THE PROBLEM DEFINITION

Background…

Mrs. Anoma Abeywickrama, chairperson of one of leading travel agencies in Sri Lanka; The Travel Club Pvt. Has been in the travel agency business for more than 12 years. Her company is widely recognized, with a monthly turnover of more than 75 million rupees, which leaves competition almost non-existent. Although there are many customers, there has been a recent incident where a mix up occurred where flight reservations have not been made for that customer due to human error, resulting in the loss of that particular customer. It is impossible to avoid human error. It is bound to happen at some time, even with the most experienced people in their own specialized field respectively. Therefore Mrs. Anoma Abeywickrama has hired me to computerize their reservation system, expenditure and profit. By doing this, Mrs. Anoma Abeywickrema hopes to eliminate any future errors, thereby increasing the amount of customers, which in turn increases profit.

How does The Travel Clubs' Manual system work?

The Travel Club, headed by Mrs. Anoma Abeywickrema, deals in creating customized tour packages for individuals only. Customers that come here can pick and choose destination, airline class(as the travel Club only books tickets on Sri Lankan airlines), date, hotel etc. according to his likes

First of all, the customer is invited to sit at a table, and an employee will then discuss with the customer what sort of a holiday trip he would like. First the employee manually takes down the name, age, address and contact number in what is called the customer preferences file. Next the customer decides on his destination, airline and so on. These details too are taken down in the customer preference file. After all the details are written down in the customer preference file by the employee regarding the customers holiday, the customer will be notified about the price of the trip by means of an invoice in a few days time by a phone call. This could take up to a week, and sometimes even more, depending on how fast the Travel Club can gain the necessary prices from the hotel reservation counter and airline ticketing office by phoning each of them individually.

The customers airline prices/hotel costs etc. will have to be confirmed via telephone with airline counters etc. Ages etc. will also have to be given manually via telephone to the ticketing offices etc. then the travel club will fill out a small sheet calculating all these costs, adding GST, and calculating the profit they can make(30%). This is called the managements customer transaction file. Then they will then give the customer his invoice while he waits at the Travel Club, which is valid for 3 days. Meanwhile, over the next couple of days, if airline ticket prices change, all calculations will have to be manually recalculated, and the customer must be notified of the new

invoice via a telephone call. However, this is only possible if 3 days have passed since the customer has been notified of the first invoice, as the invoice is valid for 3 days. If changes in invoice occur due to changes in airline tickets and hotel bookings within the time where the earlier invoice is valid, then the customers invoice remains the same, and the company will have to pay the extra to make up for the new price. If the customer agrees with the cost of the trip, then the customer must then tell the travel club go ahead and start booking hotels/plane seats etc. The customer must then obtain a visa for the country he intends to travel to(if that particular country requires a visa). The Travel Club will help the customer in obtaining his visa. Once the visa is obtained, flight dates will be confirmed and the customer is then ready to enjoy his holiday.

As a customer does more and more business with the Travel Club that customer earns what the club calls "Frequent Flier Points". That is, for a certain amount of money spent(in this case, Rs. 10000) by the customer for his trip, he accumulates 1 frequent flier point. If a customer accumulates enough points, he can enjoy benefits offered by the Travel Club such as free trips to various countries such as Russia. If a customer accumulates more than 74 points, he is eligible to go on a free world tour. A customer can keep collecting points, but once his frequent flier points have been used on a trip, the amount of points he can accumulate is reseted back to zero. This feature(Frequent Flier points)has been introduced to encourage customers to travel more often, thereby increasing the amount of business for the Travel Club

Problems with The Travel Clubs' manual system

The biggest problem with the travel Clubs manual system is that it is extremely slow at producing an invoice for a customer. This is because the Travel Club must manually look up the prices of each customers hotel and airline preferences individually via telephone(the price for a hotel booking is obtained by contacting that hotel via telephone and getting the price, while the price of an airline ticket can be found by inquiring at the airline reservations center via telephone), after this, the Travel Club must manually add the hotel and airline ticket price, GST, NSL and total profit. This all takes a long time as the invoice must be calculated manually. This means that customers will turn to other travel agencies who are able to deliver invoices while the customer discusses what type of holiday package he would like to have. This means that the Travel Club loses potential customers due to the long waiting period until the customer gets his invoice via telephone. Given below are list of other problems with the manual system.

