up and allow the user to use their disc drive effectively without any problems.

I also choose to install an alternative Optical drive because it will allow the user to burn dual layer discs which they might need to use since they are developing games. Because the multimedia office worker is developing games they might have to burn their game onto a CD or DVD which is larger than 4.7GB which requires a dual layer disc.

The alternative Optical drive will help the user perform their tasks because they will be able to read and write data from a CD or DVD a lot faster since there computer won't lag when using there optical drive. They will be able to use dual layer discs which there optical drive will support and burn at 52X

My alternative design is beneficial because it upgrades and improves certain aspects such as the RAM and the Optical drive. The upgrading of the RAM will help the user because it will allow more memory for programs to run. ICT in today's world is increasing outstandingly which only means that some components of your computer will have to improve since graphics and optical media is getting better. The optical drive will benefit the user because optical media is getting better, they are going to need a drive which supports dual layer discs if they want to use the latest optical media.

The original design isn't as beneficial compared to the alternative design because the alternative design has been a lot more refined this is mainly because the RAM has been upgraded and the optical drive has been changed. The amount of RAM on the system was

tormenting the CPU because there simply wasn't enough for the computer to run multiple programs. The original design had a lot less RAM which definitely crashed large programs.

If the alternative design was used the user would expect many benefits, firstly, they would be able to run larger programs. Additionally, they would also be able to run more programs and lastly, they would be able to use dual layer discs.

The building of the PC could be constrained by costs because an optical drive which supports dual layers discs is much more expensive than one that doesn't and users might not want or need to use dual layer discs. The building of the PC could also be constrained by the fact that they haven't got the right tools to put the PC together. Certain screwdrivers might be needed such as pillars, cutters or strippers.

The building of the PC could be constrained by compatibility of components because, for example if you buy some RAM it might not be compatible with the motherboard because the motherboard wasn't made for that sort of RAM. The building of the PC could be constrained by the fact that the RAM won't fit on the motherboard. To make sure that the RAM fits on the motherboard I will do an internet search to make sure that the RAM fits.

Another example of a compatibility constraint would be a processor say I bought a processor without any knowledge of the socket that comes with the processor, I wouldn't know if it fits on the motherboard because it might only support certain types of motherboards.

Another constraint that I could stumble upon could be the fact that the power cable for the optical drive doesn't reach to the power supply unit. Which in this case an extension power cable might be needed but that could be constrained against costs.

Further Refinements to the PC

The first improvement that I could have made to the system was the graphics card, the graphics card inside the system will simply handle graphics but it won't handle intense graphics which have been developed highly in today's world. I realised from the test results that the user might need a better graphics card because the performance of the graphics card is low and the passmark was only 50. The graphics card would improve the system because it will allow the user to test their games out in high resolution, it will improve the performance of turning data into an image to be displayed on the screen. It would improve the performance because large programs or games which reply on the graphics card will run faster because the graphics card is better and has more memory to process data into an image on the screen. It would benefit the user because the will be able to run games in high resolution and process games faster.

The second improvement that I could have made to the PC was the CPU (central processing unit)I realised from the test results that the user might need a better CPU this is because, even though the CPU could cope with the tasks which the user performs, the passmark was only 298.1 which is pretty low compared to most CPU's used in today's world. It would improve the system because the CPU (central processing unit) would be a multi core processor, which means it will have more cores which process more data between components which therefore improves the efficiently and performance of the computer. With the test results from the performance checking software and a multi-core processor the computer the user will definitely see a difference in performance. The CPU will improve the performance because the system will be faster at processing data and running programs because it will have more than one core. It would benefit the user because the speed of processing data and running programs will be faster.

Additionally, the system can be improved by adding an alternative hard disk. It would improve the system because it would add more memory for the user. After a while the hard disk will only have a small bit of room left since the user will be storing large documents having a secondary or an alternative hard disk will help the system because the user will be able to store more documents, files and data. It would improve the performance because the computer will have more room to do other things such as use virtual memory and programs will be able to launch faster because it will run at more revolution per minute (RPM). The faster revolution per minute the faster the hard drive operates. It would benefit the user because the user will be able to store more documents because the hard drive would be bigger.