In this section I will be analysing the problems defined by the management in the old system and define what requirements my ICT system should have to solve these problems.

HARDWARE REQUIREMENTS

This will be the requirements for the computer to be used in the new system:

- ATX casing
- AMD Athlon 1.2 GHz Processor
- Asus A7V33 (C.O.P.) Motherboard
- 256MB SDRAM
- Maxtor 40GB HDD
- NVIDIA GeForce 2 (64MB)
- Creative Vibra 128
- Network Interface Card (NIC)
- Creative Modem Blaster 56kbps Internal PCI Modem with Voice
- 120W speakers
- Samsung 3.44" FDD
- Sony 52X/24X/52X CD-RW (CD-reader, CD-writer and CD-rewriter combo)
- HP Inkjet 1160 printer
- Canon scanner
- Genius mouse
- Genius multi-media keyboard

This is why I chose these requirements:

The ATX casing is important as it holds all the circuits together. Without it the circuits would be easily exposed to dust and so wear off quickly.

The Asus A7V33 motherboard has CPU overheating protection (C.O.P.). Since the computers will be turned on for the whole day it is possible due to cooling fan failure that the computer will begin to overheat. This might cause damage to the internal components of the CPU. C.O.P. prevents this from happening because it shuts down the PC when the internal temperature goes above the recommended level. This system is good as now the data is more secure from being damaged or corrupted.

The AMD Athlon 1.2GHz processor is reasonably cheap and fast so it is well suited to the new system which is to be implemented. Pentium might be a good choice but the processors are expensive and since one of my objectives is to reduce the cost to the company AMD is better suited. 256MB SDRAM is a recommended amount of RAM for the concerned processor. Also, having this amount of RAM will ensure that processing is fast.

The Maxtor 40GB HDD is sufficient disk space for the system.

NVIDIA GeForce 2 is one of the best graphic cards in the world and is quite cheap for a graphic card of its type. Other cards of this capability would cost a whole lot more than this.

The Creative Vibra sound card and the speakers are required to give sound output for the computer. This will make the computer more interactive.

The NIC allows a group of computers to be interconnected to each other so that data transfer can be done. The modem allows the computer to be connected to the internet so that communication with the branch in India will be possible.

The FDD and the CD-RW are mainly required for backing up data which is meant for security purposes. This backing up of data will ensure that there is no loss of important files.

The printer is meant for producing hardcopies of the data. Some items such as reports are meant to be printed so the printer is capable of handling this job.

The scanner is meant for data collection. Pictures of the items available and data collection forms can be scanned so that the data is transferred to the computer and backups can be made.

The keyboard and the mouse are essential for data input to the computer.

SOFTWARE REQUIREMENTS

The Operating System I will be using is Microsoft Windows 2000 Professional Edition. The OS I am going to use is suitable as it was built on NT technology which was made for networking and business applications. The OS is stable enough and gives detailed information on what processes are going on in the system and how it is responding.

I will also add Norton Antivirus 2003. This is by far the world's most trusted anti-virus solution. It repairs common virus infections automatically, without interrupting your work. It scans and cleans both incoming and outgoing email, and defends against script-based viruses even between virus definition updates. These are some of the features it offers:

- Automatic removal of many viruses without interruption.
- Script Blocking detects script-based threats, even before new virus definitions are created for them.
- Scans and cleans outgoing email messages to prevent sending infected files from the PC.
- Integration with Windows Explorer lets the user use many common Norton AntiVirus functions from the Explorer menus for easy access.

The next software required is Microsoft Internet Explorer 6.0.2600.0000. This is the latest version of the world-famous internet browser and it offers problem-free browsing.

The most important software required is Microsoft Office 2000. This package contains MS Access which is a database program. I will be using this package to computerise the system. Then the drivers need to be installed so that the components will work.

I had a choice of programs such as MS Visual FoxPro and MS Excel but I chose MS Access as:

- MS Access is a ready made package so no customised program or extra software is necessary.
- MS Access is a database program.
- I am much familiar with the MS Access interface.

