

Computing Project – Designing a Ticketing System for a Cinema.

Introduction

1.1 Background; I have chosen to undertake a project where I redesign the ticket system within a cinema. I have been to many cinemas around the Croydon area, some of the more larger cinemas; for example the Warner village cinema in Valley Park Leisure Complex 21, Hesterman Way, Croydon, Surrey, -have a computer system that is quite advanced compared to those of smaller cinemas.

An example of a smaller cinema is West Croydons Safari cinema London Road Croydon Surrey. This cinema has been around for years without much of an improvement in the computer system used; their system is not as advanced as the Warner Village cinema. An example difference in the systems is that the safari cinemas uses an older interface, the dos interface. Warner Village however uses a win32 environment interface.

The safari cinema has been around for years without much of an improvement in the computer system. This type of old system as in the safari cinema would work more efficiently and prove more productive if it were redesigned. Other concepts within a cinemas workings could be incorporated within the cinema ticket system.

The setting of the problem is based upon the ticket system, which can be greatly improved on in many areas. The staff on the ticket sales desks would be more motivated with a more improved computer system, if the look and feel of the interface was made more appealing; the staff could be more encouraged and motivated in dealing with ticket requests. The staff would also be more alert with an improved computer system that would cut down on mistakes made when customers purchase a ticket from a booth.

I have had occasions where on purchasing a ticket from this cinema the film I requested is not the one that is printed on the ticket! -Which is fairly bad practice that can be contributed to by a computer systems problem or a lapse in concentration on the staff's part. However with the mistakes it can be said that the current system fails in areas, In a redesigned system, which iam going to produce there would be 'Is this ticket Correct?' message boxes to be sure that mistakes are not made as often.

I have been to the safari cinema on quite a few occasions, they have a staff of about 15 altogether for the entire running of the cinema, but with only 2 ticket booths which each occupy one member of staff. The ticket prices within the cinema are cheaper than those of larger cinemas, they are as follows; £3.50 for those aged 16 and above, and a special offer on Wednesdays where tickets are £2.00 all day. The cinema has 4 screens and around 2500 seats.

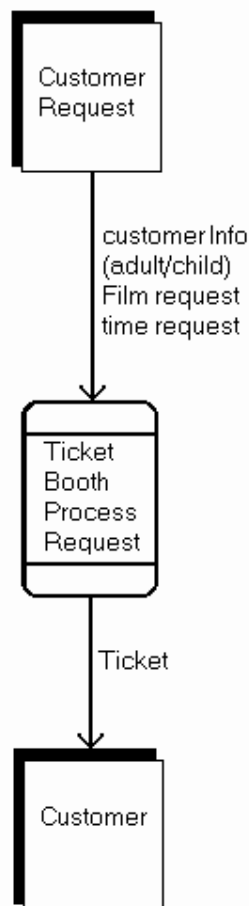
Investigation

2.1 Current System; The current system does make use of computers, although many aspects of the computer system could be improved upon greatly to enhance the workings of the ticket/cinema system. At the safari cinema they have a system which typically contains; data on the seats of each screen room- which are taken/free, data on the films screening length – start time and finish time, and data showing which film is being shown where –which screen, and when.

This is how the system works; A customer enters around the time of a film showing, they give the staff the input data of; film they want to watch, whether they are adults or under 16 years old, how many tickets they want. The member of staff at the ticket booth would, key-in this input data into the system, which would return seat coordinates for a screen, the ticket/s is then printed off.

2.2 Dataflow diagrams

Top level Diagram



The Dataflow in the cinema ticket system. A customer requests a ticket, data from the ticket request, being; customer age adult/child (under16), desired film, how many people are in the party, and time of film viewing is all input into the ticket computer by the member of staff on the booth. This is where the data flows from the customer to the ticket computer. The data is input by selecting the data in fields on screen. From here the ticket computer carries out a number of processes whereby data is retrieved and wrote to several data stores.

The data stores Screen + film, Date + Time, Ticket Price, and Seats taken are where Data is retrieved from. These data stores have had data entered into them before any ticket request has been undertaken, with the exception of date + time where this is more like a clock.

