RECOGNISING ACHIEVEMENT

Exemplar Candidate Work

GCE in Applied ICT

OCR Advanced GCE in Applied ICT: H715

Unit G058: Developing and maintaining ICT systems for users

Contents

Introduction

This exemplar material serves as a general guide. It provides the following benefits to a teacher:

- Gives teachers an appreciation of the variety of work that can be produced for this unit
- Shows how the mark scheme has been applied by a senior assessor

It is important to make the point that the teacher support materials play a secondary role to the Specification itself. The Specification is the document on which assessment is based and specifies what content and skills need to be covered in delivering the course. At all times, therefore, this teacher support should be read in conjunction with the Specification. If clarification on a particular point is sought then that clarification should be found in the Specification itself.

Moderator's Commentary: G058 Developing and maintaining ICT systems for users

Total mark for portfolio: 39 (Max. 50)

This portfolio illustrates the work of a candidate who has planned questions and interviewed two different clients about their computer needs; the owner of a small CAD business and a person who requires a PC for home use. The candidate goes on to investigate and provide a detailed explanation of the component parts for each system. The candidate then demonstrates their knowledge by selecting components for an upgrade to a CDROM and the RAM on another system and changes the BIOS as required. They provide evidence of locating and correcting hardware problems by means of a troubleshooting log. The specifications provided and approaches taken as well as the sources used are evaluated as required by the banner. Tasks are not easily identified although the pages have been numbered electronically across the whole portfolio.

Task a

The candidate produced well thought out, in depth questions in the form of a questionnaire and data collection forms as an aid to interviewing his two clients. Supplementary questions are also provided for a second interview. It is clear from the outcomes of these questions, exactly what the key requirements of each of the two users are. The key requirement of user 1 is to provide a 6 workstation CAD system for his business and for user 2, to provide a system that allows the user to store edit and share their digital photo collection.

The candidate has provided the bulk of this evidence in pages 2 – 35. However, further evidence is to be found on pages 41, for example. Maximum marks are appropriate for this task.

Mark Band 3 **Mark Awarded: 6 (Max. 6)**

Task b

The candidate has outlined the requirements for each user and investigated, by using various on-line sites and paper-based magazines, the prices of the specific components required to meet the needs of each user. The candidate has also evidenced the use of a text book for advice regarding which components are required. The candidate has described the purpose of each component given its cost and explained their characteristics.

Having worked out total costs, the candidate then meets with the users to discuss the system they have designed. The first system is over budget so a discussion as to where changes might take place is arranged. It is unclear as to what decisions were made in this meeting. A new specification is created giving similar details as in the initial specification. This time, the candidate did meet the budget requirements. No changes are made to the second system.

In the final specifications, the candidate is careful to ensure that users' requirements are met and some justification is given for choosing specific components. It is not always clear as to why specific components are chosen over rival components, including compatibility issues, cost and availability. The two reports are set out as tables, giving details of components and costs, and in the second column: an explanation as to why they were chosen. Some evidence is provided to show that the candidate has thought about future proofing the systems (e.g. page 58), however,

there is little evidence to show exactly what steps were made to ensure future proofing was actually carried out. Advice on future-proofing has been included in the report to each user.

A mark in mark band 3 is appropriate but the limited information regarding future –proofing, compatibility etc. means a mark at the top of mark band 3 is not appropriate.

Mark Band 3 **Mark Awarded: 7 (Max. 8)**

Task c

The candidate appears to have been given two scenarios for upgrades to two different systems. These can be seen on page 67. Upgrade 1, requires the RAM to be increased and Upgrade 2 requires a new DVD rewriter to be installed instead of the current CDROM drive. Both require BIOS to be edited or checked. Both of these upgrades cover the requirements of task c.

The candidate has shown evidence, by means of a very short report, that the user does indeed need an upgrade. They have shown the limitations of each current system and, in doing so, identified additional components that are required and any possible reconfiguration that may be required. The reports, though short, give sufficient details of what action is required. The candidate also includes a 'Hardware Installation Log' for each upgrade. This gives details of what actions were carried out. Both logs state that diagrams were drawn to show the PC layout. Neither drawing is given. The logs are signed by the assessor/customer to evidence the work being carried out and this is confirmed further by the observation record at the beginning of the work. It is also good practice to include photographic and screenshot evidence of the processes being carried out. Neither of these was included.

While the candidate has recognised the limitations of the existing system and the upgrades required the BIOS to be reset or drivers to be installed, no additional components were required for either upgrade, so the bottom of mark band 3 is most appropriate.

Mark Band 3 **Mark Awarded: 6 (Max. 8)**

Task d

The candidate has been asked to replace and upgrade the hard drive of a machine. No other details are given. The only evidence that exists for this task is an observation statement found at the front of the portfolio before page 1. There is no evidence of the system requiring the replacement of one component with another due to this upgrade, therefore a mark in mark band 1 is as high as the candidate is able to achieve. Greater evidence would be required to show that replacement components had been required and that BIOS had been replaced or upgraded.

Mark Band 3 **Mark Awarded: 2 (Max. 7)**

Task e

The candidate has assumed the role of a help desk technician for this task. They have been given two faulty computers to diagnose. For each computer, the candidate has given possible reasons for each fault and recommended ways to check each problem. The candidate provided sound evidence of testing and correcting the mouse problem. However, evidence for finding and correcting the keyboard error and the smell from the power area of the tower were less well

evidenced, although the problem log on page 81 does indicate that these problems were solved. The candidate worked methodically through their list of possible solutions for the mouse problem and has given advice as to how to solve similar problems in the future. For mark band 3, the problem log is required to be detailed and index problems and solutions to solve similar problems in the future. This was difficult to follow in places especially when discussing how to solve the hard drive problem. Mark band 3 also requires the use of testing tools and the location of information on hardware error messages (beep codes). There was little or no evidence of either; in fact, failure to use diagnostic tools was given as a weakness in the candidate's evaluation. Overall there is not sufficient evidence for a mark in mark band 3 as there is insufficient detail in the problem log and insufficient evidence of using testing tools and beep codes, as required by this mark band, so the higher mark in mark band 2 has been awarded.

Mark Band 2 **Mark Awarded: 4 (Max. 6)**

Task f

The candidate has evaluated the sources they used by means of a table. The table includes a column giving the name of the information source and columns that are used to discuss the accuracy of the sources, the currency and the relevance of each source. The candidate has then gone on to discuss advantages and disadvantages of each source using the information in the table as a basis for each. The candidate takes into account who has created the information and how likely it is to be out of date to critically evaluate each source that they have used. The evaluation is thorough, concise and easy to follow. Maximum marks can be justified for this task.

Mark Band 3 **Mark Awarded: 7 (Max. 7)**

Task g

For the final evaluation of the specifications provided and of their own performance, the candidate has gained feedback for each of the specifications they created. They then went on to provide strengths and weaknesses of each system, together with ways to improve them in the future. When discussing their approach to specifying each system, there was little critical analysis of each part of the process. General strengths and weaknesses were given and although these were true, they were a little vague. The candidates approach to upgrading and repairing ICT systems was more critical in approach.

There is ample evidence for mark band 3 but, for maximum marks, the analysis of their own performance in specifying systems would need to be more critical and look at all the processes involved.

Mark Band 3 **Mark Awarded: 7 (Max. 8)**

Total mark for portfolio: 39 (Max. 50)

G058 Assessment Evidence Grid

Unit G058: Developing and maintaining ICT systems for users

What candidates need to do:

Candidates need to produce: records of specifying, upgrading and repairing ICT systems. Evidence needs to include:

a: [AO3] records of interviews with **two** different users to identify their key requirements [**6**];

b: [AO2] detailed specifications for an ICT system for **each** user, along with explanations of the reasons for selecting particular components, in non-technical language [**8**];

c: [AO1] records of carrying out an upgrade involving selecting and adding a new component to a system [**8**];

d: [AO1] records of carrying out an upgrade by replacing a component in a system [**7**];

e: [AO3] records of troubleshooting procedures carried out to identify faulty components [**6**];

f: [AO4] an evaluation of the information sources used to find information on components [**7**];

g: [AO4] an evaluation of the specifications and approaches taken to specifying, upgrading and repairing systems [**8**].

How the candidate will be assessed:

Task	Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
a	**AO3**	The candidate plans some questions to ask each user and uses their responses to analyse each user's needs and establish their key requirement; **[0 1 2]**	The candidate plans detailed questioning of each user and uses their responses to analyse each user's needs and establish their key requirement; **[3 4]**	The candidate plans and uses in-depth questioning to analyse each user's needs and establish their key requirement, asking supplementary questions and/or re-interviewing the user(s) as necessary. **[5 6]**	**6/6**
b	**AO2**	The candidate specifies, for **each** system, at least **one** of **each** of the following components: – micro-processor and associated components; – display system; – memory; – storage device; – input device; – output device; and includes, in the specification for each component, details of type, size, speed, method of connection, bus type, type of case, device controllers and other cards, as appropriate; The candidate explains, in language that can be understood by each user, the characteristics of components that relate to their requirements; **[0 1 2 3]**	The candidate uses a range of sources of information, such as computer magazines, technical manuals, text books and the internet to gather information about the components listed in Mark Band 1, and their prices and configurations, in order to advise each user of configurations which closely match the requirements, renegotiating these if necessary and amending their specification to meet the revised requirements; The candidate explains, in language that can be understood by each user, the characteristics of components that relate to their requirements and justify their choice of each configuration by matching it to the user's key requirements; **[4 5 6]**	in addition to the requirements of Mark Bands 1 and 2, the candidate provides a detailed explanation of the impact on their recommended systems of the compatibility of the recommended components and other factors such as cost and availability; The candidate includes advice about 'future-proofing' in their report to each user. **[7 8]**	**7/8**

Unit G058: Developing and maintaining ICT systems for users (continued)					
Task	**Assessment Objective**	**Mark Band 1**	**Mark Band 2**	**Mark Band 3**	**Mark Awarded**
c	**AO1**	The candidate determines a user's needs for an upgrade and selects components that meet the user's needs and that are compatible with the existing system; The candidate carries out an upgrade that requires the addition of a single component, following correct procedures; **[0 1 2 3]**	The candidate determines a user's needs for an upgrade and recognises the limitations of the existing system when recommending and selecting components to upgrade it; The candidate carries out an upgrade that requires the BIOS to be reset and/or reconfiguration of the operating system, following correct procedures; **[4 5]**	The candidate determines a user's needs for an upgrade and selects components for an upgrade, recognising the limitations of the existing system and identifying any additional components or reconfiguration required; The candidate carries out an upgrade where such additional components and/or reconfiguration are required, as well as an upgrade that requires the BIOS to be reset, following correct procedures. **[6 7 8]**	**6/8**
d	**AO1**	The candidate upgrades a system by replacing **one** component with another that is compatible with the existing system, following correct procedures; **[0 1 2]**	The candidate upgrades a system where the upgrade of **one** component requires the replacement of another, following correct procedures; **[3 4 5]**	The candidate carries out an upgrade to a system where the upgrade of **one** component requires the replacement of another and that requires the BIOS to be replaced or upgraded, following correct procedures; **[6 7]**	**2/7**
e	**AO3**	The candidate uses a systematic approach to identifying the component that is causing a system to fail, keeping brief records of problems and solutions; **[0 1 2]**	The candidate uses a systematic approach, including the use of testing tools and procedures, to identifying the component that is causing the system to fail, keeping detailed records of problems and solutions; **[3 4]**	The candidate uses a systematic approach, including the use of testing tools and procedures and locating information on hardware error messages, to help them identify the component that has caused a system to fail, keeping a detailed problem log that indexes problems and solutions to help solve similar problems in the future. **[5 6]**	**4/6**
f	**AO4**	The candidate compares the information sources used when specifying and upgrading systems in terms of their accuracy, currency and relevance;**[0 1 2 3]**	The candidate evaluates the accuracy, currency and relevance of the information sources they have used when specifying and upgrading systems; **[4 5]**	The candidate provides a critical analysis of the information sources they have used when specifying and upgrading systems in terms of their accuracy, currency and relevance; **[6 7]**	**7/7**
g	**AO4**	The candidate comments on how well their specifications met the needs of the users and the effectiveness of the approach they took to specifying, upgrading and repairing ICT systems; The candidate's report may contain errors in spelling, punctuation and grammar; **[0 1 2]**	The candidate identifies strengths and weaknesses in their specifications in relation to the needs of the users and the approach they took to specify, upgrading and repairing ICT systems, recommending improvements; The candidate's report will contain few spelling, punctuation and grammar errors; **[3 4 5]**	The candidate provides a critical analysis of their specifications in relation to the needs of the users, taking into account user feedback, and of the approach they took to specifying, upgrading and repairing ICT systems, suggesting how they would refine them in the future; The candidate's report will be consistently well-structured and there will be few, if any, spelling, punctuation and grammar errors. **[6 7 8]**	**7/8**
				Total mark awarded:	**39/50**

Candidate’s work

OCR Applied ICT – Observation Statement

Unit 19 – Developing & Maintaining systems

Student name: _

Tutors name: _

Activities	Assessment Objective
Selecting and upgrading a computer system – The student was asked to select additional Ram and update the CD Drive choosing the correct components. *Correct components selected and fitted, additional Ram added*	C1
Replacing a component – The student was asked to replace and upgrade the Hard drive *Hard drive installed and BIOS changed to accept the new Drive*	D1
Repairing a computer system – The student was give two computer systems. Computer 1 – faulty Keyboard, Mouse and power, Computer 2 – Faulty Hard drive *Fault correctly diagnosed and corrected*	E1
Supervision that the student received:	

I confirm that this statement is a true description of the above candidates performance in relation to the activities outlined.

Signature: _

Unit G058 (19) : Developing and Maintaining ICT Systems for Users

Portfolio

Records of interviews with two different users to identify their key requirements

On the following page is a copy of the questions I asked users in their interviews; accompanying this is a copy of the user requirements form I created and used to systematically define their exact requirements and relating considerations.

User Requirements Form

Contact Details			
Client's Full Name:		**Date:**	
Company Name:		**Lead Time:**	
Address 1:			
City:		**Min £:**	
Postcode/Country:		**Max £:**	

Requirements and Current System
Brief requirements notes:
Personal Tasks:
Business Tasks:
OS Preference?
Printing Requirements:
Laser [ ] Inkjet [ ] Dot Matrix [ ] Laser [ ]
Standalone [ ] All-in-one PSC [ ]
Colour [ ] Black/White [ ]
Single Sided [ ] Double Sided [ ]
Paper Size(s):
Share printer (If multiple computers)? Y [ ] No [ ]
Scanning Requirements:
Colour [ ] Black/White [ ] Negatives [ ] Flatbed [ ] Handheld [ ]
Paper Size(s):
System Requirements: ** add details of current tasks and how they are performed to notes section before completing this section.*
Read DVDs/CDs? [ ] Write DVDs/CDs? [ ]
Number of workstations required:
File types to be stored:
Share files? [ ] Access off-site? [ ] Access locally off-site [ ]

Approx. quantity of files to be stored:
How long sat at a computer at once? (approx. in hours):
In/Output Requirements:
Output displays (TV/HDTV/Monitor/Projector...):
Is any specific equipment/cabling required for this?
IWB Required? Y [ ] N [ ]
Touch-screen? Y [ ] N [ ]
Sound output devices:
Subwoofer? Y [ ] N [ ]
Connect to MIDI Keyboards / Instruments? Y [ ] N [ ]
Connection from other audio sources? Y [ ] N [ ] Details:
Microphone input? Y [ ] N [ ]
Front-socket connection to soundcard? Y [ ] N [ ]
Internet access speed estimate: Dial-up [ ] Broadband [ ] Cable / Fibre Optic [ ]
Connection method: Wired to modem [ ] Wired network [ ] Wireless network [ ] Mobile BB [ ] ** explain advantages and disadvantages of each method to the user whilst in consultation.*
Approximate description of items to be connected to system (e.g. USB/FireWire peripherals):
Estimated no. of USB ports: / **USB Type: 1.0 [ ] 2.0 [ ] 2.2 [ ]**
Front connectors: [ ] Back connectors [ ]
Digital camera connections? Y [ ] N [ ]
Share digital camera data to other computers? Y [ ] N [ ]
Portable digital camera connection? Y [ ] N [ ] **Video camera connection? Y [ ] N [ ]** ***If so, how many?*** **Front connector? Y [ ] N [ ]**
Wired Mouse [ ] Wireless Mouse [ ] / **Trackball mouse [ ] Optical [ ]**
Wired Keyboard [ ] Wireless Keyboard [ ] / **Graphics tablet? Y [ ] N [ ]**
Specialist keyboard requirements:
Other control devices (joystick, etc.):
Speech recognition software? Y [ ] N [ ]
Webcam? Y [ ] N [ ]
Special software requirements (CAD/CAM, Imaging, Animation, etc.):

Ergonomics/Security:		
Specialist desk / chair requirements:		
Approx. office dimensions:		
Physical security already installed:		
Software security already installed:		
Required security: **Locked room [ ]** **Access-Control [ ]** **UPS [ ]** **Surge protection [ ]**		
Data backup: RAID [ ] **Mirror server [ ]** **NAS [ ]** ***Off-site? [ ]***		
Other User Preferences:		
New System: [ ]	**Upgrade [ ]**	**Notes:**
Current equipment/software:		
Ideas on how the new system could work:		
Any other requirements:		

Economic / Social:				
System Budget:				
Finance Method:	**Cash / Card / Cheque / Bank Transfer**			**Instant: [ ]** **Finance Agreement: [ ]**
Cost Effectiveness Gauge: ** circle*	**Quality**	**Balance**	**More Features**	**No preference**
Change Resistance:				
Changeover Method: ** circle and notes*	**Parallel**	**Phased Transition**	**Direct**	

Legal:
Impact of DPA:
Computer Misuse Act:
Display Screen Regulations:
Electronic Communications Act:

Summary of Reqs.	
What data will be input?	
How is it input at present?	***How would you like it to be input in future?***
Output Types (paper/screen), etc:	
User Comments / Other Features / General Notes:	

GUIDANCE QUESTIONS FOR COMPUTER MONITOR TYPES

What is the purpose of the display? **To work** **To present** **To interact with**

**circle and notes.*

What will be displayed on the screen (mostly)?

