Background

Gigabyte computers is a small computer shop specialising in computer hardware and software. It is run by two people and the roughly have about 25 - 30 customers per day. The two people that run the shop run it by using filing systems and this is very time consuming especially when having to see if they have something in stock.

The hardware that the shop sells consists of PC products like memory chips processors and CDR devices. The hardware that they buy comes from different suppliers and need to be ordered within two weeks of when they are needed.

The software that is available in the shop ranges from PC and console games to applications for a computer. The software titles come in to stock from the manufacturers when they are due for release date. These range in price and are stocked in order of console type and alphabetical order.

The main purpose of the shop however is to make custom built computers for customers to their specific needs and this is what their main focus of their business is.

The shop has three different clientele suppliers, buyers and sellers. The shop has records on paper file of their contacts and suppliers. In with these files are also lists of manufacturers both for computer and console types. The shop also has the ability to repair and give a diagnostics checks on customer's computers giving them a choice of whether they would like a 2 -5 year guarantee paying a monthly fee of £5.00. This consists of a check with a further charge of parts that are needed.

The shop also asks new customers and sellers to fill in information about themselves to get a general idea about the things they like and so the can store their information on their files. This will help the shop owners for when the same customer comes back because they will know information about them and they wont need to ask them questions.

Problem

Gigabyte Computers deal with about 30 customers per day over the counter and over the telephone. The orders are recorded onto carbon paper. On sheet is kept and filed so as to keep a record of the sale, on is sent to the manufacturer for the order if the item is not in stock and one is used as a receipt for the customer.

When one of the sheets are passed onto the warehouse and the ordered items are in stock, the manufacturer will then process this information and

then send the item to shop with a completed invoice which is also then filed. All the values and prices for these transactions are calculated by hand. A receipt then comes back to the manufacture r for the acknowledgement of sale and one copy of the transaction is used for the accounts.

When a customer comes in a wants a custom built computer the staff have to work out the specs in the mind and the prices and give the customer a general quote as they do not know off by hand if the prices have been changer or whether they were that price at that time. They then have to figure out what pieces will be good for that customer and the get them to fill in a questionnaire about what they might use a comp uter for and how powerful it might be.

Because the staff calculate the prices manually on a calculator and then print of a home-made statement this can be very time consuming for a lot of orders because a computer calculation can make it a lot easier. Pl us prices and stocks could change very easily giving the customer something to think about because they might get one statement of price and when the invoice will come in it might be totally different.

The staff feels that introducing a computer database to calculate and work out a suitable computer system for a customer will deal with these problems. The system will be able to make the transactions faster and give the customer a more accurate quote on what he or she will be buying. The amount of paper and documentation will also be reduced and this will help save space for stock.

