

VIDEO RENTAL SHOP

INTRODUCTION:

There are many small businesses, some of which are estate agents, sports clubs, video rental shops, and mechanics. Many of these businesses don't have a computer system to help them handle and communicate data. They do everything on paper and use filing cabinets as a means of storage. My local estate agent uses the traditional method of paper and filing cabinets, as well as my local video rental shop and mechanics. But my local sports club does use a computer database system to store membership details etc. So I have decided that they will not be requiring my services as they already have a system. Now I was left with three businesses with no use of a computer system to offer my help to. I offered my help to the mechanics as they had a lot of new customers coming in everyday and they had other challenges as well. They rejected my offer as they said that they would be getting a very advanced computer system soon. After I did some research on both estate agents and video rental shops. I decided to choose the video rental shop. I made this choice as I saw the vast amount of new data they were receiving each day whereas the estate agents were only receiving little quantities on data every two to three days. Also the video shop needed my help more as they were under a lot of stress and pressure.

I went to my local video shop 'Quick Rentals' and discovered that they keep a lot of records in filing cabinets. I tried to find members details and the video(s) that they had rented and it was impossible. It took me 45 minutes to make a match of a member and what video(s) they had. I realised how hard it's is to monitor members details. Obviously it wouldn't take the shop assistants that long, but it still does consume a lot of their time. Someone wanted to become a member and it took a worker almost 25 minutes of questions before the customer was actually a member. So we can see that everything is very time consuming and places additional stresses and pressures on the shop assistants.

The shop assistants everyday have to go through every rented video and see if it's overdue and if a video is overdue they have to write a note so appropriate actions can be taken when the video is eventually returned. So when someone returns a video a check of the notes have to be done to see if that video is in fact over due. This is also time consuming. So to make the life of the shop assistants easier I have decided to set up a database system.

INVESTIGATION:

The shop assistants have great difficulty with overdue videos, new member additions and seeing whether a video is on rent and who to, this is why the video shops owner Barry has to employ ten members of staff. With the aid of a computer all the tasks above could be very simple to carry out.

ANALYSIS:

I will be designing a database for the video rental shop. I will need to use Microsoft Access. As I have said the filing cabinet method does take up a lot of time and leads to long delays in the shop and dissatisfied customers.

The potential users of the system will be Barry and the ten shop assistants. I went into Quick Rentals and asked Barry some questions. Below are the questions and the answers.

Have you any knowledge of Microsoft Access?

Yes I do know how to use Microsoft Access, but I'm pretty sure not all of the shop assistants do. I could teach whoever doesn't know about Microsoft Access as I'm not actually in the shop all the time so they will have to learn how to use it.

In what ways will the system help you and the shop?

Well, it'll help me, as there won't be as much customer complaints about the speed of the service. Also at the moment I'm on a tight budget as I have so many staff. So hopefully I can get rid of a few as the system as you say will speed up things around here. It will also benefit the shop as those big grey filing cabinets can go. It will basically improve the general appearance of the shop. Also some customers tend to leave as queues get to big or as allocating them videos does take some time. So with the use of the computer I hope that will all be a thing of the past.

Would you let customers use the system on the computer?

I don't think so as it's going to be too inconvenient as the computer will be behind the counter. It would be a security risk if customers were allowed behind the counter. Also not all customers will know how to use the system and damage could be inflicted to the computer.

My system will consist of four stages, input, process, storage, and output. Input will be where the shop assistants will need to enter information on new customers willing to be members. The customers could fill out a data capture form to do this. Also information on the already members will have to be entered. Information on the videos would have to be entered. Process is where all the records will have to be sorted. So all member details are together etc. It's also where the data will be processed so all members will be matched up to videos they have. The information stored would have to be easily and quickly obtainable. Also the data should be able to store in vast quantities.

SPECIFICATION:

The system must include the following features:

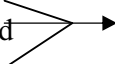
It must have the ability to add new information, edit/amend information and delete information. Also it must have the facility to implement efficient searches-specific searches by membership number, by name etc. The system should make the best use of storage facilities giving easy Access to relevant data for each employee. Finally

the system has to be a user friendly one. A database help wizard must be installed so those employees with little knowledge or those who get stuck have a method of help.

Barry at the moment doesn't have a computer in the video shop. But he is willing to purchase one for around £1000-1500. £1000-1500 is a good choice, as a very good spec computer can be purchased for well in that price range. Purchasing the computer would seem like an expensive venture, but it will certainly be for the best. Barry could get rid of some staff as he said before and also it would stop customer delays.

