AN INTERGRATED SECURE ONLINE AIRLINE RESERVATION SYSTEM

CASE STUDY: FLY 540 AIRLINE

BY

MARTIN KIARIE

BCS/10028/81/DF

AND

SSEMANDA GEORGE WILLIAM

BIT/10126/81/DU

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DECLARATION

We MARTIN K KIARIE and SSEMANDA GEORGE WILLIAMS hereby declare that this work is our original work. No any other work known to us has been submitted either in part or full to any academic institution on this topic for any award for academic requirement or publication there of. Theories, ideas and materials obtained from existing literatures and other sources have been duly acknowledged.

Signed by..... and Signed by.....

MARTIN K KIARIE SSEMANDA GEORGE WILLIAM

BCS/10028/81/DF BIT/10126/81/DU

APPROVAL

This Research proposal has been submitted with the approval of the following supervisor

Signed…….. Date…20/08/2011……..

MR BUSINGYE PHELIX

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CHAPTER ONE

1.0 INTRODUCTION.

This chapter is to cover the background of the study, statement of the problem, purpose of the study, the general objectives and the specific objectives, research questions, scope of the study, geographical scope and the content scope, the significance of the study and the conceptual framework.

1.1 BACKGROUND TO THE CASE STUDY

Most of the airlines institutions are facing the problems of less and inconsistency of passengers, staff information, and even fleet information this is caused by the poor management of the information that the poor computerized systems such as the file based systems and the manual calculations.

FLY 540 is among the companies facing the same problems. This airline company was established in the year 1992 and started its operations in1993. Its main office or location is in Nairobi the capital city of Kenya.

1.2 PROBLEM STATEMENT

Due to large volumes of data that is required to be stored, processed, analyzed and also shared among members of the organizations at the airline. For example the airports have got a lot of weaknesses such as delays in processing of information. Some information sometimes gets lost, destroyed or misplaced and all these contribute to a high level of operational cost so as to be able to make time bound and accurate decisions, hence hinders most of the operations of the airline so as to be able to meet their needs. All this is because of the fact that most of the organizations such as the airlines that are using a manual system so there is need to develop more efficient computerized program software which will be able to perform analysis, storage and to keep the passengers information or records given enough time.

1.3 GENERAL OBJECTIVE

To develop and implement an integrated secure online airline reservation system that is user friendly and convenient for all users who can get access via the internet for FLY540 company.

1.3.1 SPECIFIC OBJECTIVES

- To design and implement a sharable web based database for FLY 540 to efficiently manage customer reservation.
- To provide a security mechanism that will manage the customer billings and payments, like for example ATMs passwords.
- To enable customer reservations easier and convenient to the customer.

1.4 RESEARCH QESTIONS

- How can FLY 540 have a secure online reservation system?
- How will the program allow the user to access the data from the database?
- How can competitive advantage be obtained from the exploitation of new information technologies—in particular, e-commerce technologies?

1.5.1 GEOGRAPHICAL SCOPE

There are a number of ways that the web based expenses might be reduced. Competition in the ISP market could help to lower prices but competition alone will not be sufficient to drastically force down prices if ISP cannot also provide their own infrastructure. Nationwide the internet access for the prices of local call could also be as has been done in a number of countries. However, the researcher will base his or her study on web based developing countries in around East and Central Africa where by the airline FLY 540 is its main environs of travel, and mainly in Kenya where the airline is based.

The study will focus mainly on the staff, fleet and passenger information. It will equally aim at gender sensitivity in the section of respondents to ensure that both men and women participate equally.

1.5.2 CONTENT SCOPE

The content scope will focus on the history of the internet, how the airline should be using the web based database challenge in Africa, web based database in developed countries airlines, online booking and data keeping is the challenges facing the web based system in rural areas.

1.6 SIGNIFICANCE OF THE STUDY

The new system will be able to provide better and clear passenger information's collection, processing, integration and publication of data. The systems will benefit the company in the following ways:

- To provide high level of automation
- To be useful to run processing cycle in short period of time.
- To find out how best you can deal with large volumes of data that the organizations has.
- The system will also benefit the rural areas because it will reduce their expense of traveling to the airports to book air tickets. This because also in the rural areas people can access the internet through the internet enabled mobile phones

1.7 LIMITATION OF THE STUDY

The limitation will include probability of bias due to sampling method and data collection due to the possibility that some of the respondent may not consent to participate in the study. Time factor will also be essence due to academic pressure.

1.8 CONCEPTUAL FRAMEWORK

Figure 1.1

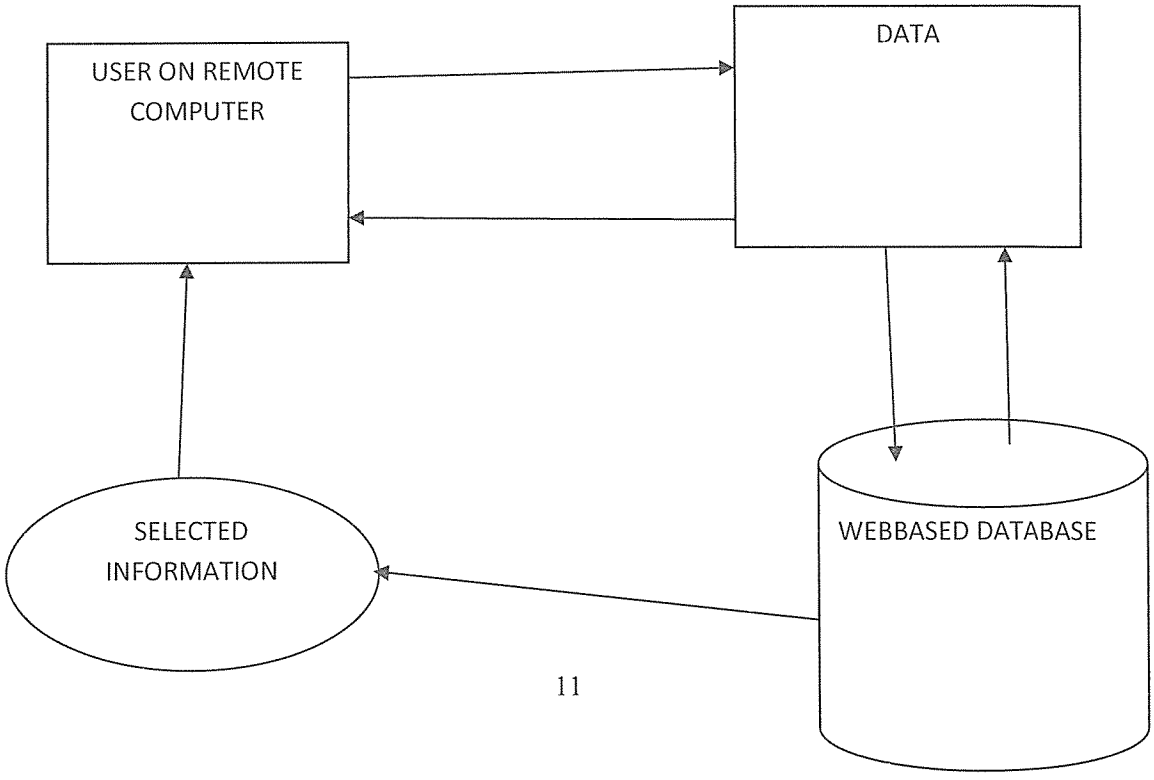

FIGURE 1

- The user will browse to the system to make his or her own order.
- The authorized user is able to issue the staff or passengers details from the database.
- The database searches for specific passengers or staff details when required.

CHAPTER TWO
LITERATURE REVIEW

2.0 INTRODUCTION

This chapter elaborates on the importance of an online airline management system and database as viewed by different authors and researchers, the effects and benefits of online reservation system, and the different analysis and design techniques used in analyzing and running the system. The purpose of the online system is to create convenient and easy-to-use online system for passengers, trying to buy airline tickets. The system is based on a relational database with its flight management and reservation functions. We will have a database supporting
dozens of major cities around the world as well as hundreds of flights by various airline companies. Above all, we hope to provide a comfortable user experience along with the best pricing available. This note provides a summary of an extensive literature revive on the role and the scope of the integrated airline reservation system.

The terms of reference for the review were the following:

- To explain the purpose and the factors influencing the idea of online reservation system.
- To elaborate on the difference of computerized approach from paper based file system.
- To elaborate on the positive implication of the online reservation system.

2.1 SOFTWARE PRODUCTION PROCESS

Software production processes is a process we follow to build, deliver and evolve the software product from the inception of an idea all the way to the delivery and final retirement of the system (Carlo Gheezzi. 2002, p 357)

Ian Somerville (2002) claims that software was not just the program but also all associated documentation and configuration of data which is needed to make these programs operate correctly. It consists of a number of separate programs, configuration of the files that are used to set up this program, documentation which describes the structure of the structure of the system and user documentation.

However as research was concerned, software can be referred as instructions which when executed provide desired functions and performance. Also software can be referred to as data

structure that enables the programs to adequately manipulate information.

2.2 SOFTWARE PRODUCTION LAYERS

Software production (engineering) was layered technology that begins with the organization commitment to quality and then moves on to the software process. The process works as glue that holds the technology (tools and method) layer together and enables rational and timely development of computer software. Below is a model showing production and layers (Carlo Gheezzi. 2002)

2.3 SOFTWARE DESIGN

Implementation of intelligent system in our airline is still evolving, so this section will give some details of what is implemented so far. System is open for further enhancements and it is designed to be able to follow changes in inventory.

Design is a process of applying various techniques and principles for the purpose of defining system insufficient detail to permit its physical realization. However Ian Somerville (2002, pg 56) explain design as a description of structure of the software to be implemented, the data which is part of the system, the interfaces between the system components and sometimes the algorithm used.

2.4 DATABASE SYSTEM

Database is an organized collection of interrelated data that supports multiple application of an enterprises business process or function unit. The database stores not only the values of the attribute of various entities but also the relationship between these entities. Zwass Foundation of Information system (1998)

2.5 DATABASE MANAGEMENT SYSTEM (DBMS)

Database management system (DBMS) is a system that provides assistance in managing database shared by many users. A DBMS helps organize data for effective access by variety of users with different access needs and for efficient storage. A DBMS makes it possible to create access, maintain and control databases. Zwass Foundation of Information system (1998).

2.6 ADVANTAGES OF DBMS

- Avoiding uncontrolled data redundancy and preventing inconsistency. Application share the data stored in a database rather than owing private files that would often store redundant data. Foundation of Information system (1998).
- Program data independence. When database is managed by DBMS, programs can be written independently of the actual physical layout of the data or even the overall logical structure of the data. Foundation of Information system (1998).
- Flexible access to shared data. The database approach opens data for access to users and application. Query language enables end user to access data directly. Foundation of Information system (1998).
- Security can be maintained by specifying with the DBMS who is authorized to access or modify the data. The DBMS which serves as the means to access to the data enforces these constraints. Foundation of Information system (1998).

2.7 INFORMATION SYSTEM

Information system can be defined technically as a set of interrelated components that collects stores and distributes information to support decision making, co-ordinate and control in an organization. Kevin .c. Laudon, Jane .P. Laudon – Essential of management information system (2003)

2.8 ADVANTAGES OF INFORMATION SYSTEM IN AN ORGANISATION

- Information system supports business operation of the firm.
- Information system supports its management.
- Information system assists general knowledge work that is working with abstract information rather than tangible materials. . Zwass Foundation of Information system (1998)

2.9 USER INTERFACE

Graphical user interface is the portion of a program that the user interacts with. Graphical user interface includes the following:

- Appointing device, typically a mouse.

- On screen pull-down menus that can appear or disappear under the control of the pointing devices.
- Widows that graphically display what the computer is doing.
- Icons which are graphical images that represent certain items such as files and directories. Introduction to computer and information system (p.12)

2.10 INTERNET TECH

2.11 CURRENT SYSTEM

The airline is using the computerized system in processing the passenger's details. The current system started its operation in the year 2006, but previously the organization was using manual system in its daily operations. This is according to deputy manager and the system documentation.

2.12 AIRLINE RESERVATION SYSTEM

Airline Reservations Systems contain airline schedules, fare tariffs, passenger reservations and ticket records. An airline's direct distribution works within their own reservation system, as well as pushing out information to the global distribution system (GDS). A second type of direct distribution channel is consumers who use the internet or mobile applications to make their own reservations. Travel agencies and other indirect distribution channels access the same GDS as those accessed by the airlines' reservation systems

2.13 HISTORY OF ONLINE AIRLINE RESERVATION SYSTEM

The history of airline reservations systems began in the late 1950s when American airlines required a system that would allow real-time access to flight details in all of its offices, and the integration and automation of its booking and ticketing processes. As a result Sabre (Semi-Automated Business Research Environment) was developed and launched in 1964. Sabre's breakthrough was its ability to keep inventory correct in real time, accessible to agents around the world. Prior to this, manual systems required centralized reservation centers, groups of people in a room with the physical cards that represented inventory, in this case, seats on airplanes.

In 1953, American Airlines CEO C. R. Smith chanced to sit next to R. Blair Smith, a senior IBM sales representative, on a flight from Los Angeles to New York. C.R. invited Blair to visit their Reserves system and look for ways that IBM could improve the system. Blair alerted Thomas Watson_Jr. that American was interested in a major collaboration, and a series of low-level studies started. Their idea of an automated Airline_Reservation_System (ARS) resulted in a 1959 venture known as the Semi-Automatic_Business_Research_Environment (SABRE), launched the following year. By the time the network was completed in December 1964, it was the largest civil data processing system in the world.

In 1976, United began offering its Apollo system to travel agents; while it would not allow the agents to book tickets on United's competitors, the marketing value of the convenient terminal proved indispensable. SABRE, PARS, and DATAS were soon released to travel agents as well. Following airline deregulation in 1978, an efficient CRS proved particularly important; by some counts, Texas Air executive Frank Lorenzo purchased money-losing Eastern Air Lines specifically to gain control of its SystemOne CRS.

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European airlines also began to invest in the field in the 1980s initially by deploying their own reservations systems in their homeland, propelled by growth in demand for travel as well as technological advances which allowed GDS to offer ever-increasing services and searching power. In 1987, a consortium led by Air France and West Germany's Lufthansa developed Amadeus, modeled on System One. Amadeus Global Travel Distribution was launched in 1992. In 1990, Delta, Northwest Airlines, and Trans World Airlines formed World span, and in 1993, another consortium (including British Airways, KLM, and United Airlines, among others) formed the competing company Galileo International based on Apollo.