- Tables are simple to create in MS Access as it is 'automatically' created i.e. you only have to define the field name, field size and data type for the field.

- I can customise databases to serve as forms to be entered. This would make the system user-friendly.

- Queries can be made in MS Access. This allows the user to filter the information according to the requirements.

- Reports can be generated through simple steps and these reports look professional.

- Relationships can be created between individual tables so that integrity of data is ensured.

- A switchboard can be designed to serve as a start-up menu for the operator.

- Help is easily available in MS Access for each feature so if I encounter any problem while designing the system help is readily available.

- MS Access is a product of Microsoft© which is the biggest computer software giant. So the program is trustworthy as the program is designed for not one application but a huge field of applications.

DATA COLLECTION

Now that the computer is taken care of, I will have to decide how to collect the data needed for computerising the system. Now, first I need information on the functioning of the branch itself. I opted for interviewing the manager and the secretary since interviews will get me more detailed information on the requirements of the system and the manager and the secretary are more knowledgeable on the functioning of the showroom as well as the administration office. Hence, I first interviewed Mr. Nathan Fernandez, the manager of the showroom. I also intended to find out what Mr. Fernandez intended with regard to the computerisation of the business.

Q: How would you rate the current system that is being implemented in the branch?

A: Well, the system is very inefficient. The branch is suffering due to so many problems. It would be better to keep the showrooms in India itself as we are progressing there.

Q: Can you tell me what exactly do you do in the office?

A: I am mainly responsible for stock control in the branch. It is my duty to ensure that the branch runs smoothly without any problems, view profit and loss graphs and judge how the public is buying each product. Accordingly, I have to manage the stock of the items. Also, I must decide how much salary the employees of this showroom.

Q: How often does the branch restock?

A: Well, we regularly restock every month. Sometimes, if an item is on high demand and we run out of stock, we then order between the month itself.

Q: Where do you store your stocks?

A: We store it in a huge storeroom located behind the showroom so that we wont have transport problems.

Q: How do you monitor and maintain the stock levels for the branch?

A: I first check the stock sheet prepared by my secretary. This stock sheet contains detailed information about each product. It also gives details about the demand of the product. It also contains the current stock level of that product. I look at the current stock level of the item and then the demand of a product and accordingly decide how many items I have to order.

Q: What disadvantages do you face when working with this system? And please explain clearly what you expect the computer system to do in order to sort out the problem.

A: A big problem is the extreme use of paper. There are loads of papers situated in the administration office which causes a huge mess. This mess makes it very difficult for us to do our job as it is hard to search for a particular file, in spite of the cabinet system. Also, I really exhaust myself when its time to restock. I expect the new system to use the minimum amount of paper so that most of the data is screen-based. Another issue is the forms where we note down the amount. We have to make numerous forms for each month so it gets really hectic. The new system should be capable of automating the stock control system so that all I will have to do is verify the stock levels and then pass the form to the secretary.

Q: Are your suppliers international or do you have a local agent?

A: Fortunately, we have local agents. Other companies import the stock from abroad. We just ask them to deliver the products to us.

Q: Do you feel this is a problem to the company?

A: No, it's really fine. We manage to bargain a bit so that our company can benefit from a larger profit level.

Q: Let's speak about the showroom itself. What must the customer do to purchase the item?

A: Well, this is similar to other companies. The customer will choose his product and then go to the cashier. The cashier will take one of the receipt books and write down the product id, the name of the product, the price paid and he will put his signature down. Then he asks the customer to sign the receipt and gives it to him while keeping the carbon copy. Customers can choose whether they want the product or products to be delivered to their residence.

Q: Do you find any problems with this?

A: The only problem is that the writing work is too slow. Also these receipt books also take up space so we need extra cabinets to store them. Otherwise it seems fine. I would want the system to automate the billing so that customer will not spend much time waiting for their receipt.