If Barry decides not to purchase the computer then his staff will still be left with the big workload. They might get sick of it and they might leave or demand a bigger wage packet. Another thing is that he will never truly be able to expand his video shop, as the workload will become too high if he wants to. This could lead to his staff not coping with the work and his reputation could go down. Or he will have to employ even more staff, which in the long run will prove to be far more expensive than a computer.

Below is the spec Barry should be looking for:

- A fast 1.5 to 1.7GHz Pentium 4 processor, so the computer opens etc very quickly.
- 256-512 MB of RAM to make sure that programs run smoothly and so many programs can be run at any one time.
- A CD-ROM drive to install new programs etc.
- CD re-writer as a form of backup.
- Zip drive for backup purposes
- 21" monitor to output the data clearly to the user.
- Scanner
- Keyboard  to input data into the computer
- Mouse
- Printer-Laser to output customer details etc in very good quality.
- Speakers to output data.

DATA TABLE:
MEDIA TABLE

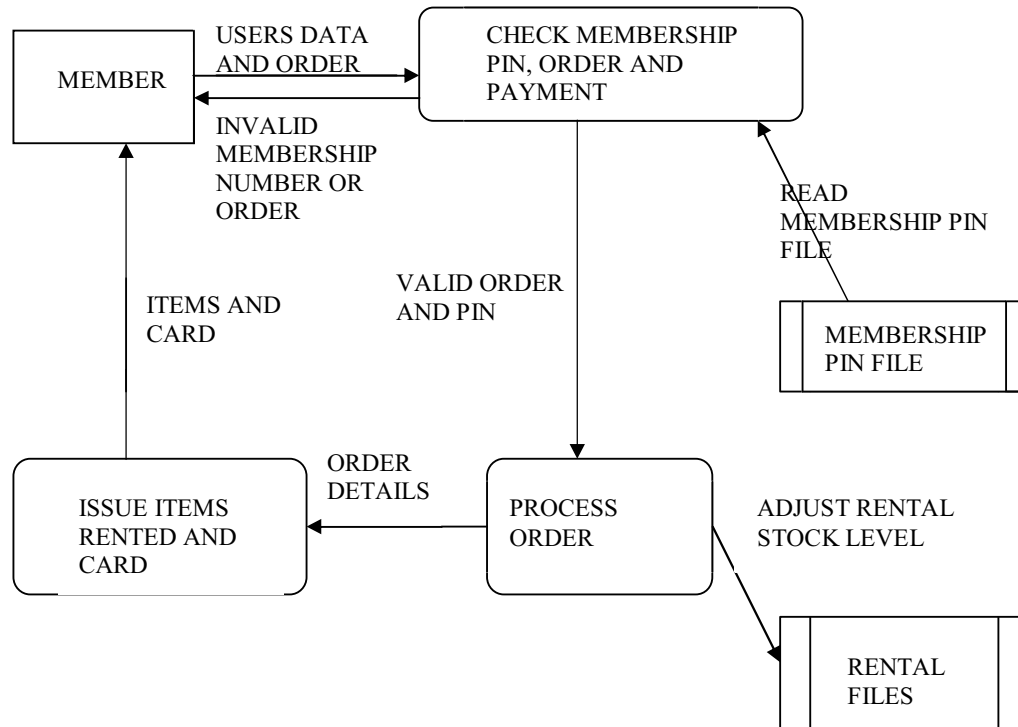
ITEM (DATA)	DATA TYPE	FIELD LENGTH	EXAMPLE
TITLE OF FILM	TEXT/ NUMBER	50	GONE IN 60 SECONDS
DIRECTOR	TEXT	30	SAM MENDES
RATING	TEXT/ NUMBER	2	18
THEMES	TEXT	30	ACTION AND THRILLER
RUNNING TIME	TEXT/ NUMBER	8	114 MINS
RELEASE DATE OF FILM IN CINEMAS	DATE	10	16-03-1999

RENT CODE	TEXT/ NUMBER	3	17B
RELEASE DATE OF FILM ON VIDEO/ DVD	DATE	10	16-08-2000
FORMAT OF FILM	TEXT	5	DVD
OVERDUE	YES/ NO	3	YES
DATE RENTED	DATE	10	21-12-2001
DATE DUE	DATE	10	24-12-2001
RENTAL CHARGE	CURRENCY	5	£3.99