2.14 Advantages of an online airline reservation system

- It eases the hustle of travelling from one location to another
- It enhances the security if the money needed for the payment because one is at a high risk of theft while travelling with money than when they are sent online.
- It increases the marketability of the airline because so many people today interact via the internet.
- It improves airline's record management providing better solutions for report handling.
- It is cost effective and very efficient to the airline.

2.15 Conclusion

Integrated online airline reservation system is more effective and eases the workload that would have to take a lot of resources to be done, now can be done by the computers that are interconnected. Thus meaning that this enhances the monitoring if data for example the customers details and flight requirements

CHAPTER THREE
METHODOLOGY

3.0 INTRODUCTION

This chapter will deal with different methods the researcher will use. It will highlight area of the study, population of the study, sample selection methods and size, data collection and analysis. Methods that will be used are;

3.1 TARGET POPULATION

The data collection technique will target on senior managers, middle managers, low level managers and passengers. This is because the categorized managers plus passengers are the ones who could give complete information that would be useful for the establishment of a new system and to know more weaknesses of the current system.

3.2 SAMPLE SELECTION

The research will use the following people according to their position at work, director as a senior manager who will give the information about strategic objectives, policies, organization structure

The manager will provide the information about the operation of business procedure as a middle manager.

Secretaries and other workers will give out day to day activities of the organization as lower managers.

Also the researcher will find information from passengers about problems facing them as details missing, inconsistence, etc.

3.3 DATA COLLECTION

The research will use the most appropriate data collection techniques to collect data from the organization.

3.3.1 INTERVIEW

The research will involve interpersonal talk between the researcher and all the managers, secretary and the passengers in order to obtain useful information about the organization. The researcher will use the instrument because it will easily administer for example, they do not require respondent (especially passengers) to have the ability to read, write and handle complex documents or long questionnaire.

3.3.2 QUESTIONNAIRE

The researcher will use this technique to collect information from staffs and passenger about the problem facing them due to the current system. These are designed in the way that respondent will be required to give a single answer among other alternatives on the question paper. The respondent will be approached and distributed with questionnaires which they will fill the answers of different views. The researcher will use this instrument because it will permit a greater depth of the response when a respondent is allowed to give a personal response usually reasons for the response given directly or indirectly.

3.3.3 OBSERVATION

This technique will be used to gather information within an organization so as to get data which were not found through questionnaire and interview technique. And to verify data which are already found in interview and questionnaire technique.

3.4 DEVELOPMENT METHODOLOGY AND TOOLS

To achieve the above objectives, the project will use the system development Life Cycle (SDLC) methodology which includes the following phases.

Planning phase, Analysis phase, Design phase and Implementation phase, Mysql and Dream Weaver will be used as tools to create user interface and data base system to manage the application's data. Other development tools include hardware tools such as:

3.4.1 Functional Requirements

Statements of services the system should provide how the system should react to particular inputs and how the system should behave in particular situations. These appear when all the parts of a system work together to achieve some objective. These include:

a. Retrieval of results from the database as requested by the client booking the and sending the information to the database.

3.4.2 Non- Functional Requirements

Constraints on the services or functions of the system that relate to the behavior of the system in its operational environment. The expected non-functional requirements of the SMS Results Retrieval System are:

- Reliability.
- Efficiency
- Security.
- Economical use of computer resources.

3.4.3 Hardware Requirements

This describes the minimum hardware requirements for the development of the system.

The following are the minimum hardware requirements.

Table :3.1

Hardware	**Minimum Requirements**
Computer	Compatible Pentium IV
Memory (RAM)	512 MB
Hard disk	40 GB
Monitor	VGA with resolution
CPU	1.6 GHz

3.4.4 Software Requirements

- WampServer5.
- Dream weaver

3.5 PROBLEM ANTICIPATED IN THE STUDY

As long as the research involved, some of the traditional data collection techniques such as questionnaire and interview, somehow wrong information about the system maybe found due to unwillingness of respondent or wrong target population.

Moreover high cost of running a project and limitation of time can cause a problem to the research. Also resistance from employees about implementation of the new system, as some of them fear to lose their job; it brought a problem in implementation of the new system.

CHAPTER 4

SYSTEM ANALYSIS, AND FINDINGS

4.1 SYSTEM ANALYSIS

System analysis is the way of studying a system with an eye on solving its problem -using computer. It is the most essential part of the development of a project of a system analysis. System analysis consists of system element, process and technology. To analyze a system, has to study the systems in details. The analyst has to understand the functioning and concept of the system in detail, before design the appropriate computer based system that will meet all the requirements of the existing system. The system analyst has to carry out a customary approach to use the computer for problem solving. System analysis includes the following basic concepts;

- Preliminary investigation
- Requirements specification
- Feasibility study
- Detailed investigation
- Drawing up of strategies

4.2PRELIMINARY INVESTIGATION

A request to receive assistance from information system can be made for many reasons, but in case a manager, employee or system specialist initiates the request. When that request is made, the first system activity preliminary investigation begins. The activity has three parts

- Request clarification: the request from employee may not be well stated. Sometimes the request may not be well defined. Therefore before any system investigation can be considered, the project request must be examined to determine precisely the actual requirements of the organization
- Feasibility study: the basic idea of feasibility study is to determine whether the requested project is feasible.
- Request approval: all projects that are requested are not desirable or feasible .some organization receive so many projects requests from employee that only a few of them can be pursued. However those projects that are feasible and desirable should put into a

schedule. The management decides request that are most important. After a project request is approved the cost priority, the completion time and the personal required are estimated. Once the request is approved, the collection of data and determination of requirements can be started.

4.3 REQUIREMENT SPECIFICATION

The primary goal of the system analyst is to improve the efficiency of the existing system. For that the study of specification of the requirements is very essential. For the development of the new system, a preliminary survey of the existing system will be conducted. Investigation done whether the up gradation of the system into an application program could solve the problems and eradicate the inefficiency of the existing system

4.4 FEASIBILITY STUDY

The initial investigation points to the question whether the project is feasible. A feasibility is conducted to identify the best system that meets the all the requirements. This includes an identification description, an evaluation of the proposed systems and selection of the best system for the job The requirements of the system are specified with a set of constraints such as system objectives and the description of the out puts. It is then duty of the analyst to evaluate the feasibility of the proposed system to generate the above results. Three key factors are to be considered during the feasibility study. Feasibility study is to check the viability of the project under consideration. Theoretically various types of feasibilities are conducted, but we have conducted three type of feasibilities explained as under.

4.4.1 ECONOMIC FEASIBILITY

With the stand alone system the operating cost of the system was so expensive and so much costly because it required the airline to employ a lot of staff to serve their clients. This cost comprises salary of 25 people, stationary, building rent, electricity, water, telephone etc. But with the new system this reoccurring cost comes out to be about $20 000 P.A. Hence the new system is economically feasible.

4.4.2 TECHNICAL FEASIBILITY

The new system requires only 6 trained people to work with the system and in overall 10 people per office is sufficient. So we will identify 6 best people from existing system and train them. As our existing system can be both used manually and online, so we need a onetime investment of $ for the purchase of 7 computers, 5 Ticket printers, a laser printer, AC and networking etc. It requires $5000 as operating cost. With the above details our system is technically feasible as after investing $8000 in a year, the company is still saving $3000.PA

4.4.3 OPERATIONAL FEASIBILITY.

The new solution is feasible in all since but operationally it is not. The new system demands the expulsion of at least 15 people from the company. It creates an environment of joblessness and fear among the employees. It can lead to an indefinite strike in the company also. So the management must take corrective actions prior in advance in order to start the further proceedings.

4.5 FINDIGS

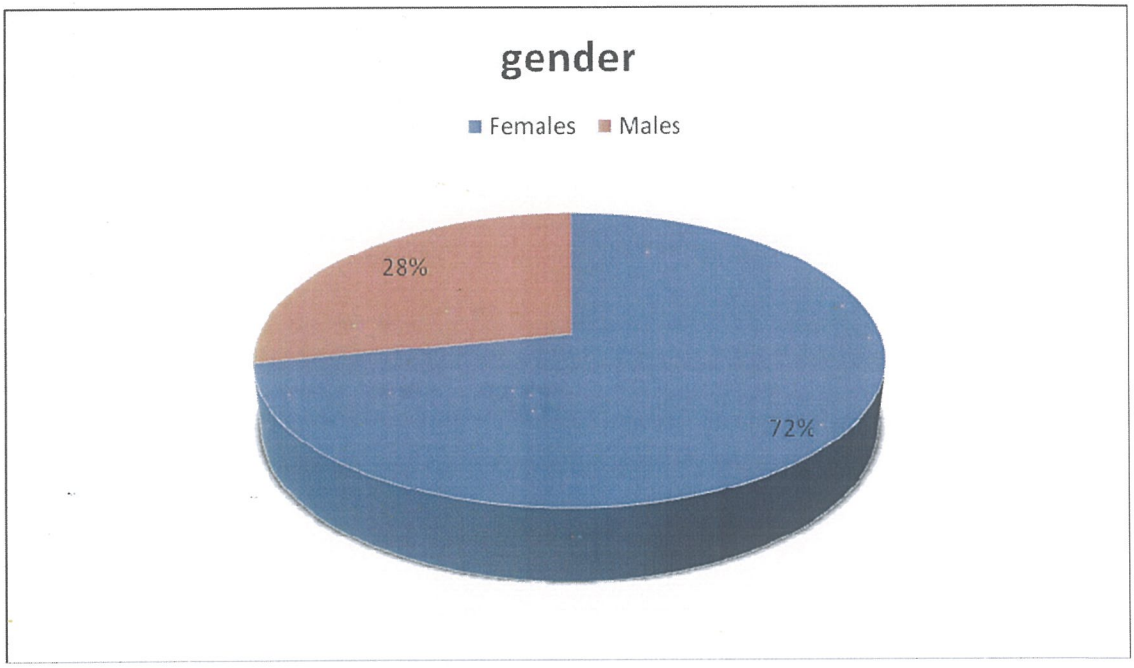
In this part we are going to show the results of what we carried out in the field and here the demographics and descriptive statistics, constructs reliability and validity assessment and then results of hypotheses tests are derived.

4.5.1 OVERVIEW OF THE SAMPLE

Data collection took place in June 2011 at Entebbe airport and Kenyatta International Airport in Nairobi. 230 questionnaires were distributed among Airline passengers from both local passengers within east Africa and international passengers who were at the airport during the time of the field work, both in Entebbe and Nairobi. First we distributed the questionnaires though the passengers who were in the checking area which resulted in to low co-operation of the subject as they were too busy with checking-in luggage and other general procedures involved with receiving tickets. Considering this situation I decide to change our location and distribute the questionnaire in the transit area which most of the passengers are usually idle and waiting for the gates to open. Out of the 230 questionnaires which we distributed we were only

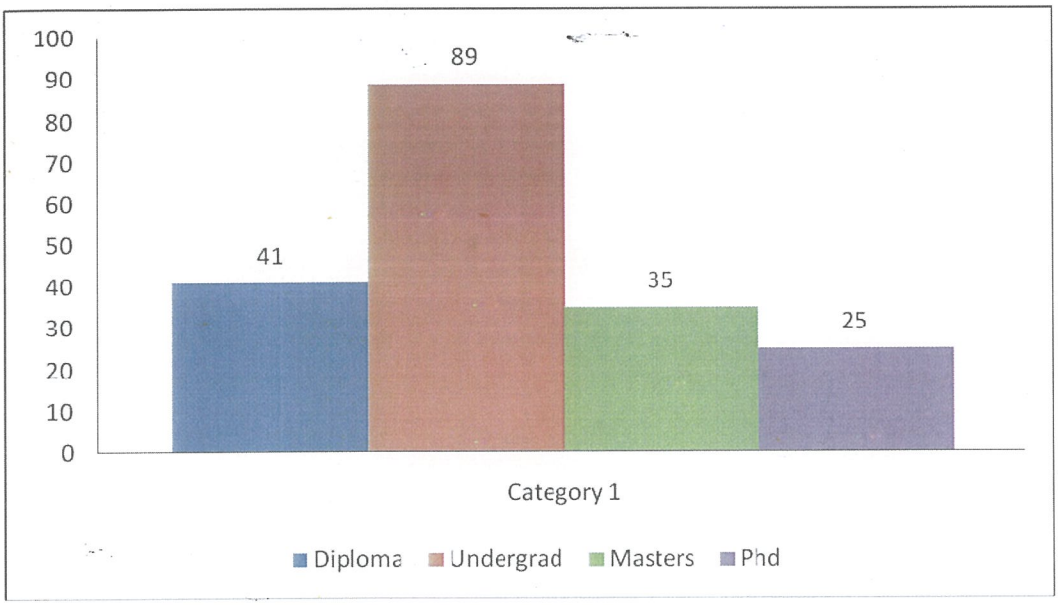
able to get feedback from 200 passengers and out of the 200 questionnaires 5 were spoilt and ten others had irregularities. So we managed to only have 185 successful questionnaires.

Figure 4.1



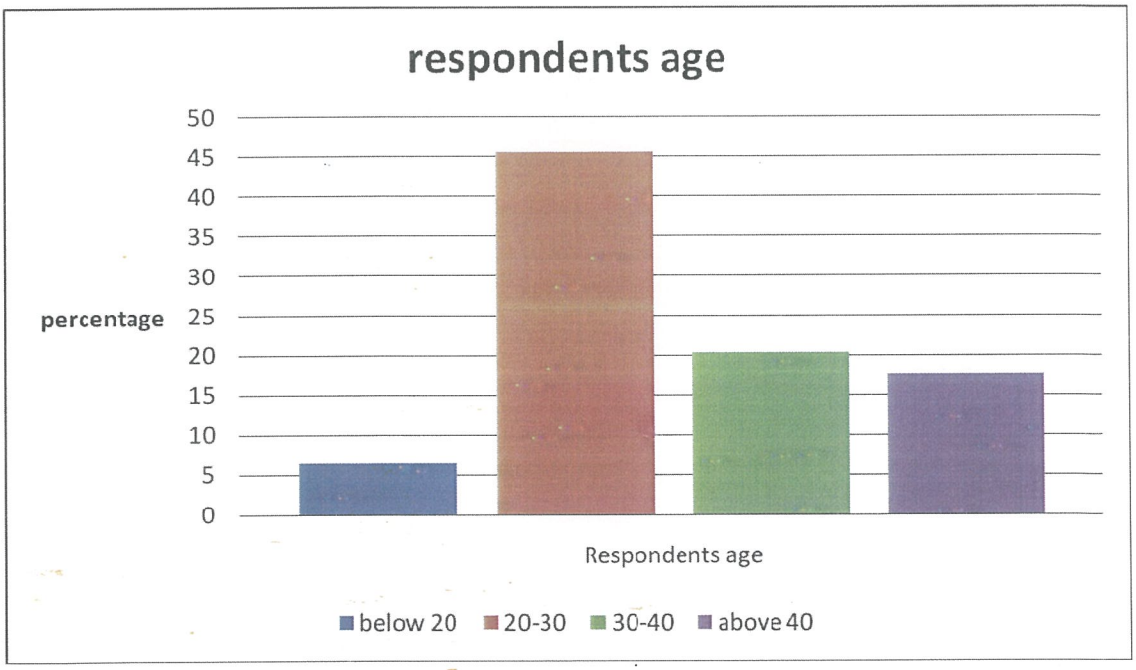
Below bar chart displays the educations level of the respondents. Majority of the respondents have above high school education. 47.85% of the respondents have a B.A degree which was no surprise

Figure 4.2



Majority of the respondents were between 20-3 years old which represents 45.6% of the total sample. People below the age of 20 were only 6.45%

Figure 4.3



CHAPTER 5

SYSTEM DESIGN AND IMPLIMENTATION

5.1 SYSTEM DESIGN

System design is the solution to the creation of a new system. This phase is composed of several systems. This phase focuses on the detailed implementation of the feasible system. It emphasis on translating design specifications to performance specification. System design has two phases of development logical and physical design.

