Message from Cambria Creatives

Thank you for the detailed investigation into our hardware. Now that we have read your findings, we would like you to upgrade and maintain the hardware in one of our technology systems (the desktop). We need you to plan the installation and maintenance of hardware to fulfil our requirements.

A new trainee has recently started work at Cambria Creatives and has been supplied with one of the desktop systems in the office, but there are a few problems with this system:

- After recently moving the system to another part of the office it had stopped booting up, prior to this it was working fine apart from being a bit slow when several programs were open at the same time.

- The trainee had also noticed that the system clock was not keeping the correct time when it had been unplugged and was finding this very inconvenient, this fault needs to be rectified after the boot-up problem has been solved.

- When the system is working properly we want a cost-effective way of speeding up the system so it can handle multi-tasking a lot better than it currently does.

- The trainee has also been provided with a new 1 TB high-speed USB 3.0 external hard drive on which to store designs. Some of these high-definition designs will be several hundred MBs in size and other colleagues are finding that the transfer of data is very slow.

- We want you to upgrade this system so that the external hard drive works faster and more efficiently. If the recommended upgrade works on this system we may ask you to upgrade all the other systems as well.

- There has been an agreement to invest in a graphics tablet for the trainee and we want you to supply and install this.

- The budget for the additional components/devices is £250 and it must be completed within 1 week of the final decision being made to do the work.

- The trainee has some important work saved on the local drive in a folder called ‘New Designs’ and would like this folder backed up, if possible before any upgrades are started.

We need all new hardware and upgrades to be purchased from our approved suppliers, a list of which will be supplied.

Approved Suppliers	
eBuyer	https://www.ebuyer.com/
Currys	https://www.currys.co.uk/
Overclockers	https://www.overclockers.co.uk/
CCL Online	https://www.cclonline.com/
CPC | Computer PC Components	https://cpc.farnell.com/computer-pc-components/

Description of the client's issues, goals, and constraints

Provide a clear, straightforward description of the purpose of installing and maintaining hardware in Cambria Creative's desktop system and how you think this can help with their problems.
The goal of installing and maintaining hardware in Cambria Creative's desktop is to ensure smooth operation and prevent issues. Adding new hardware can enhance the computer's speed and make task management easier. Routine maintenance, including cleaning and troubleshooting, will keep the system dependable and extend its lifespan. This ensures that Cambria Creative can keep using the computer for work without disruptions and can promptly address any problems when they arise.

List each of the specific issues with the system that have been identified and describe their impact on Cambria Creatives	
Issue with system	**Description of the impact of this issue**
The Computer has stopped booting up	The computer not starting up stops the trainee from using the system, causing delays and making it hard to get work done.

System Clock on the Computer isn't working	The broken system clock makes it hard to track time, which can mess up scheduling and make it difficult to manage tasks that depend on time.
The Computer is running slowly	A slow computer makes it harder to get work done, especially when using multiple programs. The trainee will experience delays and frustration, lowering productivity.
A New Graphics Tablet needs to be installed	Without the graphics tablet, the trainee can't do hand-drawing tasks properly, which affects the quality and speed of their design work.

List each of the goals for the system that Cambria Creatives have identified and describe their benefits to the company	
Goals of the company	**Description of the benefits when goals are met**
Fix the boot-up issue	Fixing the boot-up issue makes sure the computer starts properly and is ready to use. This reduces waiting time and helps the trainee begin work right away, which means less disruption and more time spent being using the computer for work.
Fix the system clock to keep accurate time	A working system clock ensures that tasks are done on time and helps with scheduling. This makes it easier for the trainee to manage deadlines and stay organised, leading to fewer mistakes and better time management.
Speed up the computer for better multitasking	Speeding up the computer helps the trainee work faster, especially when using several programs at once. This reduces delays and helps them finish tasks more quickly, improving efficiency and allowing the company to do more work in less time.
Improve external hard drive performance	Improving the external hard drive's speed makes transferring large files quicker. This saves time for the trainee and other workers, especially when handling big design files, this means that work should be finished and transferred in less time.

