A Development Prototype for Shindai Bus Service Tour Agency

by

Mr. Namapong Dejpongsarn

A Final Report of the Three - Credit Course
CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

November 1999

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Project Title	A Development Prototype for Shindai Bus Service Tour Agency
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Academic Year	November 1999

The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

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November 1999

ABSTRACT

Nowadays, the travel agency package software in the market cannot contribute user requirement in each organization about customer profile, airline information, room reserving, invoice and so on. Agencies try to contact the consultant to implement software for them all. Because of Japan agency group have the same business. They can apply this software to their organization.

Shindai Bus Service is also has many problems about agency package software so he try to search other system that support his work such as ticketing system, invoice, customer profile, and airline information.

The main function of this system is to provide the information to management level, accounting division and manage invoice system. This system is one system that is necessary for each travel agency to service customer or guest, to make more comfortable service and more efficiency work.

The system is developed by Microsoft Access 97. The system is developed to be able to share the data and to be used by multiple users.

ACKNOWLEDGEMENTS

The author is grateful to the individuals who supported the preparation of this project report. First, to thank Dr. Tatchapol Poshynond, the project advisor for his advice and counsel on the project. Thank are also given to the MS(CEM) committees for their approved.

The project report will be not successful without the kindness of people who work for Shindai Bus Service, who give their valuable time to provide the information and advice of this project.

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I. INTRODUCTION

1.1 Project Background

Shindai History

October 1968

Established Shindai Bus Service, the main purpose is to arrange VISA applying for Japanese customers.

September 1970

Head office moved to 42 Surawongs rd. Bangkok

October 1973

Change company's name to "Shindai Bus Service Co., Ltd."

August 1977

Head office moved to 138 Silom rd. Bangkok where most of the major companies in Bangkok are located (present location).

April 1983

Established Tokyo office located 1-11-12 Ueno, Taitou-Ku, Tokyo.

February 1984

Capital increased to 2,000,000 THB.

June 1985

Tokyo office moved to 3-7-7 lidabashi, Chiyoda-Ku, Tokyo.

July 1988

Capital increased to 4,000,000 THB and established "Shindai Co., Ltd." which mainly operates on air-ticketing.

January 1991

Established "Shindai Yaohan Travel Counter" in order to penetrate walk-in customers.

May 1994

Tokyo office moved to 3-7-11 Iidabashi, Chiyoda-Ku, Tokyo.

January1995

Established "Shindai Express Co.,Ltd." as an out-bound tour operator.

February 1995

Newly established "Shindai Isetan Travel Counter"

September 1995

Established "Shindai Co.,Ltd. Silom Center Branch"

January 1996

Established "Shindai Co.,Ltd. Harinthorn Branch"

May 1996

Capital increased both Shindai Co., Ltd. and Shindai Bus Service Co., Ltd. to 10,000,000 THB

Shindai Background

Shindai Co., Ltd. is a travel agency offering air ticket and hotel reservation including special service for business travellers and foreigners. With a high ticket selling record, Shindai has been the top-five agent of many airlines e.g. Japan Airline and Thai International Airline. Shindai has earned a good reputation among customers as the most reliable travel agent in Thailand for almost 30 years. Our key personnel, both local and Japanese are experienced professional staff members. Every one of them at Shindai offices is able to provide good quality service in all situations during either peak season or yearly holiday occasions. Our more than 15 Japanese staff members at

any office are ready to serve all Japanese customers according to their need and convenience.

Business Process of Shindai

(1) Ticketing

They book and issue all types of air tickets from all airlines. Focusing on the route between Bangkok and Japan, they could give more favorable offerings. Being a BSP travel agent, they are able to issue tickets by themselves and deliver to customers immediately.

(2) Hotel Booking

They offer worldwide hotel reservation service with special prices.

(3) Tour Operation

They offer a full range of travel services such as incentive tours, seasonal package tours, and VIP group tours. Additionally, supporting services are also available for tourists such as rent-a-car, worldwide hotel booking, etc.

