

Implementing an IT improvement plan

Background information

Simone is an IT manager in a logistics company. Her role is to manage the IT systems in the business and look at how they can be modernised.

The company is located in a building in Birmingham containing a warehouse and offices. The company uses 10 stand-alone desktop computers in several offices around the building. There are no computers in the warehouse where goods are received and dispatched.

When goods arrive at the warehouse they are recorded on paper forms by the warehouse staff. These forms are then sent to the office staff to input into the company stock control database which is on one computer in one of the offices. Before a lorry leaves the depot with stock the office staff print a list of the goods to go on the lorry, called an inventory, and give it to the driver. When the driver has delivered the goods, he gets the customer to sign the paper inventory to confirm all the goods have been delivered. When the driver returns to the warehouse, he gives the paper inventory back to the office staff who process it to remove the delivered items from the stock control database.

Each stand-alone computer has an individual purpose. For example:

- the computer in human resources only stores the staff and payroll records.
- the computer in stock control stores a database of all the stock in the warehouse.

Simone has drawn up an IT improvement plan and now needs to investigate how she can implement it.

Simone's IT improvement plan

- connect all the computers in all the offices to create a network
- use barcodes and barcode readers to track stock movements in and out of the warehouse
- set up a central database of stock items. This database needs to contain all the information about the stock received and dispatched from the warehouse. This can then be linked to barcode readers to keep track of the stock available
- install a wireless network connection in the company's building so additional devices can connect to the network
- ensure the IT system is secure

Your task

Your group has been allocated one of the areas listed below to investigate to help Simone implement her IT improvement plan. Research this area and answer the questions listed. You will present your findings to the rest of the class for discussion.

The areas to be researched are:

1. Creating a network of computers
2. Using barcodes and barcode scanners
3. Installing a wireless network
4. Network security
5. Considering the staff

1 Creating a network of computers

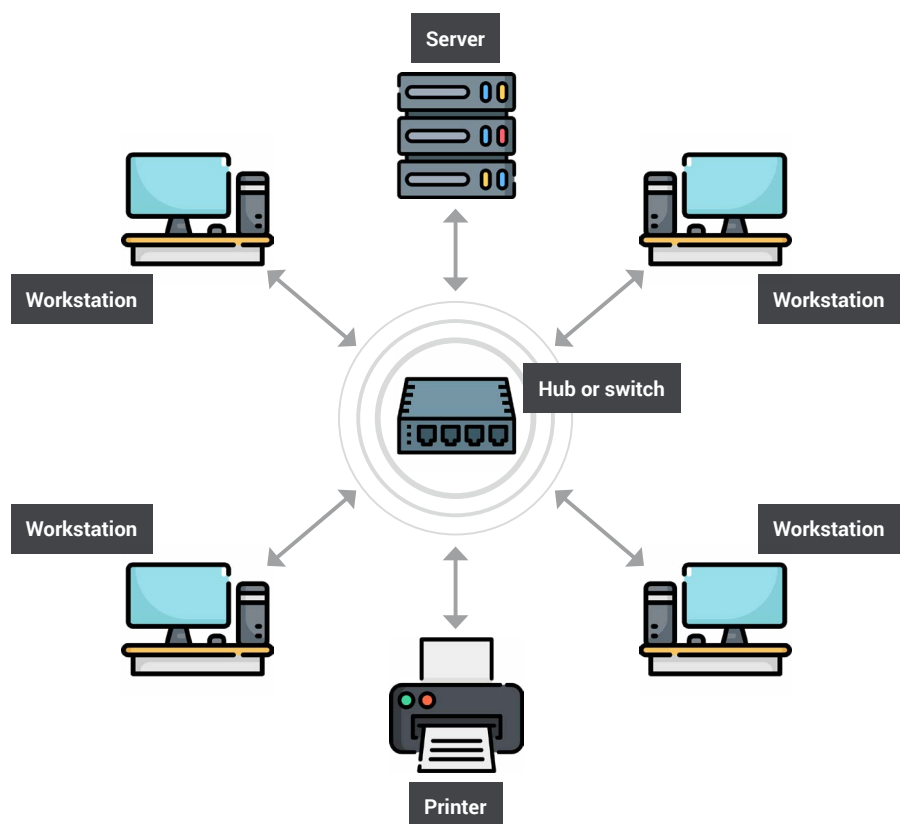
Your tasks

- List the hardware the company will need to buy to create a computer network.
- A STAR topology has been suggested for the network. Explain what this is and draw a diagram of it.
- List the advantages and disadvantages of networking a series of computers compared to using stand-alone computers.

