

## Report on an ICT system and how it meets the Organisation's needs

Marks & Spencers have brought in technology into nearly all aspects of their business. The technology is used to improve the workers and the whole organisation's efficiency, increasing profit. Marks & Spencers use input devices, output devices, processors, storage devices and ports and cables all to help them reach their goals. In this report I will be talking about how Marks & Spencers use them.

### Input Devices: Symbol LS2208 Laser Barcode Scanner

#### System Specs:

##### General

<b>Type:</b>	Barcode scanner - handheld
<b>Weight:</b>	0.1 kg
<b>Depth:</b>	8.4 cm
<b>Colour:</b>	Twilight black
<b>Width:</b>	6.3 cm
<b>Height:</b>	15.2 cm
<b>Compatibility:</b>	PC

##### Environmental Parameters

<b>Min Operating Temperature:</b>	0 °C
<b>Max Operating Temperature:</b>	40 °C
<b>Drop Specification:</b>	1.5 m to concrete
<b>Humidity Range Operating:</b>	5 - 95%

##### Manufacturer Warranty

<b>Service &amp; Support:</b>	5 years warranty
<b>Service &amp; Support Details:</b>	Limited warranty - 5 years

##### Barcode

<b>Scan Speed:</b>	100 scan / sec
<b>Pitch (Degrees):</b>	65
<b>Skew (Degrees):</b>	60
<b>Light Source Wave Length:</b>	650 nm
<b>Scan Mode:</b>	Single-pass
<b>Scan Element Type:</b>	Visible laser diode
<b>Connectivity Technology:</b>	Wired
<b>Decode Capability:</b>	Code 93, Code 39, UCC/EAN-128, IATA, RSS Code, Discrete 2 of 5, Codabar, Code 128, Code 11, UPC, Interleaved 2 of 5, MSI-Plessey
<b>TTL Decoding:</b>	Decoded
<b>Minimum Bar Width:</b>	5 mil
<b>Print Contrast Signal (PCS):</b>	20%
<b>OK Notification:</b>	Beeper, LED indicator
<b>Features:</b>	Advanced Data Formatting (ADF), Reduced Space Symbology (RSS)

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### Input Devices: Handheld Terminal

The handheld terminal is used in many aspects of Marks & Spencers. It is used for inventory control, asset management, item tracking, maintenance management and other off-line data collection applications. The HHT is easy to use for all the employees and is an efficient way of managing stock. It uses lots of communication technologies which means that when Marks & Spencers buy a new Handheld Terminal they can be sure that it still will work with their system and network. Another reason they can be sure that it will work is because the Handheld Terminal supports many different types of barcode including the main universal ones and the less well known system. If Marks & Spencers were to take over another store then they would probably still be able to use it as they can use the barcode system. This is good as before they may have had to buy a lot more hardware just to operate the new technology. The Handheld Terminal can hold large amounts of information which mean that the workers can go round the shop and record data in large shifts. It means that they don't have to worry about the Handheld Terminal crashing which would cause a lot of time wasting as the employee would have to go around the shop again. The Handheld Terminal is very versatile. It is shock and vibration protected which is really useful as the shop floor is a very busy and a worker could easily get knocked and drop it on the floor. It can also operate at low and high temperatures. This is good as if a worker wants to check the stock in the frozen food section then they can still easily operate without the worry of it crashing under low temperatures. Having a strong Handheld Terminal Marks & Spencers don't have to worry about replacing broken machines with new ones. This helps save money for the company which again helps its needs.

### POS Receipt Printer

- Print speed 127mm/sec.
- Label width 35mm (1.5) to 100mm (4")
- Easy paper loading.
- Internal or External label source.
- Die Cut fanfold or roll paper media.
- Logo store capability 8mbit flash ROM
- Serial Parallel and USB interface as standard
- Label peel off function with sensor
- High resolution at 203 dpi
- Prints all popular bar codes

POS receipt printers also allow the adding of bar codes, texts, graphics and variables fields for sell/use by dates etc.