During logical design phase the analyst describes inputs (sources), out puts (destinations), databases (data sores) and procedures (data flows) all in a format that meats the uses requirements. The analyst also specifies the user needs and at a level that virtually determines the information flow into and out of the system and the data resources. Here the logical design is done through data flow diagrams and database design.

The physical design is followed by physical design or coding. Physical design produces the working system by defining the design specifications, which tell the programmers exactly what the candidate system must do. The programmers write the necessary programs that accept input from the user, perform necessary processing on accepted data through call and produce the required report on a hard copy or display it on the screen.

5.2 LOGICAL DESIGN

Logical design of the system shows the major features and also how they are related to one another. The first step of the system design is to design logical design elements. This is the most creative and challenging phase and important too. Design of proposed system produces the details of the state how the system will meet the requirements identified during the system analysis that is, in the design phase we have to find how to solve the difficulties faced by the existing system. The logical design of the proposed system should include the details that contain how the solutions can be implemented. It also specifies how the database is to be built for storing and retrieving data, what kind of reports are to be created and what are the inputs to be given to the system.

5.2.1 CLIENT SERVER MODEL

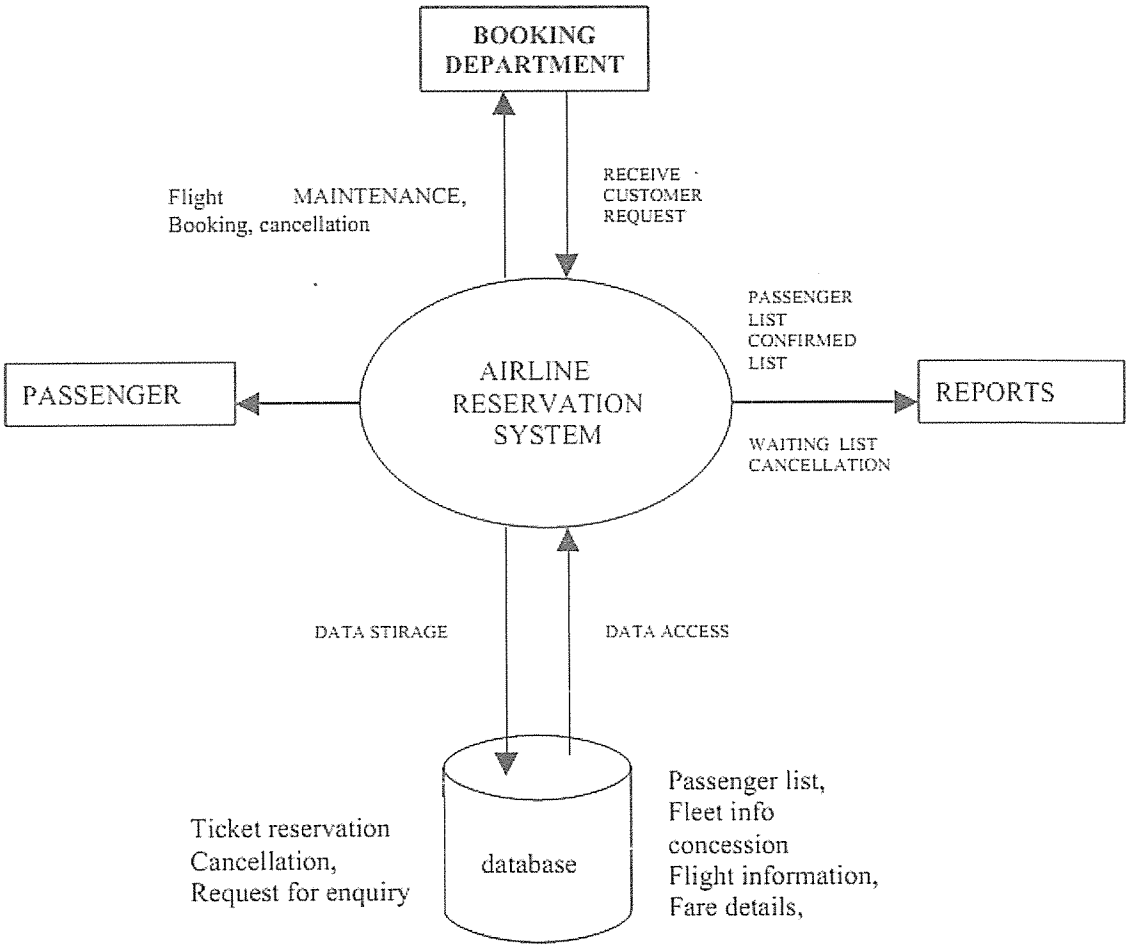
The client–server model of computing is a **distributed application** structure that partitions tasks or workloads between the providers of a resource or service, called servers, and service requesters, called **clients**. Often clients and servers communicate over a computer network on separate hardware, but both client and server may reside in the same system. A server machine is a host that is running one or more server programs which share their resources with clients. A client does not share any of its resources, but requests a server's content or service function. Clients therefore initiate communication sessions with servers which await incoming requests The client–server characteristic describes the relationship of cooperating programs in an application. The server component provides a function or service to one or many clients, which initiate requests for such services.

Functions such as email exchange, web access and database access, are built on the client–server model. Users accessing banking services from their computer use a web browser client to send a request to a web server at a bank. That program may in turn forward the request to its own database client program that sends a request to a database server at a computer to retrieve the account information. The balance is returned to the bank database client, which in turn serves it back to the web browser client displaying the results to the user. The client–server model has become one of the central ideas of network computing. Many business applications being written today use the client–server model. So do the Internet's main application protocols, such as HTTP, SMTP, Telnet, and DNS The interaction between client and server is often described using sequence diagrams. Sequence diagrams are standardized in the Language. Specific types of clients include web browsers, email clients, and online chat clients. Specific types of servers include web servers, ftp servers, application servers, database servers, name servers, mail servers, file servers, print servers, and terminal servers. Most web services are also types of servers.

5.2.2 USE CASE DIAGRAMS

The interaction between the client and the server is as shown below in the diagrams.

Figure5.1



5.3 THE GENERAL ARCHITECTURAL DIAGRAM FOR THE SYSTEM.

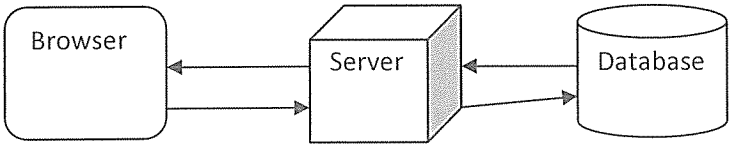
Generally, the term tier is used to describe physical distribution of components of a system on separate servers, computers, or networks (processing nodes). Three-tier architecture then will have three processing nodes. Layers refer to a logical grouping of components which may or may not be physically located on one processing node.

In three tier application server architecture, most application functions run on a shared host. This makes them more secure and scalable since it lessens the burden of software placed on the client-side. Application servers are also less expensive to install since it is installed on a single server and not on every desktop in the network.

Messaging servers in the three tier architecture also provide a middle layer in three tier client-server architectures. They also prioritize messages. The messages contain priority information, addresses and identification numbers to locate requested data on relational DBMSs and other data sources. However, in this context, the intelligent information is found in the content of the message and headings. In TP monitors, intelligence is located in the monitor itself.

The architecture uses the three tier architecture.

Figure 5.2: Three tire architecture



Three tier arch

itecture is also referred to as multi-tier architecture or as n-tier architecture is a client–server architecture in which the presentation, the application processing, and the data management are logically separate processes. For example, an application that uses middleware to service data requests between a user and a database. The three tier architecture has three main parts and they are as follow;

- Presentation tier also known as the user interface. This is the topmost level of the application. The presentation tier displays information related to such services as Register, login, post comment, view comments, logout .It communicates with other tiers by outputting results to the browser/client tier and all other tiers in the network. A front-end web server serving static content, and potentially some cached dynamic content. In web based application, Front End is the content rendered by the browser. The content may be static or generated dynamically.

- Application tier also known as the Functional process logic, data access tier, or middle tier.

- The logic tier is pulled out from the presentation tier and, as its own layer; it controls an application's functionality by performing detailed processing. A middle dynamic content processing and generation level application server, for example Java EE, ASP.NET, PHP, ColdFusion platform.

Data tier also known as computer data storage and data access. This tier consists of database servers. Here information is stored and retrieved. This tier keeps data neutral and independent from application servers. Giving data its own tier also improves scalability and performance. Advantages of three tier architecture in the web based application development are;

a) Three-tier application architecture provides a model for developers to create a flexible and reusable application. By breaking up an application into tiers, developers only have to modify or add a specific layer, rather than have to rewrite the entire application over. There should be a presentation tier, data access tier, and a data tier.

b) The three tier system is that all data access tier can be defined once within the data layer and then shared by any number of components within the presentation layer. Any changes to data rules, can therefore be made in one place and be instantly available throughout the whole application. It is possible to change the contents of any one of tiers (layers) without having to make corresponding changes in any of the others enable parallel development of the different tiers of the application. Complex application rules easy to implement in application server.

c) Easy to implement changes. Fewer JavaScript, thus simpler to the client

Figure 5.3

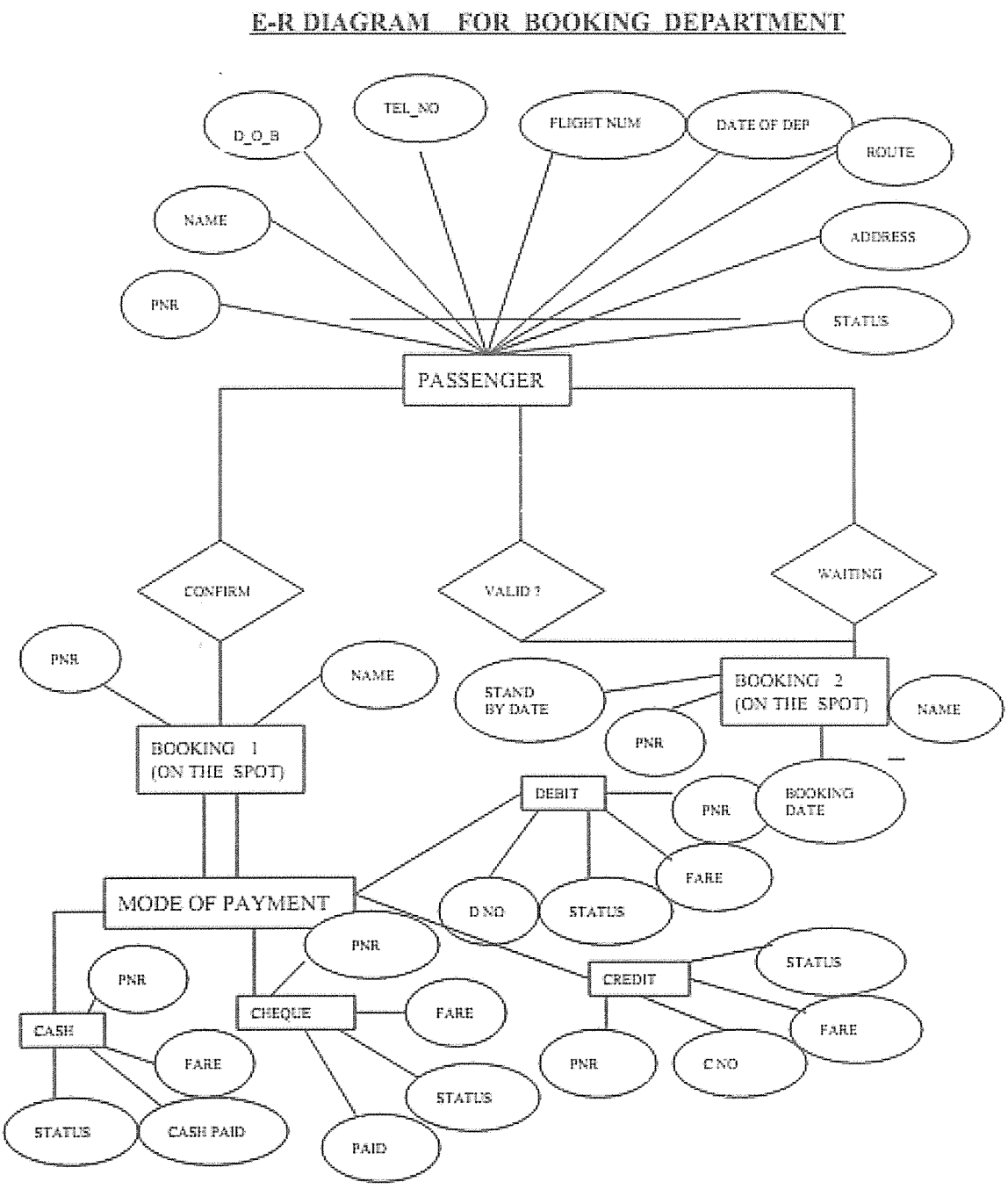
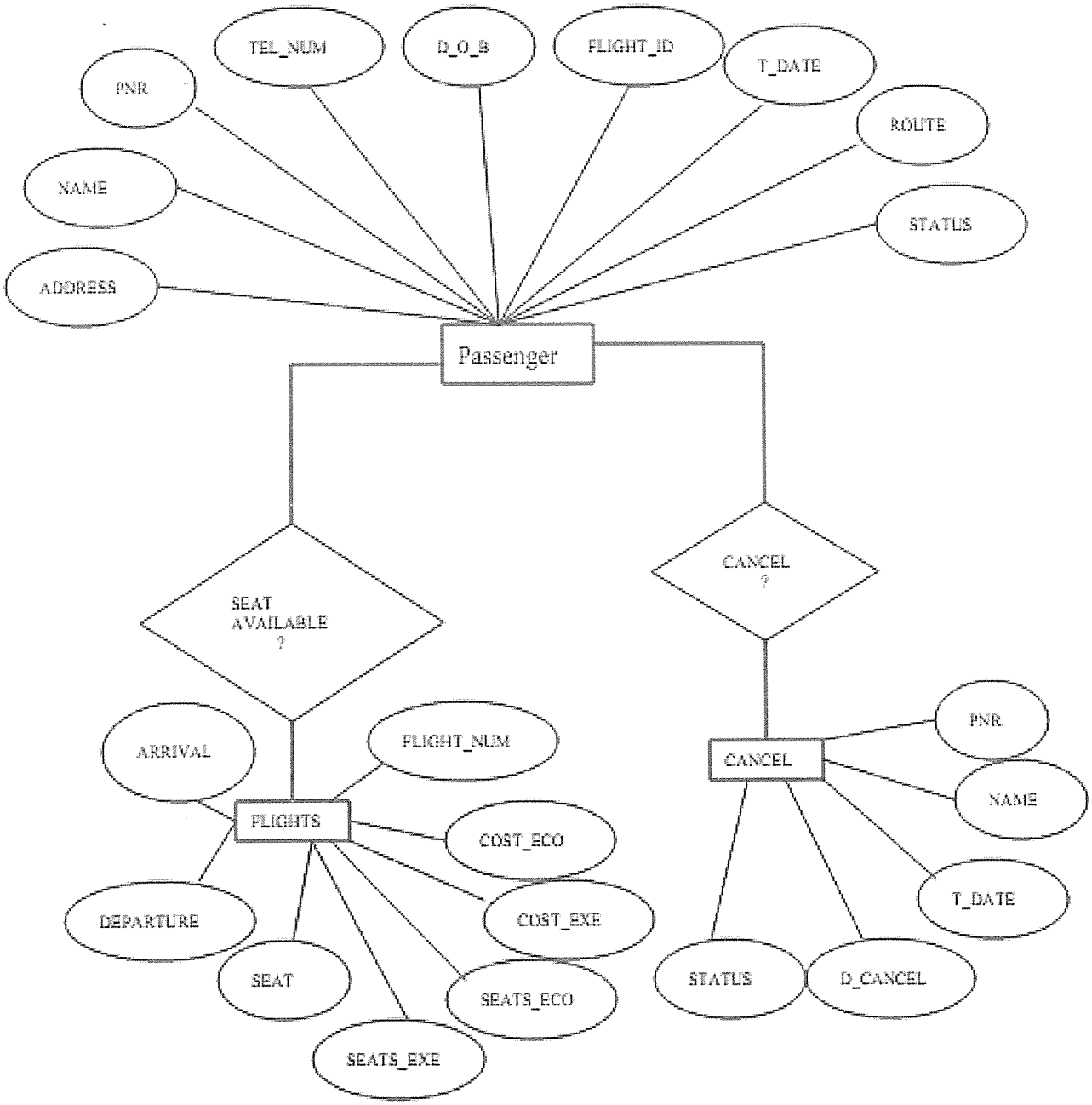