[ ]	**Images**	[ ]	**Videos**	[ ]	**Games**
[ ]	**Documents, text only**	[ ]	**Documents, images only**	[ ]	**Documents, mixed**
[ ]	**Web pages**	[ ]	**Other (please state)**		

What is the optimum connection based on these requirements?

[ ]	**VGA**	[ ]	**XVGA**	[ ]	**Component**
[ ]	**HDMI**	[ ]	**S-Video**	[ ]	**Scart (RGB)**
[ ]	**DVI**	[ ]	**Wireless connection**		

Which screen type is needed?

[ ]	**Standard Monitor (CRT)**	[ ]	**Flat-screen LCD**	[ ]	**Flat-screen Plasma**

Touch-Screen? [ ]

GUIDANCE NOTES ON COMPUTER MONITOR TYPES

Factors to consider:

- Price
- Size
- Image Quality
- Energy Consumption
- Personal Comfort (reference 'Ergonomics' and 'In/Output Requirements' from Main User Requirements Form)
- Response Time

CRT Monitors
The more dpi (dots per inch) the higher the quality of the image. Resolution is most critical for images and not text. CRTs may 'flicker' when the refresh rate (Hz) changes in different applications. CRT monitors include a 'dot pitch' specification. The lower the dot pitch rate, the clearer the picture. Some CRT monitors can display 'fuzzy' text due to a high dot pitch level. CRTs are only available between 15 and 21 inches in size. The actual viewing size of these screens is about 1 inch less than the quoted size.
The screens are heavy, bulky and consume a lot of power. However they are dependable.

LCD Monitors
LCD Monitors have flat screens. They are available in larger screen sizes than CRT monitors. They have lower power consumption than CRT monitors. They have a native-supported resolution. They also have a response time in ms. The lower this is, the less time there is between the computer sending the signal and it appearing on screen, therefore less blurring in movement. The contrast ratio measures the vibrancy of colours, the difference between dark and light colours. They are susceptible to poor quality viewing from an angle, therefore a 'viewing angle' measurement needs to be observed. They are easily damaged by being poked. CRTs are resistant to this due to a layer placed over the glass. Dead pixels can occur if the screen becomes damaged or is pressured.

Plasma Monitors
These are generally the thinnest monitors on the market. They are the thinnest and least bulky monitors available. They have the most accurate colour reproduction. The viewing angles on these monitors are generally higher than on LCD Monitors. Very high refresh rates mean there is little, if any motion blur. Screen burn-in can be a problem for plasma screens, therefore consistently static elements on the screen may leave a mark such as a ghost image. These screens are generally not available for sizes less than 32 inches. They are heavy due to the requirement of a glass screen to hold the gases. Plasma screens usually use more power than LCD screens. Radio interference and transmitters can interfere with the image produced on these screens. If a company values its eco credentials, they should be made aware of the extensive use of gas harmful to the environment which occurs in the production of these monitors, also mentioning the high amounts of power which these screens use.

Training	
Is training required?	**Y [ ] N [ ] External training required [ ]**
Provisional objectives/time estimate for training:	
Details/Notes:	

Questions to ask users

The Client / Preliminary Information

- What is your name?
- Contact information
- Company/business
- Current date
- Lead time
- Budget limit + minimum

Requirements and Current System

- What would you like a new system to do in terms of personal and business use, broken down into tasks? (word processing, spreadsheets, databases, web browsing, e-mail, web design, programming, extended tasks such as imaging/video – creating or viewing, etc.)
- Do you have a preference over the Operating System? Windows / Mac / Linux?
- Would you like to be able to print?
  - Laser/Inkjet/Dot Matrix/Plotter?
  - Would this be in colour/black and white, double-sided?
  - What would the paper size be?
  - Would you like an all-in-one printer/scanner/copier? (Note to self: what cabling would be required for these printers?)
- If you are requiring more than one computer, are you envisaging this printer to be shared?
- Will you want to photocopy documents or scan in images/documents: negatives, flatbed (normal documents,) handheld – which paper sizes?
- Would you like to be able to read CDs/DVDs?
  - Would you like to be able to write your own CDs/DVDs?
- How many computers would you like?
- Which types of files would you be keeping (video, documents, images, etc.)?
  - Would you like others to be able to access these files?
  - Would you like these files to be able to carry with you off-site?
  - Or would you want to access these files from a location off-site?
- Do you know a vague number of files which you are going to have to save?
- How long would you be sat at a computer for at any one time?
  - What would you like to display your computer's output on/through (TV, HDTV, S-Video, Video/DVD Recorder, etc.)? Are there any other equipment which need to be detailed for this (i.e. the model of a particular TV?)
  - Would you require a projector, or even an Interactive White Board?
  - What would you view on the monitor (video, images, documents, etc.)?
  - Is implementation of a touch-screen monitor applicable?
- How would you like your sound to be output? (Speakers, headphones, digital to home theatre system?)
  - Would you want to output to a subwoofer?
  - Would you want to connect keyboards/instruments?
  - Would you want to connect other audio sources?
  - Would you want to connect a microphone?
  - Would you want to connect via the front of the computer (front sound card sockets)?
    * *Especially useful if using headphones/microphones.*
- What sort of internet access would be required – also would this be wired or wireless?
  - Is internet access already available? Explain benefits and disadvantages to user.
- How would you like to connect to other computers? Which would be most practical / cost-effective – Ethernet (cabled) or Wireless (WLAN)?

- Would you like to connect any peripherals such as USB drives, etc? (Try and determine number of USB sockets – type, 1.1 or 2.0 or 2.2.)
  - Front/back loading?
  - Would you want these devices to be shared over the network? Would you want any USB devices sharing over the network with other computers?
- Would you want to connect a video camera? (FireWire?)
  - How many?
  - Front or back loading connections?
- Are you wanting to connect any digital cameras or read data from memory cards?
  - Would you want this connection on the front or back of the machines?
  - Would you want the data from these sharing across the network?
  - Would you want a portable solution of this type?
- Would you want a wired or wireless mouse/keyboard?
  - Trackball or Optical mouse?
  - Graphics tablet?
- Would the keyboard need to be ergonomic? Any specific keyboard layout preference?
- Would you require speech recognition software?
- Would you require a joystick or steering wheel to be connected to the system?
- Would you need a webcam built into the system?
- Do you need a camcorder or Digital SLR camera?
- Do you need any specialist software – bespoke or generic? CAD / CAM, Graphics, Animation, etc?
- Do you have any specialist desk or chair requirements? What are the approx. dimensions of the office(s)?
- What physical security does the office have? Is anti-virus or firewall software already in place?
  - Locked, access controlled room for servers.... UPS....Surge protection (cheaper)....
- Data backup – secondary server? RAID Server?
- Would you prefer a new system from scratch or an upgrade on the current system?
- What ICT equipment, software or systems do you have in place already?
- What do you currently do the get the same results?
- What problems do you have with the current system?
- Do you have an idea as to how you would like a new system to work?
- Is there anything else you want from the system?
- Set a time/date to explain proposals.

Technical / Transition

- How much technical knowledge or training do you have already?
- Would you be happy with having a new system installed?
- Would a parallel changeover be suitable, in a transitional period?
- How long would you like the transition to take?
- Would you or your staff require training to use the system?
- When would this be able to take place and how long for?
- What security does your company have in terms of IT, if known? What physical security is there for the system, e.g. Locks, CCTV, etc?

Economic / Social

- What is your budget for the system?

- Would you prefer quality over features in terms of the new system's attributes? (Gauging Cost-Effectiveness needs)
- What impact would implementing a new system have on the company?
- Is your company willing to accept this change?
- What benefits would you like your system to bring to your company?

Legal

- Would the Data Protection Act affect the data storage or workings of the system?
- Do you have knowledge of the Computer Misuse Act or the Electronic Communications Act?

Specific System Requirements

- What data will be input into the system?
- How do you input it already? How would you like this to be input?
- What would you like the outputs to be in your system (paper-based, on-screen, types...)? How do you already get the same outputs?

On the following pages are copies of the forms which I filled out whilst interviewing each user. These helped me to determine their key requirements in detail.

User Requirements Form

Contact Details			
Client's Full Name:	D	Date:	15/3/10
Company Name:		Lead Time:	3 months
Address 1:			
City:		Min £:	10,000
Postcode/Country:		Max £:	15,000

some flexibility

Requirements and Current System	
Brief requirements notes:	To help run business. CAD Costs business, offshore racing yachts.
Personal Tasks:	—
Business Tasks:	* CAD * Reports, e-mail, presentation * Project mgt, * Costings
OS Preference?	Mac (CAD)

Printing Requirements:				
Laser [✓]	Inkjet [✓]	Dot Matrix [ ]	✗ Laser [ ]	
Standalone [✓]	All-in-one PSC [ ]			
Colour [✓]	Black/White [ ]			
Single Sided [✓]	Double Sided [ ]			
Paper Size(s): Plotter				
Share printer (If multiple computers)? Y [✓]	No [ ]	6 PCs		

Scanning Requirements:				
Colour [ ]	Black/White [ ]	Negatives [ ]	Flatbed [ ]	Handheld [ ]
Paper Size(s):				

System Requirements:	* add details of current tasks and how they are performed to notes section before completing this section.
Read DVDs/CDs? [ ]	Write DVDs/CDs? [ ]
Number of workstations required:	6
File types to be stored:	Images, Doc, Email, Presentation
Share files? [✓]	Access off-site? [ ] Access locally off-site [ ]

Approx. quantity of files to be stored: 100,000s +	
How long sat at a computer at once? (approx. in hours):	
In/Output Requirements:	
Output displays (TV/HDTV/Monitor/Projector...): HQ Monitor, CGI Project	
Is any specific equipment/cabling required for this?	
IWB Required? Y [ ] N [✓]	
Touch-screen? Y [ ] N [✓]	
Sound output devices: Speakers	
Subwoofer? Y [ ] N [✓]	
Connect to MIDI Keyboards / Instruments? Y [ ] N [✓]	
Connection from other audio sources? Y [✓] N [ ] **Details:** Mic	
Microphone input? Y [✓] N [ ]	
Front-socket connection to soundcard? Y [✓] N [ ]	
Internet access speed estimate: Dial-up [ ] Broadband [ ] Cable / Fibre Optic [✓]	
Connection method: Wired to modem [ ] Wired network [✓] Wireless network [ ] Mobile BB [ ] ** explain advantages and disadvantages of each method to the user whilst in consultation.*	
Approximate description of items to be connected to system (e.g. USB/FireWire peripherals): Webcam	
Estimated no. of USB ports: 4	**USB Type:** 1.0 [ ] 2.0 [✓] 2.2 [ ]
Front connectors: [✓] **Back connectors** [ ]	
Digital camera connections? Y [ ] N [✓]	
Share digital camera data to other computers? Y [ ] N [ ]	
Portable digital camera connection? Y [ ] N [ ]	
Video camera connection? Y [ ] N [ ] *If so, how many?*	
Front connector? Y [ ] N [ ]	
Wired Mouse [ ] **Wireless Mouse** [✓]	**Trackball mouse** [ ] **Optical** [✓]
Wired Keyboard [ ] **Wireless Keyboard** [✓]	**Graphics tablet?** Y [✓] N [ ]
Specialist keyboard requirements: None.	
Other control devices (joystick, etc.):	
Speech recognition software? Y [✓] N [ ]	
Webcam? Y [✓] N [ ]	
Special software requirements (CAD/CAM, Imaging, Animation, etc.): CAD/CAM, Animations	

Ergonomics/Security:

Specialist desk / chair requirements: ——

Approx. office dimensions: ——

Physical security already installed: Locks on doors/windows.

Software security already installed:

Required security: Locked room [ ] Access-Control [ ] UPS [ ]
Surge protection [ ]

Data backup: RAID [ ] Mirror server [ ] NAS [ ]
Off-site? [ ]

Other User Preferences:

New System: [ ] **Upgrade** [ ] **Notes:**

Current equipment/software:

None.

Small Microsoft packages + letters etc.

Ideas on how the new system could work:

On-screen design, simple use.
Computer literate

Any other requirements:

* Availability of they system - 9-5.
some overtime.
power mgt

User Requirements Form

Unit 19: Developing and Maintaining ICT Systems for Users

Economic / Social:				
System Budget:				
Finance Method:	**Cash / Card / Cheque / Bank Transfer**			**Instant: [ ]** **Finance Agreement: [ ]**
Cost Effectiveness Gauge: ** circle*	**Quality**	**Balance**	**More Features**	**No preference**
Change Resistance:	Training req'd - New venture			
Changeover Method: ** circle and notes*	**Parallel**	**Phased Transition**	**Direct**	
Legal:				
Impact of DPA:				
Computer Misuse Act:	files cannot be sent			
Display Screen Regulations:				
Electronic Communications Act:				
Summary of Reqs.				
What data will be input?	Design specifications + drawings. Costings			
How is it input at present?	***How would you like it to be input in future?***			
Output Types (paper/screen), etc:				

GUIDANCE QUESTIONS FOR COMPUTER MONITOR TYPES

What is the purpose of the display? (To work) To present To interact with

*circle and notes.

What will be displayed on the screen (mostly)?

[✓]	Images	[✓]	Videos	[ ]	Games
[ ]	Documents, text only	[ ]	Documents, images only	[✓]	Documents, mixed
[✓]	Web pages	[✓]	Other (please state)	precise CAD designs	

What is the optimum connection based on these requirements?

[ ]	VGA	[ ]	XVGA	[ ]	Component
[✓]	HDMI	[ ]	S-Video	[ ]	Scart (RGB)
[✓]	DVI	[ ]	Wireless connection		

Which screen type is needed?

[ ]	Standard Monitor (CRT)	[✓]	Flat-screen LCD	[✓]	Flat-screen Plasma

include both in spec. for comparison

Touch-Screen? [ ]

GUIDANCE NOTES ON COMPUTER MONITOR TYPES

Factors to consider:

- Price
- Size
- Image Quality
- Energy Consumption
- Personal Comfort (reference 'Ergonomics' and 'In/Output Requirements' from Main User Requirements Form)
- Response Time

CRT Monitors

The more dpi (dots per inch) the higher the quality of the image. Resolution is most critical for images and not text. CRTs may 'flicker' when the refresh rate (Hz) changes in different applications. CRT monitors include a 'dot pitch' specification. The lower the dot pitch rate, the clearer the picture. Some CRT monitors can display 'fuzzy' text due to a high dot pitch level. CRTs are only available between 15 and 21 inches in size. The actual viewing size of these screens is about 1 inch less than the quoted size.
The screens are heavy, bulky and consume a lot of power. However they are dependable.

LCD Monitors

LCD Monitors have flat screens. They are available in larger screen sizes than CRT monitors. They have lower power consumption than CRT monitors. They have a native-supported resolution. They also have a response time in ms. The lower this is, the less time there is between the computer sending the signal and it appearing on screen, therefore less blurring in movement. The contrast ratio measures the vibrancy of colours, the difference between dark and light colours. They are susceptible to poor quality viewing from an angle, therefore a 'viewing angle' measurement needs to be observed. They are easily damaged by being poked. CRTs are resistant to this due to a layer placed over the glass. Dead pixels can occur if the screen becomes damaged or is pressured.