### What can the hardware do in comparison to what the business needs it to do?

The POS is needed for employees at the till to easily print of a receipt for the customer and themselves. This is so they can keep a record for themselves to check what the customer has bought. This can help them make sure they can check if a customer returns with an item. The printer is very fast at printing and can print about 127mm of paper a second. This shortens queues which keeps customers happy and helps Marks & Spencers sell more products in a shorter time. The printer can be easily integrated into many different things as it supports serial, parallel and USB so when they purchase a new store or company and website they can easily integrate it into their system. It is quicker and easier. The high quality printer makes it a standard that other companies aspire to and makes them a high quality service. The printer can also print of all the main barcodes which helps Marks & Spencers be a popular service and helps Marks & Spencers save money not having to buy multiple printers that print of different types of barcodes.

### Evaluation Have the objectives been met?

Marks & Spencers need high quality printers for quick and easy printing. The employees need a fast printer to print of the receipt for the customers. If it was slow then the customers would leave and wouldn't meet the needs. They also have a backup paper reloader that if the paper ran out the reloader would quickly reload it stopping a slow down.

### DAT Drives

#### Specs

- Up to 260GB capacity in a compact 3.5 drive
- Outstanding reliability at 400,000 hours MTBF (100% duty cycle)
- Fastest access to data on the market, averaging < 35 seconds
- Outstanding performance with 112 GB/h\* backup rate
- Low power consumption, meaning low heat generation
- Full read and write compatibility with AIT-2 and AIT-1 media as standard

### What can hardware do in comparison to what the business needs to do?

Marks & Spencers as a business needs to rely on technology as it is an ICT reliant business so if their system was to fail then they would be very

disrupted. They need a something to store their data on. This is where the DAT Dives come in. an ICT technician would be employed to regularly store the data. This would be done every day the end of the day. Marks and Spencers need there data stored with information like credit card transactions. These are important to save as customer may want to return the product and Marks & Spencers need to know the price. This helps keep customer satisfaction and makes Marks & Spencers a customer friendly place. Other information can be stored like employee pay checks. If this data was lost Marks & Spencers could be paying employees more than they need. This helps Marks & Spencers be a company that other companies aspire to.

Some DAT drives can only hold 4 gigabytes but some can hold up to 300 gigabytes. The device that is describes in the specs costs £971 and models of the same storage capacity could store most of Marks & Spencer's network. They would only need a few of them to store the whole system. They can get this whole system for around £5000. This is worth the money for safety against a system failure. The DAT drive needs to be reliable so that if the system failed and the DAT drive fails as well then Marks & Spencers would be in trouble. The DAT drive has 400,000 hours of run time. This means that the technicians can be sure that they always have a backup to restore and that they can restore it quickly. The DAT drive can access data at about 35 seconds which makes Marks & Spencers a company that others aspire to.

The bad thing about the tape drive is that they have to use tapes. This means that the technician has to sort thought the tapes if they want to retrieve some data. This is time wasting and time is money. Also they are not efficient for locating small bits of information. This is because the data has to be played thought the tape.

### Have the objectives been met

The DAT drive is very good for what it needs to do. That is to save large amounts of data and for that data to be accessed quickly. This is a very necessary backup as important data could be lost. Also the quick accessing time is useful as time spent not working is money which is reducing Marks and Spencers productivity. The main flaw is the way that the DAT drives work. The method for finding small amounts of data is unpractical and time wasting. The DAT drives are very cheap for what there worth so smaller companies could buy them. Marks and Spencers isn't a small company so they could buy much better hardware and probably shouldn't use DAT drives.

### Alternatives

One alternative of DAT drives are to back things up using the internet. Now because of fast internet data can be backed up across the internet. This means that Marks and Spencers can employ specialist companies that can back up data remotely. This is a safe system as Marks and Spencers can be sure that the company that employ is safe. If Marks and Spencers use their own technicians

to back up the data then they won't be wasting money on something that they can do themselves. Also using their own technicians they can make the process more customisable as they can tell the technicians what they want them to do firsthand.