List any constraints that Cambria Creatives have identified affecting the proposed upgrade and describe how they might affect your work in making the changes	
Constraint	**Description of the possible effect of the upgrade**

Budget of £250 for the upgrade	The limited budget means I have to choose lower-cost components, which might not be as powerful or advanced as I would prefer. This could limit the performance improvements and require careful planning to find the best options that stay within budget while still fixing the system's issues.
Work must be completed within 1 week of the final decision	The tight one-week timeline means I have to plan and carry out the upgrade quickly. If there are any delays in getting parts or setting things up, the work might take longer than expected. I will need to work efficiently and avoid any setbacks to make sure everything is finished on time.
All hardware must be purchased from approved suppliers	Only using certain suppliers could limit the number of products available or result in higher prices. I might need to spend extra time checking stock and prices with the approved suppliers. This could also mean I have fewer options for upgrading hardware.
Backup of "New Designs" folder before starting upgrades	The company has said that I need to make sure that the "New Designs" folder is backed up before performing any upgrades, which adds an extra step in the process and could slightly increase the time needed for preparation.

Plan for installing and maintaining hardware in a technology system

Component and Installation and Maintenance Activities List the activities you intend to take to improve the system and the steps you will take to install and maintain the hardware.	
1	Install USB 3.0 PCI Express Card Purpose: The purpose of this component upgrade is to allow for faster data transfer rates, specifically to improve the performance of the external hard drive, which is currently transferring data slowly. Steps: ● I will power off the system and unplug it from the power source. ● I will open the system case and locate an available PCIe slot on the motherboard. ● I will carefully insert the USB 3.0 PCI Express card into the PCIe slot and secure it. ● I will close the case, plug the system back in, and power it on. ● I will install the necessary drivers for the USB 3.0 card to ensure it is properly recognized by the system.

	• I will test the new USB ports by transferring a large file to check if the data transfer speed has improved.
2	Install RAM Stick Purpose: The purpose of adding more RAM is to help the system run multiple programs at once without slowing down. Steps: • I will power off and unplug the system from the power source. • I will open the system case and locate the RAM slots on the motherboard. • I will remove the old RAM stick (if necessary) and insert the new RAM stick, ensuring it is seated properly. • I will securely close the case and plug the system back in. • I will power on the system and enter the BIOS to verify that the new RAM is detected and recognised. • I will run a test to make sure the RAM is functioning correctly and improving multitasking performance.
3	Replace CMOS Battery Purpose: The purpose of replacing the CMOS battery is to resolve the issue of the system clock not keeping accurate time, especially when the computer is unplugged. Steps: • I will power down the system and open the case to access the motherboard. • I will locate the CMOS battery (a small, round CR2025 coin cell) and remove it carefully. • I will replace the old battery with a new one of the same type and size. • After the new battery is installed, I will power on the system and enter the BIOS to set the correct date and time. • I will reboot the system to confirm that the time is now being kept accurately, even after the system is powered off
4	Install Graphics Tablet Purpose: The purpose of installing the graphics tablet is to help the trainee draw directly on the computer, which is important for their design work. Steps: • I will unbox the graphics tablet and connect it to the system via an available USB port.

	• I will install any necessary drivers or software for the tablet, either from the provided CD or the manufacturer's website. • I will follow the on-screen instructions to calibrate the tablet for optimal accuracy and responsiveness. • I will test the tablet by using it with compatible software to make sure it is functioning properly.

Component and Installation and Maintenance Activity 1					
Component & Purpose	**Specification**	**Image**	**Source**	**Price**	**Software needed?**
Install USB 3.0 PCI Express Card **Purpose**: The purpose of this component upgrade is to allow for faster data transfer rate	Ports: 2 x USB 3.0 ports Transfer Speed: 5 Gbps (USB 3.0 transfer rate) Interface: PCI Express (PCIe) Compatibility: Compatible with systems that have a free PCIe slot and support for USB 3.0.		https://business.currys.co.uk/catalogue/computing/components-upgrades/network-cards/startech-com-2-port-pci-express-pcie-superspeed-usb-3-0-card-adapter-with-uasp-sata-power-dual-port-usb-3-pcie-controller-pexusb3s24-usb-adapter-pcie-usb-3-0-x-2/P191072P?cidp=Froogle&gQT=1	£22.99	Comes with the drivers on a CD but otherwise so specialised software needed.
Alternative Solution: Discuss Alternative ideas for meeting the user requirements with reasons why they have been discarded					