Q: One of my friends who purchased some goods from your store said that you do not accept credit cards. Is this true?

A: Yes. The problem is cash is the easiest payment. We do not have any terminals for using credit cards and credit cards bring up expenses. Since we are not benefiting from this old system, we would find the credit card terminal to be a great liability.

Q: Do the problems you have mentioned increase the prices of the goods that you sell?

A: Of course they do. We can't afford to keep profit levels low when the management expenses are high.

Q: Is training required for the staff?

A: Yes. We don't want any mishaps to take place so I think training is really necessary.

From this interview I learned about many problems that the company is facing. These are the important points I have noted:

- A lot of paper is used. This makes it easy to misplace. Some important files can be considered as trash and be disposed off accidentally. This could cause a problem for the company. Storing in a computer would be a better choice as the files could be organised. Also information is displayed on screen so no paper is needed unless the need for hardcopies arises.

- Forms need to be made and filled in often. The changes to be made have to be written on new forms hence it contributes to the use of more paper. This also means the data which remains the same also has to be rewritten. If a mistake is made then it is a problem changing the figure as the report gets untidy. The value might be hard to read. In a computer, however, changes can be made in the same field. Again these are displayed on screen so there will be less use of paper.

- The showroom does not accept credit cards as a method of payment. This is a loss to the company as most people pay using credit cards. A computer could be used instead to store the information and it could be attached to a terminal which reads credit cards and carries out the transactions.

- The staff needs training to use the new system. Hence we have to arrange for training sessions for the staff and a complete documentation of the newly implemented system.

Next, I interviewed Mrs. Lorraine Hudson. We talked about what was her function in the company and what disadvantages she faced while working with the old system. This is what I gathered from the interview:

- She had to write the same letter to all the supplying companies. The letter stayed the same – the only difference was the change in company name and figures. Writing was becoming a pain for her and on top of that she had to put them in envelopes. I figured that a computer can directly use a standard letter and the varying data can be obtained from the database itself (mail merge).

- She was in charge of preparing stock levels. Again this was a written job and was therefore exhausting. Sometimes she was asked to prepare graphs and so plotting it was hard. A computer can easily generate reports and can also make graphs and charts to make the information more comprehensible.

PLANS

Now that I have my information, it is time to work on the system. I have all the details necessary so I can start making my databases for the new system.

tables

These are the tables I intend on designing for my system:

- A stock table that holds the stock information of each product. This will have detailed information about a product like the present stock level, the minimum value before restocking level and the maximum level of the product. It will also display the status by comparing the present level to the minimum level.

- A details table that holds information of each product. This table will have the product's ID, the name of the product, the supplier name, description and other required fields.

- A repairs table that holds the information of the customers who have sent in appliances for repairs. Here the customer's id, name, product submitted, price and other important fields will be added.

- A customers table that holds information on the customers that have bought an appliance from Elektroniks Inc. for the past 2 years. This is just for reference and statistics. This table will have important details of the customer, the items he has purchased, total price and the method of payment.

- A table to hold the different types of items in the company e.g. TV, PC etc.

In all these tables a very important feature is validation. Validation is used to avoid errors and I have mentioned its importance in the new system later on in this section. I will basically use it to avoid important fields being left blank. I will also use the Input Mask property to enter data in a certain format. The Input Mask will also act like a kind of validation in the sense that it will restrict the user from entering incorrect data.

forms

Forms are more presentable that the plain tables. I can edit the colours of the form, the various options in it as well as add graphics and headings. These are the forms I intend to create:

- A 'purchase' form which will be used to enter new customers' details. This form is created from the customer table. Here I will use the code-builder function to create the total field such that it should really calculate the total and display it automatically.

- A 'repairs' form which will be used to enter details of customers who have sent in appliances to be repaired. This form is created from the repairs table.

- A 'stock control' form which is used to enter item information and stock details. This is created from the stock control table. Here I will add an extra 'find' feature which will allow the user to search for an item.