The Current System

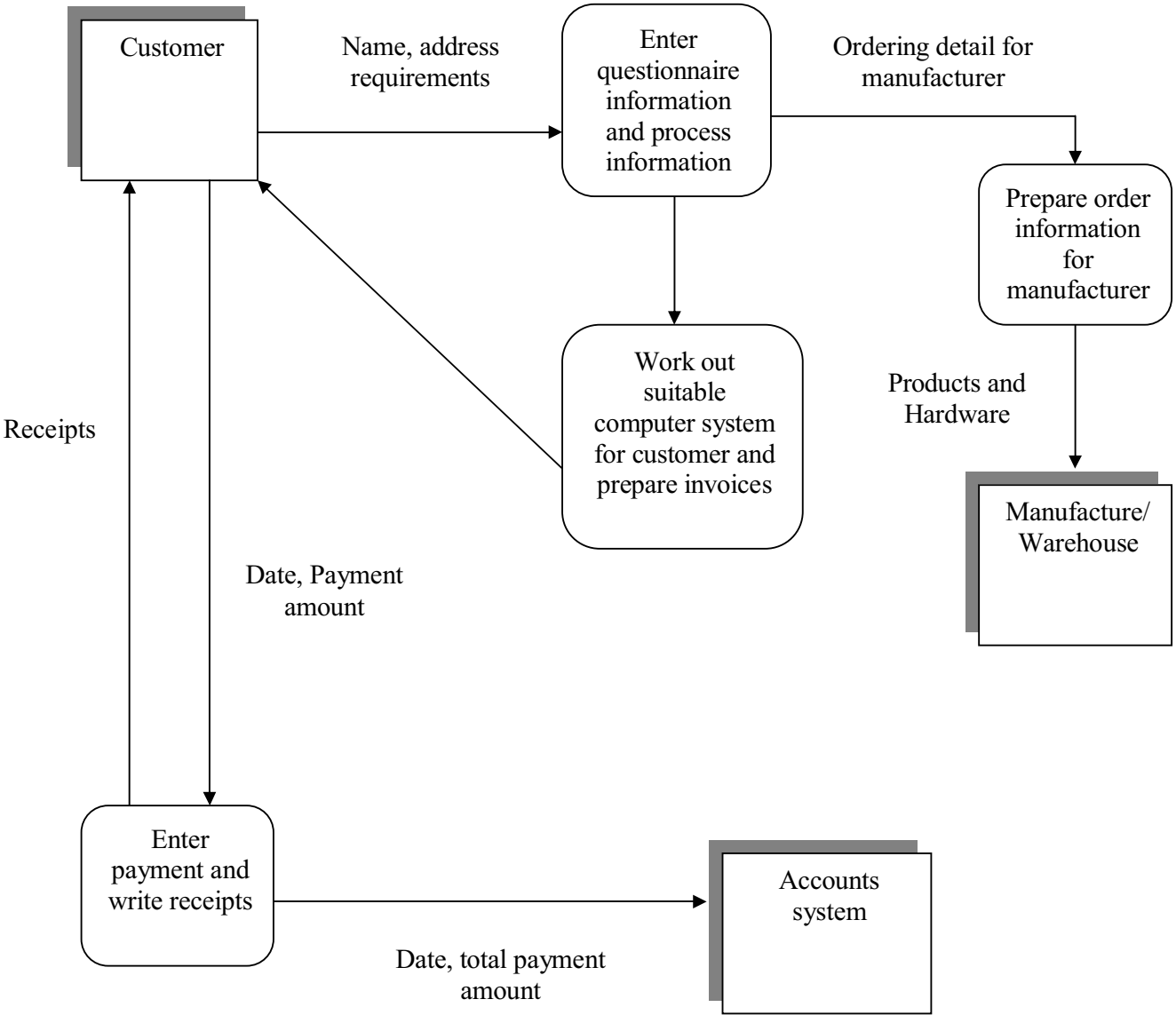
When a customer comes into the shop and asks for a computer system the first thing that the staff do is asks the customer to fill in a questionnaire about what they might be using the computer for and what they will want to get out of their computer system. The customer is also asked if they want different peripherals added to their computer e.g. scanner, printer etc. The staff will then look at this information and they will then take from that information what the customer might want.

They will then use their knowledge and files that they have kept on computer parts to make an educated guess on what kind of computer the customer might want. The staff then gives the customer a quote on what the price might be due to the figures that they have down on paper. If the customer will want that system the shop will take a deposit and then start to deal with the orders.

The shop will then check if the y have some of the parts in stock and what start they will need to order. They will then order the parts that the need from the manufacturer and all the information will be recorded on paper and filed. When that parts come from the manufacturer the parts are put together and the receipts for the parts are calculated up including VAT and then put in a final invoice for the customer and then the customer is notified that the product is ready.

Once the customer comes in and pays for the computer the receipt s have to be the processed and the filed away with all the other information from the transaction including parts and stock checks. This will then be put with all the other customer files and stocked away.

Data Flow Diagram for current system



Problems with the current system

The system that the shop uses is really totally basic and will not be helpful if 3 or more orders are processed in a day. First of all when the questionnaire is filled in the staff will need to go and look at this and see what the customer will want. This could be quite time consuming with the customer having to wait to find out what he/she will want.

Although the customer has filled in the information in the questionnaire the staff will have to keep asking the customer questions so as to get the computer system just right when they are working out what the customer will want. Even though this might be need it could lead to customer dissatisfaction as they having to wait a long time and they might not want to be spending time being asked a lot of questions.

When the staff have got this sorted out they then have to find out what the have in stock. Meanwhile the customer is still waiting to get a quote on the computer they will get. It will be quite difficult to find out what item the will have in stock because they will have to search their stock for each specific part that they have come up with to fit onto the computer.

Once they have found out all the information they need they then have to calculate the guessed prices by hand and the give the quote to the customer who has to give a £50 deposit. All the information has to be written down and filed and all the parts that are needed need to be ordered and the parts that are in stock need to be put aside. All this has to be done by hand and can be very time consuming.