E-R DIAGRAM FOR BOOKING DEPARTMENT
D_O_B
TEL_NO
FLIGHT NUM
DATE OF DEP
ROUTE
NAME
ADDRESS
PNR
STATUS
PASSENGER
CONFIRM
VALID ?
WAITING
PNR
NAME
STAND BY DATE
BOOKING 2 (ON THE SPOT)
NAME
PNR
BOOKING 1 (ON THE SPOT)
DEBIT
PNR
BOOKING DATE
FARE
MODE OF PAYMENT
D NO
STATUS
PNR
PNR
CREDIT
STATUS
CHEQUE
FARE
CASH
FARE
PNR
C NO
FARE
STATUS
STATUS
CASH PAID
PAID

Figure 5.4

ENTITY RELATIONSHIP DIAGRAM FOR CANCELATION



DATA FLOW DIAGRAM

In order to design a better solution. I had designed the DFD for system including all technical processing details is given bellow

Figure 5.5

LEVEL 0 DATA FLOW DIAGRAM

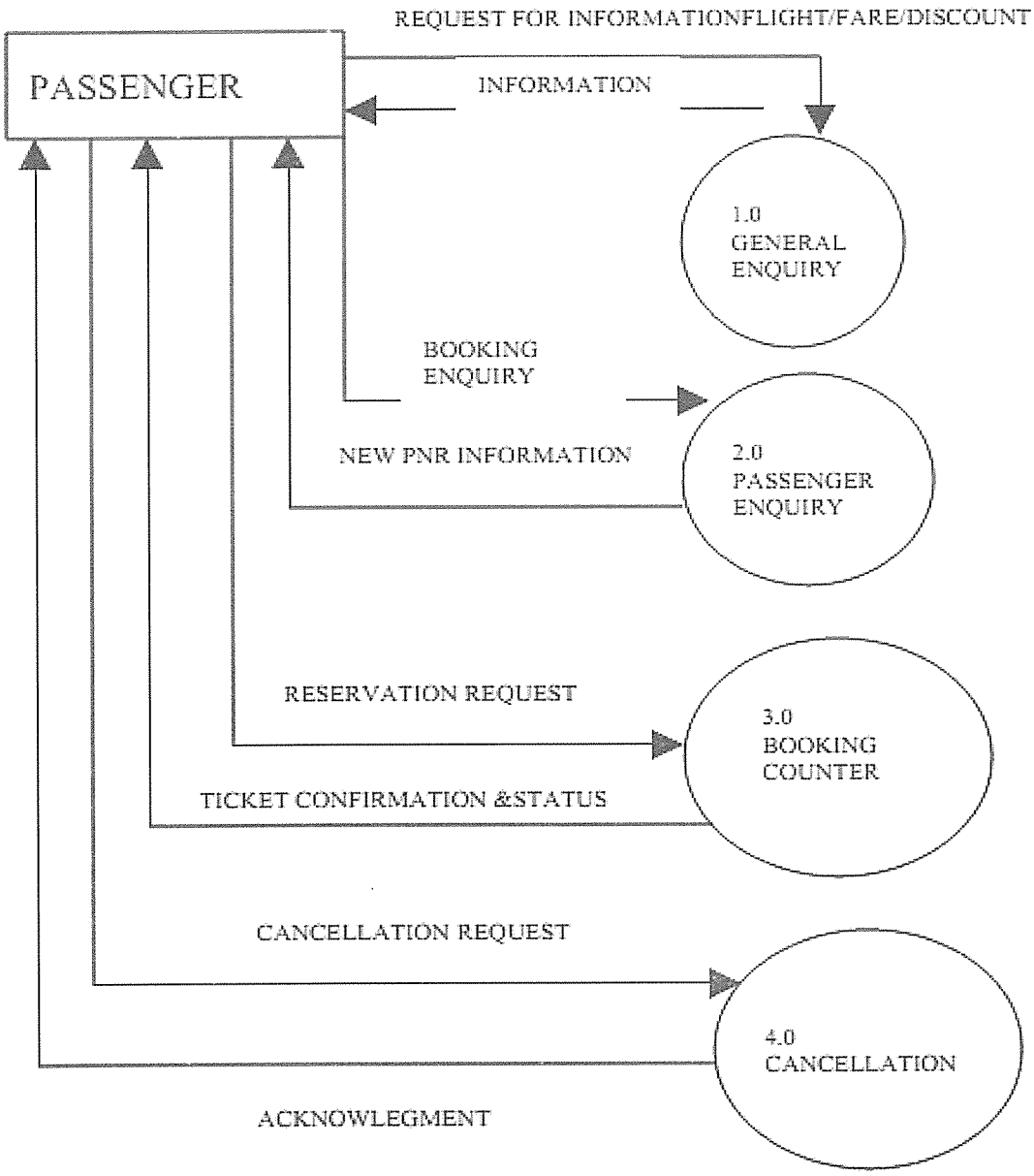


Figure 5.6

LEVEL 1 DATA FLOW DIAGRAM OF GENERAL ENQUIRY SYSTEM

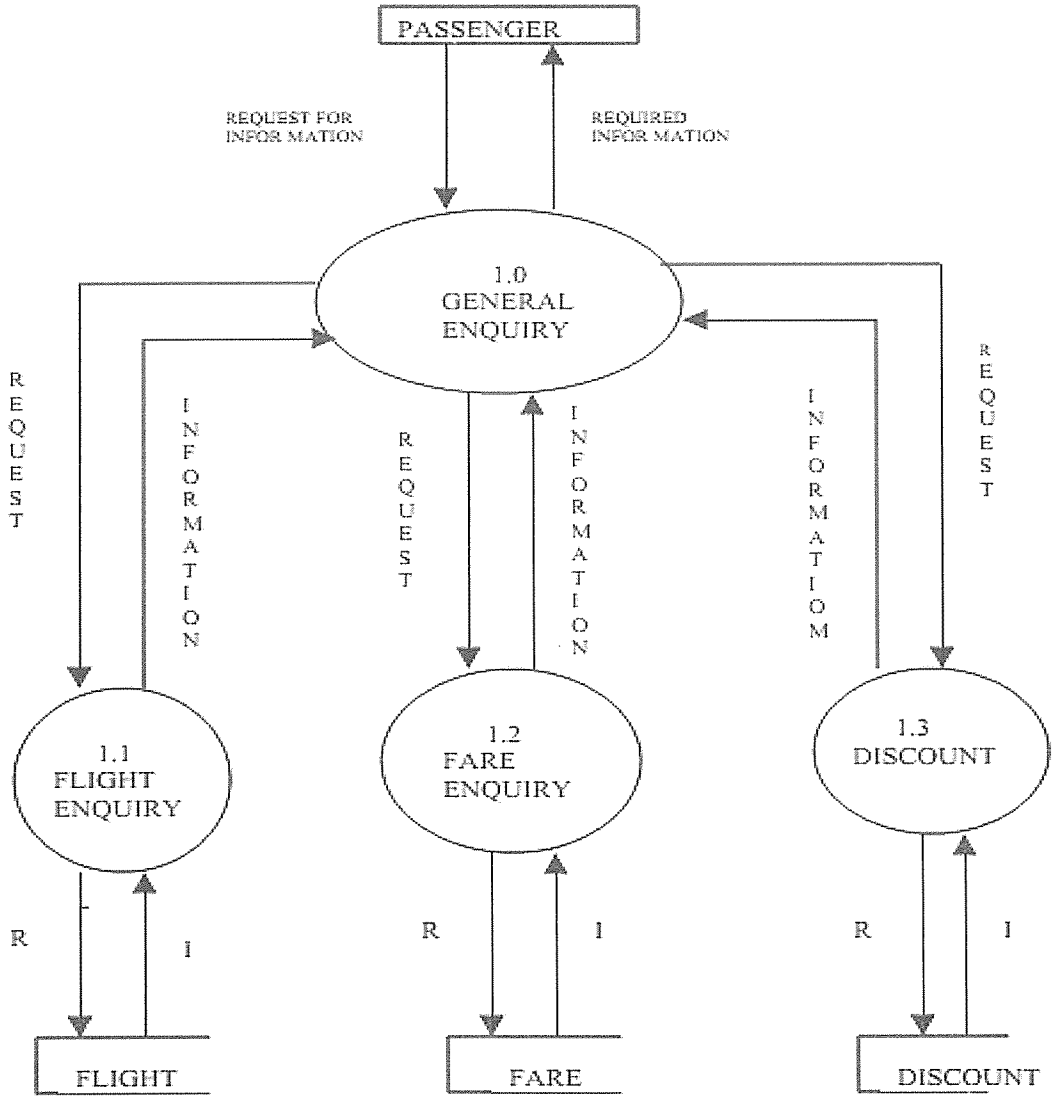


Figure 5.7

LEVEL 1 DATA FLOW DIAGRAM OF PASSENGER ENQUIRY

SECTION

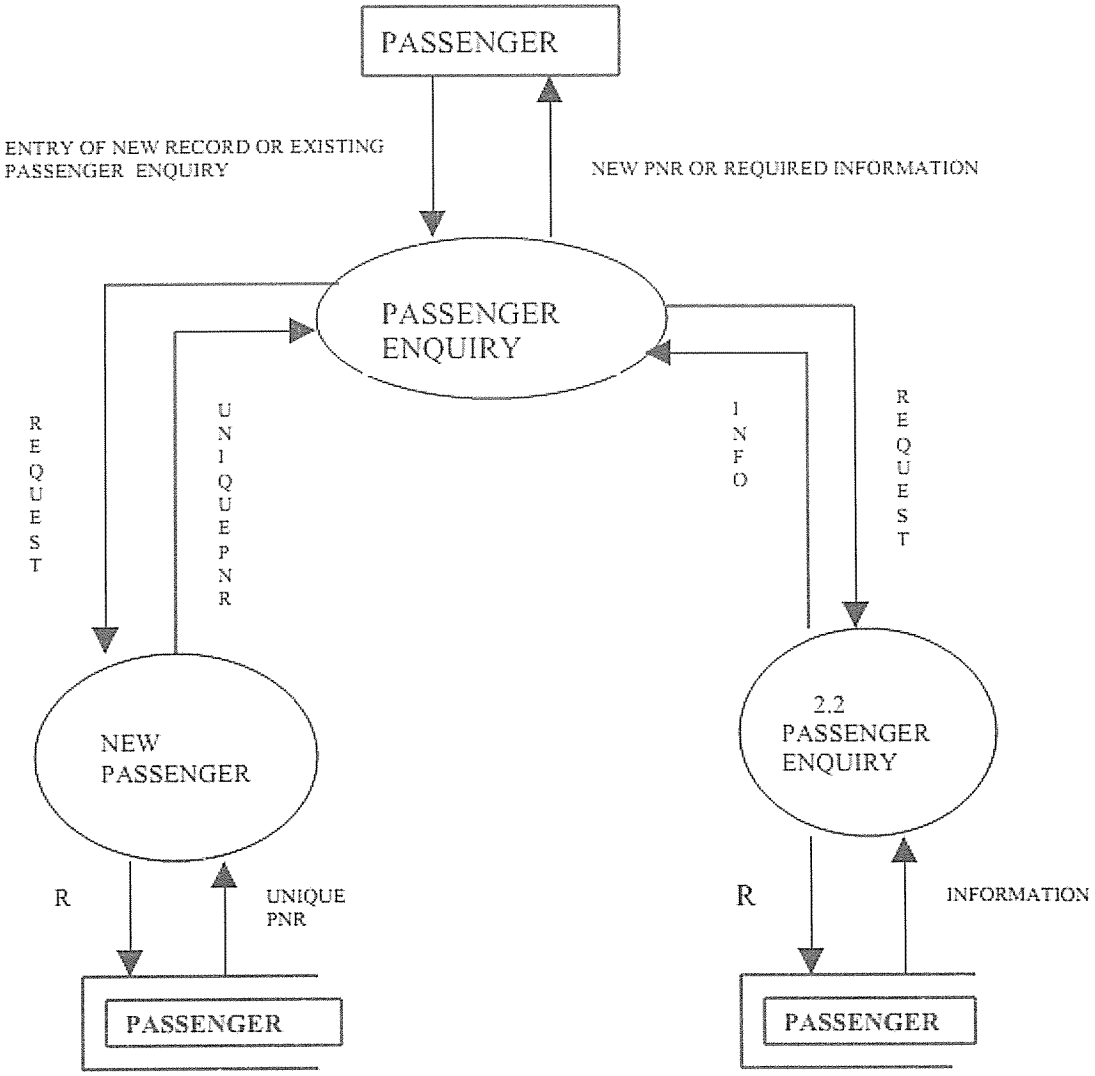


Figure 5.7

LEVEL 2 DFD OF BOOKING

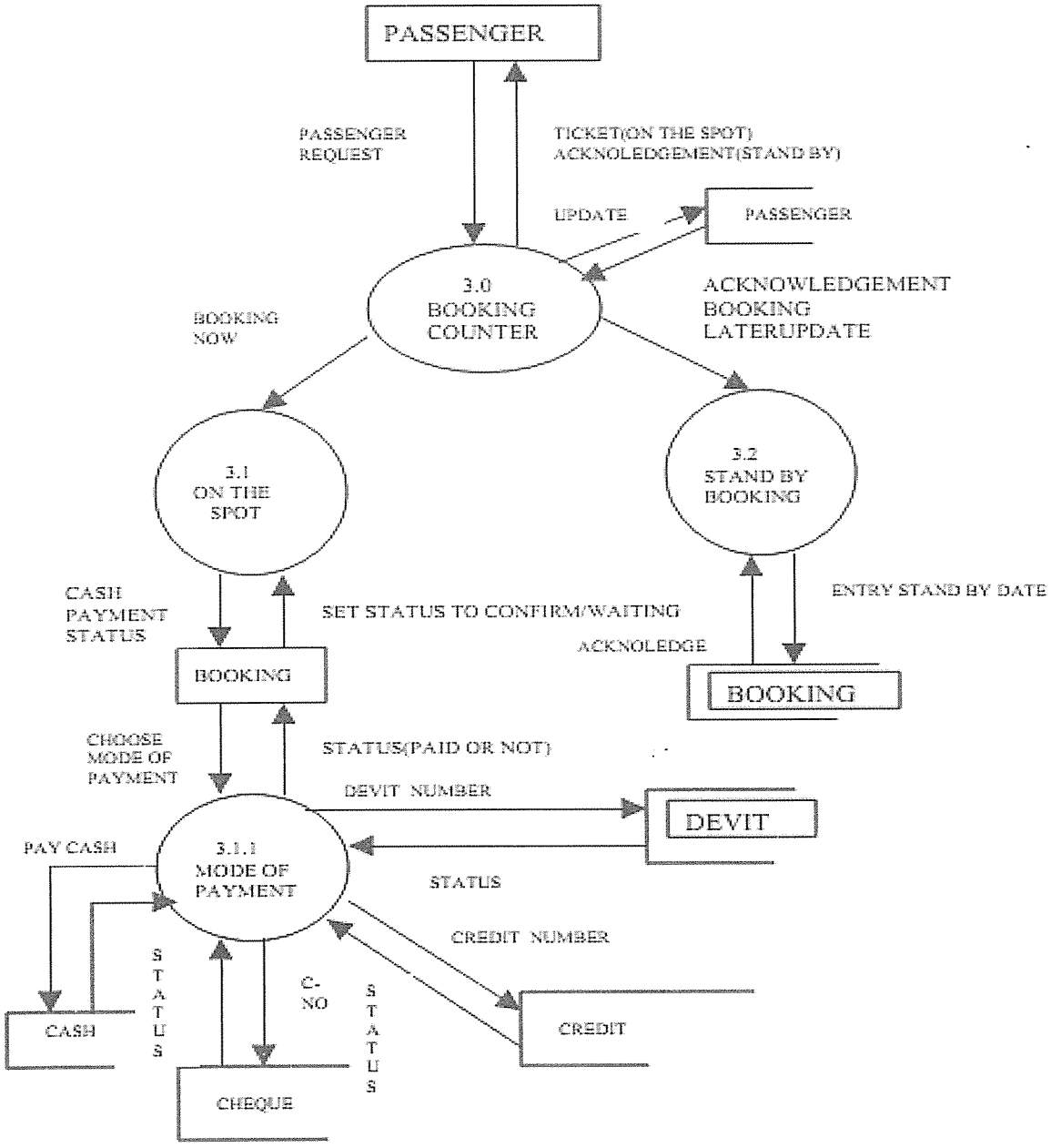
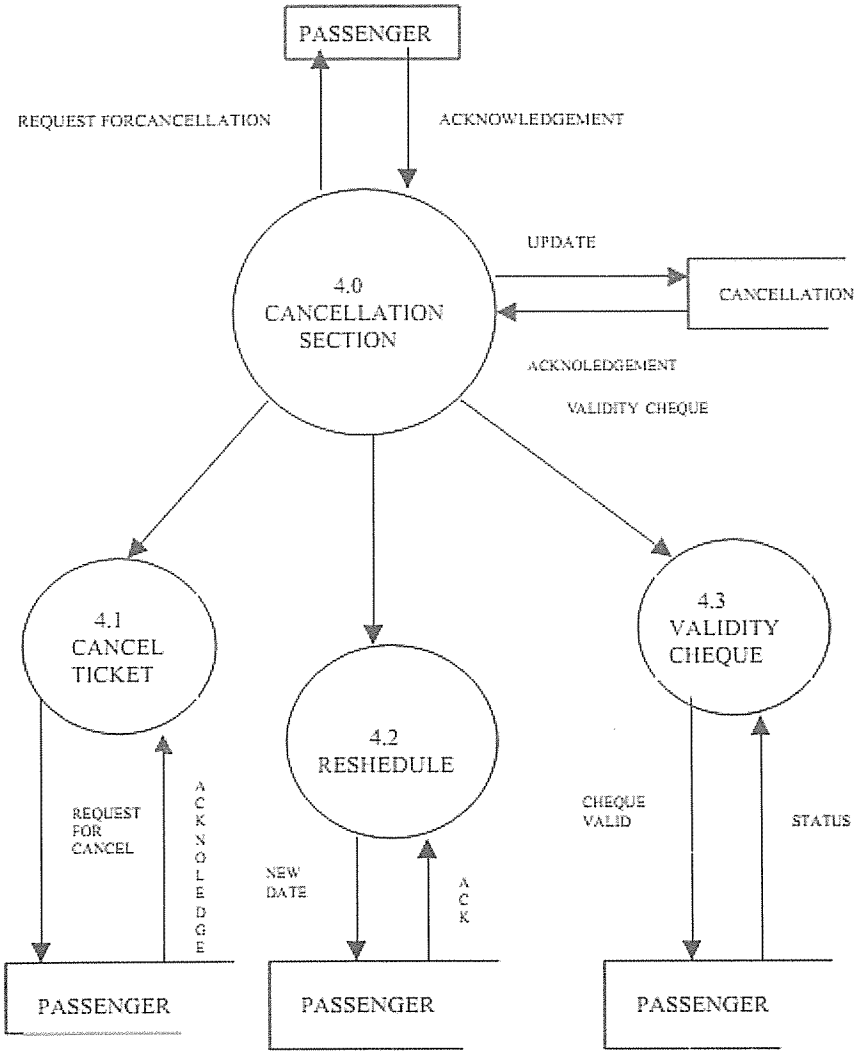


Figure 5.8

LEVEL 2 DFD OF CANCELLATION



5.4 MODULAR DESIGN

A software system is always divided into several sub systems that makes it easier for the development. A software system that is structured into several subsystems makes it easy for the

development and testing. The different subsystems are known as the modules and the process of dividing an entire system into subsystems is known as modularization or decomposition. A system cannot be decomposed into several subsystems in any way. There must some logical barrier, which facilitates the separation of each module. The separation must be simple but yet must be effective so that the development is not affected. The system under consideration has been divided into several modules taking in consideration the above-mentioned criteria.