(4) Business service

They handle any kind of official documents needed for living in Thailand such as applying for work permit, long-stay visa, re-entry visa, driving permit, etc. They also take care of customers' taxation and company registration. Shindai's experienced staff could help foreign customers with any problems.

Shindai Billing System

The Shindai billing System is system that is developed for Shindail Company. The Shindai company has business about air ticket reservation, hotel reservation for travelers, and inbound and outbound touring.

In the old system, there are several systems to mange this business such as Microsoft office for management reports, Amadeus system for air ticket reservation, and a manual system is used to keep customer profiles, room rates of hotels and print invoices.

The front desk is assigned to operate the process of air ticket reservation, grouping travelers for inbound/outbound touring and processing billing and payment.

The process for air ticket reservation is as follows:

All customers are handled at the front desk. The customer will ask about the price of each airline ticket and airline schedule. The front desk officer will find the information in the Amadeus system that is linked to the system of each airline. When the customer reserves a ticket, the front desk officer will print an invoice and give the customer the ticket. Everyday, the front desk officer will summarize ticket reservations for each airline and send ticket numbers and information to BSP (Bank Settle Payment, a company that works with every airline).

The process for hotel reservation is as follows:

All customers, most of whom are foreigners, are handled at the front desk like the airline ticket reservation process. The customer will ask about the price and locations of hotels and the different price of workday and holiday. The front desk officer will find information in the paper or brochure that hotel had sent to company. When the customer reserves the room, the front desk will print an invoice for the customer and call the hotel for a room reservation.

This project will concentrate on the billing of air ticket reservations.

1.2 Project Objectives

The objectives of the project on the Shindai billing system are as follows:

(1) To study the existing system of the tour agency business.

(2) To identify the real problems and users.

(3) To improve the business processes by computerization.

(4) To establish the Shindai billing system to serve the several business processes of a tour agency.

(5) To establish the management information system and generate management reports for management level.

1.3 Scope of the Project

The project will cover major topics of a tour agency management system that includes:

(1) Billing System

To fill in information and print the invoice of each passenger who reserves an air ticket.

(a) Passenger and company information

(b) Airline, price and route information

(c) Credit of each company

(d) Discount of each company

(2) To keep passenger's company's information.

All details of the company.

(a) Company name

(b) Company address

(c) Company credit

(d) Company discount

(3) To keep Airline information.

All needed details of the airline.

(a) Airline name

(b) Airline vat

(4) To keep salesman information.

The salesman code and name will be kept.

(5) To keep flight information.

All details of flight and airline.

(a) Destination of each flight

(b) Flight details

(c) Class

(d) Price of each flight

(6) To generate Month-end, daily and management reports.

II. LITERATURE REVIEW

2.1 Joint Application Design

The JAD concept will concern the key user, managers and system analyst to be involved in the system analysis of a current system. In that respect, JAD is similar to a group interview; a JAD however, follows a particular structure of roles and has an agenda that is quite different from a group interview during which analysts control the sequence of questions answered by users. The primary purpose of using JAD in the analysis phase is to collect a system's requirements simultaneously from the key people involved with the system. The result is an intense and structured, but highly effective, process. As with a group interview, having all the key people together in one place at one time allows analysts to see where there are areas of agreement and where there are conflicts. Meeting with all these important people for over a week of intense sessions allows you the opportunity to resolve conflicts, or at least to understand why a conflict may not be simple to resolve.

JAD sessions are usually conducted in a location other than the place where the people involved normally work. The idea behind such a practice is to keep participants away from as many distractions as possible so that they can concentrate on systems analysis. A JAD may last anywhere from four hours to an entire week and may consist of several sessions. A JAD employs thousands of dollars of corporate resources, the most expensive of which is the time of the people involved. Other expenses include the costs associated with flying people to a remote site and putting them up in hotels and feeding them for several days.

The typical participants in a JAD are listed below.