Plasma Monitors

These are generally the thinnest monitors on the market. They are the thinnest and least bulky monitors available. They have the most accurate colour reproduction. The viewing angles on these monitors are generally higher than on LCD Monitors. Very high refresh rates mean there is little, if any motion blur. Screen burn-in can be a problem for plasma screens, therefore consistently static elements on the screen may leave a mark such as a ghost image. These screens are generally not available for sizes less than 32 inches. They are heavy due to the requirement of a glass screen to hold the gases. Plasma screens usually use more power than LCD screens. Radio interference and transmitters can interfere with the image produced on these screens. If a company values its eco credentials, they should be made aware of the extensive use of gas harmful to the environment which occurs in the production of these monitors, also mentioning the high amounts of power which these screens use.

Notes	
User Comments / Other Features / General Notes:	Secure company designs ESSENTIALS * Animation on screen * Printing drawings for manu. * Security

Action Planning	
Date of next meeting:	
Time of meeting:	
Attendees:	
Subject / Purpose:	Review draft system options
Venue:	
Targets / Deliverables from this meeting:	Draft specifications comparison document
Success Criteria:	* To outline satisfactory system specifications for the user * To reach an agreement on a system spec.

THE DATA PROTECTION ACT (1998) AND YOU

Under the rules of the Data Protection Act 1998, by signing this form you give consent to the system designer to store your details for no purpose other than the processing of data relating to the development of your system. Your data will not be shared with third-parties unless prior written permission is sought from you. Your data will be stored securely and will not be shared with any other individual or organisation. We will ensue of the protection of the confidentiality, integrity and security of all and any information supplied to us. We may keep your details for up to 5 years after the successful development of your system, after which they will be destroyed and disposed of securely.

CLIENT / CONSULTATION VERIFICATION

Signed:	...	Date:	15/03/10
Signed by user:	...	Date:	15/03/10

Follow-Up User Requirements Form

Training	
Is training required?	**Y** [✓] **N** [ ] **External training required** [ ]
Manufacturer supplied	
Provisional objectives/time estimate for training:	
Details/Notes:	

USER 2
User Requirements Form

User Requirements Form

Contact Details			
Client's Full Name:	A	Date:	18/03/2010
Company Name:		Lead Time:	ASAP.
Address 1:			
City:		Min £:	
Postcode/Country:		Max £:	1500 ish

Requirements and Current System	
Brief requirements notes:	Word processing internet/e-mail photos - store+edit excel.
Personal Tasks:	
Business Tasks:	
OS Preference?	Windows

Printing Requirements:				
Laser [ ]	Inkjet [✓]	Dot Matrix [ ]	Laser [ ]	
Standalone [ ]	All-in-one PSC [✓]			
Colour [✓]	Black/White [ ]			
Single Sided [✓]	Double Sided [ ]			
Paper Size(s): A4				
Share printer (If multiple computers)? Y [ ]	No [✓]			

Scanning Requirements:				
Colour [ ]	Black/White [ ]	Negatives [ ]	Flatbed [ ]	Handheld [ ]
Paper Size(s):				

System Requirements:	*Add details of current tasks and how they are performed to notes section before completing this section*
Read DVDs/CDs? [ ]	Write DVDs/CDs? [✓]
Number of workstations required:	
File types to be stored:	
Share files? [ ]	Access off-site? [ ] Access locally off-site [ ]

Approx. quantity of files to be stored: lots of photos	
How long sat at a computer at once? (approx. in hours):	
In/Output Requirements:	
Output displays (TV/HDTV/Monitor/Projector...): Monitor, TV maybe.	
Is any specific equipment/cabling required for this?	
IWB Required? Y [ ] N [ ]	
Touch-screen? Y [ ] N [ ]	
Sound output devices: Normal speakers	
Subwoofer? Y [ ] N [ ]	
Connect to MIDI Keyboards / Instruments? Y [ ] N [ ]	
Connection from other audio sources? Y [ ] N [ ] **Details:**	
Microphone input? Y [ ] N [✓]	
Front-socket connection to soundcard? Y [ ] N [✓]	
Internet access speed estimate: Dial-up [ ] Broadband [ ] Cable / Fibre Optic [ ]	
Connection method: Wired to modem [ ] Wired network [ ] Wireless network [ ] Mobile BB [ ] ** explain advantages and disadvantages of each method to the user whilst in consultation.*	
Approximate description of items to be connected to system (e.g. USB/FireWire peripherals):	
Estimated no. of USB ports:	**USB Type:** 1.0 [ ] 2.0 [ ] 2.2 [ ]
Front connectors: [ ] **Back connectors** [ ]	
Digital camera connections? Y [✓] N [ ]	
Share digital camera data to other computers? Y [ ] N [ ]	
Portable digital camera connection? Y [ ] N [ ]	
Video camera connection? Y [✓] N [ ] *If so, how many?*	
Front connector? Y [ ] N [ ]	
Wired Mouse [ ] **Wireless Mouse** [ ] price.	**Trackball mouse** [ ] **Optical** [ ]
Wired Keyboard [ ] **Wireless Keyboard** [ ]	**Graphics tablet?** Y [ ] N [ ]
Specialist keyboard requirements:	
Other control devices (joystick, etc.):	
Speech recognition software? Y [ ] N [ ]	
Webcam? Y [ ] N [✓]	
Special software requirements (CAD/CAM, Imaging, Animation, etc.):	

Ergonomics/Security:	
Specialist desk / chair requirements: New chair	Back problems
Approx. office dimensions:	
Physical security already installed:	
Software security already installed: Antivirus Internet bank	
Required security: Locked room [ ] Access-Control [ ] UPS [ ] Surge protection [ ]	
Data backup: RAID [ ] Mirror server [ ] NAS [✓]	*Off-site?* [ ]
Other User Preferences:	
New System: [ ] Upgrade [✓]	**Notes:**
Current equipment/software:	
Ideas on how the new system could work:	
Any other requirements:	

Economic / Social:	
System Budget:	
Finance Method:	(Cash) / Card / Cheque / Bank Transfer — Instant: [✓] Finance Agreement: [ ]
Cost Effectiveness Gauge: ** circle*	(Quality) Balance More Features No preference
Change Resistance:	
Changeover Method: ** circle and notes*	Parallel Phased Transition (Direct)

Legal:
Impact of DPA:
Computer Misuse Act:
Display Screen Regulations:
Electronic Communications Act:

Summary of Reqs.	
What data will be input?	
How is it input at present?	***How would you like it to be input in future?***
Output Types (paper/screen), etc:	

Notes
User Comments / Other Features / General Notes:

Action Planning	
Date of next meeting:	
Time of meeting:	
Attendees:	
Subject / Purpose:	
Venue:	
Targets / Deliverables from this meeting:	
Success Criteria:	

THE DATA PROTECTION ACT (1998) AND YOU

Under the rules of the Data Protection Act 1998, by signing this form you give consent to the system designer to store your details for no purpose other than the processing of data relating to the development of your system. Your data will not be shared with third-parties unless prior written permission is sought from you.
Your data will be stored securely and will not be shared with any other individual or organisation.
We will ensue of the protection of the confidentiality, integrity and security of all and any information supplied to us.
We may keep your details for up to 5 years after the successful development of your system, after which they will be destroyed and disposed of securely.

CLIENT / CONSULTATION VERIFICATION

Signed:	.....	Date:	...../...../.....
Signed by user:	...]	Date:	...../...../.....

I then made detailed notes explaining what each user required in order to help me create a specification for each system:

Record of User Requirements – D

D would like his company to have a computer system which will be developed within **3 months**. His budget restrictions are **£10,000 - £15,000**; however he stipulated that there was some room in the budget for expansion if the system he requires exceeds this price.

The main functional requirements which D asked for were:

- To have a system which helps him run his business and complete business documentation
- To have a system which can design the graphics to be printed onto offshore racing yachts.

We discussed the main tasks which the system would perform, which included the following business tasks:

- To produce CAD (Computer Aided Design) documents
- To produce reports, e-mails, presentations and spreadsheets to help with business administration

CAD software and Office software will thus be required.

The system will not be used for personal tasks.

C said that he would like a Mac system due to its superiority in graphics design and the availability of graphics software on such systems.

D requires **6 workstations**.

To print documents D said that he would like a **laser printer** for business documents such as high quantities of letters and a separate **inkjet printer** for draft paper designs and more detailed colour documents.

He also said that the company required a **plotter** in order to print onto the large format media to transfer onto the racing yachts.

These printers should be shared with other computers as part of the system, as D asked.

C does not require the facility to scan.

D said that the system would store images, documents, e-mails and presentation files. He asked for these files to be made available to everyone on the network. These would not need to be accessed outside of the office as D said he would like security to be a priority for the system; therefore running the risk of such remote access would not be desired. D estimated that around 100,000 files would be stored.

D said each computer should have a high quality monitor to display graphics work with high levels of detail on. D also said a projector would be a luxury to consider in the system specification to present design portfolios and CGI graphics to clients with. He did not require an Interactive Whiteboard as I suggested may have been useful during the interview.

D said speakers would be required as the company would sometimes record commentaries to accompany design videos; this also meant that video editing software would be required and a microphone. D said just one microphone would be sufficient.

He did say that a subwoofer would not be required though.

D said for ease of connecting/disconnecting and sharing the microphone, front sockets to plug the microphone into would be useful.

D said he would like the fastest internet connection available in his area to help him to access the internet and download images. He would like the internal connection of computers to be wired, for a more secure network nature as his top priority is the confidentiality of data and security of the computer systems; he said that the company's work was very sensitive and should never have any risk of being accessed by others.

D said a webcam may be useful however it is not a key requirement. He said that the company would not require the ability to import photos from a digital or video camera.

D said that a wireless mouse and keyboard would be useful to free desks which often become cluttered of wires. He specifically requested an optical mouse due to the lack of cleaning which these require and due to their better accuracy of movement in comparison with tracker ball mice.

He also said a graphics tablet would be useful to facilitate drawing into applications by hand.

In discussion we discussed ideas about how the system could work. D said that the system should be simple to use as far as possible however him and his staff are fairly computer literate.

The system will be used between 9am – 5pm every working day with the occasional overtime. A power management system incorporated scheduled system shut downs, automatic nightly backups and then automatic power cut off could help to save the company money meaning that equipment would not have to be left on overnight. D said that the company has reasonable security including locks on doors and windows and would be open to any extra security required both on a physical and software level to improve the security of the system, its data and the hardware physically.

The company will require a back up drive to keep a copy of data in case the system fails. This should ideally be stored off-site however the budget may restrict the type of backup available to be purchased.

Record of User Requirements – A

A is a home user who stipulated a key requirement of being able to store and share her photo collection using her computer system.

She requires a system to be implemented as soon as possible with a budget maximum of £1500.

A said that she would like her system to perform the following tasks:

- Word processing
- Internet browsing and sending/receiving e-mails
- Keeping a log of personal finances using a spreadsheet
- Storing, editing and sharing photos

A said that she prefers the Windows operating system as she is used to it; therefore asked for this to be used for her system configuration.

A said that she would like an inkjet printer to print high quality photos with; onto photo paper.

She said she would also like a scanning facility to scan in and store paper photos which she has.

This printer does not need to be able to be shared with other possible computers in her house.

A would like to be able to create CDs and DVDs of her photos and envisages herself storing thousands of photos.

A said she would like a good and clear monitor which has a good screen size for viewing photos on.

She would also like to have speakers with her computer system. She does not require a microphone or a front-connection to the soundcard.

A requires USB ports on her computer as she said she would like to be able to connect a digital camera. She will also require a FireWire port as she said she would like to be able to connect her video camera to save video files from it.

A does not mind which mouse or keyboard she has as long as it is comfortable and allows her to use the computer.

A also said she would find a backup very assuring for her system so that she knows her photos will be kept safe and also would like her data to be kept secure and virus-free, therefore virus protection software is required.
Basic photo editing software and the ability to store photos is embedded within the Windows operating system and A said she only required basic editing functionality and would mostly use the computer for image storage and video storage; therefore no specific image or video editing software is required.

A also explained that she has back problems and therefore the chair I choose for her will need to be comfortable, adjustable and ergonomic. I would also advise wrist rests and possibly a foot rest to further support a comfortable body position in order to cater for A specific health needs which may be affected by working at a computer.

A has a current WiFi connection with internet connectivity at home so does not require provisioning of networking equipment or an internet connection, she just requires a computer which can connect to this wireless network.

I then made notes on system requirements for software and hardware to fulfil the tasks and requirements of the users:

Record of User Requirements – System 1

Date of Interview: 15th March 2010
Interviewee: D

Lead time: 3 months
Budget: £10-15,000 (however some flexibility)

Key Requirement: To help run the CAD business to design yacht artwork for offshore racing yachts.

No personal tasks

Business tasks: CAD, Reports, e-mailing, presentations, project management and calculating costings / bookkeeping.

Preference of a Mac System for CAD

A laser printer is required for printing off business documents

A plotter / LFP would be required for printing artwork

(Single-sided media)

This printer would be SHARED

---

6 workstations are required

The file types to be stored are: Images, CAD documents, Documents, E-mails and presentations

These files should be SHARED internally (no VPN access)

Approximately 100,000+ files to be stored

A HQ Monitor is required

Possibly some sort of projection system for presenting designs to clients

Standard speakers are required

A microphone connection is required (front socket connection to soundcard)

A secure fibre optic internet connection would be preferred

Wired network to connect workstations

Wireless Optical Mouse required

Wireless Keyboard required

Graphics Tablet required

Speech Recognition Software and Webcam required
Special Software: CAD/CAM and Animation Software

SECURITY IS A PRIORITY

Lock security currently installed physically at the building

Current system:

Windows XP system – standalone – runs Microsoft Office for administration purposes

---

Current workforce fairly computer literate and would not require anything specialist or explanatory to help them use the system, however ease of use is a focus for the system's setup

---

System to be used 9am – 5pm with some possibility of occasional overtime

Energy saving seemed to be hinted – power management?

Cost Effectiveness Measure: More features preferred rather than quality, the more requirements that can be met the better.

Training: Some instruction on navigating the system and using its features would be required. User manuals from manufacturers or any additional handbooks which could be provided would suffice for this.

CMA: Files cannot be sent outside of the company network, over the internet, e-mail or transported on removable media or otherwise under any circumstances for intellectual property protection.

Inputs: Designs and data for documents

ESSENTIALS:

- **Animation on screen and CAD**
- **Printing of drawings**
- **Security enforcement**

Could use a **plasma or LCD screen**, decide with client upon consultation about draft specifications:

Deciding factors
Energy efficiency / budget restraint (LCD) ***over*** quality and precise colour reproduction (plasma) and more expense.

Record of User Requirements – System 2

Date of Interview: 17th March 2010
Interviewee: A

Lead time: ASAP
Budget: £1500

Key Requirement: To perform office software tasks and image editing and storage/management.

No business tasks

Preference of a Windows system as user is familiar with it

An inkjet printer – for printing photos, onto A4 paper – including photo gloss media

(Single-sided media)

This printer would not be shared, only 1 WORKSTATION is required

---

1 workstation required

The file types to be stored are: Images, Documents, E-mails and spreadsheet files

No sharing – already has wireless network at home

Many photos to be stored

A HQ Monitor is required

Possibly some sort of projection system for presenting designs to clients

Standard speakers are required

A microphone connection is required (front socket connection to soundcard)

A secure fibre optic internet connection would be preferred

Wired network to connect workstations

Wireless Optical Mouse required

Wireless Keyboard required

Graphics Tablet required

Speech Recognition Software and Webcam required
Special Software: CAD/CAM and Animation Software

SECURITY IS A PRIORITY

Lock security currently installed physically at the building

Current system:

Windows XP system – standalone – runs Microsoft Office for administration purposes

---

Current workforce fairly computer literate and would not require anything specialist or explanatory to help them use the system, however ease of use is a focus for the system's setup

---

System to be used 9am – 5pm with some possibility of occasional overtime

Energy saving seemed to be hinted – power management?

Cost Effectiveness Measure: More features preferred rather than quality, the more requirements that can be met the better.

Training: Some instruction on navigating the system and using its features would be required. User manuals from manufacturers or any additional handbooks which could be provided would suffice for this.

CMA: Files cannot be sent outside of the company network, over the internet, e-mail or transported on removable media or otherwise under any circumstances for intellectual property protection.

Inputs: Designs and data for documents

ESSENTIALS:

- **Animation on screen and CAD**
- **Printing of drawings**
- **Security enforcement**

Could use a **plasma or LCD screen**, decide with client upon consultation about draft specifications:

Deciding factors
Energy efficiency / budget restraint (LCD) ***over*** quality and precise colour reproduction (plasma) and more expense.

On the following pages are copies of draft specifications I made prior to re-interviewing and re-negotiating these with each user:

Draft System Specification Document
D

Prepared by

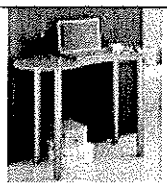
Date of Meeting: ..... **Attendees:** .....
Meeting Purpose:
.....
.....
Further Action Required after Meeting? [ ] Y [ ] N Details:
.....