Their images are as shown below

Figure 5.9

Figure 5.10

Figure 5.11

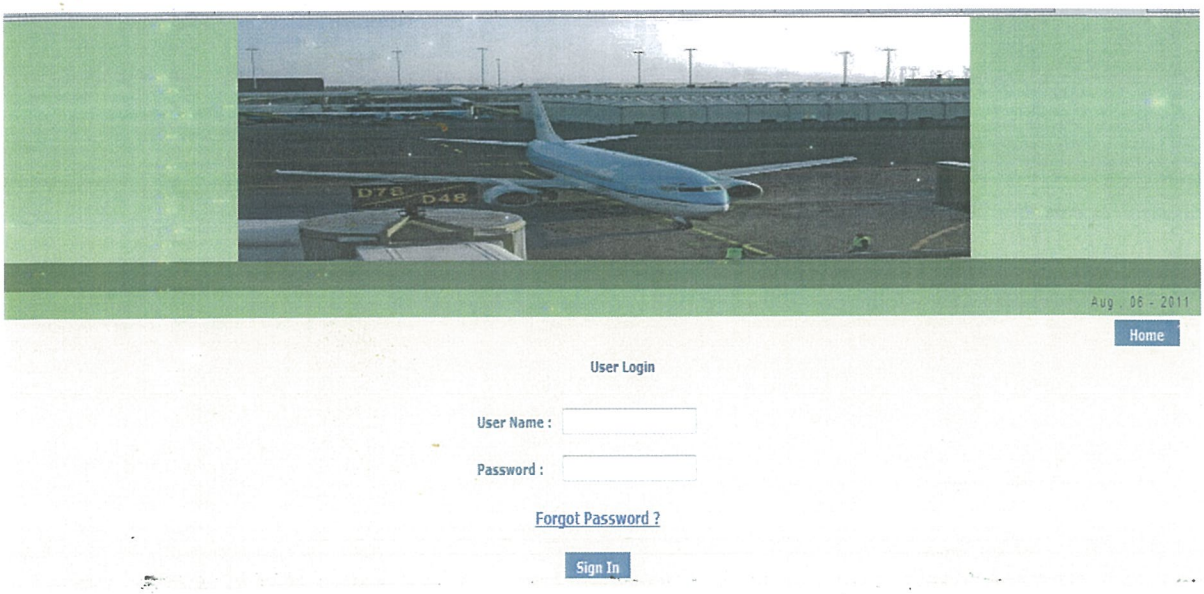


Figure 5.12

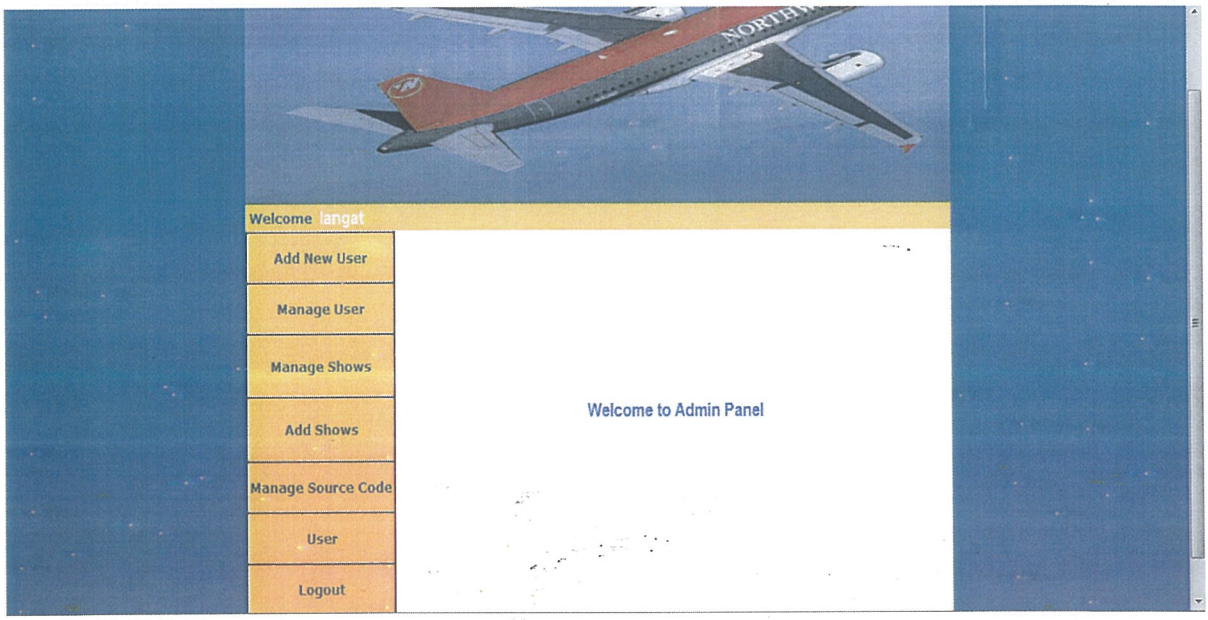


Figure 5.13

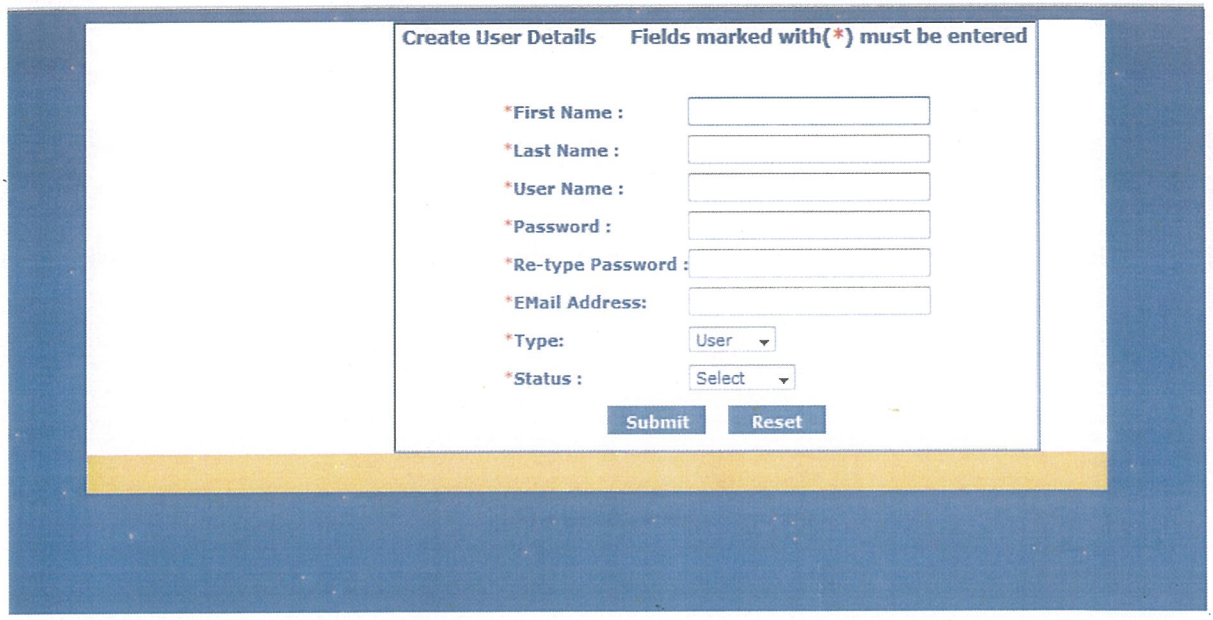

Create User Details
Fields marked with(*) must be entered
*First Name :
*Last Name :
*User Name :
*Password :
*Re-type Password :
*EMail Address:
*Type:
User
*Status :
Select
Submit
Reset

Figure 5.14

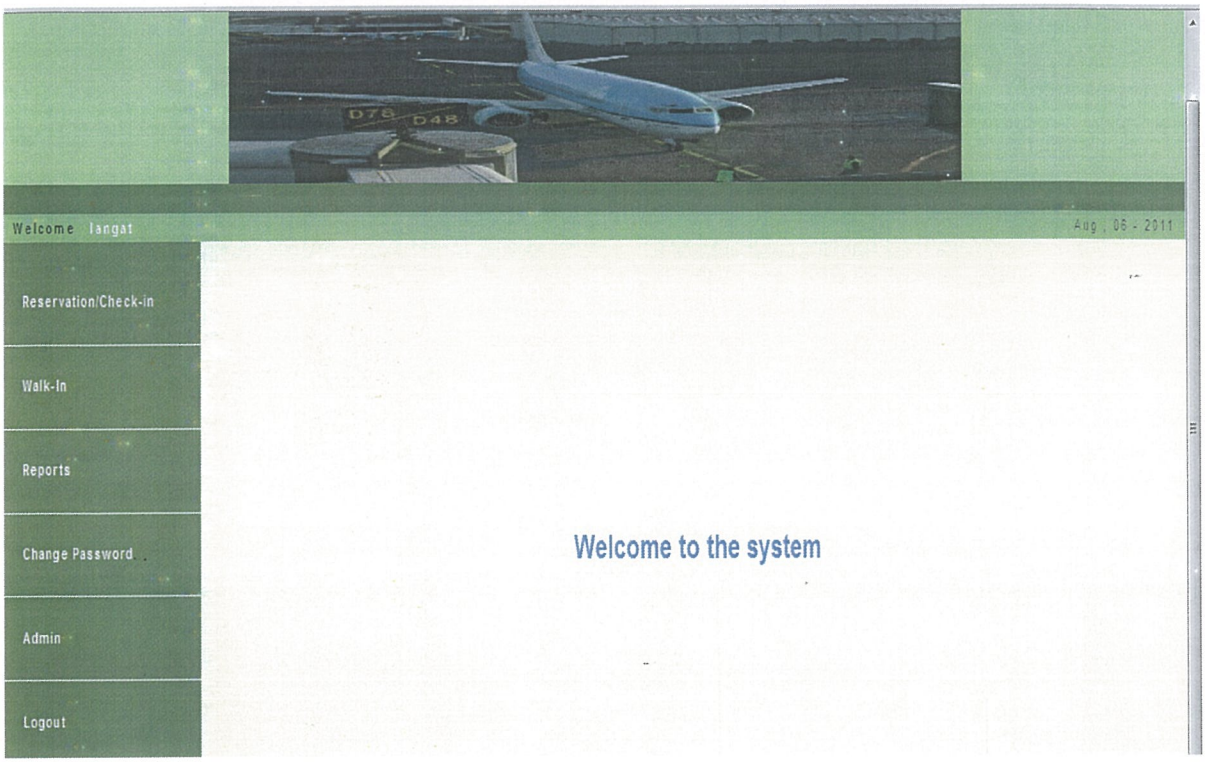

Welcome langat
Aug , 06 - 2011
Reservation/Check-in
Walk-In
Reports
Change Password
Admin
Logout
Welcome to the system

Figure 5.15

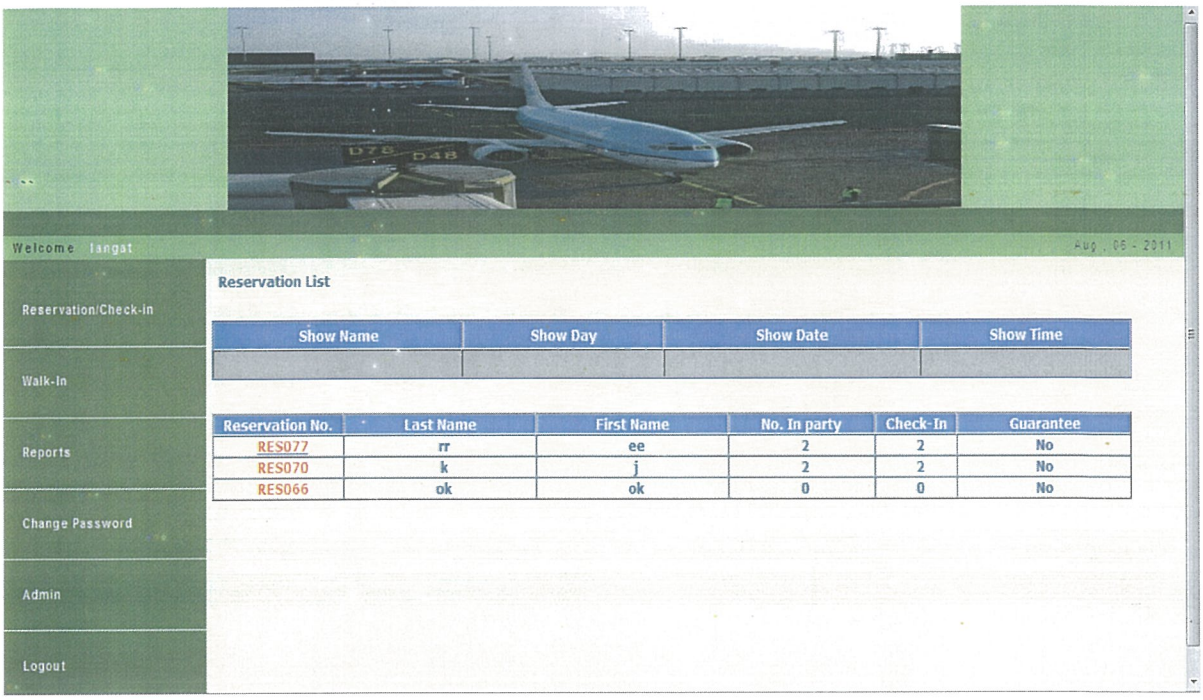

Welcome langat
Aug , 06 - 2011
Reservation/Check-in
Walk-In
Reports
Change Password
Admin
Logout
Reservation List
Show Name
Show Day
Show Date
Show Time
Reservation No.
Last Name
First Name
No. In party
Check-In
Guarantee
RES077
rr
ee
2
2
No
RES070
k
j
2
2
No
RES066
ok
ok
0
0
No

Figure 5.16

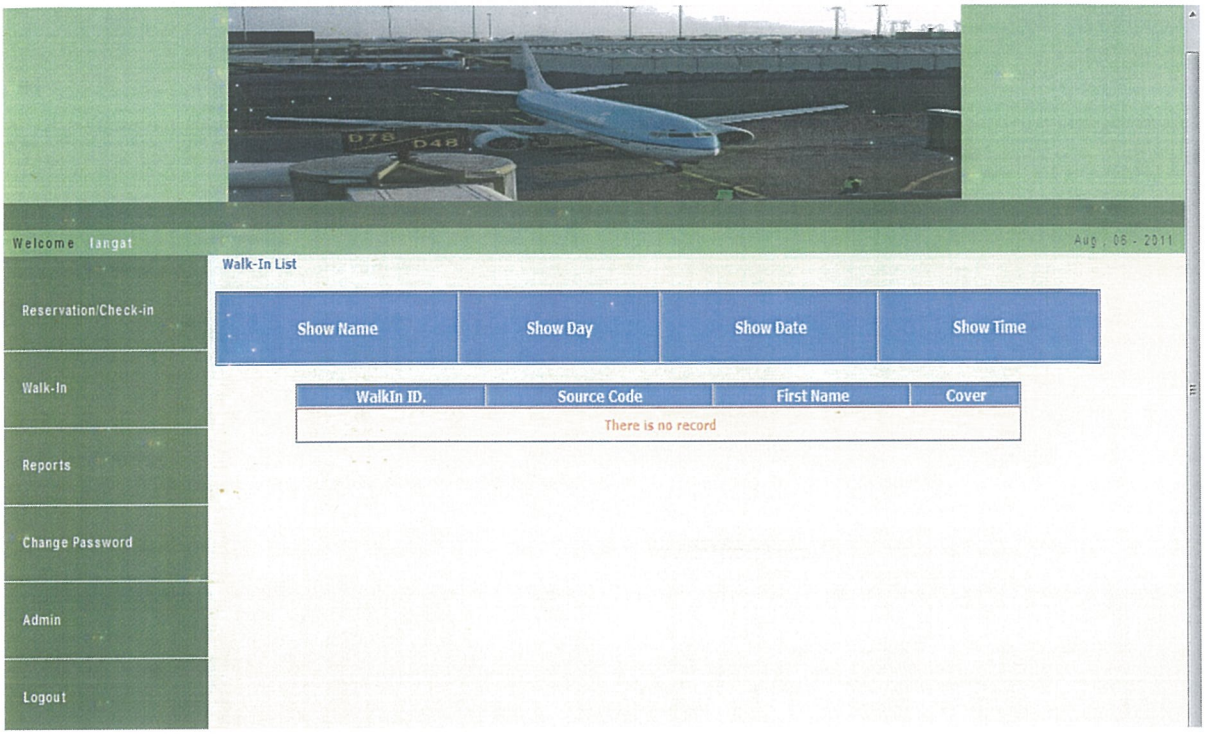

Welcome Iangat
Aug , 06 - 2011
Walk-In List
Reservation/Check-in
Walk-In
Reports
Change Password
Admin
Logout
Show Name
Show Day
Show Date
Show Time
WalkIn ID.
Source Code
First Name
Cover
There is no record

Figure 5.17

5.5 DATABASE DESIGN