The screen and film data store contains the data about which screen is showing which movie, and at what start time and finish time.

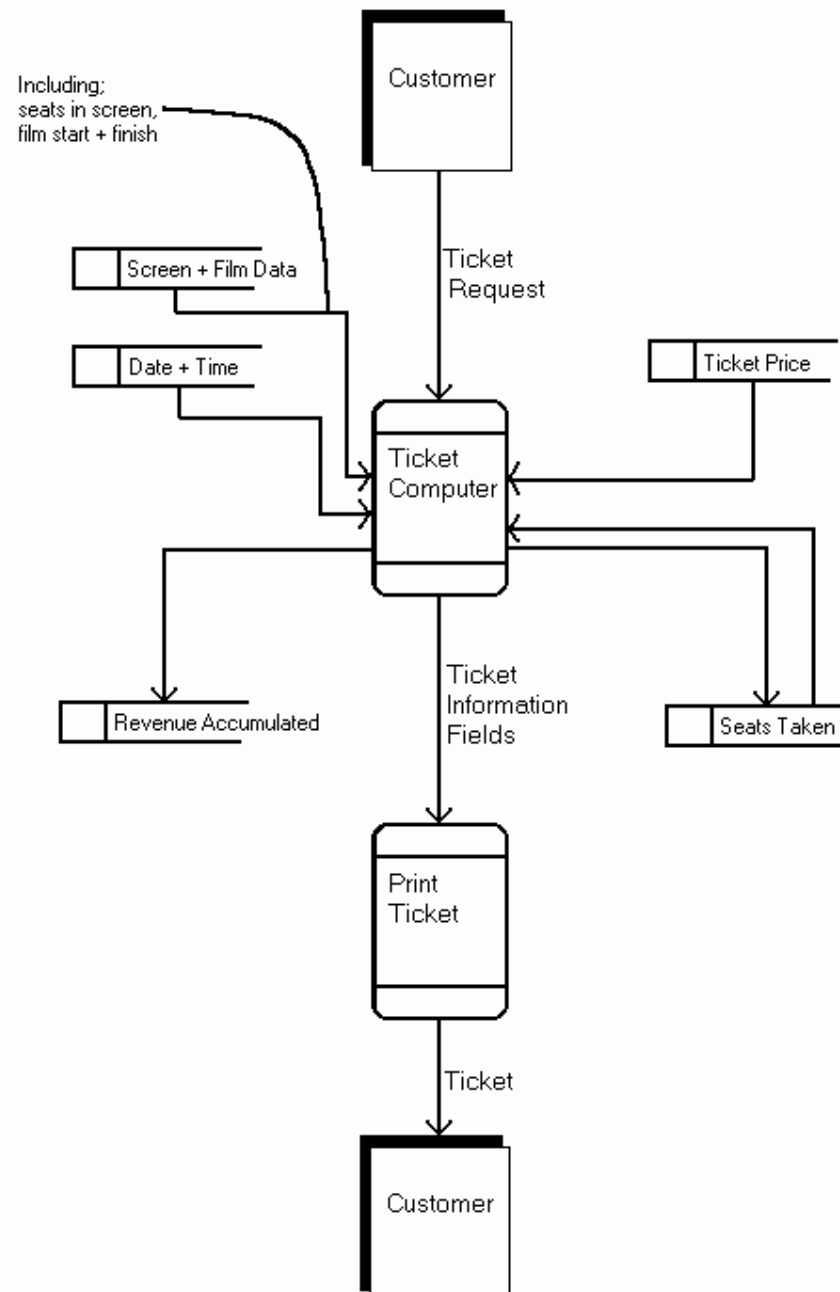
The date and time store is that which contains the current date and time (clock). The Ticket price store contains data about pricing on certain days and according to age (adult/child). The relevant ticket price is retrieved by a query from this store, the ticket price store is queried with; the current date and time, and age data (adult/child). This allows for the cinema to easily make changes to their pricing methods and ticket prices in the computer system. A relevant improvement that could be added to this existing system of ticket pricing would be to allow for a certain discount if there are a certain number of people going in a group to watch a movie, for example; an extra field in the ticket price data store 'Discount'.