Specification	Comment
〈 One 2.66GHz Quad-Core Intel Xeon 〈 3GB (3x1GB) 〈 640GB 7200-rpm Serial ATA 3Gb/s 〈 NVIDIA GeForce GT 120 512MB 〈 One 18x SuperDrive 〈 Apple Magic Mouse 〈 Apple Wireless Keyboard (British) and User's Guide (English) **£1,987.99 per workstation** **6 workstations = £11,927.94**	This meets the requirements necessary for the following software: 〈 AutoDesk (for producing 3D Models) 〈 Final Cut Pro (for creating videos of these) 〈 Microsoft Office for Mac (for creating reports in Word, managing e-mails/projects in Entourage and for presentations in PowerPoint) These are the industry standard software packages and have been chosen as your company will therefore be leading in the market and compatible and able to work with other companies in this field of work if need be.
WACOM Graphics Tablets – compatible with Mac, A5 size: £154 each. 6 graphics tablets = **£924**	You stipulated a requirement of having graphics tablets to help you design artwork for yachts. WACOM are the leading brand for such hardware devices and are compatible with the system as specified in this specification. There could be a possibility to choose a cheaper alternative or not have a tablet for each workstation. This should be discussed. The company may want a smaller or bigger size of graphics tablet, this should also be discussed.

AutoDesk - £467 (no restriction on users) FCP - £384 (no restriction on users) Microsoft Office Mac - £128 (2 x £64, = 6 users) ***TOTAL = £979 software costs***	〈 AutoDesk (for producing 3D Models) 〈 Final Cut Pro (for creating videos of these) 〈 Microsoft Office for Mac (for creating reports in Word, managing e-mails/projects in Entourage and for presentations in PowerPoint) Are there any specific packages you wish to use? Would you be happy with any cheaper less popular software packages if budget is an issue?
2TB NAS= £115	Network Attached Storage to allow for backup and central access to files which all users create. Users on the network can access this. 2TB will be perfectly sufficient to store the large design file sizes which will be created. Would a slightly smaller size be acceptable? Would separate USB HDDs (Hard Disk Drives) on each machine be more acceptable, which could be shared over Apple's AppleTalk protocol over the network?

Cable broadband provision = UNAVAILABLE AT LOCATION **£6.99 per month cheapest with best speed provision opportunity (up to 24Mbps) – 18 month contract, no set-up fee = £6.99 x 18 = £125.82** **Includes Modem**	
Cable router - £15.99 **Ethernet cabling = £6.87 each, x 7 = £48.09** **Network Ethernet Firewall Security Appliance = £81**	A router is required to connect machines together and share services – cheapest available has been found as you stipulated features over quality, however this will be perfectly acceptable Cabling is required, a wired network has been chosen for security reasons to minimise the risk of users gaining access over a wireless radio connection A firewall is provided to block attacks from outside sources and keep the network safe, a good quality trusted firewall has been selected with Trend Micro Security Systems embedded within it, the industry standard for system protection as you stipulated keeping your files and users safe was a priority and ensuring that staff only use the system for legitimate reasons was also important, the firewall also allows this.
Plotter printer = £590	For printing onto large formats

Laser Printer (B/W for documents) = £66.90	If budget is an issue, is there a possibility that printing could be outsourced? Most efficient for printing documents in bulk and quickly.
MONITOR 24" LCD WITH WEBCAM/MIC BUILT IN AND SPEAKERS (UR,) 3MS RESPONSE TIME (BETTER ACCURACY) = £318.90 X 6 = £1913.40**	In-line with requirements you stipulated Good response time and therefore good colour reproduction, important for a design company such as this
VGA Projector - £109.99 Projector screen £40 Total = **£149.99**	As you suggested you would like to be able to present to clients. Could you rent a projector if budget is an issue? Is this requirement a necessity for the system?
Ergonomic Office Chair = £45 each £45 x 6 = **£270**	As stated in user requirements discussion. However, do you already have desks?

Desk  £40, £40 x 6 = **£240**	
Wrist Rest £8 £8 x 6 = **£48** Computer Locks x 6 = £6.99 x 6 = **£41.94**	For the health and comfort of users – legal requirement to keep users safe using computers and reduce the risks of any injuries. Recommended by HSA. Computer locks are required for security so that machines cannot be stolen. Is this a necessity or do you feel that security is already satisfactory at the company?

Total cost of this specification:
£17,537.07
Comment: This system is over budget however fully meets the user's requirements in as reasonable way as possible, with quality compromised on elements where quality would not affect the performance of the company.

- **Negotiate changes/alterations and budget flexibility with the client and re-draft the specification.**

I then met with D to refine and renegotiate this specification:

Meeting Plan for D

Prospective Attendees: .

Meeting Subject: Draft System Specification

Success Criteria:

- To reach an acceptable configuration specification which meets the user's requirements which is financially acceptable and suitably future-proofed.
- To amend draft specification details to meet client needs, budget constraints and choose exact components which the user may prefer or which may have arisen since the initial meeting.

Notes:

- Do you require any additional support manuals, as you stated in our initial meeting that you would have liked an amount of support on a manufacturer level?
- Would you require any support packages?
- The budget should be considered when discussing this.
- Is the company eligible for VAT redemption?
- Does the company already have desks and chairs or is it looking to upgrade these?
- Does the company have a disaster recovery plan for any emergencies; for example in the case of a data loss due to fire or corruption?

Draft System Specification Document

Prepared by

Date of Meeting: ..... **Attendees:** .....
Meeting Purpose:
.....
.....
Further Action Required after Meeting? [ ] Y [ ] N Details:
.....

Specification	Comment
MESH Computer – Matrix 250M Model *£606.02* 〈 AMD Athlon™ II X2 250 Dual Core Processor AM3 (3.0GHz, 2MB Cache) 〈 Microsoft® Windows® 7 Home Premium pre-installed 〈 Stylish Mini-Tower uATX Chassis with 300W PSU - Piano Black 〈 ASUS M4A78LT-M LE Mainboard (DDR3), with integrated DVI/VGA Graphics - MATX 〈 2GB DDR3 1333MHz Memory 〈 500GB Serial ATA Hard Drive with 16MB Buffer 〈 22x Dual Layer DVD Writer Super Format +R/-R/RW/RAM 〈 1GB ATI Radeon HD3000 Integrated Graphics - Full HD Support (M4A78LT-M LE) with TV Output for VGA, HDMI, DVI 〈 20" Widescreen LCD TFT Display - Analogue 〈 7.1 High Definition onboard sound card - for 8 Channel Cinema sound 〈 Logitech Deluxe Keyboard & Optical Mouse Cordless 〈 1 Year Return to Base Hardware Warranty - inc 3 Months Free Collect & Return 〈 Multi format Memory Card reader 〈 2.1 Speaker system with subwoofer 〈 3 port FireWire card (for connecting video camera) 〈 Wireless LAN integrated card 〈 USB Bluetooth Dongle with EDR (Enhanced Data Rate) 〈 Microsoft Office 2007 Home and Student software 〈 6-socket surge protecting adapter 〈 CyberLink Video Editing Suite software 〈 12 USB 2 Ports (6 front, 6 back) 〈 BullGuard Internet Security 90-day trial included	The processor is perfectly adequate and will run the applications software and OS with ease. Windows 7 is more productive, significantly better at performing than its predecessor Windows Vista and is now the standard OS shipping with computers from factories. The processor allows you to run more than one application at once, e.g. write a document and view pictures, increasing productivity. **Choice of Black or White colours** The graphics installation has a TV output, perfect for sharing your photos on TV. The RAM will run multiple applications with ease. A large hard drive is installed which will store hundreds of thousands of pictures and weeks worth of video footage. The DVD re-writer allows you to create DVDs for TV or for storage of your images/videos as you required. Monitor – a better monitor can be provided, e.g. Plasma or a TV display – discuss. Sound Output for speakers Wireless keyboard/mouse included in budget however would you like to keep replacing batteries or prefer wired? For editing photos a graphics tablet may be better for precise editing as a wireless mouse may not pick up motion very effectively. Memory Card reader for photos from camera cards. FireWire port for inputting video from a video camera. WLAN to connect to your home network. Bluetooth dongle to receive photo/video from your mobile phone or PDA, or to send to these. Office included to create the word processed documents and to manage e-mail / produce spreadsheets. Surge protection to prevent computer from damage if a power cut / fault occurs. USB for peripherals, .e.g digital camera.

Microsoft Works productivity tools software	
Ergonomic Office Chair = **£45** £45 x 6 = **£270**  Desk **£40**	As stated in user requirements discussion, particularly well suited to prevent back injuries. However, do you already have desks?
Wrist Rest **£8**	For health and comfort.

Computer Locks = **£6.99**	Computer locks are required for security so that machines cannot be stolen. Is this a necessity or do you feel that security is already satisfactory?
500GB NAS Network Attached Storage backup drive = **£65.61**	To keep a copy of your files separate from your computer in case of failure, corruption or accidental deletion.
All-in-one Printer Scanner Copier, specialist photo printer: hp psc 2355 **£67**	As stipulated in requirements and also very useful for printing high quality photos on photo media.

Total cost of this specification:
£838.62
Comment: This system is within budget with room for additional features and a higher performing hardware specification which could be implemented. Higher quality more professional software could be considered also dependent on whether the client requires or wishes to have this.

Consider additional features or improving quality with the client and re-draft the specification.

I then met with A to review and renegotiate this specification:

Meeting Plan for A

Prospective Attendees:

Meeting Subject: Draft System Specification

Success Criteria:

- To reach an acceptable configuration specification which meets the user's requirements which is financially acceptable and suitably future-proofed.
- To amend draft specification details to meet client needs, budget constraints and choose exact components which the user may prefer or which may have arisen since the initial meeting.

Notes:

- Do you require any additional support manuals, as you stated in our initial meeting that you would have liked an amount of support on a manufacturer level?
- Would you require any support packages?
- The budget should be considered when discussing this.
- Do you already have a TV to output your photos to or would you like one to be factored into the specification? If so, refer to the choosing monitors guidance and me to advise.
- **Would you like any additional features or software considering the fact that there is room left in the budget?**
- Do you have any specific software/hardware tendencies?

On the following pages are copies of e-mails, evidence that I planned meetings with the users and also met to renegotiate the requirements and specifications and asked supplementary questions:

Interviewing Two Users about a System

From:
To:
Date: 15/03/2010 10:55
Subject: Re: Interview for Unit 19

HI A

I can see you on Wed 17/3/10 at 15:15.#

D

>>> 12/03/10 15:27 >>>
Hi ,

M has asked me to arrange an interview with you to find out your user requirements for Unit 19.

Could you let me know when would be suitable for you to meet to discuss this then I can arrange the meeting.

Thank you,

From:
To:
Date: 15/03/2010 11:29
Subject: Re: Interview for Unit 19

Hi

I can see you same time today

>>> 15/03/10 11:10 >>>
Hi D

Thank you for your response. Unfortunately I am not able to make the 17th due to an AimHigher masterclass, which I have just e-mailed yourself and M to inform you about.

Please let me know any dates/times which do not clash with the events which you would be able to make.

Thank you,

03/15/10 10:55 AM >>>
HI /

I can see you on Wed 17/3/10 at 15:15.#

D

>>> 12/03/10 15:27 >>>
Hi .

M has asked me to arrange an interview with you to find out your user requirements for Unit 19.

Could you let me know when would be suitable for you to meet to discuss this then I can arrange the meeting.

Thank you

From:
To:
Date: 15/03/2010 12:18
Subject: Re: Interview for Unit 19

Hi ,

The best time to catch me in college are Monday and Thursday. I could possibly meet you on Monday at 11.45 or Thursday at 1.00. Let me know which day and date suits you best.

Regards, Al

>>> 12/03/2010 13:09 >>>
Hi A and D

M has asked me to arrange an interview with you to find out your user requirements for Unit 19.

Could you let me know when would be suitable for you to meet to discuss this then I can arrange the meeting.

Thank you,

From:
To: Dc
CC: Mi
Date: 15/03/2010 15:55
Subject: Following up your Requirements

Dc

Thank you for our discussion about your requirements for your system.

After I have produced a specification which I believe will meet your requirements I would like to review it with you to gain your feedback and discuss how to progress.

I will let you know when this is complete and contact you to arrange a follow-up meeting.

Regards,

System Specifications for each user; with justification explanations for each component

System Specification for D

Computer Case: Tower – this is the type of computer which will stand underneath the desk, standing vertically. This has been chosen as the amount of space available within a tower casing allows for higher performing components to be inserted in comparison with the smaller size of a desktop or 'pizza box' cased computer.

Computer Model: Mac Pro with Configuration as below **£1,987.99 per workstation 6 workstations = £11,927.94**

Software Requirements:

Mac OS X Snow Leopard Operating System (this is the only operating system available to run on newly purchased Macintosh systems. You stipulated a Macintosh system due to its highly regarded status for producing high quality graphics and its superior ability to perform graphics tasks compared to a Windows computer.)

AutoDesk - £467 (no restriction on users)
FCP - £384 (no restriction on users)
Microsoft Office Mac - £128 (2 x £64, = 6 users)
TOTAL = £979 software costs

- AutoDesk (for producing 3D Models)
- Final Cut Pro (for creating videos of these)
- Microsoft Office for Mac (for creating reports in Word, managing e-mails/projects in Entourage and for presentations in PowerPoint)

System Component and Configuration	Explanation	How it meets your needs
• One 2.66GHz Quad-Core Intel Xeon CPU	A CPU (Central Processing Unit) or processor is the main chip in the computer tower which carries out the processing of data. Processors with multiple cores (more than one processing chip) can run several applications simultaneously without losing processing speed.	The software you require to design the artwork for the yachts demands a high speed processor. You may be checking e-mails, importing images from the web or performing other tasks at the same time as designing the artwork. Therefore a processor with multiple cores (multiple processing chips) allows you to run different applications at once without a loss of performance; this will help you to work more effectively. This processing speed exceeds the requirements of the software and therefore ensures that it will run efficiently on the system. This processor is also the only processor type **compatible** with a new

		Macintosh system configuration and therefore this further adds to its appropriateness to your needs.
〈 3GB (3x1GB) RAM	RAM (Random Access Memory) is an amount of memory which is used to temporarily store data and programs while they are being used. It is volatile, meaning that anything stored in it is lost when the power is switched off. There is direct correlation between the speed of processing and the amount of RAM as the processor and RAM work together to run programs and perform tasks.	This amount of RAM exceeds the requirements of the software and is the lowest amount of memory which can be installed on a system configuration of this caliber. Exceeding the requirements of the software makes this a more suitable choice for the amount of RAM in the system as it means that multiple applications can be run simultaneously without a loss of performance which improves your productivity at work; hence downloading graphics and working in graphics software may be a common task combination.
〈 640GB 7200-rpm Serial ATA 3Gb/s Hard Drive	An internal hard disk drive is where data is stored on the computer system. Programs and files can be stored on the disk. The parameters to be considered when determining a hard disk are the rotation speed, access time and the capacity. Rotation speed is measured in rpm (revolutions per minute) and the faster this value is, the faster the access time for the drive is meaning that you can get to files quicker. The access time is measured in Megabits (Mb) or Gigabits (Gb) per second. Again the higher this value is, the faster you will be able to access and write/transfer files. The highest rpm revolution speed available is 15,000 rpm however this level of speed	This hard drive has a large amount of space which will be useful to you for storing your design work on. The software applications require around a tenth of this space and operating system updates and its footprint (working space) will also take up some of this. Your designs will be of large sizes, measured in GB (gigabytes) based on my research and therefore this size is suitable for you to store a good amount of data on.

	is not required for the tasks you need your system to perform. The capacity is simply a measure of how much data the drive can hold and logically, the higher this value is the more data you can store. This is measured in GB (gigabytes) and to help you realize the amount of space on this drive, a music file typically is 3MB (0.003GB.) This drive is a SATA (Serial Advanced Technology Attachment) drive and this means that the circuit board and hard drive itself are combined in a unit within the system. This shrinkage of the components and controller for the hard drive helps to keep it cool and generally running more efficiently than the other type of hard drives (IDE – Integrated Drive Electronics.) There is also an amount of on board memory known as 'cache' to help the disk perform its own checks to keep data safe and to keep the drive running smoothly.	
〈 NVIDIA GeForce GT 120 512MB	A video or graphics card enables graphics to be displayed on screen or on a monitor connected to the system. The capabilities of graphics cards have developed over time and most include a chip called a graphics accelerator to speed up the display of graphic images. A dedicated graphics card is more beneficial as it frees up processing power and memory of the system so that graphics can be produced independently without compensating for system performance. Therefore the higher the amount of memory allocated	This particular NVIDIA model has the capability of outputting video content to a high definition external monitor source, useful for you to show presentations on other screens or display your graphics to clients. It also includes a separate output port which combines to show video through a projector which you said would be a useful feature if it could be incorporated in your requirements. The high amount of graphics memory allocated to it meets the requirements of the graphic-intensive programs which you will be using to design artwork with, which makes

	to a graphics card the smoother the graphics will appear and the faster they will be created. Some models also have extra ports for connecting High Definition monitors as output devices and for inputting from TV aerials.	this model suitable for your requirements.
〈 Apple Magic Mouse	A mouse allows you to interact with the computer and perform tasks on the Graphical User Interface. Some mice may be wireless and connect via a technology called Bluetooth. Some use a roller ball but are susceptible to clogging up and poor performance due to dust, newer mice use a laser or optical beam to track movement which eliminates this issue and improves performance and precision. Other pointing devices include graphics tablets for precise movements and drawings.	This mouse has been specifically created to work with Macintosh systems and includes a optical laser to track movements with precision which will improve the efficiency of your work with the computers, which helps this mouse be appropriate for this system due to its compatibility in relation to other components.
〈 Apple Wireless Keyboard (British) and User's Guide (English)	A keyboard allows for textual and numerical data entry onto the computer. Standard English keyboards have a 'QWERTY' layout and some are especially designed which are called 'ergonomic' keyboards which include rests and specially shaped designs to reduce the risk of RSI (Repetitive Strain Injury) which managers at companies should be looking out for as their responsibility as an employer. Some keyboards also include special buttons for performing tasks such as opening e-mail software quickly. Some are also wirelessly connected to the computer. All keyboards will include legs at the back for standing the keyboard up to	This keyboard includes hot keys to expedite specific tasks in the Macintosh environment and has been specifically designed to work with Macintosh computers so is therefore appropriate for the system due to its compatibility in relation to other components.