The overall objective in the development of database technology has been to treat data as an organizational resource and as an integrated whole. DBMS allow data to be protected and organized separately from other resources. Database is an integrated collection of data. The most significant form of data as seen by the programmers is data as stored on the direct access storage devices. This is the difference between logical and physical data. Database files are the key source of information into the system. It is the process of designing database files, which are the key source of information to the system. The files should be properly designed and planned for collection, accumulation, editing and retrieving the required

information.

The organization of data in database aims to achieve three major objectives:

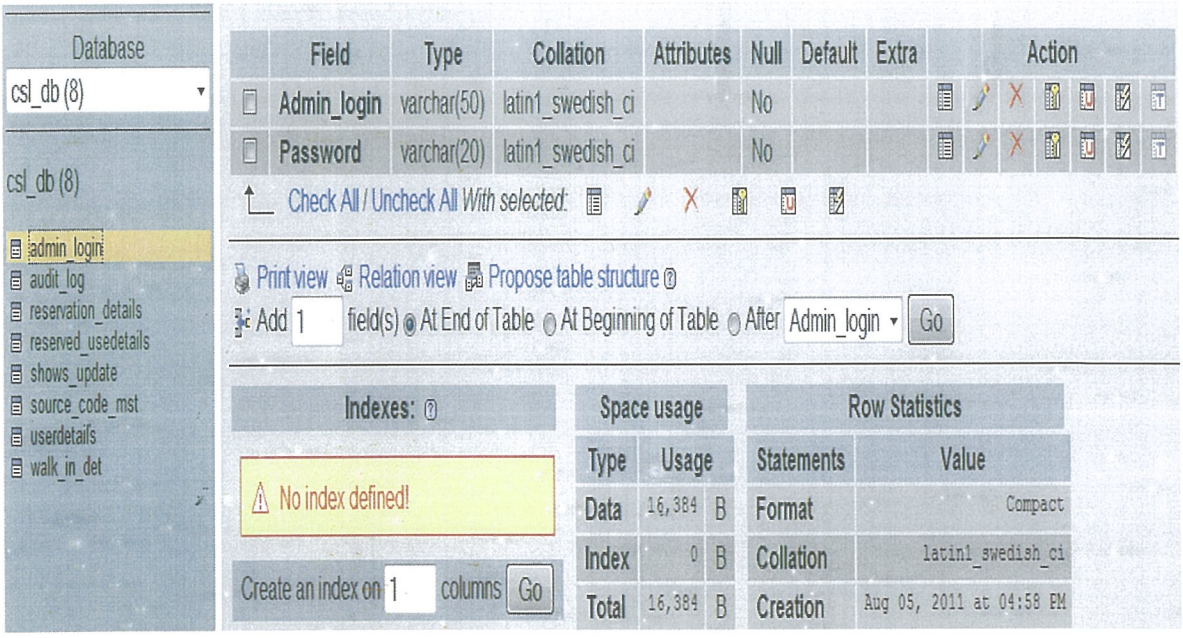
- Data integrity
- Data integration
- Data independence

The proposed system stores the information relevant for processing in the MS SQL SERVER database. This database contains tables, where each table corresponds to one particular type of information. Each piece of information in table is called a field or column. A table also contains records, which is a set of fields. All records in a table have the same set of fields with different information. There are primary key fields that uniquely identify a record in a table. There are also fields that contain primary key from another table called foreign keys.