The data store 'Seats taken', is a database containing all the seats in the cinema for each of the four screens these are either taken or free. The ticket computer queries the seats taken store to retrieve which is the next free seat or seats. With the system it is only possible to tell whether seats are next to each other by the coding of the seats which are in a grid of letters and numbers, so a seat would be for example 'G4'. The allocating of seats to those stated on the tickets is only used when there is a particularly large demand to watch the movie. The staff may have a certain difficulty when allocating seats to a group of people who want to sit by each other. The staff would have to work out the seats and those surrounding by using the grid of letters and numbers. A solution to this problem in the existing system would be to have a layout of each screen in the form of an overhead view showing all the seats as small boxes, with those which are taken being marked by a cross or blanked out. The ticket computer flows data to and from the 'Seats taken' data store, the free seats available data is flowed into the ticket computer, the ticket computer then chooses a seat or seats depending on how big the party is, then the ticket computer flows the data back to the 'Seats taken' store that certain seats are taken, these seats are then marked in the database as not available.

The revenue accumulated store calculates the revenue being made by the sale of the cinema tickets, as each ticket is sold the ticket computer adds another 1, to the fields in the revenue accumulated store which would be 'adult', or 'child' the total the revenue made is then calculated by means of multiplying the number of adult tickets sold by their price, and the number of child tickets sold by their price, then adding them together.

Then from the ticket computer the relevant data for the fields that are included in the ticket are sent to the printing process, where the resulting tickets are printed off via the dot matrix printer. The fields printed on each ticket are; the current day and time, the start and finish time of the film, the films name, the ticket age status (adult/child), screen number, and seat coordinates.

Greater Detail



2.3 Problems with the current system; The computer system in use is viable for use in the cinema although it does have drawbacks which I aim to rectify and solve with my system solution. The staff who add input to the system may find it hard to accurately process the request of the customer (ticket buyer), this can be due to the interface currently in use, which is fairly dated, it is not appealing, it looks boring, and looks much like ms-dos (uses the ms-dos interface). The text output displayed on the monitor is sometimes hard to recognise; it is all in one font that is fairly narrow. The output onto the monitor can also be an eyestrain. The system makes use of only three colours; black, white and blue, not very appealing at all. The system in use is not generally user friendly, the ability to undo mistakes is not taken into account.

Objectives of the new system

3.1 General Objectives;

- To create a more user-friendly interface.
- To create a more appealing and eye-pleasing interface.
- A system where the outlets for cinema tickets are more efficient and productive.
- The staff will be more alert and encouraged to work – The interface will be appealing and a big change from the existing dos type interface.
- To incorporate several of the cinemas other aspects, making the whole cinema into a complete system, - including aspects such as the food products; i.e.: popcorn, coke, sweets, slush-puppies, etc, the ticket system could incorporate a special offer discount or give free food products with the tickets.
- Improved, or additional, management reports
- Better Service to customers (ticket buyers)
- Time is saved
- Improved accuracy of tasks carried out
- Save money
- Gain more credibility with new systems to hopefully increase the standard of the cinema (draws in more customers)

Objectives In further Detail

To create a more user-friendly interface, which is also eye pleasing and appealing; This can be achieved by subtle, interesting colour schemes, and images, which have the ability to be interchanged. This objective is not very high in priority as far as the actual raw workings of the system are concerned, it is more of a cosmetic addition. –Which will probably have only a limited affect on the systems workings, nevertheless it is well worth its place as an objective.

Incorporation of other cinema aspects, the purpose being to integrate the cinemas workings together, this makes the system more advanced which may give customers more of an incentive to visit the cinema. – Also with the added discounts and/or freebies. This would be a priority higher than an increased user-friendly interface. The output from this objective would be tickets printed with '50% off large coke' -for example. Also on screen it may display similar offers so the ticket staff can explain them to the customers.

Improved, or additional, management reports, purpose being to show figures and information regarding the cinemas performance in terms of tickets sales, popularity of films, and also food and drink (refreshment) popularity and trends, which all add help when deciding on pricing and promotion for refreshment products. This is a fairly high priority objective. Output from this objective would be reports; these could be stored on system disk, or printed for a hard copy.