〈 FireWire port	a suitable height for the user. A FireWire port is a high speed data port which allows data such as video to be captured from a video camera.	This is a useful feature of the system as it allows you to create and import videos of yachts for your designs as you stipulated in your requirements.
〈 USB ports x 4	You can connect peripherals such as digital cameras and memory drives to Universal Serial Bus (USB) ports which allow for quick and easy connection of hardware devices and data storage mediums.	By incorporating these ports in the system you will be able to import and share photos of your work easily to and from digital cameras and memory devices as you stipulated in your requirements.
〈 Sound card (High Definition) with input port and output port	A sound card creates audible waves which can be sent to speakers or headphones through an output port, or to a recording device and can capture audio from other devices through 3.5mm ports on the card. Some cards include digital interfaces for high definition audio which connect via optical fibre cabling.	This sound card will enable you to show your recordings to clients and record a voice commentary for designs as you said you would like in your user requirements due to its ability to capture from a plug-in source such as a microphone.
〈 One 18x SuperDrive	A SuperDrive is Apple's branded name of a DVD Writer drive. This allows you to burn data onto DVD (Digital Versatile) Discs and onto Compact Discs (CDs.) CDs hold up to 700MB of data and DVDs up to 4.7GB on a single-sided disc. There are different disc types which can be written to. –R can only be written to once, -RW can be rewritten and –RAM are for specific drive types which perform like –RW. There is also a +denotation for each type which is less compatible.	This drive reads and writes onto every CD and DVD type available meaning that it will be fully compatible with disc types which you may have and may wish to present content to clients with; which improves your productivity and helps your work to be fully compatible with discs and hardware which your clients may have. This makes this drive type suitable to meet your requirements of sharing your work on discs with your clients as the drive makes that possible.
2TB NAS= £115	Network Attached Storage to allow for backup and central access to files which all users create. Users on the network can access this. 2TB will be perfectly sufficient to store the large design	

	file sizes which will be created.
Cable broadband provision = UNAVAILABLE AT LOCATION **£6.99 per month cheapest with best speed provision opportunity (up to 24Mbps) – 18 month contract, no set-up fee = £6.99 x 18 = £125.82** **Includes Modem**	To allow for file downloading, internet browsing and sending/receiving of e-mails.
Cable router - £15.99 **Ethernet cabling = £6.87 each, x 7 = £48.09** **Network Ethernet Firewall Security Appliance = £81**	A router is required to connect machines together and share services – cheapest available has been found as you stipulated features over quality, however this will be perfectly acceptable Cabling is required, a wired network has been chosen for security reasons to minimise the risk of users gaining access over a wireless radio connection A firewall is provided to block attacks from outside sources and keep the network safe, a good quality trusted firewall has been selected with Trend Micro Security Systems embedded within it, the industry standard for system protection as you stipulated keeping your files and users safe was a priority and ensuring that staff only use the system for legitimate reasons was also important, the firewall also allows this.
Plotter printer = £590 **Laser Printer (B/W for documents) = £66.90**	For printing onto large formats as you stipulated. Most efficient for printing documents in bulk and quickly.
MONITOR 24" LCD WITH WEBCAM/MIC BUILT IN AND SPEAKERS (UR,) 3MS RESPONSE TIME (BETTER ACCURACY) = £318.90 X 6 = £1913.40**	In-line with requirements you stipulated Good response time and therefore good colour reproduction, important for a design company such as this
VGA Projector & Projector screen	As you suggested you would like to be able to present to clients.
To be rented	
Wrist Rest £8 £8 x 6 = **£48** Computer Locks x 6 = £6.99 x 6 = **£41.94**	For the health and comfort of users – legal requirement to keep users safe using computers and reduce the risks of any injuries. Recommended by HSA, Health and Safety Alliance. Computer locks are required for security so that machines cannot be stolen. Is this a necessity or

	do you feel that security is already satisfactory at the company? *You said that these would be useful after we met to review your requirements.*

Total cost of this specification (net, exc. VAT as you are able to redeem this):

£13,923.59

AGREEMENT TO SPECIFICATION

After discussing with the system designer the draft specification above and after negotiating my requirements, I am happy that the solution to be provided will meet my requirements.

I understand that I will need to confirm the exact system specification after it has been redrafted by the designer; however I am satisfied with the current course of action.

By signing this form I understand that if my requirements change, I must inform the designer as soon as possible to prevent the possibility of any additional costs being incurred or the specification not meeting my requirements.

THE DATA PROTECTION ACT (1998) AND YOU

Under the rules of the Data Protection Act 1998, by signing this form you give consent to the system designer to store your details for no purpose other than the processing of data relating to the development of your system. Your data will not be shared with third-parties unless prior written permission is sought from you.

Your data will be stored securely and will not be shared with any other individual or organisation.

We will ensue of the protection of the confidentiality, integrity and security of all and any information supplied to us.

We may keep your details for up to 5 years after the successful development of your system, after which they will be destroyed and disposed of securely.

CLIENT / CONSULTATION VERIFICATION

Signed:	.....	***Date:***	...../...../.....
Signed by user:	.....	***Date:***	...../...../.....

System Future-Proofing

What is 'future proofing'?

The phrase 'future proofing' describes the process of trying to anticipate future developments and advancements so that what is being designed can meet prospective future needs and configurations, for example future developments in technology, in this case.

Future-proofing considerations made for your system

Your system has been designed to be as future-proofed as it possibly can. There obviously is no guarantee that it is totally future proofed as technology changes so quickly, without any prior indications in some cases.

The following considerations help your system to be compatible in the future:

〈 Quad-Core Processing: This is a processing method which involves four dedicated pieces of equipment to process the system data. In terms of processing, the more the merrier, therefore this high quantity of processors will allow the system to be compatible with more advanced and power-hungry applications in the future, which may be useful as your business grows and requires the ability to create more complex designs. Generally two processors ('dual core') is the highest performing commercial standard at present.

〈 640GB 7200-rpm Serial ATA 3Gb/s – this concerns the amount of space on the computer's disk to store files on (its 'Hard Drive.') Its fast data rate of 3Gb/s is about 30 times faster than most hard drives on the market, meaning your system will be able to work with and store more data faster than other computers, meaning more powerful applications will be able to run on it with ease in the future. Its large amount of space (considering that 250GB is the norm at present) makes it even more compatible for the future allowing you to be able to store large amounts of data over time, meaning it will last longer than most hard drives.

Further future proofing advice

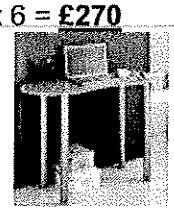
As a responsible system designer it is my job to inform you of how you can help to ensure that your system will be able to utilise the latest technologies as soon as they are available; through future-proofing.

〈 Information created, stored and accessed digitally is at risk of loss in two ways: obsolescence and physical damage. A file format or storage device may be superseded, for example floppy disks are now no longer in production as CDs and DVDs (optical media) have taken over. Hardware and software can develop so rapidly that older formats are unable to be opened on computer systems. Physical threats such as fires, thefts, etc. can also make data inaccessible.

Draft System Specification Document
A

Date of Meeting: ..... **Attendees:** .....
Meeting Purpose:
.....
.....
Further Action Required after Meeting? [ ] Y [ ] N Details:
.....

Specification	Comment
MESH Computer – Matrix 250M Model *£606.02* 〈 AMD Athlon™ II X2 250 Dual Core Processor AM3 (3.0GHz, 2MB Cache) 〈 Microsoft® Windows® 7 Home Premium pre-installed 〈 Stylish Mini-Tower uATX Chassis with 300W PSU - Piano Black 〈 ASUS M4A78LT-M LE Mainboard (DDR3), with integrated DVI/VGA Graphics - MATX 〈 2GB DDR3 1333MHz Memory 〈 500GB Serial ATA Hard Drive with 16MB Buffer 〈 22x Dual Layer DVD Writer Super Format +R/-R/RW/RAM 〈 1GB ATI Radeon HD3000 Integrated Graphics - Full HD Support (M4A78LT-M LE) with TV Output for VGA, HDMI, DVI 〈 24" Widescreen LCD TFT Display - Analogue 〈 7.1 High Definition onboard sound card - for 8 Channel Cinema sound 〈 Logitech Deluxe Keyboard & Optical Mouse Cordless 〈 1 Year Return to Base Hardware Warranty - inc 3 Months Free Collect & Return 〈 Multi format Memory Card reader 〈 2.1 Speaker system with subwoofer 〈 3 port FireWire card (for connecting video camera) 〈 Wireless LAN integrated card 〈 USB Bluetooth Dongle with EDR (Enhanced Data Rate) 〈 Microsoft Office 2007 Home and Student software 〈 6-socket surge protecting adapter 〈 CyberLink Video Editing Suite software 〈 12 USB 2 Ports (6 front, 6 back) 〈 BullGuard Internet Security 90-day trial included	The processor is perfectly adequate and will run the applications software and OS with ease. Windows 7 is more productive, significantly better at performing than its predecessor Windows Vista and is now the standard OS shipping with computers from factories. The processor allows you to run more than one application at once, e.g. write a document and view pictures, increasing productivity. It also includes software to let you edit and store photos as you asked for. **Choice of Black or White colours** The graphics installation has a TV output, perfect for sharing your photos on TV. A graphics card is required to see graphics on screen and output to screens, in this case inclusive of a TV which is an added bonus as you said TV output of photos would be a luxury. The RAM will run multiple applications with ease. RAM is memory reserved for helping the computer to run software; and it exceeds the requirements for your tasks therefore is perfectly suitable and will allow the system to run efficiently. A large hard drive is installed which will store hundreds of thousands of pictures and weeks worth of video footage. The DVD re-writer allows you to create DVDs for TV or for storage of your images/videos as you required. Monitor – this is the higher spec monitor with a larger screen size as you stipulated based on the extra budget room. Its response time makes it very clear and sharp and its LCD display will give accurate rich colours, important for viewing photos. Sound Output for speakers Wireless keyboard/mouse included in budget-wireless chosen as the budget allows; you can work without wires which is more convenient. For editing photos a graphics tablet may be better for precise editing as a wireless mouse may not pick up motion very effectively. Memory Card reader for photos from camera cards.

(Microsoft Works productivity tools software	FireWire port for inputting video from a video camera as you stipulated you would like. WLAN to connect to your home network. WLAN is a wireless network standard which is used by this hardware so will allow you to connect to your network at home. Bluetooth dongle to receive photo/video from your mobile phone or PDA, or to send to these. Office included to create the word processed documents and to manage e-mail / produce spreadsheets. Surge protection to prevent computer from damage if a power cut / fault occurs. USB for peripherals, .e.g digital camera.
Ergonomic Office Chair = **£45** £45 x 6 = **£270**  Desk **£40**	As stated in user requirements discussion, particularly well suited to prevent back injuries due to the ergonomic design. The chair has 5 point spools and adjustable height and back rest so is therefore very adjustable, comfortable and will help prevent interference with your back injury.

Wrist Rest **£8** Computer Locks = **£6.99**	For health and comfort. Computer locks are required for security so that machines cannot be stolen. This is an added extra for your peace of mind.
500GB NAS Network Attached Storage backup drive = **£65.61**	To keep a copy of your files separate from your computer in case of failure, corruption or accidental deletion. This will be attached to the network, much more budget efficient than the thousands of pounds which may be required to implement off-site backup. This will keep a separate copy of your files in case your computer suffers an error.
All-in-one Printer Scanner Copier, specialist photo printer: hp psc 2355 **£67**	As stipulated in requirements and also very useful for printing high quality photos on photo media.

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We may keep your details for up to 5 years after the successful development of your system, after which they will be destroyed and disposed of securely.

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Signed:	.....	***Date:***	...../...../.....
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Bibliography for System Specifications

Specification 1

Mac Pro Configuration Information: www.apple.com/uk
Software Choices based on research from: MacFormat Magazine
PCPro Magazine
Information at www.apple.com/uk/thestore
Expert References at www.apple.com/uk/pro
Explanations of System Components: OCR GCE Applied ICT AS Double Award Guide Heinemann Publishing
Prices: compared from www.google.co.uk/products

Specification 2

Computer Configuration based on reviews and recommendations at: www.dooyoo.co.uk
www.which.co.uk
Computer Configuration Information: www.mesh.co.uk
Software Choices based on research from: Digital Photographer magazine
Explanations of System Components: OCR GCE Applied ICT AS Double Award Guide Heinemann Publishing
Prices: compared from www.google.co.uk/products

Upgrading Documentation

Summary of Upgrading

Maintenance Task

Carried Out: 3/3/10

Removed and refitted:

1. CD Drive
2. Memory
3. Hard drive
4. (Network card) > not able to refit at this time due to PC; motherboard had embedded NIC which was not removable/upgradeable

Safety procedures followed:

1. Discharged myself of any static
2. Visually checked the outside of the computer and surrounding work area
3. Any potential hazards were looked for – tutor would have been informed if any were observed
4. Disconnected all cables
5. Opened the case
6. Familiarised with the computer components and how they are connected
7. Drew and labelled the inside of the PC
8. Removed the components carefully and visually inspected them
9. Refitted the components
10. Visually inspected the computer
11. Closed the case and re-connected the cables.

I then completed the 'Hardware Installation Log' for the Memory, Hard Drive and CD Drive.

Upgrade and Maintenance Document

UPGRADE 1

User Needs: The user said that their computer was performing slowly when more powerful applications such as PowerPoint were open, when a lot of data was being processed. The CPU speed is 2GHz and the amount of hard disk space on the machine is plentiful. I therefore recommended that the current low amount of RAM Memory should be upgraded with the highest possible amount which can be installed for this machine. This will require replacing the current RAM module with a new RAM module with a higher amount of memory.

Components Required: RAM Module (DDR2 – in compliance with the slot type for this machine)

System Limitations: This system's motherboard allows a maximum of **512MB of RAM** to be installed; therefore this will be the amount I install to the system.

Additional Components: I will require an Earthing Wrist Strap in order to earth myself following correct safety procedures for working with computer systems and bare components. This will reduce the risk of me suffering from an electrical shock and shorting the components (rendering them inoperable) on the system whilst working inside it.

Reconfiguration: The BIOS (Basic Input Output System) software will need to be reconfigured to become aware of the newly installed amount of RAM. This will be performed by pressing F2 on system startup and navigating to the 'Memory' setting on the BIOS configuration screen; which I will change to adapt to the new amount and I will save these settings to the BIOS chip and restart the system.

Testing: To test that the RAM is available and recognised by the system I will review the BIOS setting after reconfiguring it and will check in the 'System' pane of the Control Panel to check that the system displays '512MB' on the 'Installed RAM' section.

UPGRADE 2

User Needs: The user would like to be able to write to CDs and DVDs rather than just play them, as the current disc drive is a CD Reader and does not have writing capabilities. Therefore the disc drive will need replacing with a DVD ReWriter Drive.

Components Required: An Internal IDE Connecting DVD-RW drive is required which will replace the current CD Reader drive. This system has a disc drive which connects through an IDE connection therefore this type of drive is required for the system so that it will be compatible.