Hardware

- Cables
- Switch or Hub
- Server
- NIC – Network interface card installed on all computers
- WAP – Wireless Access Point
- Router

STAR topology



Networking computers

Advantages

Possible answers could include:

- Can access files from any computer
- Back up to a central point
- Software and updates delivered at once to all computers
- Any damage to one computer means information can still be accessed from another

Disadvantages

Possible answers could include:

- If a virus infects one computer, it could spread easily
- Any damage to the server means all files lost
- Cost of wiring up all computers
- Cost of hardware

2 Using barcodes and barcode scanners

Your tasks

- Describe how barcodes and scanners could be used by Simone's company.
- List the advantages and disadvantages of using barcodes and scanners to monitor stock levels compared to using a paper-based system.

Simone's company could use barcodes and scanners as follows:

- When an item arrives in the warehouse find out its product code and turn it into a barcode and stick it on the item.
- Scan the barcode with the scanner. This feeds into the central stock database to add the item to the list.
- When an item leaves the warehouse in a lorry it is scanned and the central database is automatically updated to remove the item.
- When the lorry driver delivers an item to a customer he scans the item again to confirm delivery which updates the database at the company. With this information the company can charge the customer for the delivery.

(Some items may already have a barcode on from the supplier.)

Advantages

Possible answers could include:

- Reduces the amount of manual data input
- Reduces potential errors in the central stock database
- Will speed up data entry so central stock database will be more up to date and accurate
- Easier to track the location of items

Disadvantages

Possible answers could include:

- Barcodes may get damaged so can not be read so will still need human intervention
- Cost to implement the system
- Cost of wiring up all computers
- Cost of hardware

3 Installing a wireless network

Your tasks

- List the hardware the company will need to buy to set up a wireless network.
- List the advantages and disadvantages of having a wireless network compared with wired one.

Hardware needed to set up a wireless network:

- Wireless access point (WAP).
- A few WAPS may be needed to cover the whole building including the warehouse.

Advantages

Possible answers could include:

- Allows network users to move away from a wired connection point
- Cheaper to set up than wired systems
- Little to no cabling required so easier to set up

Disadvantages

Possible answers could include:

- Less secure than a wired network as signal can not be contained within a building and no physical connection is required to intercept data
- Data transfer speed is lower than wired network
- Can only connect a device up to 50 metres from a wireless router and connectivity may vary in different parts of a building

4 Network security

Your tasks

- List the possible threats to a company's computer network.
- Describe how a computer network containing a wireless network can be made secure.

Threats to a company computer network:

- Malware including: viruses that might damage files, spyware which collects and shares confidential information, and ransomware which blackmail companies into paying a fee to unlock the network.
- Phishing - deceiving a user into giving up information.
- Denial of service - Flooding a network with too much traffic.
- Data theft or interception.
- Poor user security including weak passwords or screens left unlocked.
- Brute force – where a programme tries multiple character combinations to crack a password.
- Poor network policy such as allowing inappropriate user access to data, no back-up procedure.

A network can be made more secure in the following way:

- Firstly identify vulnerabilities by:
 - Penetration testing to see how resilient the network is to attack.
 - Carry out network forensics to identify invasive traffic.
- Ensure there is an acceptable use policy and that staff are fully aware of it and have sufficient training to understand its meaning.
- Have appropriate user access levels.
- Ensure there is a robust network policy in place which is fully implemented.
- Spot check that the elements of the network policy are being followed.
- Install firewalls to control network traffic.
- Encrypt sensitive data.
- Use anti-malware like anti-virus software.
- Implement secure passwords.

5 Considering the staff

Your tasks

- How could the new IT systems be introduced to staff?
- What impact will the installation of a new computer network and the introduction of barcodes and scanners have on the following staff?
 - Office staff
 - Warehouse staff
 - Drivers

Simone needs to consider the impact on staff carefully. All staff will need training on the new systems. She also needs to keep them fully informed of her plan explaining why these changes are necessary. Some members of staff might be worried about the introduction of the new technology.

Impact on staff

For office staff less manual data entry will be required and they will have a more accurate reflection of the stock held in the warehouse. They will also be able to work at any of the workstations to complete their work as all data will be held on a central server. However, as there may be less work to do some staff may be made redundant.

With the new wifi network in place warehouse workers will be able to access the central stock database so will be able to locate and dispatch items more quickly. They will also have to do less paperwork. However, as there may be less work to do some staff may be made redundant.

For drivers there will be less paperwork to fill in when they deliver goods to customers so it will make their job easier, but they will still be needed to drive the lorries to and from the warehouse, so they are unlikely to be made redundant.