MEMBER TABLE

ITEM (DATA)	DATA TYPE	FIELD LENGTH	EXAMPLE
FIRST NAME	TEXT	30	JOHN
LAST NAME	TEXT	30	FALKNERS
FULL POSTAL ADDRESS	TEXT/ NUMBER	50	85 GEORGE TOWN, WEST WINDFORD, LONDON. E14 1FF
E-MAIL ADDRESS	TEXT/ NUMBER	30	John49303@hotmail.com
HOME PHONE NUMBER	NUMBER	30	020-8-506-7897
WORK PHONE NUMBER	NUMBER	30	020-7-892-4678
MOBILE PHONE NUMBER	NUMBER	25	07797373237
D.O.B	NUMBER	10	09-11-1967
MEMBERSHIP NUMBER	NUMBER	8	00997788
NUMBER OF ITEM (S) RENTED	NUMBER	4	3
TOTAL PRICE OF RENTED ITEM (S)	CURRENCY	6	£10.99

DATA FLOW DIAGRAM



IMPLEMENTATIONS:

SOFTWARE:

Software there are two types of software these is application software and operating systems. Application software is programs that are designed to do a task on the computer e.g. databases, word processors spreadsheets etc. A database can be used to store, sort, and search and retrieve information. You can also make database forms, database reports and Macros with your information. Quick rentals can use it to store customer details, also video or DVD details etc. Word processors could be used to write letters to the customer etc. there are many features available on word and one very useful one is spell check. This is where the computer underlines spelling and grammar mistakes you make in a document. When you see a word underlined you go to spell check in the tools bar. Then you will get suggestions to your mistake and you choose one, which will correct the mistake. A spreadsheet can be used to calculate complex calculations. It involves you typing in formulae and numbers to get answers. The spreadsheet can also show numbers in the form of graphs.

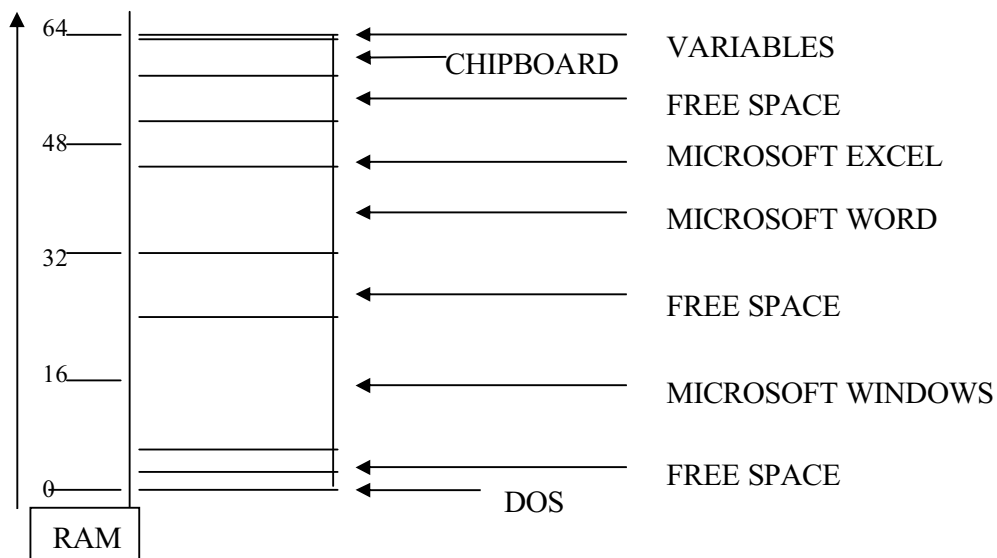
I'm going to use a database for my system, I will be using a relational database using the software: Microsoft Access. I could use Microsoft works but that is a flat file database and I need to have lots of information on my database. I can't use a spreadsheet as that is a program for calculations and I need to make query forms etc.

Operating systems basically keep the smooth running of your computer and it also controls basic inputs and outputs like the movement of the mouse. Running many tasks at the same requires the processing power to split up and powering each task. Balances between tasks have to take place and this requires a lot of time. They also handle input and output and make sure that each of these things does what they are meant to.

HARDWARE:

There are many hardware devices available, but the following will be essential for Quick Rentals. They would certainly need a PC with a processing speed of around 1.5-1.7 GHz. So the PC starts, closes etc at high speeds. Alternately they could go for a processing speed of around 1GHz, this would be a lot slower and is around a year old. This would be cheaper by about £200-300, but my client wants to keep up with the new technology. This is good as some software might not be able to run on 1GHz PC's in the coming years.

Quick rentals would also require a lot of RAM for storing customer details, video and DVD details etc. So around 40-60GB should be required. They would also need lots of random access memory (RAM). This is needed so many programs can be run at once with smooth ease and speed. I would recommend 256MB of RAM, but my client is insisting to keeping with the latest developments. So I think 512MB of RAM is will be purchased, this amount of RAM will make many programs run simultaneously very smoothly and rapidly. Below is an example of how 64MB of RAM may be used by the computer.