The diagrams for the database design are as shown below

Figure 5.18

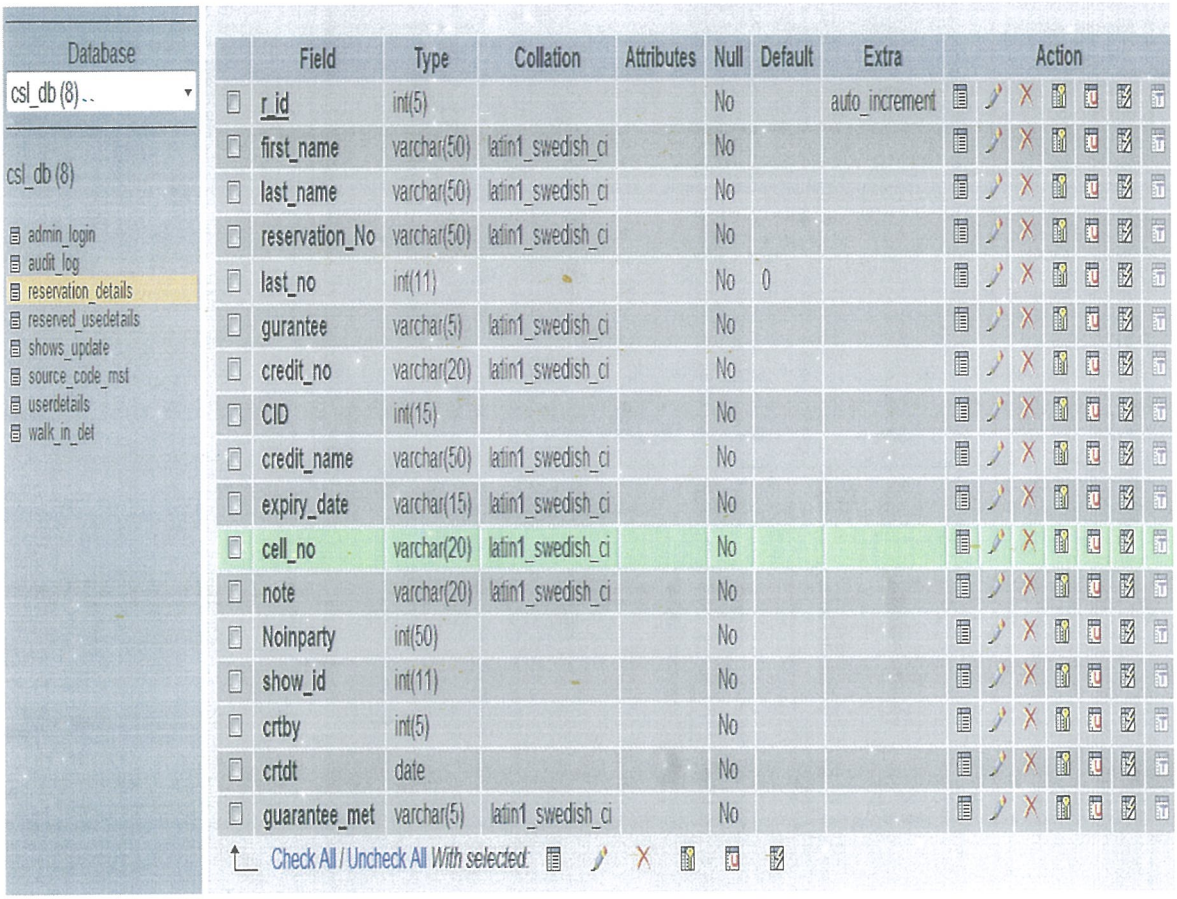
This are lists of tables which are used in the database



In the database above one login his username and password to access the database.

Figure 5.19

CUSTOMER DETAILS



r_id captures the passengers id number on the plane.

First_name captures the passengers first name.

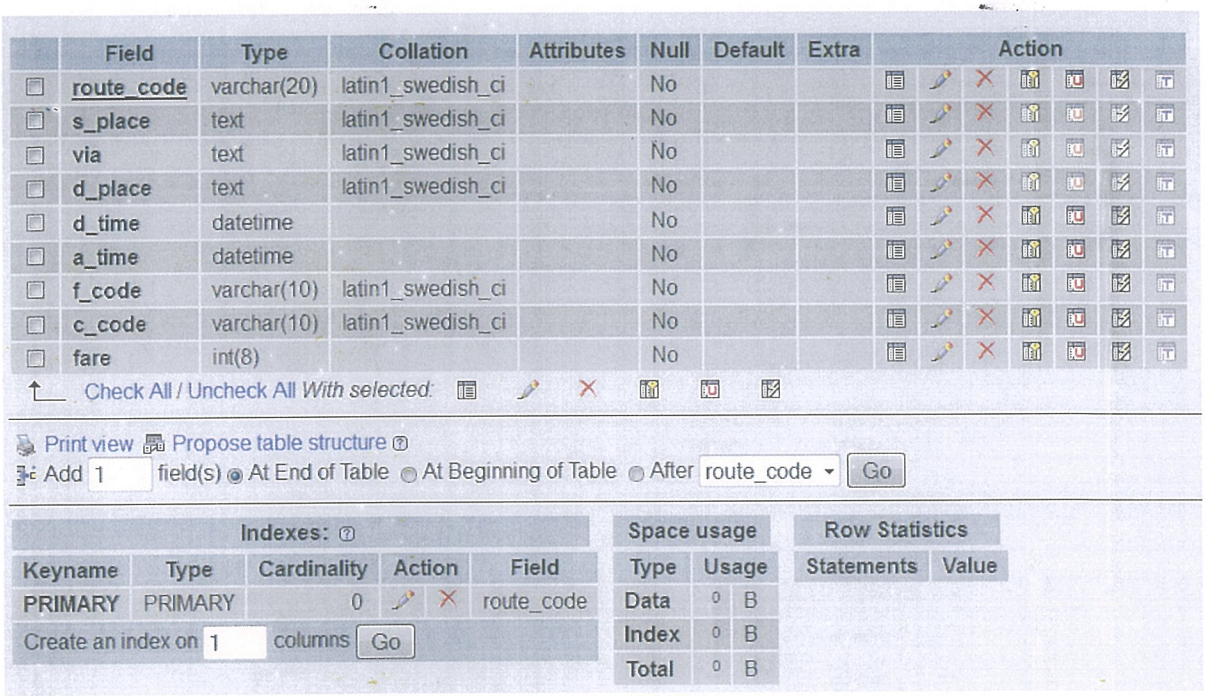
Last _name captures the passengers last name

Expirely _date shows when the passengers ticket expires.

Cell_no captures the cell number of the passenger.

Figure 5.20

Flight fares database



	Field	Type	Collation	Attributes	Null	Default	Extra	Action
☐	route_code	varchar(20)	latin1_swedish_ci		No			
☐	s_place	text	latin1_swedish_ci		No			
☐	via	text	latin1_swedish_ci		No			
☐	d_place	text	latin1_swedish_ci		No			
☐	d_time	datetime			No			
☐	a_time	datetime			No			
☐	f_code	varchar(10)	latin1_swedish_ci		No			
☐	c_code	varchar(10)	latin1_swedish_ci		No			
☐	fare	int(8)			No			

Check All / Uncheck All *With selected:*

Print view Propose table structure

Add 1 field(s) At End of Table At Beginning of Table After route_code Go

Indexes:

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	0		route_code

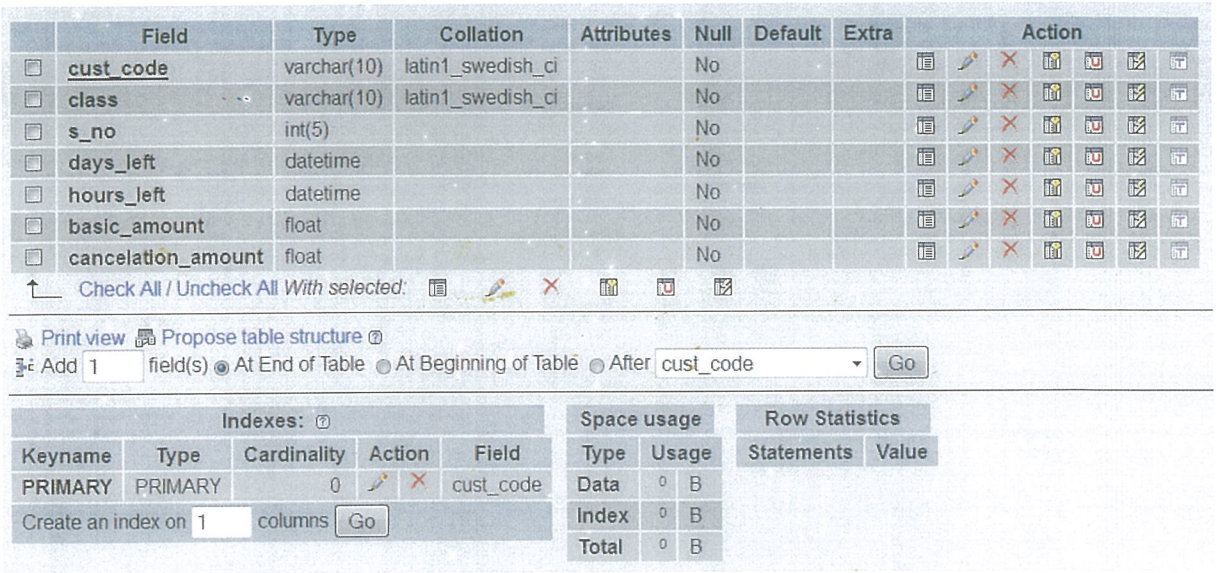
Create an index on 1 columns Go

Space usage		Row Statistics	
Type	Usage	Statements	Value
Data	0 B		
Index	0 B		
Total	0 B		

In the database above here one click on place to show the place of destination time of departure and fare shows the costs of the flight.

Figure 5.21

Flight cancelation database



	Field	Type	Collation	Attributes	Null	Default	Extra	Action
☐	cust_code	varchar(10)	latin1_swedish_ci		No			
☐	class	varchar(10)	latin1_swedish_ci		No			
☐	s_no	int(5)			No			
☐	days_left	datetime			No			
☐	hours_left	datetime			No			
☐	basic_amount	float			No			
☐	cancelation_amount	float			No			

Check All / Uncheck All *With selected:*

Print view Propose table structure

Add 1 field(s) At End of Table At Beginning of Table After cust_code Go

Indexes:

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	0		cust_code

Create an index on 1 columns Go

Space usage

Type	Usage
Data	0 B
Index	0 B
Total	0 B

Row Statistics

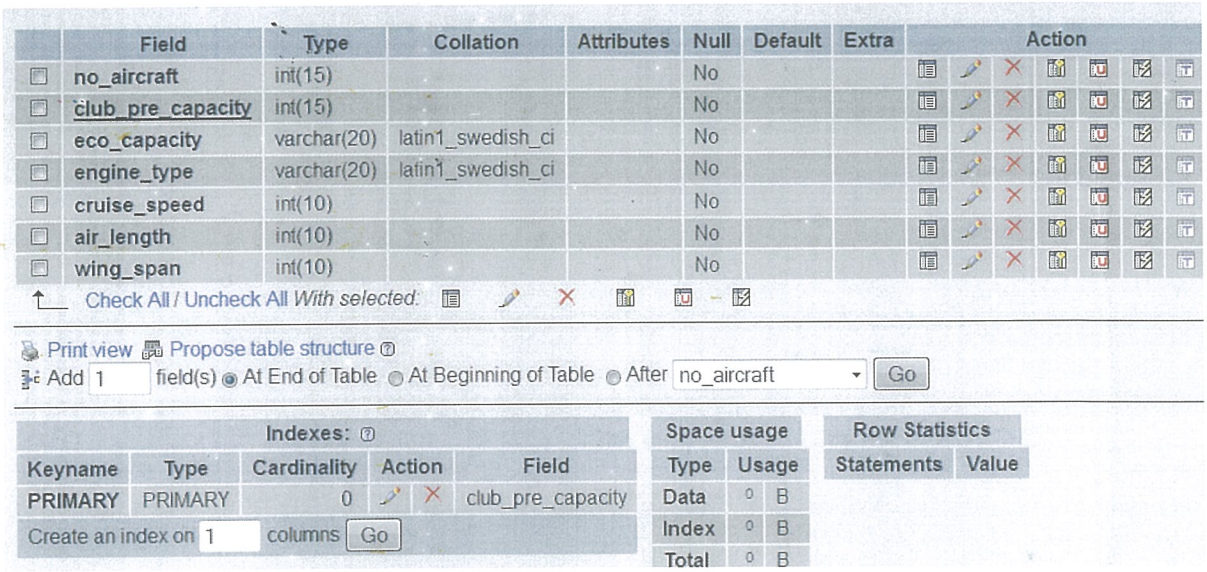
Statements	Value

Class shows the class on booked and $_no shows the seat number, days shows the number days left for the flight and hours_ left shows the hours left for the departure.

Cancelation_ amount shows the amount charged for ticket cancelling.