All of these calculations that are done by hand could create lots of problems not to mention the errors that will occur by adding up all the parts. Many mistakes could be made on the quote. All this information has to be recorded on paper and then filed away creating lots of paperwork and a lot less space.

Once the customer comes in and pays for the computer the receipts have to be the processed and the filed away with all the other information from the transaction including parts and stock checks. This will then be put with all the other customer files and stocked away. This will be creating lots more paperwork and even less spaced for more valuable stock such as computer parts. Because all of the information is filled if it is ever needed again it will be very hard to find along with all the other paperwork that is filled away this will create problems if the information is needed quickly to solve a problem.

General objectives

The system should be able to hold information about:

Customers
Manufacturers
Products (Hardware components)

The system will:

- be able to calculate the value of invoices
- be able to create a suitable computer system
- be user friendly
- be easily updateable
- be able to calculate the prices and add on the VAT
- be able to automatically update stock levels when required
- print out a receipt for the customer
- print out a receipt for the shop
- be able to find products quickly and easily

Specific Objectives – Quantitative

1. It should not take any longer than 1 minute to enter in the customers questionnaire answers.
2. It should not take any longer than 30 seconds to find customers details
3. It should take no longer than 30 seconds to find what products a re in stock and what price
4. It should only take at least 10 seconds for the system to find a suitable computer system for the customer
5. An order should take no longer than 1 minute to process
6. It should take no take no longer than 15 seconds to record a custo mer payment

Specific Objectives – Qualitative

1. The system should have a user friendly interface
2. The system should cater for the different hardware products that could go in a computer system
3. The data will be able to be easily entered into the database
4. The invoice generated should be easily understandable for the customers that purchase a product
5. The system should ensure data integrity so that no payment on a computer system can be deleted or altered once they have been entered onto the system

6. The system should be useable by a person with no real prior knowledge of using database software
7. The system should be able to calculate and work out a suitable computer system without any trouble

Hardware and Software

Gigabyte computer currently has a top of the range PC. It is a Pentium 4 with 256Mb of memory; it has a 20 Gb hard drive and an inkjet printer. The system has Windows Millennium Edition installed along with Microsoft 2000. This hardware will be more than adequate to implement a suitable system.

The system that I will be devising and making will be done both on the computers at college and the computer at my house. My home computer is a standalone and is 1.4Ghz AMD Athlon processor with 256Mb of sdram and a 25 Gb hard drive. I also have an inkjet printer. The computers that are used at college are networked up. They have 233Mhz Pentium Processor with 32 Mb of sdram and are attached to a laser printer. My work that is done at college can be stored in user areas and I will be able to transport data via floppy disks or CDR. This will be helpful if I am transferring larger files than usual.

Users IT Skills

The skills of the people that work in the computer shop are quite competent. Although they are not experts they are probably at an intermediate level due to them using computer software day in and day out. This will make them using the system no trouble at all.

Design

Inputs, processes and outputs

Inputs – The system must have the ability to:

- **Add a new customer**; there should be a main screen so that a customers details and information can be added.
- **Edit an existing customer**; the customers that are already in the database should be able to be edited.
- **Enter customer questionnaire information**; the ability to enter the customers questionnaire data so as to get specific information on their preferences
- **Add a new hardware component**; the system must have a screen so as to enter new hardware components and update hardware products
- **Edit a hardware component**; the system should have a link so you will be able to edit existing hardware components e.g. price
- **Find Customer Information**; the system should be able to find a customer within a matter of seconds

Process – The system will:

- **Calculate the price with and without VAT of a computer system** – the system will be able to calculate this quickly and efficiently
- **Update the information automatically when inputted** – if a new hardware device is added then the system will automatically update itself
- **Automatically update stock levels when required**
- **Be able to find products quickly and easily**

Outputs -The system will

- **Print out an invoice for the customer –** the system will be able to print out the fully calculated and list of all the components that were used to make the computer system.
- **Have a fully calculated system –** the system will calculate and show the system on screen
- **Have correct user information –** the system will print out the correct customer information for the orders that the customers made.

Considerations of solutions

There are different methods used for storing such information and organising it.

- **Spreadsheet system –** This would be able to store the customers details, their orders and it will be able to print out the relevant calculations on invoices in the system. The ca lculations could be done to some extent. However it would be difficult to design a data entry form so that the customer details and the customer orders could be entered in one operation and on the same data entry form. It I a lot harder also to format reports in excel so the designs of the invoices would be a lot harder to make.