Better service is always quite a high priority. Output from this objective can be generally what the whole new system will provide, also mistakes in issued tickets will be minimised. – this is also attributed to the objective where accuracy of the tasked carried out is improved.

Time saved, purpose to allow the customers (ticket buyers) to get their tickets quicker, less of the extremely long cues I have seen trailing down the road out of the cinema.

To gain more credibility in the cinema business, this cinema will be helped to reach that objective with an improved computer system.

Constraints

4.1; Hardware + Software.

For the implementation of the new computer system the hardware specifics required would include;

IBM compatible PCs Specification;

- Pentium III 600Mhz
- 128 Mb Sdram
- 6.4 GB (gigabyte) hard-drive IDE ata66
- 17" monitor
- 16mb graphics card (OpenGL)
- 10mbps LAN Card.
- Motherboard Atx size, slot1, 133mhz-bus
- Atx case.
- Floppy + CD-ROM

Two of the above computer systems would be required for the two ticket booths available in the cinema.

I would recommend the above specification for the cinema ticket outlets (booths). Pentium 600mhz, simply because they are fast processors and they are available, speed is imperative. 128Mb ram is optimum when running a windows environment, although 64Mb may well be adequate, I choose to opt for the amount which provides optimal performance, for a smoothly running system.

6.4Gb would be more than enough space, I could choose a smaller hard-drive, for example 4.3Gb or even less, but these days not many hard-drives are being sold any smaller than 4.3Gb, even so for the system it needs to have free disk space for; the possible storage of reports created. Also space could be used for screensavers and images related to the cinema and film, screensavers could be displayed while the ticket booths are closed. (It could also be a great idea to have screensavers or a CD containing trailers and Information given out free at the cinema for people having bought a ticket.) Free disk space is also needed for the swap file. Newer technology hard-drives are not easily available smaller than 4.3Gb/6.4Gb these days.

17" monitor to reduce eyestrain, and make good viewing of screensavers. (even though the monitor screen will not be facing forward, people can still see the computer screen from certain places)

16mb Graphics Card with OpenGL drivers, this would be the best specification for screensavers, special OpenGL graphically enhanced screensavers could then be run on the systems.

10mbps LAN card, used to network the two computers together, the network could use bnc cable, t-pieces and terminators, to form a bus network, this is not the fastest of networks, but in the case of the cinema there is not going to be sharing of huge files, 10mbps (1.25Mb/s)

would therefore be fast enough. The system would need to share the information in the databases, in this case the databases could be stored on one of the two computers and then accessed through the network by the other.

Printer; A special printer would have to be implemented which disperses the tickets with tearable edges and one single ticket at a time if required. A printer using laser technology would be the best choice for its speed and accuracy. Currently at the cinema they are using a dot-matrix printer, which is quite slow, and can have more problems and is not as reliable as laser.

I have chosen the hardware specification on the basis of the importance of quality output.

Software;

The computers would be good running OS (Operating System); Windows 98SE, this is a pretty sound operating system considering. Easily configurable, networkable, and easy to work with, and also has a faster bootup time compared to winNT/windows2k. It is compatible with *almost* every piece of hardware available.

Anti-Virus software may be needed, certain floppy disks may contain malicious virri, a member of staff may unwillingly have a virus on a disk from home that they run on the system.

The cost of the computers and equipment would have to be taken into account, If it is the case that the cinemas budget cannot cover the cost, the computer specification can always be lowered, this can save a fair amount of money, but at cost of using slightly older specification parts, examples maybe; using Amd450Mhz processors instead, with 64Mb ram, 4.3 gigabyte Hdd, AT motherboard + case, 8mb Graphics OpenGL, 14inch monitors, the network capability can even be taken out of the new system, therefore meaning that files would have to be shared by loading to each computer via the Floppy disk drive, or maybe the CD-ROM. Lower specification parts would still be usable for the task intended, but the processes within the computer by the software would be slower. For the fast system performance needed it is imperative that the budget does allow for latest technology components.