(a) JAD session leader: The JAD leader organizes and runs the JAD. This person has been trained in group management and facilitation as well as in system analysis. The JAD leader sets the agenda and sees that it is met. The JAD leader remains neutral on issues and does not contribute ideas or opinions but rather concentrates on keeping the group on the agenda, resolving conflicts and disagreements, and soliciting all ideas.

(b) Users: The key uses of the system under consideration are vital participants in a JAD. They are the only ones who have a clear understanding of what it means to use the system on a daily basis.

(c) Managers: Managers of the work groups who use the system in question provide insight into new organizational directions, motivations for and organizational impacts of system, and support for requirements determined during the JAD.

(d) Sponsor: As a major undertaking due to its expense, A JAD must be sponsored by someone at a relatively high level in a company. If the sponsor attends any sessions, it is usually only at the very beginning or the end.

(e) System Analysts: Members of the systems analysis team attend the JAD although their actual participation may be limited. Analysts are there to learn from users and managers, not to run or dominate the process.

(f) Scribe: The scribe takes notes during the JAD session. This is usually done on personal computer or laptop. Notes may be taken using a word processor, or notes and diagrams may be entered directly into a CASE tool.

(g) IS Staff: Besides systems analysts, other IS staff, such as programmers, database analysts, IS planers, and data center personnel, may attend to learn

from the discussion and possibly to contribute their ideas on the technical feasibility of proposed ideas or on technical limitations of current systems.

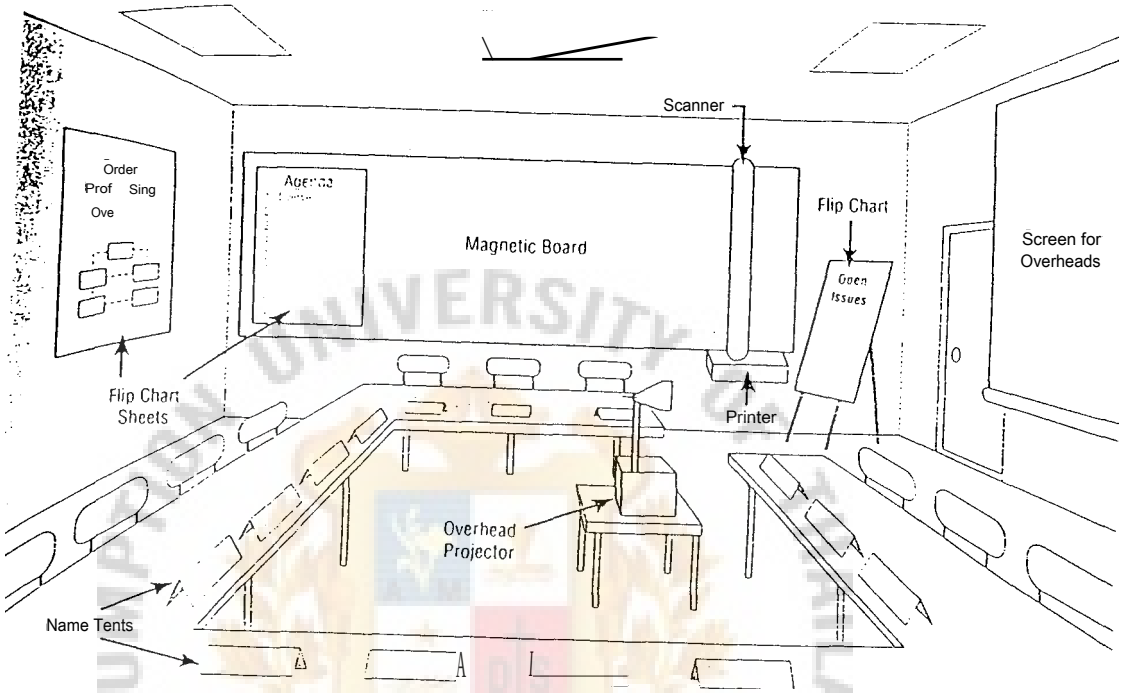

Figure 2.1. The Typical Room Layout for a JAD.