### Ports and cables

- Technology: double shielded
- Type: Parallel cable
- Connector(s) (other side): 1 x 25 pin D-sub (DB-25) - male
- Product Description: Belkin PRO Series parallel cable - 6.1 m
- Connectors(s): 1 x 25 pin D-Sub (DB-25) - male
- Length: 6.1 m
- State-of-the-art-writing design ensures 100% compatibility with all devices 100% of the time
- Gold plated copper contacts provide maximum conductivity and keep data loss to a minimum.
- IEEE 1284 compliant cable.
- Ten times faster data transfer when compared with non-compliant IEEE 1284 cables.

What can the hardware do in comparison to what the business needs it to do?

Marks and Spencers needs to connect their devices to their IT system. They also use them to connect terminals in their network. This is when small scale amounts of data need to be transferred between two terminals that need to communicate. This parallel cable is 6.1 m long, which is quite long. It has gold plated contacts which stops signal disorder from cables this length. This means that Marks and Spencers technicians can set up printers to printer services and other things like this. They can also be sure that the cables won't be too short or that taut wires don't become tripping hazards. The bad thing about parallel cables is that they suffer from signal disorder when the wire is long. This can be overcome by using a signal booster. This boosts the signal but the signal booster requires another electrical supply and more electricity means more money. This doesn't meet Marks and Spencers needs as they could easily use an Ethernet cable or networking printing cable. Parallel cables use 25 strands inside the wire and data can be transmitted across all these wires at the same time. This means that they can transmit data quite quickly. It can be even faster if used with the IEEE 1284 compliant device. This means that employees can do what they want quickly and get back to work. This increases speed and profitability. The port that attaches to other devices is very secure. It has thumbscrews to help keep the port secure. This combined with gold plated copper contacts keeps the conductivity which helps stop signal loss. It also helps the cable accidentally being pulled out. This increases speed as

technicians don't have to worry about cables being unplugged and also productivity as the increased conductivity means less signal loss.

### Evaluation

Overall the parallel cables meet the needs quite well but the limitation on the length because of the signal length. The method for securing the port is very secure and helps the company in many ways. Parallel cables are actually more expensive than a USB cable and are no more difficult to set up. This means that parallel cable aren't very good and don't meet Marks and Spencers needs very well.

### Alternatives

The parallel wires are not practical enough due to the short distance of the wire length. This is where the parallel to USB adaptor cable comes in. This device connects DB25 ports to USB ports. This allows Marks and Spencers employees to be able to use the useful screw device and have the adaptability and speed (up to 1mbps). The downside of this is that the adaptor is costly and therefore reduces Marks and Spencers profit. Also the 1mbps transfer rate isn't nearly as good as the USB 2.0 cable which can work at rates of 480 mbps.

Most PCs have one or two USB ports as USB ports are used to connect many devices. This saves money for Marks and Spencers as they don't have to buy lots of different technologies because the USB is so versatile. USB's work in a similar way to telephones. They transmit large amounts of data very quickly much quicker than parallel. This increases efficiency in Marks and Spencers and increases profit as the employees can work quicker. USB's can also communicate with up to 127 other USB devices. This is very useful as Marks and Spencers don't have to worry about buying lots of USB peripherals. This is much better than parallel as parallel can only support a few other devices. USB can also power small devices like modems. This means that they don't have to buy as many power cables and power plugs. This also makes it easier for technicians to look round the back because of the lack of wires.

The bad points about USB is that they are very easily pulled out. When the USB plug is pulled out it can damage the internal device. This means that data can be easily lost and that means that the technicians will be constantly losing data. Also Marks and Spencers will have to be buying USB devices repeatedly as the fragility causes them to constantly break. This lowers the profit of Marks and Spencers.

## Evaluation

The USB device is very versatile and efficient. It can work with many different devices and is very easy to use. It is also quite quick and can support many other USB peripheral. The downsides are that it can be easily unplugged and easily broken.