- Sheets or pages like the customer preference sheets could get misplaced or torn, making the writing on it impossible to refer.

- All the customers requirements such as hotel/ etc must be manually written in the customer preferences file. This leaves margin for human error to occur.
- All calculations such as calculating GST, profit etc. must be manually calculated. This is time consuming, and human errors could occur during calculations
- Travel sheets and reservation sheets could get lost or misplaced, thus causing inconvenience to both the customer and the Travel Club as another meeting with the customer is required to reconfirm the customers airline/destination etc, because there are no backup copies available besides filing cabinets where the original copy is kept for future use
- All corrections such as changes in price of tickets/hotels etc. have to be changed manually, leaving room for human error to occur. These changes in prices occur frequently so every time a change in cost is made, the whole costing sheet will have to be altered. This too is time consuming, as another invoice must be sent to the customer via telephone.
- Making reservations is time consuming as documents/ invoices must be manually looked up.
- Plane bookings are a long process as each customers destination and airline must be specifically looked up.
- All flights/ hotel reservations must be manually recorded. This is time consuming and can lead to human errors.
- The travel Club has recruited a large amount of employees such as typists to manually record all transactions/ hotel reservations etc. Thus a large sum of money is wasted on employees salaries. And the company is not as profitable as is could be.
- Hotel reservations and costs/ flight bookings take up a considerable amount of time as all the aforementioned prices must first be manually checked up with ticketing office counters etc. via telephone and then recorded in filing cabinets.

The solution for the Travel Clubs' problem with its manual system

The travel club could introduce a computerized system to over come problems with the current manual system. However, the Travel Club has asked me to computerize only part of their manual system. They have asked me to computerize just the first part of their manual system, where(in the case of the manual system) an employee must manually take down everything that the customer would like to include in his holiday, up to the point where all calculations such as the calculation of GST, total profit etc. The computerized system has many advantages over a manual system. By far the biggest advantage of a computerized system over manual system is that computers are much faster doing calculations compared to a manual system(where in this case, employees will have to calculate prices using calculators). This advantage in speed with a computerized system almost automatically solves the Travel Clubs' main problem with its manual system, the

main problem being that a customer must wait a long period of time(around a week) to be informed of his invoice, because the Travel Club takes a long time to prepare the invoice(as it must be done manually). There are other advantages in a computerized system over a manual system. These advantages will be discussed below.

Other advantages of a computerized system over a manual system

- Computers take up much less space than files and folders as all data is stored on hardisks which are slightly larger than your hand and can store up to about 80 Gigabytes of data , thereby reducing overall space taken and eradicating the need of paper, thus creating what we can call a "paperless office."
- Features in computers such as validation rules stop people from entering incorrect data, thereby reducing human error. However, these facilities are non-existent in a manual system where records must be entered manually into the customer preferences file.
- Looking up a particular record is quick and easy in a computerized system, where the user can apply filters(a facility existing in many software packages such as MS Access) to extract records needed. However, in a manual system, one must go through all files and folders individually to find a particular record. This is a very tedious and time consuming process.
- In a computerized system, passwords can be applied to restrict the number of people able to access data. In a manual system, money must be spent to buy locks/ keys etc. Locks could get lost etc. So, as you can see, restricting the amount of users in a computerized system is much easier and cheaper in comparison to that of a manual system.
- In a computerized system, data can be transferred easily, and without any loss of data, over a long distance. This is possible thanks to facilities such as e-mail, Internet, LAN(Local area networking), WAN(Wide area networking) etc. However, in a manual system, data stored in filing cabinets must be transported physically. This is a tedious process, especially in the case of large filing cabinets where the data must be transported by means of vehicles. And if the data transference is over a large distance, the data must be freighted by either sea or air. This is extremely expensive and time consuming. Also, data could be lost while being transported. So we can see that a computerized system is much easier and faster to transport compared to a manual system.
- In a computerized system, data can be presented in many forms. E.g. charts, tables etc. But in a manual system, data can be presented only in the format that was originally inputted. This means that The Travel Club can read data in a variety of ways in the computerized system.