JAD sessions are usually held in special-purpose rooms where participants sit around horseshoe-shaped tables, as in Figure 2.1. These rooms are typically equipped with whiteboards (possibly electronic, with a printer to make copies of what is written on the board). Other audiovisual tools may be used, such as transparencies and overhead projectors, magnetic symbols that can be easily rearranged on a whiteboard, flip charts and computer generated displays. Flip paper is typically used for keeping track of issues that cannot be resolved during the JAD or for those issues requiring additional information that can be gathered during breaks in the proceedings. Computers may be

used to create and display form or reports designs or for diagramming existing or replacement systems. In general, however, most JAD do not benefit much from computer support.

When a JAD is completed, the end result is a set of documents that detail the workings of the current system related to the study of a replacement system. Depending on the exact purpose of the JAD, analysts may also walk away from the JAD with some detailed information on what is desired of the replacement system.

2.2 Database Management Software Overview

One of the most powerful applications of computers is the capability to store, organize, and retrieve large quantities of data. An organized collection of data is referred to as a database. The programs designed to manipulate databases are known as database management systems, commonly abbreviated as DBMS.

The purpose of databases is to make large amounts of information easier for humans to understand. Databases do not necessarily require the use of a computer. You probably already maintain several databases without even knowing it! Any time you keep track of information with some type of organized system, you are managing a database. Your calendar, personal phone book, and 'to do' list are all databases, even if you commonly write them with pencil (or crayon!) The telephone book is a database. Any time you keep a list of any sort, you are forming a sort of database. Databases have been an important information management tool since written language began.

Keeping track of information by hand has some shortcomings. Written lists can get very unwieldy if you have more than a pageful of entries. This problem is compounded if the information is not organized in some fashion like alphabetic order. This process of sorting is very tedious when done by humans. Anyone who files papers in an office knows how easy it is to misplace files when humans are responsible for

keeping them in alphabetical order. Every time a new document is created, it must carefully be placed in the right spot. If it is ever 'taken out' and not replaced properly, it may never be found again.

The searching process can also be difficult. Looking up a word in a dictionary or a number in a phone book can be a frustrating experience if the word or name you are looking for is not spelled as you expected. Finally, these manual systems of organization can be quite clumsy when we want to find information in more than one way. For example, if you have a person's name, and you want their phone number, you can go to the phone book to find it. But what if you have the phone number or address, and not the name? A traditional phone book is almost completely useless for this kind of problem. In old detective shows, there were books printed by the phone companies for this type of purpose, but most people did not have access to them. If you think about it, the "find a person from a number" book would contain exactly the same information as a traditional phone book, just organized in a different order. It was necessary to recreate the entire database just to allow this amount of flexibility. If we wanted to be able to search for the name of a person with a certain address, we would need yet another entire book of the same size. With paper databases, it is impossible to search by more complex criterion, such as "tell me all the people that live on Poplar Street."

2.2.1 The Problem Databases Help You Solve.

Electronic databases are much more flexible and powerful than their paper ancestors. They have made entirely new kinds of data storage and analysis practical. A database is called for whenever you are interested in keeping track of information. Electronic databases are especially helpful when you want to store large amounts of information, information with a lot of complex characteristics, or when you want the capability for complex types of information retrieval.

You will often come across a database program as a user. Many of you encountered such a program when signing up for this class. The scheduling programs of many universities have the entire course schedule and all student schedules stored in a massive system of databases. You may have examined the class schedule by interacting with such a system. In fact, you may have been able to sign up for a class online. When you did so, your personal scheduling information was added to the university database. As a user, you can usually look at a database, and you can sometimes even add to the pool of information it contains.

You might also interact with a database as a developer. In this role, you are not as concerned with the actual information that the database contains as you are with the general structure of that information; how it is organized, how it can be searched, and how the users will see it.

Although you will do this less frequently than you might encounter databases as a user, it is a good idea to understand a little bit about database development, because the principles will make you a much stronger user.

2.2.2 How Databases are Organized

As you have seen, computers can only understand very rudimentary elements. In order to store complicated stuff like fruit, addresses, and whatever else, we have to have some kind of organizational scheme. Computer scientists have come up with some terms that are used to define databases.