System Limitations: The system does not have the processing power to utilise a BluRay drive, therefore the limitation is that the highest specification of disc drive which can be installed is a DVD-ReWriter drive. The system also does not have a compatible chipset to install a 'Lightscribe' drive (which has the capability of writing labels onto the underside of discs.)

Additional Components: No additional components required.

Reconfiguration: The system will need new drivers installing to be able to utilise the features of the drive and the BIOS will need to be checked to ensure that the drive is recognised. The drivers will be installed from the internet on the manufacturer website if they are not detected by the operating system automatically through Plug and Play.

Testing: The BIOS will be checked to ensure that the drive is recognised correctly by the system. The Operating System will then install drivers either automatically or through the manufacturer website. I will then try and boot from this drive by resetting the BIOS boot sequence to prioritise booting from the disc drive and will check that a bootable disc loads; if it does, the upgrade has been successful.

Suitable components will be identified in the Hardware Installation Logs for each upgrade task

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I then completed Hardware Installation Logs for each maintenance and upgrading task to outline the steps I took in performing the tasks and these included details of the hardware.

Hardware Installation Log

New Hardware Details			
Device Name	CD Drive.	Model	SH-S223C
Manufacturer	Samsung	Web Site	samsung.com
Type of Media Software Contained On		OS Drivers + Manufacturer disc	
Location of Media	OS HDD / CD	Version No	1.0
Connection Type	IDE		
Path of Files	/		

Machine Hardware Installed on Details			
Machine Name	Dell	Location	ICT Centre
Backup Files	—	Registry Backup	—

Details of Installation / Problems

Pre Installation

* Discharged myself of any static
* Visually checked outside of computer and cleared work area
* Checked for potential hazards
* Disconnected all cables from PC
* Opened lift-off case
* Reviewed computer components and how they are connected
* Draw a diagram of internal PC layout
* Removed and stored watch and took off jacket

No problems.

Installation

* Removed IDE Cable
* Removed drive from slot and placed on earthing mat
* Removed new drive from antistatic bag
* Put drive in slot
* Inserted IDE connector to slot
* Checked machine to see if any wires caught
* Replaced system casing

Testing

* Booted up machine, press f2 and see if CD-Rom DRIVE appeared in BIOS settings, appeared OK
* Set to boot from CD and inserted bootable disc
* Disc booted - OK

Administrative Details			
Installation Date	28/4/10	Successful / Not Successful (ring)	
Name of Installer			
By signing below you are confirming that the above work has been carried out and the system is functioning within acceptable boundaries			
Name of Customer	———	Signature	

Hardware Installation Log

New Hardware Details			
Device Name	2GB Kingston	Model	~~KTH9600~~ V64464C2SO
Manufacturer	Kingston	Web Site	kingston.com
Type of Media Software Contained On		OS Drivers / BIOS	
Location of Media	HDD	Version No	—
Connection Type	DDR2 Slot		
Path of Files	/		

Machine Hardware Installed on Details			
Machine Name	Dell	Location	ICT Centre
Backup Files	—	Registry Backup	—

Details of Installation / Problems

Pre Installation

* Discharged myself of any static
* Visually checked outside of computer and cleared work area
* Checked for potential hazards
* Disconnected all cables from PC
* Opened lift-off case
* Reviewed computer components and how they are connected
* Draw a diagram of internal PC layout
* Removed and stored watch and took off jacket

NO problems

Installation

* Identified current RAM modules in top right of motherboard (256MB)
* Pushed back clips and removed existing RAM module
* Avoided chips + circuitry
* Slotted new 512MB module (motherboard maximum) into place without touching circuitry
* Pushed clips into place, had to repush in right hand edge of RAM
* Replaced system casing

Testing

* Switched on PC and configured RAM amount in BIOS — was 512MB

No problems.

Administrative Details		
Installation Date	28/4/10	(Successful) / Not Successful (ring)
Name of Installer		

By signing below you are confirming that the above work has been carried out and the system is functioning within acceptable boundaries

Name of Customer	——	Signature	

Computer Help Desk Task

Computer 1 - Reported Problems

- Mouse (ball) - Cursor not tracking correctly with mouse movements
- Keyboard not registering key strokes or having multiple key presses
- Strange smell reported coming from the tower when the power is switched on.

Identifying the possible faults

- Mouse (ball) - Cursor not tracking correctly with mouse movements – *1) The mouse is clogged up with dirt and needs cleaning. 2) The mouse drivers are outdated or are functioning incorrectly. 3) The USB port drivers are outdated or are functioning incorrectly. 4) The mouse has become faulty.*
- Keyboard not registering key strokes or having multiple key presses – *1) The keyboard is clogged up with dirt and needs cleaning. 2) The keyboard drivers are outdated or are functioning incorrectly. 3) The USB port drivers are outdated or are functioning incorrectly. 4) The keyboard has become faulty.*
- Strange smell reported coming from the tower when the power is switched on. *1) The machine's vents are covered in dust and the machine needs cleaning. 2) The power supply is nearing the end of its life (due to dust) and needs replacing.*

Solutions and advice and solving the problems in future

Recommended method: Cleaning routine

Cleaning your computer and its peripherals helps to keep the machine and its components working efficiently. It also prevents the spread of germs and diseases through infected and contaminated hardware.

Mouse (ball) - Cursor not tracking correctly with mouse movements

Cleaning the mouse: I turned off the computer and disconnected the mouse so that the equipment was safe and powered down before I performed the maintenance. I released the track ball on the underside of the mouse and used my finger to clean the three points inside the mouse in a horizontal direction to remove dust and particles. This aims to improve mouse pickup. I then cleaned the trackball with a damp cloth to ensure that it would roll smoothly. I then dried it and reassembled the mouse. I wiped over the mouse's exterior with a damp cloth to clean it and then dried it.

Effect: The mouse still functioned erratically.

Secondary Solution: I downloaded the latest mouse drivers from the manufacturer website, installed them and restarted the system.

Effect: The mouse still functioned erratically.

Third Solution: I downloaded the latest USB port drivers from the manufacturer website, installed them and restarted the system.

Effect: The mouse still functioned erratically.

Fourth Solution: I replaced the mouse (see Hardware Installation Log, attached.)

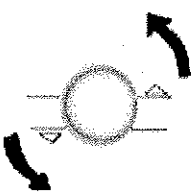
Effect: Problem solved, the mouse was therefore faulty and the new mouse works correctly and has been tested.

Advice for solving similar problems in future: Mice (Track Ball)

Why should I clean my mouse? To improve the mouse's traction and stop irregular movements. You should also clean the mouse to stop the spread of germs and diseases.

How to clean the mouse:

Turn off the computer and disconnect the mouse. On the underneath of your mouse you should see a plastic part as shown below:



The part will have two small depressions which you can press on and turn in the directions shown, which will release the track ball. You may shake the mouse gently to remove the track ball if necessary.

Inside the mouse, where you have removed the cover, there should be three rollers. Using a cotton swab or your finger you should wipe these rollers in a horizontal direction to remove dirt or hair.
Once you have done this, you may clean the track ball with a damp cloth, dry it and place it back into the mouse. Then re-apply the cover.

You should also clean your mouse pad with a damp cloth, possibly a cloth sprayed with disinfectant if you are removing germs. This should also improve mouse movement.

You may also clean your mouse's exterior with a damp cloth, possibly sprayed with disinfectant if you are removing germs. If you are still having issues with your mouse then it has probably developed a fault or there may be a driver issue on your computer.

Keyboards

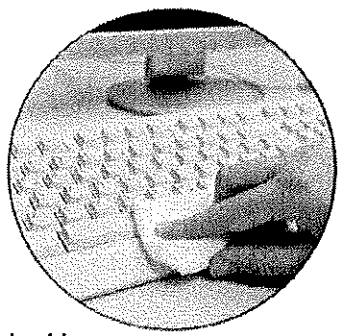
Why should I clean my keyboard? A team at the University of North Carolina (USA) tested several computer keyboards and found that most contained two or more micro-organisms. Various bacteria were also found to be present. These bacteria and micro-organisms can cause bloodstream infections and other illnesses. You can also eliminate stickiness of keys and improve the responsiveness of your keyboard by cleaning it.

How to clean the keyboard:

- For a quick clean or to remove any debris or particles from between the keys, you can lift the keyboard up and turn it upside down. Shaking can also help remove pieces from between the keys.

Using compressed air is a more effective cleaning method. Compressed air is pressurised air usually stored in a can, released through a nozzle. You can blow the air between the keys to remove dust and dirt. You could also use a vacuum cleaner to do this, however you should make sure that keys cannot easily detach from their sockets so that they are not accidentally sucked up by the vacuum.

If a substance has been spilt onto the keyboard:
You should turn off the computer immediately if a substance has been spilt on the keyboard. After doing this you should turn the keyboard upside down to prevent the substance from damaging circuit boards on the keyboard. You may shake the keyboard. After this you could use a cloth to dry parts which you can reach between keys on the keyboard. Then leave the keyboard to dry for at least 24 hours.



If the keyboard has stopped functioning after this, you should replace it.

To disinfect a keyboard you should spray disinfectant onto a cloth with alcohol and rub this on each keyboard key individually. Do not spray the liquid onto the keyboard, as advised in the general guidance above.

Cleaning outside the case of your computer

Why should I clean the exterior of my computer's case? This keeps the computer looking new. If vents are cleaned it also helps improve the efficiency of the machine and diminishes the chances of the machine overheating and keeps components running at a good temperature in a good working condition.

How to clean the outer casing:

You may use a slightly dampened lint-free cloth to clean the case. To remove any stains you could add a small amount of household detergent to the cloth to help remove the stains. Note that you should never use solvents on plastics.

You should wipe over vents also. You could vacuum over vents and holes to unclog them and remove any dust or particles restricting the airflow. Note that it is not safe to use a standard vacuum to clean the inners of a computer system; you may only use a standard vacuum to clean a computer's outer casing.

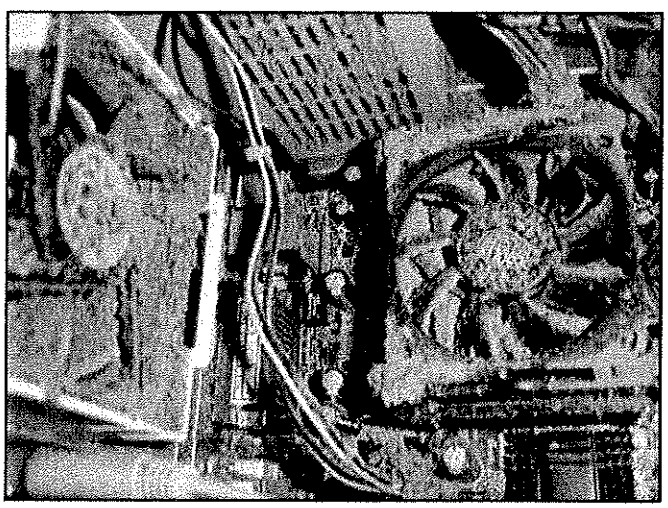
Cleaning inside the case of your computer

Why should I clean the interior of my computer's case? Dust and particles can build up inside the case and corrode circuitry causing performance issues with the computer. This can cause computers to crash at certain points if circuitry is damaged. This can also lead to the power supply burning out and failing and also the machine giving off a smell.

It is recommended that you use compressed air to clean the inners of a computer case. Hold the air container in an upright position; else chemicals may spill out of it. Ensure that when air is blown onto the internal components, that dust and particles are moving away from the system and not into it.

You may use a handheld battery-powered vacuum to pick up dust and debris from the inside of the case. Note that you must not use a standard vacuum as this builds up static electricity and can cause electrical impulses, shocks and create a dangerous situation.

Pay particular attention when cleaning the fans and heat sinks inside the computer as these build up the greatest amount of dust.



Compressed Air Can

(Images from www.computerhope.com)

Computer 2

The computer is not recognising the hard drive after having recently upgraded the RAM. The computer fails to boot up.

The following error message was displayed: 'Primary hard disk drive 1 not found.'

The system gave the option of pressing F1 to continue and F2 to check the disk.

I used the checking tool to check the disk but the check could not run due to a hardware fault: 'Hard disk drive not found.'

This would indicate that either the hard disk has failed or that it is not connected properly.

I switched off the machine, discharged myself of any static, removed all wires from the machine, took off my jacket and watch and removed the casing on the outer of the machine. I saw that the hard drive was not correctly plugged in and re-inserted the wires securely.

I repacked the machine and connected the cables and restarted the machine.

TESTING) To check that the hard drive was functioning correctly and was detected I pressed DEL to enter the BIOS software and saw that the hard drive was recognised through the 'Hard Disk Drive' status function. I then booted the system and it booted correctly, therefore I was sure that the hard drive was now functioning correctly.

In the future, this problem could be solved by:

1) Using the option of the testing facility to check the hard drive's integrity
2) Upon a failure of this test or undesired results, checking in the BIOS by using the DEL/F2 command upon system boot up and checking in the 'Hard Disk Status' function as to whether the system has detected the hard disk drive
3) By safely opening the computer and checking that the hard disk is connected
4) Or by replacing the hard drive in the bay and reconnecting cables if the hard drive does not function after performing the above steps

I recorded formally the detailed and systematic installation and testing procedures undertaken for the mouse:

Hardware Installation Log

New Hardware Details			
Device Name	Basic Optical Mouse	Model	Basic Optical Mouse
Manufacturer	Microsoft	Web Site	www.microsoft.com
Type of Media Software Contained On		CD-ROM	
Location of Media		Version No	1.1
Connection Type	USB through PS/2 adapter		
Path of Files	CD-ROM Drive		

Machine Hardware Installed on Details			
Machine Name	-	Location	-
Backup Files	-	Registry Backup	-

Details of Installation / Problems

Pre Installation
The computer was powered down.

Installation
The mouse was plugged into the USB port and the plug and play wizard installed basic drivers. I installed further manufacturer mouse software from the CD-ROM using the Installation Wizard.

Testing
I moved the mouse and it moved the pointer on screen accurately. I tested right and left clicking and this worked correctly. I navigated to a web page and used the scroller to scroll up and down the website. This worked correctly.

Administrative Details		
Installation Date	21/4/10	Successful / Not Successful (ring)
Name of Installer		

By signing below you are confirming that the above work has been carried out and the system is functioning within acceptable boundaries

Name of Customer		Signature	

To further help identify the problems and how I solved them, I kept a detailed index of problems in a problem log:

Problem Log (Task 4)

Date	Problem and description (including error messages)	Time taken	Attempted solution and suggestions for next step	Technician
22/04/10	The mouse cursor is not tracking correctly with mouse movements	30 mins	I turned off the computer and disconnected the mouse so that the equipment was safe and powered down before I performed the maintenance. I released the track ball on the underside of the mouse and used my finger to clean the three points inside the mouse in a horizontal direction to remove dust and particles. This aims to improve mouse pickup. I then cleaned the trackball with a damp cloth to ensure that it would roll smoothly. I then dried it and reassembled the mouse. I wiped over the mouse's exterior with a damp cloth to clean it and then dried it. **Solved?** No, problem still exists.	A
22/04/10	The mouse cursor is not tracking correctly with mouse movements	20 mins	I downloaded the latest mouse drivers from the manufacturer website, installed them and restarted the system. **Solved?** No, problem still exists.	A

22/04/10	The mouse cursor is not tracking correctly with mouse movements	15 mins	I downloaded the latest USB port drivers from the manufacturer website using the Device Manager Tool, installed them and restarted the system. **Solved?** No, problem still exists.	A
22/04/10	The mouse cursor is not tracking correctly with mouse movements	5 mins	I replaced the mouse and used the accompanying CD-ROM from the manufacturer to install the mouse software. **Solved?** Yes.	A
22/04/10	Keyboard not registering key strokes and having multiple key presses	5 mins	I turned the keyboard upside down and shook it to remove any debris which may have been causing keys to stick or not depress properly. **Solved?** Yes.	A
22/04/10	Strange smell reported coming from the tower when the machine is switched on	20 mins	I used a damp lint-free cloth to wipe clear the vents on the outer casing of the machine to prevent dust build up and clear the air flow through the system. I then disassembled the casing and used a hand held vacuum cleaner to remove dust and particles from the inside of the casing to further clear the air flow path and eliminate any smell from the warming up of dust and components. **Solved?** Yes, the problem was not reported after this.	A

The 'future advice' section in my help desk document previous to this problem log gives advice on how to solve similar problems in the future.

Critical Analysis of Information Sources

Commentary on Information Sources

In order to decide on the processor, storage devices and components to use for my clients' systems I used a variety of different information sources to research information.

Corroboration of Information
I used matching facts and information from multiple sources in order to confirm the accuracy and validity of information which I used to inform my specifications and upgrading tasks.