As we can see from the memory map even if Barry decided to buy a PC with 64MB of RAM, he would have 8MB of free RAM when running 3 programs. But Barry wants a PC with 512MB of RAM so it is obvious that programs etc will run amazingly well.

Quick rentals would need a QWERTY keyboard to input information on members etc. A mouse would be needed to access programs and for use on windows. A printer would be needed: a laser printer is recommended as it prints pages very quickly, the printing quality is very good and noise made when printing is low. And finally, Quick rentals would need windows, windows 2000 or 98 is needed to get all the applications running and to get a graphical user interface (GUI).

DATA CAPTURE/ COLLECTION:

Capturing data is very important. Advantages in terms of speed, accuracy, and/or cost would have to be taken into account in choosing which method to use. Methods of direct data capture are becoming more common. You don't need to key in large documents anymore, the speed is cut and accuracy is greater. Costs of systems can be expensive, but after they have been set-up barcodes and magnetic strip are cheap. The information can be inputted using the following devices: a keyboard, mouse, graphics tablet, touch screen, but the quicker methods are using scanners, optical mark readers, optical character recognition and a barcode reader. The Quick rentals will need to capture information on members and their media. So they can make someone a member if they want to join. Asking the customer to fill out a simple form can capture the data needed for someone to become a member. Then all captured data can be put on the database.

There are several possible sources of error before the data is processed:

1. The person responsible for completing the form could make an error entering an incorrect code, adding up totals incorrectly, forgetting to enter some aspects of the data etc.
2. The person keying in the data from the form to the computer could make a transcription error.
3. A form could go missing-dropped onto the floor unnoticed or the writing was so difficult to read, the operator put it in the bin.
4. A bored keypunch operator, chatting to a colleague. Could enter the same form twice without realising it.
5. A faulty connection between hardware components such as the processor and disc drive could result in some characters being wrongly transmitted.

Below is a data collection form:

FIRST NAME:
LAST NAME:
NATIONALITY:
D.O.B:
FULL POSTAL ADDRESS:

HOME TELEPHONE NUMBER:
WORK TELEPHONE NUMBER:
MOBILE NUMBER:
E-MAIL ADDRESS:
PROFESSION OF WORK:
REASON (S) FOR WANTING TO JOIN QUICK RENTALS:

HOW DID YOU HEAR ABOUT US:

WHAT DO YOU THINK OF QUICK RENTALS:

HOW FREQUENTLY DO YOU SEE FILMS IN THE CINEMA:

The first 10 questions are closed questions, as they have no alternate answer. I put these in as they are needed for security reasons and for the identity purposes of the person. E.g. in case they don't return an item of media then Quick rentals can contact them and take the necessary precautions.

'Reasons for wanting to join Quick rentals.' This should be asked so Quick rentals can find out exactly what makes people join them. Finding out this information will help them find out how they can expand etc.

'How did you hear about us?' This is an open question as a wide number of answers can be given. This should be asked so they can find out the main places where people are finding out about them.

'What do you think of Quick rentals?' This is asked so they know what people think of the business. It helps as Quick rentals find out where they stand with the customers and improvements can be made if necessary.

'How frequently do you see films in the cinema?' This was asked so the Quick rentals can see how many of their members do visit the cinema a lot. If a lot of their members visit the cinema a lot this could mean to them that, they would be less likely to rent media. If most of their members don't go to the cinema on a regular basis this shows them that they have more of a chance of people renting media.

INPUT:

Below are my choices of input devices followed by an alternative to them:

Keyboard- these normally come in a QWERTY format and are a very useful way of entering data into a computer. Most keyboards come with a wrist rest device so to

make typing faster and comfortable. Entering data via a keyboard can be slow, but it's accurate. I choose a keyboard as it's very reliable and is cheap.

Concept keyboard- this is just an alternative, but it's not a good one. As these type of keyboards are mainly only used in restaurants etc as they only have to input simple things.

Mouse- the movement of the mouse is mirrored on the monitor as it moves. It's a good way of entering programs and working your way around the GUI. It's also relatively quick to use as well as being simple to use. They don't cost much and are useful, that's why I choose a mouse.

Touch screen- these are very easy to use and information is accessed by touching the screen. But these are very expensive and Quick rentals are not looking for something like that, so it's just an alternative choice.