Disadvantages of a computerized system in comparison to a manual system

The advantages of a computerized system far outweigh its disadvantages when compared to a manual system. However, there are 2 main disadvantages of using a computerized system over a manual system. They are as follows-
- Computerized systems are expensive compared to manual systems.
- Computerized systems require specially trained staff, whereas a manual system does not require such people to run it.

Possible application software packages that could be used by the Travel Club to computerize the current manual system

There are many suitable software packages which can be used to solve the problem. 3 popular software packages I have selected have for The Travel Club to computerize their current manual system are as follows-
- Spreadsheets
- Databases
- Word processors

Each type of application program has its own strong and weak points. Given below is an analysis conducted on each type of program to find the most suitable one which can be used to computerize the Travel Clubs' manual system.

Spreadsheets-
Spreadsheets are used to carry out calculations. They have many advanced built in functions such as V-Lookup, If, Minimum and maximum etc. These calculations are essential for me in construct a computerized system of the Travel Club. For example, the If function can be used to calculate what free trips a customer should get according to the number of frequent flier points he has accumulated. Advanced graphs mean that I can now analyze and compare graphs to find out various things such as the amount of customers for a particular month. Another features with spreadsheets is that if one value is changed, all other values related to the modified value will change as well. This feature is especially useful for me. For example, if the cost of a ticket of one

flight increases, the total amount payable, GST and profit involved will also change. This means that instead of manually recalculating the GST etc, the values will automatically change. This saves me a lot of time, and also eliminates human error coming into play as values are automatically changed. An example of a spreadsheet package is MS excel.

Databases-

Databases are used primarily to input large amounts of records, and extract records using filters. Databases are capable of fast storage and retrieval of data. However, databases lack even the most basic built in functions. This lack of functions deters me from using this package as my system requires many calculations, (some simple and others complex) such as sum and If to calculate things like profit/total amount payable etc. The non availability of graphs also deters me from using this package for computerizing the Travel Clubs manual system, as graphs are essential for me to calculate and compare such things like the difference in profit acquired by the Travel Club for each month. Therefore I have decided not to use databases. An example of a database program is MS Access.

Word processors-

Word processors are used primarily for the typing of documents. They have very simple calculations such as addition, subtraction. Graphs too are primitive. Word processors do not suit me as I require complex calculations such as V-Lookup, If functions etc. For example, the V-Lookup function can be used to extract data from one spreadsheet and automatically compare and copy data into another spreadsheet according to similarities. However, this function is not available in word processors, so instead I will have to manually lookup all values and copy it into other cells. This is time consuming, and could lead to human errors. Extremely basic graphs mean that I cannot display data in many formats. For example, I need to illustrate the profits made for a particular month with bar charts/ pie charts etc. As I need to analyze and compare graphs in different ways. This is not possible with word processors. I cannot use word processors to computerize the Travel Clubs manual system as important features such as V-Lookup, the If function and advanced graphs are absent. However, a word processor is the ideal program for typing documents. I myself used MS Word 2000, a type of word processor to do my documentation. Examples of word processors are Word perfect and MS Word.

Which is the most suitable type of software?

I decided to use spreadsheets to computerize the Travel Clubs' manual system for the following reasons-

- Spreadsheets have many complex mathematical calculations such as minimum, maximum, If etc. These functions are necessary for me as functions like V-Lookup and If save time and eliminate the possibility of human error.
- Spreadsheets are capable of producing complex graphs. This feature is useful for me for many reasons. For instance, if I want to find the expenditure for two

different months, spreadsheets can easily present this information in the form of graphs. Spreadsheets can also present graphs in different formats such as pie charts, bar charts etc. However, programs such as word processors are not capable of producing such advanced graphs in such a diverse array of formats.

- In spreadsheets, if one value is changed, all other values connected to the edited value will automatically change as well. This is an especially useful feature I can use for many reasons. For example, if the cost of a plane ticket increases, all I have to do is enter the new price of that ticket into the spreadsheet, and all other values such as GST, Total cost, expenditure and profit, amount of frequent flier points etc. automatically get updated as well. This feature saves me a lot of time and eradicates human error as I don't need to keep typing the new cost of the ticket individually for GST, total cost(for the customer) etc.