Information Sources Table for system specification

Information Source	Accuracy	Currency	Relevance
Wikipedia	The information on Wikipedia may be accurate as reference sources should be provided by all who contribute to the site's content, however this does not mean that what people freely type onto the site is totally correct. Some people may quote from inaccurate sources or may misinterpret or misrepresent information, its full accuracy cannot be guaranteed.	Due to the internet based nature of Wikipedia and the easiness of uploading to the site, users can update information quickly. Therefore the information on Wikipedia is generally current and as up-to-date as possible. However some users may not have updated some encyclopaedia pages. Again, total currency cannot be guaranteed.	The information I have found on Wikipedia has been relevant as it has listed the advantages and disadvantages and the purposes of certain hardware devices and software packages. Information is organised on Wikipedia by title and I can be sure that the information I accessed was relevant and pertained only to the items in question, for example Intel Processors.
Manufacturer Websites	Technical information and specifications on manufacturers' own websites can be considered accurate as it is the manufacturers who have created these devices; they will undoubtedly know the correct information regarding specifications and features of their own products.	Manufacturers will probably update their websites to contain the latest information about their products. For the sake of investors, developers and customers it is in their best interests to do so. However, the currency of information from manufacturers cannot be fully guaranteed.	Manufacturer websites may include important and relevant information; however the representation of their solutions may be biased as these companies are trying to promote their own products. They may exaggerate the positive aspects of their products which may make them

			seem as if they perform better than any other. This factor makes deciding between different products difficult based on these manufacturer claims, as each manufacturer may claim that their solution is better than any other.

Critical Analysis of Information Sources for specifying systems

Advantages and Disadvantages of Sources

In order for me to determine how useful my information sources are I will set sufficient conditions for them to be deemed useful:

Sufficient conditions for usefulness

- The information source should provide accurate information
- Its information should be up-to-date
- The information provided should be relevant to my research and transparent (free of any bias)

The information on Wikipedia may be accurate as reference sources should be provided by all who contribute to the site's content, however this does not mean that what people freely type onto the site is totally correct. Some people may quote from inaccurate sources or may misinterpret or misrepresent information, so its full accuracy cannot be guaranteed. However technical information and specifications on manufacturers' own websites can be considered accurate as it is the manufacturers who have created these devices; they will undoubtedly know the correct information regarding specifications and features of their own products. Due to the internet-based nature of Wikipedia and the easiness of uploading to the site, users can update information quickly. Therefore the information on Wikipedia is generally current and as up-to-date as possible. However some users may not have updated some encyclopaedia pages. Again, total currency cannot be guaranteed. Manufacturers will probably update their websites to contain the latest information about their products. For the sake of investors, developers and customers it is in their best interests to do so. However, the currency of information from manufacturers cannot be fully guaranteed. The information I have found on Wikipedia has been relevant as it has listed the advantages and disadvantages and the purposes of certain hardware devices and software packages. Information is organised on Wikipedia by title and I can be sure that the information I accessed was relevant and pertained only to the items in question, for example Intel Processors. This is dissimilar to manufacturer websites, which may include important and relevant information; however the representation of their solutions may be biased as these companies are trying to promote their own products. They may exaggerate the positive aspects of their products which may make them seem as if they perform better than any other. This factor makes deciding between different products difficult based on these manufacturer claims, as each manufacturer may claim that their solution is better than any other. Wikipedia does include quality standardising

patrols and policies which moderators check articles with, ensuring articles are bias free and are not phrased as if they are an advert.

However accurate or up-to-date the information on Wikipedia may appear to be, its actual accurateness in regards to real-life details may be inhibited as the content on Wikipedia is user-generated. Whoever has created or updated the encyclopaedia entry for a specific item may not have inserted the most up-to-date information on the site, the user may also not have used accurate or reliable sources for their information (for example forums or word-of-mouth); therefore the source can be deemed considerably useful however it may not be as accurate or up-to-date as it can be. Manufacturer websites can be relied upon to provide accurate technical details and therefore is useful in matching hardware and software to technical requirements, however in terms of discriminating between different solutions, manufacturer websites may not be effective. This is due to the amplification of positive features which such manufacturer websites engage in – in order to promote their product to prospective customers and clients. However official manufacturer websites are the most useful sources for technical information for this project, yet the decision regarding which solution to choose would have to be based on user opinions and reviews of such hardware and software and will have to be based upon other features such as warranties, compatibility with other requirements and hardware/software items, which I will have to consider personally in regards to users' particular needs and requirements, and items' prices; which can be compared using online comparison sites.

Information Sources Table for system upgrades

Information Source	Accuracy	Currency	Relevance
Wikipedia	The information on Wikipedia may be accurate as reference sources should be provided by all who contribute to the site's content, however this does not mean that what people freely type onto the site is totally correct. Some people may quote from inaccurate sources or may misinterpret or misrepresent information, its full accuracy cannot be guaranteed.	Due to the internet based nature of Wikipedia and the easiness of uploading to the site, users can update information quickly. Therefore the information on Wikipedia is generally current and as up-to-date as possible. However some users may not have updated some encyclopaedia pages. Again, total currency cannot be guaranteed.	The information I have found on Wikipedia has been relevant as it has listed the advantages and disadvantages and the purposes of certain hardware devices and software packages. Information is organised on Wikipedia by title and I can be sure that the information I accessed was relevant and pertained only to the items in question, for example Intel Processors.
Computerhope.com Advice Website	Practical advice on computer maintenance and hardware installation techniques was	The currency of the information is that it is fairly recent. The site is updated constantly and the information I	This information source is most relevant to my particular upgrading tasks as it provided

	provided by this website. The site was written by people who work in the field of computer maintenance, therefore giving appropriate advice which can be used in practical situations, rather than theoretical methods. The advantage is that this source is relevant to my situation as it provides usable advice, not just factual methods for hardware installation (e.g. general principles) that may be inaccurate or less relevant to a practical situation.	accessed had been updated at a time recent to the time it was viewed at.	advice for completing maintenance using methods to speed up the time taken to upgrade components and provided tips from those experienced in the field, as opposed to information developed by system manufacturers which may not always be relevant to every upgrading situation. This source gave information on replacing the RAM for differing sizes of slots, which was helpful as other sources only included certain slot types.
Cisco Reference Book	The book has been written by specialists in the field of computer systems and provides knowledge which could be used to study for professional computing qualifications and has been approved by course providers and curriculum teams, therefore the information it provides can confidently be classed as accurate;	The book is several years old and it is likely that technology may have changed or advanced since, therefore the information cannot be identified as wholly current.	The fact that the book has been written by specialists in the field of computer systems makes its information relevant to my research. Because the writers and compilers are experienced in the work field they are writing about, the information is therefore relevant and appropriate to use in my situation. Cisco are a leading company providing
	it also boasts the added advantage that it has been written by people who develop hardware solutions for computers also, therefore practical experience forms a		and developing IT equipment and provisioning IT qualifications and therefore their information can be classed as highly valuable and relevant

	basis for the information provided in the book.		to IT developers, installers and professionals.
NovaTech.co.uk	In order to upgrade the system RAM I researched principles and the method from this website. This website is from a computer maintenance company who are professionals in this field; therefore adding to the credibility and presumed accuracy of the information. The company has won an award for computer upgrades and this adds further to the presumed accuracy of this information.	It is not possible from this source to determine how current the information is, however it did relate perfectly to the system configuration I was working on. New technologies and revised methods in completing such a task may have come to surface since the creation of this document and may have provided more efficient ways of working therefore this information may not be fully current.	This information was wholly relevant to my system specification and the task in hand, it provided step by step information and guidance to help me complete the task and related to the RAM module and system configuration I was working with.

Critical Analysis of Information Sources for system upgrades

Advantages and Disadvantages of Sources

In order for me to determine how useful my information sources are I will set sufficient conditions for them to be deemed useful:

Sufficient conditions for usefulness

- The information source should provide accurate information
- Its information should be up-to-date
- The information provided should be relevant to my research and transparent (free of any bias)

The information on Wikipedia may be accurate as reference sources should be provided by all who contribute to the site's content, however this does not mean that what people freely type onto the site is totally correct. Some people may quote from inaccurate sources or may misinterpret or misrepresent information, so its full accuracy cannot be guaranteed. However technical information and specifications on manufacturers' own websites can be considered accurate as it is the manufacturers who have created these devices; they will undoubtedly know the correct information regarding specifications and features of their own products. Due to the internet-based nature of Wikipedia and the easiness of uploading to the site, users can update information quickly. Therefore the information on Wikipedia is generally current and as up-to-date as possible. However some users may not have updated some encyclopaedia pages. Again, total currency

cannot be guaranteed. Manufacturers will probably update their websites to contain the latest information about their products.

Advice from a website is most probably current due to the easily updatable nature of the internet and resources stored on it. The information I accessed had been updated recent to the time which I viewed it, which therefore adds to the credibility of the information I accessed. The tips it provided were written by experts trained in the field of computer maintenance and this therefore added to the validity and usefulness of the information on this site. I could therefore have trust in the information source due to the fact that it was created by professionals who are suitably trained in the field. Compared to Wikipedia, which may be a source for referential information, this site provided more specific advice on maintenance and hardware installation with the added reinforcement that the information had been written by reputable professionals who are suitably qualified, rather than an information researcher who (on Wikipedia) may not have such in-depth or specialised levels of knowledge of the subject matter.

The most accurate source of information is the Cisco reference book. Due to the fact that the information is from Cisco, being an internationally reputable company specialising in computer hardware who provide world-leading training in the subject, I can confidently trust the information from the source. However due to the fact that the book is several years old, I cannot be sure as to the currency of the information in regards to current standards and technologies which detracts from the usefulness of the information however it did provide me with useful information and methodologies to employ to my maintenance tasks. Its relevance is absolute due to its specialism in the subject and its astuteness as a source of information and technology for this industry sector. In comparison with the website I used for other maintenance information, the Cisco book provided more valid information due to Cisco's higher regard in terms of reputation and qualifications.

In order to upgrade the system RAM I researched principles and the method from NovaTech.co.uk. This website is from a computer maintenance company who are professionals in this field; therefore adding to the credibility and presumed accuracy of the information. The company has won an award for computer upgrades and this adds further to the presumed accuracy of this information. It is not possible from this source to determine how current the information is, however it did relate perfectly to the system configuration I was working on. New technologies and revised methods in completing such a task may have come to surface since the creation of this document and may have provided more efficient ways of working therefore this information may not be fully current. This information was wholly relevant to my system specification and the task in hand, it provided step by step information and guidance to help me complete the task and related to the RAM module and system configuration I was working with.

Final Critical Analysis (Evaluations)

Unit 19: Developing and Maintaining ICT Systems for Users

CRITICAL ANALYSIS

Evaluation of my system specifications

User feedback for my specifications

I gained detailed feedback from each system user to help me evaluate how well the specifications met the needs of each user. This is copied alongside each specification aspect below to help me complete my evaluation. This feedback was gained in interview with the clients after finalising the specifications with them. They commented on *their satisfaction with the specifications* and *how well it met their needs.*

Specification One inc. Feedback

Specification Aspect	User Comments
Computer Case: Tower	This is good as I can hide the computer tower under the desk and it will help to provide more desk space whilst designers are working and drawing.
Computer Model: Mac Pro	I am happy with this as I said that I would like a Mac system due to its good performance for graphic design which will help my company to lead in its industry field.
AutoDesk Software	This software will be useful to help me and my staff members create the designs which we need to create however we will need to have some training on this as it is fairly new to us.
Final Cut Pro Software	This will be helpful to us so that we can create detailed videos to display our designs to the client but again we will need some training in order to get to grips with the software.
Microsoft Office for Mac Software	This is a good software suite which we are all familiar with and will help us to create our documents and manage e-mails and appointments as I would have liked. We are confident using this software which is also a good point.
⟨ **One 2.66GHz Quad-Core Intel Xeon CPU**	It seems from your recommendations that this will help us to create all of our work easily without having to worry about the computer underperforming or crashing so I am happy with this and happy that it allows for more powerful software to be used in the future. I am

	particularly impressed with the ability to run more than one application at once which will help us to be more productive whilst working.
〈 3GB (3x1GB) RAM	Again based on your explanation I am confident in this configuration which will help us to work effectively without having to worry about the system crashing.
〈 640GB 7200-rpm Serial ATA 3Gb/s Hard Drive	I am pleased to see a high specification hard drive in the configuration. I was looking for a large hard drive space and this meets that requirement so I am happy that we can store a lot of work on machines individually for each designer.
〈 NVIDIA GeForce GT 120 512MB	Based on your explanations I am happy that this will help us to work productively with a good level of graphic detail and the ability to output to another monitor makes this specification more appealing and will enable us to present our work on a projector for instance, as I would have liked.
〈 FireWire port	This will help us to capture video from cameras which we can use to create video portfolios from for our clients. I was not expecting such a high level feature but am happy to see it in the specification as it means we can improve our work now for the future by using video content.
〈 USB ports x 4	These are useful so that we can plug in new devices in future, and plug in the mouse and keyboard. It is also good to have these ports so that we can import photos from digital cameras, for instance.
〈 Sound card (High Definition) with input port and output port	This is useful as it will enable us to share sound output from our videos when presenting to clients and will help us to record commentaries for the videos.
〈 One 18x SuperDrive	This will help us to share our work on disc which is perfect for our clients.
〈 **2TB NAS= £115**	I am happy that backup has been considered as I stated that this was a concern of mine for the business and its files. However I have heard that off-site backup is more reliable, especially if the drive were to be stolen or if there were to be a fire. I would have liked a more robust backup method to have been used.
〈 **ADSL broadband and relevant equipment and networking**	This will enable us to get online and surf the web and send/receive e-mails and is

equipment	beneficial to the company for its organisational effectiveness. I am also happy that we can connect our computers together to share the internet and files which reduces the costs involved in multiple connections.
〈 **Network Security Firewall**	I said that I was concerned about security and welcome this aspect of the specification as it helps our files to stay secure.
〈 **Plotter printer**	This is the type of printer I would have liked and am happy to see it included in the specification as it allows us to print on large formats such as yacht designs as we need to.
〈 **Laser printer for documents**	I am again happy that a separate printer has been included for documents as it means that we do not have to waste time resetting and changing the paper in our large format printer. This will help us to be more efficient.
〈 **MONITOR 24" LCD WITH WEBCAM/MIC BUILT IN AND SPEAKERS**	I am happy that good monitors have been chosen and that these have built in speakers and a microphone. Speakers are good for sharing content with from our videos and presentations and the microphone helps us to record our commentaries which is beneficial.
〈 **Wrist rests**	I am happy to see that consideration has been made to the health and safety of computer users and am aware that it is a responsibility of mine to keep my employees safe. Therefore the inclusion of wrist rests is a positive aspect of the configuration.
〈 **Computer Locks**	I am again happy that security has been considered but would also have liked to have seen consideration made for the security of the mice and keyboard, etc. The security considerations seem a little limited.

Advantages of my specification

It is clear that my specification has met the requirements of the user and has been created to perform all of the tasks it needs to in order to help the organisation. It includes the relevant graphic design, video editing and office software in order for the business to complete graphic design tasks, create video portfolios and create word processed documents and spreadsheets as stipulated in the initial client consultation. The facility to capture audio for the portfolios is realised through the built in audio capturing facilities of 'QuickTime' embedded into the operating system of the computer. Therefore my system does include the software and a fully capable hardware configuration to perform the tasks which the organisation requires it to, making my specification suitable for the user and therefore an asset to the company.

I included guidance on health and safety regulations and included components such as wrist rests and well shaped mice in order to implement the guidance I provided on these measures. I made it clear that it was the company manager's responsibility to ensure that users are kept safe and not exposed to health or safety risks at work and provided guidance in the specification as to how these measures could be implemented. This strengthens the quality of my specification as it considers an ICT system in a holistic way, not just on a surface level in terms of performing tasks.

The user commented on the fact that it was pleasing to see consideration for health and safety and that they had been made aware of such implications for when implementing an ICT system. The user was also satisfied that the system met their needs and was happy at the software and hardware specifications chosen, as exemplified in the feedback table preceding this commentary.

The fact that my system was within the budget set by the company also made it more appealing to the user and therefore more efficient for the organisation. It provided value for money and met or exceeded all requirements as noted in the preliminary client consultation meeting, accounting for other wider aspects of computer system implementation including health and safety, backup, protection and interconnecting of computers. The user commented that they were happy that resources and the internet could be shared securely through the specification configuration I created.

Weaknesses of my specification and how to improve in future

My user commented that the software chosen was appropriate however the company's staff were unsure of how to use it. The user said that they would have liked to have seen consideration made for training to use this software due to the fact that it is new and the staff members have not used it before. This comment was made for all three pieces of software which I included in the specification. To improve for the future I should consider system implementation as well as basic specification. I should have thought that staff may not be used to the software and could have enquired as to whether training would be considered (even if extra costs would need to be incurred for this.) This would help to make my specifications more appealing and easier to adjust to for my clients for the future.