MINIMISING THE POSSIBILITY OF ERROR

1. Control Totals and Hash Totals

50 documents are collected into batches these can be sales orders. This is what is done in batch processing and a data control clerk would be responsible for:

- Counting the documents
- Checking each one visually
- Calculating a control total of a crucial field such as Total Payable for the entire batch of documents
- Calculating hash tools: A total which is collected purely for the validation purposes e.g. the size of all the garments ordered in a batch of forms
- Filling in a batch header document which will show a batch number, number of documents in the batch, date received, control total and hash total.
- Logging the batch in a book kept for this purpose

In the control and hash tools data from the batch header is keyed in as well as all of the documents in the batch. The computer can do calculations that were done manually by the data control clerk. If there is an error then batch is rechecked.

2. Validation checks

These are what the computer can do when data is being inputted. Validation checks include Presence check, Format check, Range check, File lookup Check, Batch header checks and Check digit checks.

The modulus-11 system is the best way of calculating check digits. The method is that each digit has a weight, with the number on the end (right-hand) having the lowest weight of two, and the next digit has three and so on. Then each digit is multiplied by its weight and the products are then added together. After the sum is divided by eleven the remainder is kept. The remainder is taken away from eleven to give check digit. Below is an example:

$$\begin{array}{cccccccc} 0 & 9 & 5 & 3 & 2 & 4 & 9 & 0 & 8 \\ \times & \times & \times & \times & \times & \times & \times & \times & \times \\ 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 & 2 \\ = & = & = & = & = & = & = & = & = \\ 0 & 81 & 40 & 21 & 12 & 20 & 36 & 0 & 16 = 226 \end{array}$$

$$\frac{226}{11} = 20 \text{ remainder } 6$$

$$11 - 6 = 5$$

Check digit = 5

VERIFICATION

This is when data is entered twice to make sure the data is accurate. E.g. this is used commonly in when setting passwords.

DATA SECURITY

INTERNAL AND EXTERNAL THREATS TO ICT SYSTEMS

Data and programs are vulnerable to deliberate or accidental loss or damage form within and outside the organisation. It can be anything from computer hackers trying to hack into company's files to a floppy disk that no longer contains your work. There could even be an employee who seeks to do illegal means.

INTERNAL THREATS

Internal threats could be hardware failure where there could have been a system crash or maybe a disk head crash. Employees could be using faulty procedures: a poorly trained employee who doesn't understand how to make entries. The employee might not be keeping to "good will", e.g. not changing password every two to three weeks or keeping a very simple password to guess or know.

EXTERNAL THREATS

Hackers could gain entry into a companies database and stealing or corrupting data or using information gained to carry out fraudulent transactions.

TYPES PF BACKUP:

There are several types of backup and these include online backup, periodic backup, backing up files onto the Internet and backing up laptop data.

OTHER SECURITY MEASURES:

One is installing virus checkers on all networks. Another could be careful vetting of staff. This when if an employee is fired they are escorted from their desk and out of

the building. Careful placing of mainframe computers in large organisations to minimise danger from flooding, with smoke alarms and fire- quenching systems installed. Normally they are sited in anonymous buildings because of the treat of extremist attacks. And also firewalls can be used to maintain security on the Internet.

OUTPUT:

Below are my output devices followed by an alternative to them:

MONITOR:

A monitor is the most common output device and they range in size from 13 inches to about 21 inches. A 21 -inch is needed by Quick rentals as they need to use it all day and the bigger the monitor the less stress there is on the eyes. Also they need to be able to see the information quickly as they will be serving members, so a good way of doing that is by having a big monitor. I choose a monitor because of the reasons above and because its not too expensive.

THE FILM TRANSISTOR SCREEN:

This is an advanced form of display giving high quality output. These are generally more expensive than normal monitors.

INK-JET:

This is a printer in which the print head contains tiny nozzles through which ink I sprayed onto paper, to form characters. They are not expensive and are useful for printing of documents etc. So an inkjet is my choice for a printer.

LASER:

A laser printer works on the same basis as photocopiers. They are very quick and have an excellent quality print. But colour laser printers are very dear and Quick rentals don't really need to do too much printing so there is no point in purchasing a laser printer.

TESTING:

Below is a testing table for my database system:

TEST	PREDICTION	RESULTS
TYPE ON MORE NUMBER OF CHARACTERS THAN ALLOWED.	ERROR MESSAGE COMES UP AND MORE TEXT CANNOT BE TYPED.	ERROR MESSAGE DID COME UP.
PRINT	THE SELECTED SHEETS SHOULD PRINT.	SHEETS PRINTED OUT.
DELETE	SELECTED ITEM (S) SHOULD DELETE.	SELECTED ITEM (S) DID DELETE.
EXIT	PROGRAM SHOULD CLOSE.	PROGRAMS DID CLOSE.