Testing Plan for Component and Maintenance Activity 1			
What is being tested	**How it is being tested**	**Fault-Finding Tools/Skills Used**	**Expected Result**
Test that the newly installed USB 3.0 PCI Express Card is working correctly.	1. Once the card is installed and the drivers are set up, I will check the Device Manager to ensure the card and its USB 3.0 ports are correctly recognised by the system. 2. I will test the connected devices for functionality such as file transfers, reading/writing from an external USB drive, and checking for any disconnections or errors.	Electrostatic Discharge (ESD): Before working with the internal components of a computer, I will discharge any static electricity by grounding myself, either through an anti-static wrist strap or by touching a metal surface, to prevent potential damage to sensitive components. Device Manager: I will use Device Manager to check if the USB 3.0 card and its ports are correctly installed and visible under "Universal Serial Bus controllers". File Explorer: I will track file transfer speeds by observing the transfer progress in File Explorer and	Port Recognition: The system should correctly recognise the USB 3.0 PCI Express card and show it as an active device in Device Manager under "Universal Serial Bus controllers". USB Functionality: The connected devices should be fully functional, with no disconnections or errors during file transfers. The file transfer should complete without interruptions.

		noting the time it takes to transfer a large file.	

What is next step if expected result isn't met?

If the port is not recognised in Device Manager:

- I will check the PCIe card's physical connection to ensure it's seated properly in the PCIe slot.
- I will verify that the card is compatible with the motherboard and that no drivers are missing.
- If issues persist, I will try reinstalling the drivers or trying the card in another PCIe slot to see if that improves things..

If devices are not functioning properly:

- I will check for power issues or faulty cables.
- I will test other USB 3.0 devices to ensure that the issue is not with the specific device being used.
- If the problem persists, I may need to replace the card or test the card in a different system to confirm if it's faulty.

Component and Installation and Maintenance Activity 2

Component & Purpose	Specification	Image	Source	Price	Software needed?
Install RAM Stick Purpose: The purpose of installing additional RAM is to improve the system's ability to handle multitasking.	Type: DDR2 SDRAM Memory: 32GB (2X16GB) Speed: 3200 MHz frequency Voltage: 1.35 V667 MHz Form Factor: DIMM (240-pin)		https://www.ebuyer.com/1138630-corsair-vengeance-lpx-32gb-ddr4-3200mhz-ram-desktop-memory-for-gaming-cmk32gx4m2e3200c16	£49.98	No specific software is needed for the installation of RAM. The system BIOS should automatically detect the newly installed RAM upon boot-up. However, after installation, I will need to check the BIOS to ensure that the new RAM is properly recognised. The operating system will also manage the RAM automatically once detected.

Alternative Solution: Discuss Alternative ideas for meeting the user requirements with reasons why they have been discarded

Testing Plan for Component and Maintenance Activity 2			
What is being tested	**How it is being tested**	**Fault-Finding Tools/Skills Used**	**Expected Result**
I'm testing the newly installed RAM stick and its impact on system performance, specifically its ability to improve multitasking and ensure the system recognises and uses the additional memory correctly.	1. After installing the RAM, I will boot up the system and check the BIOS to ensure that the new RAM is detected and recognised by the system. 2. Multitasking Test: I will open multiple programs (such as a web browser, word processor, and any additional applications) simultaneously to check how well the system performs under multitasking conditions. I will monitor system performance and responsiveness to ensure there is a noticeable improvement in speed and smoothness when switching between programs.	Electrostatic Discharge (ESD) : Before working with the internal components of a computer, I will discharge any static electricity by grounding myself, either through an anti-static wrist strap or by touching a metal surface, to prevent potential damage to sensitive components. BIOS: I will use the BIOS to check that the RAM is correctly recognised by the system on startup. This is the first place the system checks hardware components during startup. Task Manager: I will use Task Manager to monitor system performance and memory usage while multitasking to	RAM Recognition: The system should recognise the new RAM stick in BIOS, and the total available RAM should increase as expected. System Performance: The system should perform better during multitasking, with less delay and fewer slowdowns when switching between applications. The system should be able to handle multiple applications open at once without a noticeable performance slowdown.

		ensure the new RAM is improving performance.	

What is next step if expected result isn't met?

If the RAM is not recognised in BIOS:

- I will first ensure the RAM is properly seated in the slot. If it is correctly installed, I will try reseating it in a different slot on the motherboard. If it still isn't recognised, I will test the RAM in another system to check if the stick is faulty.
- If the motherboard does not support the additional RAM, I may need to review the specifications and upgrade the system's motherboard to support higher RAM capacities

Component and Installation and Maintenance Activity 3

Component & Purpose	Specification	Image	Source	Price	Software needed?
Replace CMOS Battery Purpose: The purpose of replacing the CMOS battery is to resolve the issue of the system clock not keeping accurate time	Battery Voltage: 3V Battery Size Code: 2032 Battery Technology: Lithium Manganese Dioxide Battery Capacity: 240mAh External Diameter: 20mm Battery Terminals: Pressure Contact External Height: 3.2mm		https://www.currys.co.uk/products/duracell-dl2032cr2032ecr2032-batteries-pack-of-4-10161524.html	£8.00	No software is needed for the installation of the CMOS battery. The system will automatically recognize the battery once installed, and BIOS will be able to maintain time settings without needing additional configuration or software.