## Processing Devices

### **Specific detail of hardware device**

#### **Dual-Core processor server:**

**Processor(s)** Pentium® D processor - 3.2GHz

**Front side bus** 533MHz or 800MHz

**Cache** Up to 2MB

**Chipset** Intel E7230

**Memory** 256MB/4GB2 DDR2-533MHz (single DIMM config)

**I/O channels** Five total: three PCI Express™ slots (1 x 8, 1 x 4, 1 x 1); two PCI slots (32-bit/33MHz), 5v

**Drive controller** Embedded 4xSATA channels; optional Adaptec U320 (PCI)

**RAID controller** OS-Based RAID 0-1

**Tape support** Travan TR40 (IDE); DAT 72 (SCSI)

**Drive bays** 1 x 3.5'' floppy optional; 2 x 5.25'' total bays: (CD optional) one for CD, CD/DVD-ROM, CD-RW/DVD combo; one for TBU

**Maximum internal storage** Up to two 300GB cabled SCSI for max 600GB; Up to two 250GB SATA for max 500GB

**Hard drives** 1 73GB, 146GB and 300GB SCSI (or) 40GB, 80GB, 160GB and 250GB SATA

**Internal storage performance** 10K RPM SCSI drives; 7.2K RPM SATA drives

**Network interface card** Single embedded Gigabit3 NIC

**Availability** ECC memory; OS Based RAID 0 or 1

**Systems management** Dell Server Assistant for PowerEdge SC

**Rack support** None

**Operating systems** Microsoft® Windows® 2003 Server (both IA32 and EM64T versions);

Microsoft Windows Small Business Server 2003; Red Hat® Linux® ES 4.0

## What can the hardware do in comparison to what the business needs it to do.

Using dual processors Marks & Spencers can increase performance without a large power consumption increase. This is because the dual processor divides the tasks that one of the processor could be doing which therefore increases performance. This means that the dual core processors can carry out large tasks. Another plus towards dual processors is that they use a little less power

than two single processors. Now because of this decrease in power consumption it brings down Marks and Spencers's overall power usage. This will make Marks and Spencers a more environmentally friendly place to shop which will increase customer happiness. The dual processors also allow for an increase in performance which means the technicians can carry out tasks easier and quicker. Also they can run more advanced programs quicker and more smoothly thanks to the increased performance. It also means the network operations can be carried out quicker and means that the technicians can fix problems quicker. Advanced programs such as high performance anti hacker and anti virus can be used without slow down. The bad thing about it is that it costs more. It also cost more to upgrade the whole system to be able to take advantage of the extra power.

### Evaluation

The dual core processors means that Marks and Spencers can increase performance without having to invest that much money. Also the dual processors mean that not as much electricity is used. This makes Marks and Spencers look more environmentally friendly and makes customers more eager to shop there. The down side is the increased costs. Not only does money have to be spent on the dual processor but the whole system has to be upgraded.

### Alternatives

AMD have a range of dual core processors.

#### **Tech Spec Core Manchester**

**Multi-Core** Dual-Core

**Name** Athlon 64 X2 3800+

**Operating Frequency** 2.0GHz

**HT** 1GHz

**L1 Cache** 128KB+128KB

**L2 Cache** 2 x 512KB

**Process Type** 90 nm

**Hyper-Transport Support** Yes

**64 bit Support** Yes

**Multimedia Instruction** MMX, SSE, SSE2, SSE3, 3DNOW! Professional

**Voltage** 1.35-1.4V

**Cooling Device** Heatsink and Fan

AMD is a much cheaper way of upgrading the system as it would only cost around. The down side is that because of the cheaper costs the components won't be as good. It would save Marks and Spencers money in the short run but in the long run they would be losing money on frequent repairs and system and the servers might fail more often. This probably wouldn't benefit Marks and Spencers and shouldn't be used.