Possible spreadsheet packages which could be used to computerize the Travel Clubs' manual system

There are many spreadsheet packages available in the market today. I've selected 3 spreadsheet packages, one of which will be finally chosen to computerize the Travel Clubs manual system. They are as follows-
- MS Excel
- MS Works
- Lotus 97

All three packages are freely available and are reasonably inexpensive. Each package also has its individual strengths and weaknesses. Given below is an analysis on each package to explore the positive and negative points of each package, to decide which package I should use to computerize the Travel Clubs' manual system.

MS Excel-
Ms excel has an excellent array of graph formats, varying from bar charts to scatter graphs and more. Graphs are a necessity in my system as I need to compare data in the form of graphs for many reasons such as to find out how many customers the Travel club has dealt with for different months. MS Excel also has a wide variety of built in functions. These are necessary in my system in more than one way. For example, I can use functions such as sum to calculate the total price the customer must pay.

MS Works-
MS Works is an integrated package. The problem with MS works is that graphs and functions are primitive. Graphs and functions are extremely important for me. There are no validation rules in MS works. This means that a user can enter incorrect data, such as impossible sums of money(purely by accident) and this error will go un-detected, and the customer will be given an incorrect invoice. Errors like these that have been accidentally entered could prove severe, as incorrect and even bogus invoices can deter the customer from doing business with the Travel Club. Macros, too, are another missing feature in this package. Another example of a function lacking in MS Works but found in MS Excel is the V Lookup function.

Lotus 97-

Lotus 97 is yet another example of a spreadsheet package. Lotus has an interface which is totally different to the normal office interface. Because of this, users will have to be specially trained to operate the program. This means money and time spent to train staff, and this deters me from selecting Lotus to computerize the Travel Clubs' manual system. Lotus 97 also lacks validation. This also deters me from using the package as without validation, errors that are inputted will not be detected, causing chaotic events to occur such as loss of customers due to incorrect invoice. To create macros in Lotus 97, another language needs to be used. This is both time and money consuming as users must be specially trained to use macros in Lotus 97. This language difference too, deters me from using Lotus 97 to computerize the Travel Clubs' manual system.

Which is the most suitable type of spreadsheet package?

I decided to use MS Excel to computerize the Travel Clubs' manual system for the following reasons-

- A wide variety of graphs and charts are available. Graphs help me compare data such as the profit earned for different months. MS Excels graphs are superior to both MS Works and Lotus 97 as Excel is capable pf outputting much more complex graphs, which helps me to compare data in the spreadsheet in the form of tables.
- Validation rules are present in MS Excel. These are useful as they stop me from entering incorrect data into the spreadsheet. Validation is missing in both MS Works and Lotus 97.

Hardware needed for the computerized system to function

The Travel Clubs' computerized system is not very complex, as the only two tasks assigned for the system are-
- The recording of the customer's name, age, hotel, destination, airline etc. on the computers hard disk.
- The calculation of GST, profit for the company, the customers total amount payable to the Travel Club etc.

I chose a business micro to handle the job. Below are the details about VDU, microprocessor and printer

Microprocessor-

I chose a Pentium 2 Processor running at 300 MHz for my micro processor. Absolute speed is not required because there is not much data processing involved with my system. Only mathematical calculations and the construction of different graphs all done on MS Excel. These calculations and the drawing of graphs are not difficult or time consuming for the PC to process, so I chose to buy a 300 MHz processor, as it is cost effective, and I do not require a lot of processing power.

Monitor(VDU)-

I chose an 18 inch SVGA 24 bit colour monitor to display the necessary information. Color is not needed as the monitor will only display spreadsheets and various charts, which do not require color.

Printer-

I chose a monochrome laser printer to print the customer invoices, as laser jets are fast at printing(approximately 15-20 ppm{pages per minute}. I chose a thermal colour inkjet printer to print my graph as colour is necessary to distinguish the different coloured lines.

Random Access Memory(RAM)-

32 MB of Random Access Memory (RAM) is sufficient, as not much data processing is involved in my system.

Interface-

I have selected Windows 98 as my operating system, as the interface is user friendly, and I have had past experience with that operating system. Most programs are compatible with Windows 98.

Minimum requirements for MS Excel 2000-

- A 100MHz or above Pentium processor
- A mouse and keyboard
- 54Mb hard disk space for installation.