Alternative Solution: Discuss Alternative ideas for meeting the user requirements with reasons why they have been discarded

Testing Plan for Component and Maintenance Activity 3			
What is being tested	**How it is being tested**	**Fault-Finding Tools/Skills Used**	**Expected Result**
Test the newly installed CMOS battery, specifically ensuring that the system clock retains the correct time even when the computer is powered off or unplugged.	Time Retention Test: After installing the new CMOS battery, I will power off the system and unplug it. I will leave the system off for a while to ensure the time is reset without a working battery. Upon powering the system back on, I will check the system time in the BIOS and the operating system to see if it keeps the correct time.	Electrostatic Discharge (ESD) : Before working with the internal components of a computer, I will discharge any static electricity by grounding myself, either through an anti-static wrist strap or by touching a metal surface, to prevent potential damage to sensitive components. BIOS: I will use BIOS to check the system time after powering on the computer. If the CMOS battery is functioning correctly, the system should retain the correct date and time. Operating System Clock: I will also check the system clock in the operating system (Windows) to ensure	Time Retention: After shutting down and unplugging the system, the system should retain the correct time and date in the BIOS and the operating system.

		that the time remains accurate. If the CMOS battery is working, the operating system should show the correct time on startup. Multimeter (optional): If the issue persists and the time is not retained, I will use a multimeter to test the voltage of the new CMOS battery to ensure it is providing the expected 3V.	
What is next step if expected result isn't met?			

Component and Installation and Maintenance Activity 4					
Component & Purpose	**Specification**	**Image**	**Source**	**Price**	**Software needed?**
Install Graphics Tablet Purpose: The purpose of installing the graphics tablet is to enable the trainee to hand-draw directly on the computer,	Pressure levels 2048 Active area 21.6 x 13.5 cm Type Graphics tablet Power supply		https://www.cclonline.com/ctl-672-n-wacom-one-by-wacom-medium-creative-pen-display-410307/	£57.99	The WACOM One CTL-672-N tablet should be plug-and-play with most systems, but the trainee will need design software installed on the computer to use it such as: ● Adobe Photoshop ● Paint ● Paint3D

	- DC 5V from USB Port with 500 mA capacity - Self-powered USB hub or PC USB port				The tablet itself does not require additional software, as it will work natively with supported applications due to it being plug-and-play.

Alternative Solution: Discuss Alternative ideas for meeting the user requirements with reasons why they have been discarded

Testing Plan for Component and Maintenance Activity 4			
What is being tested	**How it is being tested**	**Fault-Finding Tools/Skills Used**	**Expected Result**
I'm testing the functionality of the WACOM One CTL-472-N graphics tablet, including drawing capabilities and overall integration with the computer system.	1. Connectivity Test: I will connect the graphics tablet to the computer via USB and ensure that it is properly recognized by the operating system. I will then verify that the appropriate drivers are installed (either automatically or from the supplied CD/website). 2. Drawing Test: Using software such as Paint, I	Device Manager (Windows): To ensure the tablet is properly detected and the drivers are installed without issues. Graphics Software (e.g., Paint): To test the tablet's pressure sensitivity, precision, and functionality when drawing on the screen.	The WACOM One CTL-472-N tablet should be properly recognised by the operating system and function seamlessly with the drawing software. Pressure sensitivity and stylus responsiveness should be smooth and precise when drawing. The tablet should not experience any lag or failure to register strokes within the software.

	will use the stylus to draw on the tablet and check the tablet's response. I will test for responsiveness and accuracy in the drawing software to make sure that it functions as expected.		

What is next step if expected result isn't met?

If the tablet is not detected:

- Make sure the USB connection is secure and try different ports.
- Reinstall the drivers either from the disk provided or download the latest drivers from the Wacom website.
- Test the tablet on another system to rule out computer-specific issues.

If the tablet is detected but does not respond in software:

- Verify that the correct input device (tablet) is selected in the software settings.
- Check if the stylus settings need adjustments, such as pressure sensitivity or stylus calibration in the tablet configuration utility.