- **Manual system –** This system would be very difficult to keep up to date and would be very time consuming. This is the system that is already in place. There would be quite a lo t of paper work involved and the amount of space needed to store all this information will be quite a lot. You would have to produce the invoices manually on a word processing package and this could make the action very boring. It would be very impractic al to consider using a manual system.

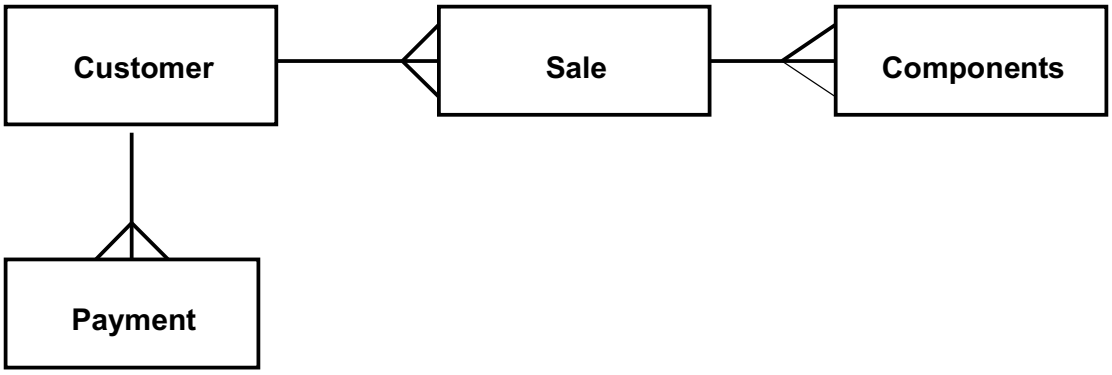
- **Access Database –** This would definitely be the best option to chose for the system that I am going to implement for the data that I am going to be using. I can create easy reports and print them out with ease. The calculations can be done that are needed to be done and I can create a data entry form where I am able to input both the customer details and the customer orders in one east operation. This will the make it a lot easier and more practical to use instead of the other systems. Access, which is a relational database, is already installed on the company's computer and on the school network so it will be easily accessible for me to do my work.

Final Choice of software

The system that I am going to create will be created using Microsoft Access 97 and I have got access to this both at home and at college. This package is great for the system that I am going to create because it has many features which can be used for customising and developing the application, such as:

- Ability to relate tables in a common field;
- Ability to create a customised menu or switchboard system which is user friendly
- Advanced for design features the can be used to integrate sub forms
- Advanced report options that allow p eople to format text, set margins and page layout, import a company logo and preview all this before printing
- Access has the ability to stop users from making mistakes such as typing in a number where the first name should be typed
- You can also perform different processing tasks via queries and macros which allow things such as automated price calculation
- Access also has the ability to create links to other programs such as word or Microsoft Excel.

Database Design



There are 4 entities in this database;

- The customer can make many payments e.g. if they buys more than one computer system then he can make two payments, one for each system
- The customer can have many sales e.g. if they want to buy more than one item, they can buy separate computer systems on separate occasions.
- There can be many components for one sale e.g. the many components that are used make up one computer system which in turn makes one sale

There has to be an entity between the customer and the components. This is so that there can be a relationship made, and that there can be referential integrity kept. A customer cannot pay for the components without a sale because there has to be a 'middle ground' on which the transaction can take place. This will help keep the relationship together.

Table Design

Table name: tblCustomer

Field Name	Data Type	Length	Input Mask	Validation	Format
CustomerID	AutoNumber				
First Name	Text	20			
Last Name	Text	20			
Street	Text	20			
Town	Text	15			
City	Text	15			
Postcode	Text	7	>LL00 0LL		
Telephone Number	Text	10	(99999)000909		

Table name: tblBaseUnit

Field Name	Data Type	Length	Input Mask	Validation	Format

Table name: tblCD

Field Name	Data Type	Length	Input Mask	Validation	Format

Table name: tblHardDrive

Field Name	Data Type	Length	Input Mask	Validation	Format

Table name: tblMemory

Field Name	Data Type	Length	Input Mask	Validation	Format

Table name: tblMonitor

Field Name	Data Type	Length	Input Mask	Validation	Format

Table name: tblOrder

Field Name	Data Type	Length	Input Mask	Validation	Format

Table name: tblVideoCard

Field Name	Data Type	Length	Input Mask	Validation	Format