The backup medium chosen for this specification was a network attached storage drive, a drive which is connected to the network which users can place a copy of files on in case their local copy corrupts or is overwritten or goes missing for any reason. The user was happy that backup had been considered as one of their initial requirements was the security of the system and integrity of data. The user commented that they had heard about off-site backup, the storage of data in a different location. They said they would have liked this to have been considered to more appropriately meet their need of having a backup medium available. This would have eliminated the risk of data loss due to fire, flood or any other natural disaster in the building, including theft. For the future I should critically analyse each backup method and discuss the advantages and disadvantages of each with my user prior to choosing one appropriate based on budget (which is what I did in this case,) this would help my specifications to be more wholly suited to the specific requirements of my users in the future.

I did have to make some quality renegotiations with the user in a consultation to amend the specification based on the budget restrictions for the system. These were not related to software or performance features but rather subsidiary features such as the quality and size of desks, wrist rests and other accessories. This did not impact on the system dramatically but did detract from the overall quality of the

working environment and the system in a fuller sense. I could have cut costs in other areas and have performed a more thorough analysis of my specification in order to have avoided such quality reductions in order to create higher quality specifications for my clients in the future.

One area overlooked in my specification was the renting of the projector and screen. Due to budgetary restrictions it was impossible to purchase a projector and screen for the company as well as meeting all of the requirements for software, hardware and furniture which were more mission-critical to the business. This was discussed with the user and we decided upon renting a projector and screen as and when these were needed; especially as they would not be required on a regular basis. I did not investigate the costs and possible ways to implement this, which may have dissatisfied my user (even though it was not commented on.) For the future I should ensure that all considerations and renegotiations are fully planned prior to implementation so that after receiving the specification document my clients will be clear as to how every aspect of their system will be developed and will work.

Specification 2 inc. Feedback

Specification Aspect	User Comments
⟨ AMD Athlon™ II X2 250 Dual Core Processor AM3 (3.0GHz, 2MB Cache) ⟨ Microsoft® Windows® 7 Home Premium pre-installed ⟨ Stylish Mini-Tower uATX Chassis with 300W PSU - Piano Black ⟨ ASUS M4A78LT-M LE Mainboard (DDR3), with integrated DVI/VGA Graphics - MATX ⟨ 2GB DDR3 1333MHz Memory ⟨ 500GB Serial ATA Hard Drive with 16MB Buffer ⟨ 22x Dual Layer DVD Writer Super Format +R/-R/RW/RAM ⟨ 1GB ATI Radeon HD3000 Integrated Graphics - Full HD Support (M4A78LT-M LE) with TV Output for VGA, HDMI, DVI ⟨ 20" Widescreen LCD TFT Display - Analogue ⟨ 7.1 High Definition onboard sound card - for 8 Channel Cinema sound ⟨ Logitech Deluxe Keyboard & Optical Mouse Cordless ⟨ 1 Year Return to Base Hardware Warranty - inc 3 Months Free Collect & Return ⟨ Multi format Memory Card reader ⟨ 2.1 Speaker system with subwoofer ⟨ 3 port FireWire card (for connecting video camera) ⟨ Wireless LAN integrated card	I am happy that based on your explanations the system will be able to run the software I need with ease and I will not need to worry about the system crashing or freezing. I am happy that the new operating system is included as it has more features and is more multimedia friendly, however I am used to Windows XP. The big hard drive is useful as it will allow me to store all of my photos and videos, which I have a lot of. I am also happy that I can create discs of my photos/videos and DVDs to share with friends and family. We renegotiated the monitor size and I am happy that there was room in the budget for a larger monitor as this would help me to see the photos more clearly. I am happy that the sound card is of a good quality as this will help with listening to video sound through headphones or speakers. The wireless mouse will allow me more freedom which is good but I am unsure about it due to having to replace

〈 USB Bluetooth Dongle with EDR (Enhanced Data Rate) 〈 Microsoft Office 2007 Home and Student software 〈 6-socket surge protecting adapter 〈 CyberLink Video Editing Suite software 〈 12 USB 2 Ports (6 front, 6 back) 〈 BullGuard Internet Security 90-day trial included Microsoft Works productivity tools software	batteries every so often. The memory card feature is also a good point to note as it will allow me to insert memory cards and I will then be able to leave my camera. I am also happy that I can connect my video camera which may be useful if I record videos on it in the future. I can connect to my network and perform tasks using the office software; however I am used to Office 2003, I will be able to get used to the new version but may need to convert my files. The antivirus and firewall software is useful and will help to keep my computer safe and running smoothly and will be able to protect my files which are important to me. All of the software provided will help me to create videos and store photos, which is what I asked for the system to do.
〈 Desk and Chair	I am happy with the design of the desk and chair and the chair is useful due to its adjustability and cushioning which will help support my back which you know I can sometimes suffer with.
〈 Wrist rest and computer locks	The computer lock helps to keep the computer safe which is a positive point however I am not overly comfortable with having to have a lock covering my computer front, it seems a little too officious for a home-user. The wrist rests are useful as they will help me to stay comfortable whilst working, preventing the chance of any other injuries.
〈 500GB NAS Network Attached Storgae	I am happy to see network attached storage which will help me to keep a back up of my files. Does this happen automatically? I may have to look into automating backup; it may have been useful to have had advice and clarification on this.
〈 All-in-one printer scanner and copier, specialist photo printer	This will save desk space being a multifunction device and is also useful as a photo printer meaning that I can print my images to a high quality.

Advantages of my specification

The specification includes the software and relevantly specified hardware configurations to perform the photo storage, importing and video editing tasks which the client specified. Features such as the DVD Writer and backup have been identified as further positive aspects which I considered in terms of possible further system uses which the user may have liked. For example we discussed photo importing and storage and my natural thought was that sharing photos on DVDs may be a future requirement; therefore my consideration for wider system uses and possible future and alternative system tasks helped to satisfy the client further by extending the capabilities of what they could do with the system. As exemplified in the specification evaluation feedback above, the system meets the requirements of the user which is a further strength of the specification.

The system is well within the user's budget which is a further advantageous feature of it. This leaves plenty of room in the budget for the user to spend on other things meaning that this configuration, exceeding the requirements of the user, is exceptionally good value for money and this is therefore a further advantage of it.

My consideration for the back problems suffered by the user and the way of solving this through a specially designed ergonomic chair satisfied the user, as commented on in the feedback received above. This specific configuration for the user's needs and special requirements further enhances the positive aspects of my specification as it provides solutions to current problems which the user faces.

Weaknesses of my specification and how to improve in future

My specification clearly had a lot of budget left over which I believe could have been put to better use. I could have expanded upon the features in the specification, providing a higher specification of system which would have enhanced the performance of the system and have made it better equipped for the future and new advances in technology and software. However I did have to consider that this solution was for a home user, who was not in need of exceptionally high performing components as the advantages of such higher specifications may not have been specifically beneficial to my user. I could, however, have incorporated higher quality furniture or better versions of software to slightly expand upon the features of the system, after speaking with the user and discussing the prospect of further system enhancement. The monitor size was enlarged based on a discussion about budget space and potential to improve, I could however have chosen a better performing model and have more comprehensively have discriminated between the quality of such system components in order to maximise the potential from the budget I had available. In the future I will conduct such in-depth research and partake in more user re-questioning in order to maximise the budget in such situations and make the user aware of possible additions or upgrades which could be made, even if these exceed the requirements of the user.

I could have stipulated a Macintosh system due to its better capability for dealing with photos and video. The user did stipulate that they preferred using Windows as it was what they were useful; however it may have been beneficial to at least explore or show the user a Macintosh system as it may have performed more efficiently and with greater levels of security and exposing/facilitating better creative freedom for my user. In the future I will ensure that all configurations and specifications have been explored and discussed if I professionally believe that there may be advantage in changing the convention of a solution or trying to change a user's mind about what they may believe is best for them; however taking care not to force them into an uncomfortable decision.

Evaluation of my performance in specifying, upgrading and repairing systems

System Specification - Strengths of my approach

I fully prepared myself for interviewing my clients by producing a pro forma to follow when interviewing the clients. I ensured that my questioning covered every possible configuration consideration for a computer working through the system internals, software, security and extras. I ensured that I included space to comment on key requirements, preferences for the operating system, the impact and enforcement of laws such as the Data Protection Act, etc. This exemplifies my thorough planning and preparation of the client consultations. This thorough planning was a strength of my approach as it meant that I could analyse requirements in detail and plan for every part of the system to be compatible and suited to the needs of my client. The fact that my questioning and line of enquiry was very precise and direct led to simple application of my information to a system configuration, expediting the configuration process and ensuring that every aspect of system configuration and specification was covered in my interviews.

After producing an initial draft and reflecting upon the answers and requirements stipulated by my clients I set a date convenient to consult further with the client to negotiate requirements and explore the possibilities, limitations and preferences towards a suggested draft specification which I had compiled based upon my impression of their needs. This helped me to correct any misconceptions I may have made about specific requirements and helped me to make renegotiations to further suit the budget, requirements and preferences of my users exactly. For example for one system we decided that renting a projector would be more cost-efficient for the system due to its infrequent use rather than paying thousands of pounds to buy the projector as part of this system. The chance to renegotiate and clarify and finalise requirements was therefore useful as it helped to ensure that my specifications thoroughly met my clients' needs and where wholly appropriate and satisfactory.

System Specification – Weaknesses of my approach and improvements for the future

My systems did meet the needs of my clients and I gained feedback to ensure that the plans were satisfactory. This is not to say that other system specifications may have been equally as satisfactory, therefore I could have included alternative system specifications capable of performing the same tasks to further allow the client to choose components and specifications to suit their needs more exactly in ways which may not have been conventionally thought of. For example I could have proposed a Windows system using different software to perform tasks if a user said they would like a Macintosh system, in order to ensure that 'no stone is left unturned' so to speak. This may lead to better configurations which are more appealing to clients, the exclusion of alternative specifications may have limited the capabilities and suitability of my system for clients. Therefore in the future I will produce alternative configurations which allow my client to make more informed decisions on the suitability of components and specification elements in order to provide the client with the most informed information as possible in order to make a good decision about their system after knowing all possibilities.

I considered the hardware, software, furniture and additional components for my systems however did not give consideration to training or implementation methods

for the system. As a systems designer, my job would also include implementing the system and ensuring that users can interact with it straight away after boot-up. My user gave me feedback for the first system configuration stating that staff were not used to the software I had specified, even though it was the most appropriate software for performing specific tasks; they commented that they would have liked to have seen a training package provided or offered in the system specification. In terms of implementation methods I did not consider how the system would be installed, how existing data and settings would be preserved and transferred and how the businesses or users may be disrupted through implementation of a new system. Therefore it may be beneficial to complete a feasibility study in accompaniment to my specifications in the future in order to explore the impact of installing new systems in terms of staff skills, business disruption and in terms of social impact. This will help my users to be more comfortable with their systems and be rest assured that it will be able to be installed and will have no negative impact on their employees, or the productivity of their company. I should also consider configuration requirements for the systems, for example how networks will be installed and the settings which need configuring for software and hardware components. It would be unreasonable to presume that the user could perform such configuration and this confusion upon initial installation may cause client dissatisfaction and bring with it a comeback for me as the client may ask for configurations to be made. Therefore my systems are appropriate for their users however not ready to use once implemented and a consideration like this must be made for future projects in order to fully ensure that the system can be implemented and can work for my clients without any additional training or planning. To summarise, my approach could therefore be more holistic.

Upgrading systems – Strengths of my approach

Through planning and researching the stages of upgrading by systematically analysing the requirements of the user and the work to be done, my productivity and efficiency in completing the tasks was improved. I outlined the user requirements for an upgrade, the components required, any limitations imposed by the current configuration and thoroughly planned the steps of implementation and how I would test my work to ensure that it had been completed successfully. This helped to ensure that I would complete my work in a well-prepared manner without becoming confused, without making mistakes and with good procedures prepared to ensure that my work has been completed successfully. Previously knowledge and experience from work experience placements, experience building systems and through completion of a hardware and system building qualification I already had skills which I could utilise in order to perform the tasks efficiently following the correct procedures.

My first priority in completing these tasks was to ensure of absolute safety of myself and the other system components, therefore I followed electrostatic discharge procedures and relevant guidelines for safety which I had researched and had prior knowledge of in order to inform safe and risk-free working. This helped to ensure that I minimised any risks associated with working with electronic equipment and helped to ensure that I completed my work safely and efficiently.

When testing my upgrades I used system tools such as BIOS (Basic Input Output Software) statuses and diagnostic tools as well as hardware checking in the computer's Control Panel to ensure that the components I installed had the correct drivers installed and were recognised and working correctly. This helped to ensure that the system would work properly and that my work had been completed properly. By using tools and techniques such as these to check my work I could be sure that my upgrading had taken place successfully and that I had fully met the needs of the user and that dissatisfaction would not occur.

Upgrading systems – Weaknesses of my approach and improvements for the future

A major weakness in the approach I took to upgrading systems was the lack of safeguarding of data and existing system components. The major failure I made was the fact that I did not plan to, nor did I complete any backup of data stored on the system. If an electrical spark shorted circuits inside the system, if I damaged a component whilst working or if an error occurred in my configuration the integrity of data and other components in the system could easily have been compromised. Luckily during completion of these tasks no errors occurred but the possibility of data loss was very real and it was not satisfactory of me to not plan for this possibility. To improve my working and to insure my work for the future I should back up all data stored on the system to a safe backup location away from the computer prior to working on the system. If critical data were stored on the system and I deleted it or caused it to become corrupted or inaccessible whilst working on the computer there would be serious repercussions for me, dissatisfaction for the client and a loss of data which may lead to loss of income and an inability for a person or a business to work.

My testing could also have been more thorough. I used tools and techniques to check that I had completed the work successfully and my upgrades had been properly registered and configured by the system, however my testing did not comprehensively ensure that the system could not fail. For example when testing the DVD drive I installed I did not test whether the drive could burn to disc properly. I should have analysed the features which each hardware device should complete and then utilise a testing technique or method to check that each function could be completed properly after I had installed the hardware. This would help to ensure that my work had been fully completed successfully and that the hardware was fully functioning, not just functioning. This would improve the ensuring of complete satisfaction for my client and full operability of installed components for the future, through comprehensive testing of all features and functions.

Repairing systems – Strengths of my approach

When repairing systems I adopted a systematic approach to troubleshooting and created a logical and clear set of instructions to follow in order to solve the problem. Firstly for hardware problems involving the mouse and keyboard I utilised a cleaning method which I had researched in order to eliminate simple problems which may occur due to excessive use and lack of care for the device, then began to complete troubleshooting procedures on a technical level using the computer's hardware checking wizard and updating drivers to try and solve the problem. Unfortunately the mouse had become unusable and needed to be replaced and in order to eliminate possibilities of such a problem occurring again I installed a new mouse which did not use a roller ball, therefore improper tracking would only involve a hardware fault as there are no mechanical parts in an optical mouse. The systematic approach I took to investigating the problem and solving the problem in a step by step way helped to improve my efficiency in repairing systems and in identifying problems and proved useful for comparison as common faults could be compared based on the logical and clear approach I took to documenting and determining the problems.

As an integral part of repairing systems I included generic advice for solving such problems in the future which is a major advantage of my approach. By providing advice which included easy to follow instructions on determining the problem and steps in solving it, common problems could be identified by system users and

technicians and problems could be solved easily by users and technicians. This helped to improve my usefulness as a technician and also strengthened the quality of my repairing process by documenting how to solve the problem in future, which in the long term saves time and will help expedite future problem solving processes.

Repairing systems – Weaknesses of my approach and improvements for the future

I did test the results of my repairs through checking that the hardware performed the functions which it should, but this did not comprehensively test whether the devices worked properly. I could have utilised a comprehensive range of formalised tests which covered every feature and function of the hardware device and which utilised hardware diagnostic tools and techniques such as driver-checking wizards to ensure that the hardware was fully functioning on a functional and software level, which may help uncover any underlying compatibility issues or faults which may not be visible in everyday use of the system.

I could also have improved the troubleshooting process which I adopted. I followed my own method for solving hardware problems but could have utilised testing tools on the computer to help eliminate deeper and less obvious problems which my own techniques and knowledge may not have covered. This would help to extensively and efficiently uncover problems which may be occurring on a system rather than simply basing problems on my own knowledge. For example I may replace a hardware device if I cannot formulate another solution, yet this may be due to lack of knowledge of what the underpinning problem is; therefore the adoption of thorough tools and techniques to test for problems would help me to assure myself of the actual problem with the system and thus more effectively repair it rather than formulating a 'make-do' solution.