## Software

- computer-like menu-driven human interface with full alphanumeric editing and control functions for easy & smart operation
- up to 5000 plus on a sophisticated pos-like database & 5 dynamic vat rates
- up to 50 departments & 10 different operators with computer-like access rights
- up to 20 different payment types with multi-currency support & 12 discount/mark-ups
- multiple price-lists with dynamic selection
- a magnitude of sales, accounting & inventory reports similar to a pc-based pos system
- ean-13 full barcode support as well as special barcodes for weight, quantity & price
- on-line communication capability with PC and back-office server
- full daily electronic journal memory & transfer capability to PC or to an on-board compact flash storage module
- both fiscal & non-fiscal versions are available
- supports scanners, pc-connection and other peripherals as needed
- 58mm graphic/alphanumeric easy load thermal receipt printer with 60mm/sec printing speed & 203dpi resolution
- double-line (2x16) or single line (1x16) backlit alphanumeric LCD displays for operator and customer
- portable outdoor usage unit battery operated with external charger

The screenshot displays the EPOS software interface on a handheld device. At the top, the 'EPOS' logo is on the left, 'Scan in Product Code' is in the center, and the time '12:32' is on the right. Below the header, there is an 'Invoice Number' field with the value '441'. A prompt reads: 'Scan, type or select the down key on your keyboard to enter a Product Code'. Below this is an 'Enter Here' input field. A list of items is shown with their quantities and prices:

Item	Qty	Unit Price	Total Price
SEAGRASS 3 BOTTLE RACK	1	£14.50	£14.50
PUFFED KASHI	1	£2.01	£2.01
BIOF HERBAMARE 90G	1	£1.41	£1.41

At the bottom, it shows 'Total Items: 3' and 'Sub Total: £17.92'. On the right side, there is a vertical menu with buttons: 'Cancel Sale (ESC)', 'Void Item (F3)', 'Discount Item (F4)', 'Multiple Items (F5)', 'Account (F6)', 'Sale Total (v)', and 'More (Ctrl)'.

To get top efficiency and lower margins Marks and Spencers need to keep the minimum amount of products in the shop so finding a product is easy but still need to have enough in stock to make sure that they are always ready. EPOS (electronic point of sale) helps Marks and Spencers scan their products and find out important information about them. Such as which products are the most popular as these need to be restocked regularly. It is useful to Marks and Spencers because they have lots of regular sales and many suppliers and customers who need fast, accurate service.

The basic EPOS system is a regular computer with cheap modifications and add-ons. They can handle payments quickly, update inventory lists and give instant stock information. You can add software updates to the system like Electronic Funds Transfer (EFT). Every time a transaction is recorded on the system the EFT records the credit or debit transfer which reduces time per transaction. This increases performance and helps employees sell more goods in a shorter amount of time and reduces waiting time for customers. EPOS can also be linked to a website. It displays the amount of stock for every item. This is very useful as buyers can see if a product has run out of stock and don't need to waste time coming into the shop. This helps increase customer happiness. EPOS can also estimate when an item will run out of stock and warn employees to restock. The EPOS system can also be integrated with handheld devices such as the HHT. This helps Marks and Spencers search the shop firsthand and find out information on stock.

There are many different packages that the EPOS software can be bought as. This helps the EPOS software be versatile as it can be introduced to the system very easily. First of is the stand alone system which comes with a specialised EPOS terminal and other add-ons. You can also buy the software based method which can be installed on to an existing computer. The other products like barcode scanner can be bought separately. Another method is to Outsource EPOS to a third party specialist. This requires a broadband internet connection as the third party will send a secure internet based link to Marks and Spencer's. it is useful as the third party will manage any technical problems. This lowers costs as not as many technicians are needed but will cost more to pay the third party. The last method is for a customised EPOS solution. EPOS software specialist can design and integrate it into the Marks and Spencers system. This is very useful as the process is completely customisable and Marks and Spencers can get the most out of the software this way. This is the most expensive method as prices will usually cost over £10,000 but prices can vary depending on how you customize.

### Evaluation

Overall EPOS provides a useful easy to use service. It can do stock management very well and can provide detailed information to Marks and Spencer's. the downside is that the service is quite expensive to buy but with so many options that isn't an issue.