Figure 5.22

Flight database



	Field	Type	Collation	Attributes	Null	Default	Extra	Action
	no_aircraft	int(15)			No			
	club_pre_capacity	int(15)			No			
	eco_capacity	varchar(20)	latin1_swedish_ci		No			
	engine_type	varchar(20)	latin1_swedish_ci		No			
	cruise_speed	int(10)			No			
	air_length	int(10)			No			
	wing_span	int(10)			No			

Check All / Uncheck All *With selected:*

Print view Propose table structure

Add 1 field(s) At End of Table At Beginning of Table After no_aircraft Go

Indexes:				
Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	0		club_pre_capacity

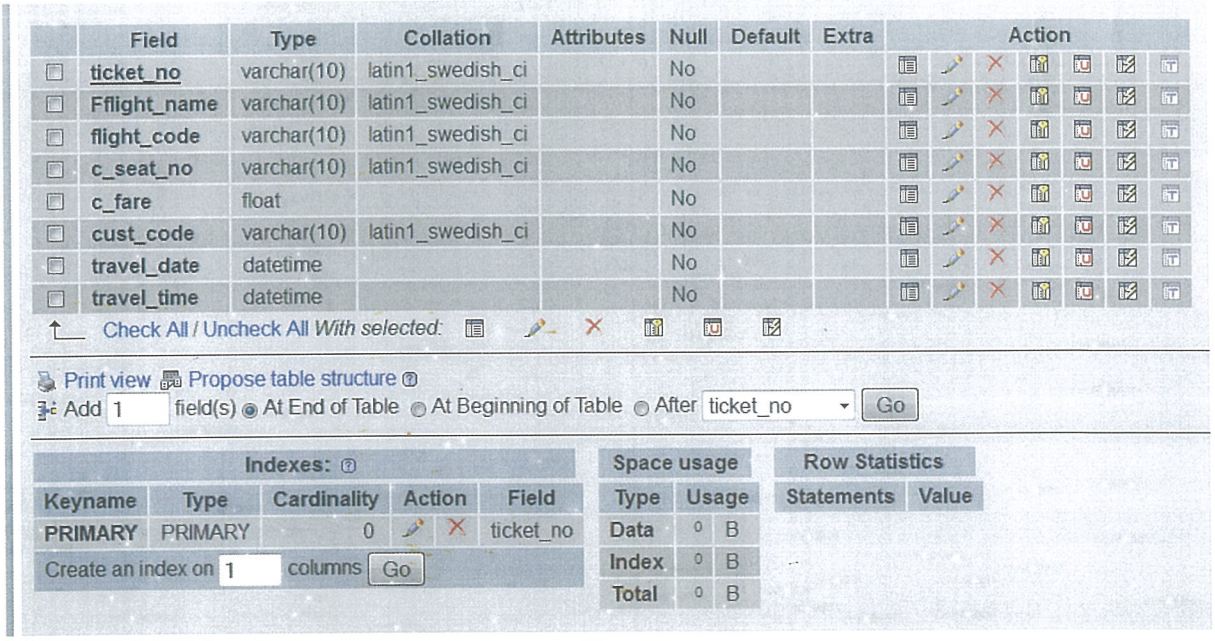
Create an index on 1 columns Go

Space usage	
Type	Usage
Data	0 B
Index	0 B
Total	0 B

Row Statistics	
Statements	Value

Figure 5.23

Database for enquiry



	Field	Type	Collation	Attributes	Null	Default	Extra	Action
	ticket_no	varchar(10)	latin1_swedish_ci		No			
	Fflight_name	varchar(10)	latin1_swedish_ci		No			
	flight_code	varchar(10)	latin1_swedish_ci		No			
	c_seat_no	varchar(10)	latin1_swedish_ci		No			
	c_fare	float			No			
	cust_code	varchar(10)	latin1_swedish_ci		No			
	travel_date	datetime			No			
	travel_time	datetime			No			

Check All / Uncheck All *With selected:*

Print view Propose table structure

Add 1 field(s) At End of Table At Beginning of Table After ticket_no Go

Indexes:				
Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	0		ticket_no

Create an index on 1 columns Go

Space usage	
Type	Usage
Data	0 B
Index	0 B
Total	0 B

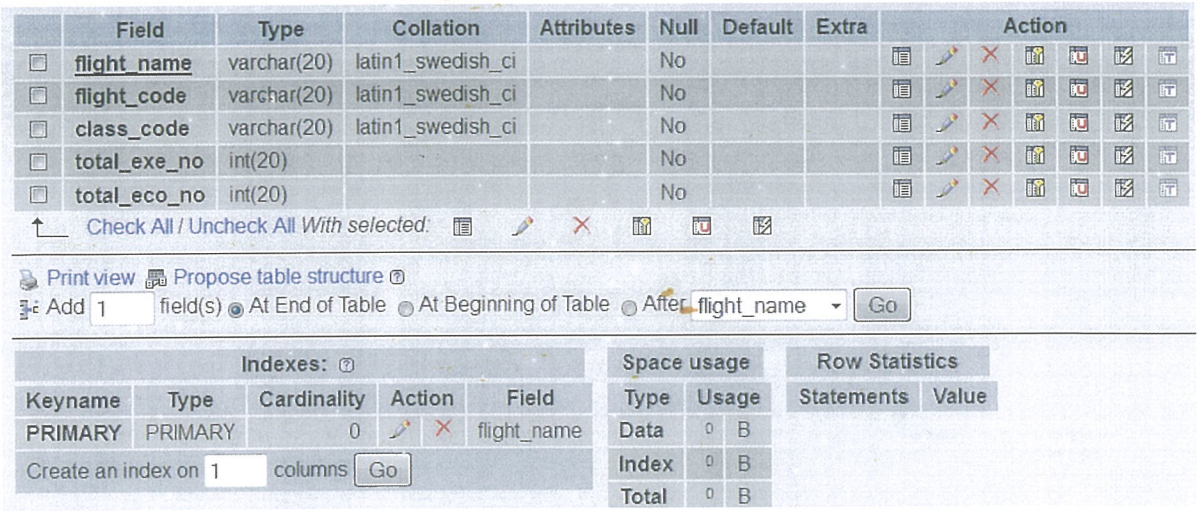
Row Statistics	
Statements	Value

Ticket no_ shows the numbers of the passengers ticket.

C_seat number shows the seat number booked on the plane.

Figure5:24

Flight database



	Field	Type	Collation	Attributes	Null	Default	Extra	Action
☐	flight_name	varchar(20)	latin1_swedish_ci		No			
☐	flight_code	varchar(20)	latin1_swedish_ci		No			
☐	class_code	varchar(20)	latin1_swedish_ci		No			
☐	total_exe_no	int(20)			No			
☐	total_eco_no	int(20)			No			

Flight name shows the passengers names on the plane

Flight_code shows the code of the plane.

5.6 TARGET USERS

- A system will be used by lower level manager in their day to day information system automation
- It will also be used by database administrator to guarantee the privilege to the user.
- High level managers will also use the system to obtain reports for decision making.
- Middle level managers will use system for organizing information and preparing report for high level managers.

5.7 SYSTEM REQUIREMENTS.

The new system is required to be able to deal with large volume of data that the organization has, on the other hand the new systems requires the following component

Table 5.1 hardware and Software requirements

ITEM	SPECIFICATION	DESCRIPTION	BENEFITS
1 PC	Pentium iv	➢ Cpu with 2.0GHZ ➢ RAM (256MB) ➢ CD Drive ➢ Hardisk(40GB)	➢ Better access to data ➢ .To improve o Performance ➢ Use of CDs ➢ Large storage space
1 printer	Hp inkjet printer	With black cartridges, and Color cartridge	➢ more timely report
1 ups	NASH	➢ .220-240volts ➢ .4A	For power stability And storage to keep PCworking,to prevent data loss
Development Application	Dream weaver	Version 6.0 with MSDN integrated	.Customization of Package and to provide report Writing
DBMS	MySql	Version 5	Data storage

5.8 SYSTEM IPIMENTATION

The proposed system stores the information relevant for processing in the MS SQL SERVER database. This database contains tables, where each table corresponds to one particular type of

information. Each piece of information in table is called a field or column. A table also contains records, which is a set of fields. All records in a table have the same set of fields with different information. There are primary key fields that uniquely identify a record in a table. There are also fields that contain primary key from another table called foreign keys.

5.8.1IMPLEMENTATION METHODS

There are several methods for handling the implementation and the consequent conversion from the old to the new computerized system. The most secure method for conversion from the old system to the new system is to run the old and new system in parallel. In this approach, a person may operate in the manual older processing system as well as start operating the new computerized system. This method offers high security, because even if there is a flaw in the computerized system, we can depend upon the manual system. However, the cost for maintaining two systems in parallel is very high. This outweighs its benefits. Another commonly method is a direct cut over from the existing manual system to the computerized system. The change may be with in a week or with in a day. There are no parallel activities. However, there is no remedy in case of a problem. This strategy requires careful planning. A working version of the system can also be implemented in one part of the organization and the personnel will be piloting the system and changes can be made as and when required. But this method is less preferable due to the loss of entirety of the system.

5.8.2 IMPLEMENTATION PLAN

The implementation plan includes a description of all the activities that must occur to implement the new system and to put it into operation. It identifies the personnel responsible for the activities and prepares a time chart for implementing the system. The implementation plan consists of the following steps

- List all files required for implementation.
- Identify all data required to build new files during the implementation
- List all new documents and procedures that go into the new system

The implementation plan should anticipate possible problems and must be able to deal with them. The usual problems may be missing documents; mixed data formats between current and files, errors in data translation, missing data etc

5.9EDUCATIONS AND TRAINING

The implementation of the proposed system includes the training of system operators. Training the system operators includes not only instructions in how to use the equipment, but also in how to diagnose malfunctions and in what steps to take when they occur. So proper training should be provided to the system operators. No training is complete without familiarizing users with simple system maintenance activities. Since the proposed system is developed in a GUI, training will be comparatively easy than systems developed in a non-GUI. There are different types of training. We can select off-site to give depth knowledge to the system operators. Success of the system depends on the way in which it is operated and used. Therefore the quality of training given to the operating person affects the successful implementation of the system. The training must ensure that the person can handle all the possible operations. Training must also include data entry personnel. They must also be given training for the installation of new hardware, terminals, how to power the system, how to power it down, how to detect the malfunctions, how to solve the problems etc. the operators must also be provided with the knowledge of trouble shooting which involves the determination of the cause of the problem. The proposed system requires trained personnel for operating the system. Data entry jobs must be done utmost carefully to avoid errors. This will reduce the data entry errors considerably. It is preferable to provide the person with some kind of operating manuals that will explain all the details of the system.

5.10POST IMPLEMENTATION REVIEW

After the system is implemented, a review should be conducted to determine whether the system is meeting expectations and where improvements are needed. System quality, user confidence and operating systems statistics are accessed through such technique event logging, impact evaluation and attitude surveys. The review not only assesses how well the proposed system is designed and implemented, but also is a valuable source of information that can be applied to a critical evaluation of the system.

The reviews are conducted by the operating personals as well as the software developers in order to determine how well the system is working, how it has been accepted and whether adjustments are needed. The review of the system is highly essential to determine the future enhancements required by the system. The system can be considered successful only if information system has met it objectives. The review analyses the opinion of the employees and identifies the attitudes towards the new computerized system. Only when the merits and demerits of the implemented system are known, one can determine what all additional features it requires are. The following are the issues to be considered in the evaluation of the system.

5.11 SYSTEM TESTING

System testing is a critical aspect of Software Quality Assurance and represents the ultimate review of specification, design and coding. Testing is a process of executing a program with the intent of finding an error. A good test is one that has a probability of finding an as yet undiscovered error. The purpose of testing is to identify and correct bugs in the developed system. Nothing is complete without testing. Testing is the vital to the success of the system. In the code testing the logic of the developed system is tested. For this every module of the program is executed to find an error. To perform specification test, the examination of the specifications stating what the program should do and how it should perform under various conditions.

Unit testing focuses first on the modules in the proposed system to locate errors. This enables to detect errors in the coding and logic that are contained within that module alone. Those resulting from the interaction between modules are initially avoided. In unit testing step each module has to be checked separately.

System testing does not test the software as a whole, but rather than integration of each module in the system. The primary concern is the compatibility of individual modules. One has to find areas where modules have been designed with different specifications of data lengths, type and data element name.

Testing and validation are the most important steps after the implementation of the developed system. The system testing is performed to ensure that there are no errors in the implemented

system. The software must be executed several times in order to find out the errors in the different modules of the system.

Validation refers to the process of using the new software for the developed system in a live environment i.e., new software inside the organization, in order to find out the errors. The validation phase reveals the failures and the bugs in the developed system. It will be come to know about the practical difficulties the system faces when operated in the true environment. By testing the code of the implemented software, the logic of the program can be examined. A specification test is conducted to check whether the specifications stating the program are performing under various conditions. Apart from these tests, there are some special tests conducted which are given below

- Peak Load Tests: This determines whether the new system will handle the volume of activities when the system is at the peak of its processing demand. The test has revealed that the new software for the agency is capable of handling the demands at the peak time.
- Storage Testing: This determines the capacity of the new system to store transaction data on a disk or on other files. The proposed software has the required storage space available, because of the use of a number of hard disks.
- Performance Time Testing: This test determines the length of the time used by the system to process transaction data.

5.12 MAINTENANCE

Maintenance is making adaptation of the software for external changes (requirements changes or enhancements) and internal changes (fixing bugs). When changes are made during the maintenance phase all preceding steps of the model must be revisited. There are three types of maintenance

- Corrective (Fixing bugs/errors)
- Adaptive (Updates due to environment changes)
- Perfective (Enhancements, requirements changes)

5.13 CONCLUSION

The project report entitled "AN INTERGRATED SECURE ONLINE RESERVATION SYSTEM" has come to its final stage. The system has been developed with much care that it is free of errors and at the same time it is efficient and less time consuming. The important thing is that the system is robust. Also provision is provided for future developments in the system. The entire system is secured.

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APPENDIX A

QUESTIONNIRE ON AN INTERGRATED SECURED ONLINE AIRLINE RESERVATION SYSTEM

CASE STUDY: FLY 540.COM

INSTRUCTIONS: **TICK IN THE BOXES** WHERE PROPRIATE AND **FILL THE BLANK SPACES**

GENDER Male ☐ Female ☐

AGE below 20 ☐ 20-30 ☐ 30-40 ☐

Above 40 ☐

NATIONALITY _____

LEVEL OF STUDY; Diploma ☐ Undergraduate ☐ Masters ☐ PhD ☐

FLY 540

1. Have u ever travelled with fly 540? Yes ☐ no ☐
2. If yes how many times? Once ☐ less than 5 times ☐ less than 10 ☐ above 20 ☐
3. How did u pay for your ticket or which mode did u use to pay for your ticket?
   (a) Online via the internet _____
   (b) Through an agency _____
   (c) At the airport _____
4. How conversant are u with the internet? Excellent ☐ good ☐ average ☐ fair ☐ poor ☐
5. Are u comfortable carrying cash money to go an reserve a ticket or would u rather use a secure online reservation system?
6. Do you prefer old filling or record storage system to safeguard your data or you prefer a secured computer managed database to secure your data

APPENDIX B

WORKING SCHEDULE

TASK NAME	MARCH	APRIL	MAY	JUNE	JULY
Preliminary Investigations					
Data collection					
Problem design					
Design Implementation					
System check up					