The system may well need some security measures, a password needed to logon to the computer, maybe passwords to deactivate the screensavers. The terminals would not be connected online to the Internet so firewalls and elaborate security are not necessary. The computers will be inaccessible to 'just anyone' the only operators of them would be the ticket booth sales staff.

Certain files can probably be backed up on floppydisks. Or the hard drives could be partitioned and a partition reserved as backup, if anything were to happen to the originals they could easily be restored. There is however the possibilities that the whole hard disk will fail, data will become corrupt, or damaged, the system gets infected with a virus, or other reasons for mass loss of data. It would be a good idea to run an anti-virus program, and backup data on a regular basis.

Justification Of the proposed system.

Changes to be made to the current way of working; The current way of working will remain the same in many ways, except there will be great improvements in the speed and accuracy of the system. There will be other aspects of the cinema included in the ticket system – special refreshment offers are going to be included with tickets. Iam improving on an existing computerised system, but an extra area of the cinema that iam going to add to the computerised system is the refreshment area which will be incorporated by the use of special offers included with the tickets. The special promotional offers would be based on sales of items in the refreshment area of the cinema.

The sequence in which Implementation will take place; the new system would be best implemented on a day when the cinema is not showing many films. The method of implementation I would use would be a parallel conversion. The implementation would have to run smoothly to allow use of the new system before the next opening/viewing time the

next day. Therefore before the parallel conversion starts extensive testing and error utilisation would be carried out on the system off site. Although all errors may not be encountered. The method of a parallel conversion is most appropriate for the cinema's new system, the new system could then be checked against known results, and if any difficulties occur, operations can continue under the old system while the errors or omissions are sorted out. The method of a direct changeover would not be suitable for the implementation of the system because normal operations could be seriously disrupted if the new system has errors in it or does not work quite as expected.

A phased conversion could be used, by implementing the computer system into one of the two ticket outlets (booths), it does however lead to a parallel conversion, so the two ticket booths may as well be implemented together by parallel conversion which would be quicker. Phased conversion is mainly used within larger systems that can be broken down into individual modules that can be implemented separately at different times.

For the development of the system I have chosen to use the application; Microsoft Visual Basic. This is because it contains all the relevant aspects that are needed to create the system. A database can be created with it and can then be manipulated. Compatibility problems can occur when using a separate application and visual basic rather than using visual basic alone. I have considered using Microsoft Access in conjunction with visual basic, but have already experienced using them together in a previous project. Compatibility problems occurred with that previous project. I have considered using Microsoft Access alone, although I would prefer to become more experienced with visual basic.

Options for use in developing system; Existing packages; I do not know of any existing package that will do what the cinema's new system is proposed to do.

Writing a bespoke system using a high level language such as; Pascal, basic, prolog, or 'C' would allow total control over file organisation, record structure and processing, would make efficient use of computer resources – as only required processing is required, it is also cost effective for the user – no need to buy a package. This however may prove to be more complicated than using an object code language like visual basic. It would be a quicker task to use visual basic as opposed to writing the system in a High level language. Using the visual basic package it is quicker and easier to produce the system. It is much simpler to maintain and add new features if necessary. In visual basic there is fast creation of customised input screens, report layouts can also be created with a certain ease. It is also easier to create unforeseen queries, there is a built in security schema, and there is automatic organisation of data structures.

More Benefits and Consequences of Computer System Solution;

Improved company organisation and image; the cinema will with the improved system create an updated image to the public, showing that they are moving with the times. The new system is likely to become known by word of mouth and consequently the cinema is likely to increase ticket sales and profits. The new computer system may pay for itself. However the system including cost of hardware software and maintenance would be fairly expensive. The staff may need to be retrained to use the new systems software - as how to use it won't come naturally, either that or they may need some time to familiarise themselves with the workings of the system. This takes time in training or getting them used to the system, it could also cost some money too.

Limitations of the new system;

A desirable feature of the cinema system could be a method by which people become members of the cinema, they generate special points for watching films, and if their accumulated points is above a certain amount they receive a free ticket or other freebie or discount/offer. However this could prove hard to implement, there would have to be some sort of membership card given to members- this would cost a lot of money to implement.