- A 'suppliers' form where details of the suppliers can be entered.

- A 'suppliers and goods' sub form where the details of both the supplier and the item supplied by it can be entered, at least the basic information.

To these forms I will use various controls from the toolbox to make a neat and easy-to-understand form. This will include buttons, option group etc. I will also use the 'filter by selection' function in the stock control form in order to view all the items that require restocking.

queries

I will be creating queries to filter data with a certain criteria. I intend to create the following queries:

- A query which displays items whose price is lesser than Dhs. 100.

- A query which displays items whose price is greater than Dhs. 15,000.

- A query which displays repairs by a user-defined collection date.

- A query which displays repairs by a user-defined technician name and submission date.

- A query which displays the repairs to be handled by Andy (technician).

- A query which displays the repairs to be handled by Arvinda (technician).

- A query which displays the repairs to be handled by Barry (technician).
- A query which displays the repairs to be handled by Jose (technician).
- A query which displays suppliers by a user-defined country.
- A query which shows the information of an item whose item code is user-defined.
- A query which displays the items which need restocking.

relationships

I will also add relationships to avoid the duplication of data. Relationships are associations established between common fields in two tables. It will also increase the integrity of data as an error message will be displayed if values are different from any of the tables. Relationships appear in three different forms – one-to-one, one-to-many and many-to-one. I will be using the one-to-many relationship.

reports

I will also create reports as they are important for statistical purposes. These are the reports I intend to display:

- A report which displays all the items sold by the company.
- A report which lists all the items by suppliers.
- A report which lists all suppliers by the country they are located in.
- A report which lists all repairs to be handled by Andy (technician).
- A report which lists all repairs to be handled by Arvinda (technician).
- A report which lists all repairs to be handled by Barry (technician).
- A report which lists all repairs to be handled by Jose (technician).
- A report which displays all the repairs to be collected on a particular date.
- A report which lists all the repairs by the technicians' names.
- A report which lists all the repairs by collection date.

In addition to this I will be using MS Word for mail merging so that the secretary's problem of sending mail to the suppliers is handled.

macros

Macros are a small set of instructions which carry out an action when it is activated. I will be using macros to open queries as opening queries is not an option in the switchboard manager. These are the macros I am going to create:

- A macro which opens the query for displaying items less than Dhs. 100.
- A macro which opens the query for displaying items more than Dhs. 15,000.
- A macro which opens the query for displaying repairs by a user-defined collection date.
- A macro which opens the query for displaying repairs by a user-defined technician name and submission date.
- A macro which opens the query for displaying items to be restocked.

BACKUP STRATEGY AND DATA PRIVACY

In my project, validation and verification processes are essential. In a computerised system the integrity of data is important. Verification is a double check to see whether data is correct or not. This can be done by having two operators type in the data and then the computer checks both lists and identifies any differences in the records. This would be very useful to the company as this would avoid any mistakes and increases the integrity of the data. Since the data should be accurate, verification should be carried out on every data entry so that none of the data is corrupt.

Validation also is a very powerful feature as it too increases the integrity of data. Validation is carried out by placing some 'checks' on certain data items. For example, a length check could be installed on an ID field so that the field will not exceed the limit of characters. So if a product's ID is A4710 and a length check of 5 characters is induced then the value A47102 which might be accidentally typed will not be accepted by the computer. Validation is very important in my system as it completes one objective of my project: the integrity of data should be as high as possible. I will be using validation checks on most of my data items to ensure that the system is as accurate as possible.

Backing up files is another important issue. The company could be at a loss if a virus is introduced to the computer system or there is a physical threat such as flood, fire etc. This would prove to be a serious problem to the company as important files may be lost. Since I am using a CD-RW the company can make a copy of the file and burn it onto a blank CD. Thus if there is a threat to the computer system then worry is not necessary as there are back ups. The company should back up their files every week on to a CD and everyday onto a floppy disk.