(a) Records

The most critical unit in a database is the record. If you think about it, most databases are arranged around a certain kind of entity. A phone book is a collection of telephone companies. A card catalog is an index to a collection of books in a library. You might also have a database referring to

diseases and viruses, giraffes in a zoo, videotapes in your library, or anything else. The important idea here is that you can think of a database as a collection of like things. These things don't even have to be real. You could just as easily have a database of dreams, monsters, or concepts. What really matters is that all the things in the database have to be similar. For example, you might have a database of fruit in a supermarket. You might have entries in this database describing bananas, pears, oranges, and apples, but an entry describing a station wagon might not fit here. It also may not make sense to have an entry for pork chops in this database, even though pork chops might be in the same supermarket.

Each entity in the database is one record. If your database describes a bunch of giraffes, one record in the database describes one giraffe. If your database describes fruit, one record might describe one type of fruit.

(b) Fields

Each entity in a collection shares a certain number of characteristics. Each type of fruit might have the following relevant characteristics:

What is the name of the fruit?

How long can we keep it on the shelf?

When did it come to the market?

How much does it cost per pound?

Is this fruit spoiled?

This list of characteristics is called fields. The fields are the characteristics, which describe one record. All of the records in the database must have the same fields, but the values of those fields will be different. For example, all of the fruit in the database will have a name, but the names

will be different. One record will have a name field with the value 'Bananas', and another record's name field will have the value 'Apples.' A field can be thought of as a detail of a record.

Fields represent units of the computer's memory. Because the computer stores different kinds of information in different ways, each field must have a specified data type. When you create a database, you need to tell the computer what kind of data each field will be so it knows how to store the information.

Data types in databases get a little more specific than you have seen before, because databases have more specialized ways of storing things in memory. Here's a few of the common ones:

(1) Text

You are already familiar with text from spreadsheets, but now we also have to specify a length. This has to do with the way that databases find records. All records in a database must be the same length (number of bytes in memory), so you have to specify the length of each text field. You might give a field that will hold state names a length of two characters, for example and a 'first name' field a length of fifteen characters.

(2) Integer

An integer is a whole number (no fractions or decimals) including zeroes and negative numbers. (...And you told that seventh grade math teacher you would never need this stuff again!!!) Integers are pretty easy for the computer to work with and store. Sometimes you will come across long integers, which

are also integers, but stored in a different way that takes more memory but allows for larger (and smaller) values.

(3) Real numbers

Real numbers are integers and decimal values. As you may remember, the computer has to use a special form of exponential notation to store them in the computer. You might encounter 'super real numbers' (often called double-precision real numbers) These are real numbers that take more memory to store, but allow more decimal places.

(4) Logical

Logical values (also sometimes called boolean or binary values) are values that can be expressed in terms of 1/0, yes/no, true/false, on/off, and so on. Binary fields take very little memory. (Think about it, you know how much they take!) They can be surprisingly useful.

For example, in our fruit example the field that relates to whether the fruit has spoiled might be a binary field. Most of the time you can direct the database to use a yes / no or true / false notation rather than 1 / 0, but of course the 1/0 value is closest to what the computer recognizes.

(c) Tables

So far, we have thought of a database being a collection of records. To be more precise, a collection of similar records is a table. All the records in a table must have the same fields, but they can have different values in the

fields. A table could make up an entire database, but as we will see later, there are databases with multiple tables.

(d) Index

We expect tables to be sorted. Think back to the telephone book example. The traditional phone book is sorted by last names. The 'backwards phone book' might be sorted by phone numbers. "Last name" and "phone number" describe fields in a database. The field that you use for sorting the database is often referred to as the key field

2.2.3 Creating a Database

Creating databases is an art form. People make their living doing it. You have the skills to build a simple database, and you should know enough now that you can start exploring the more advanced topics on your own.

To build your own database, you follow the same general steps regardless of your specific DBMS software.

(1) STAIR! (You KNEW you couldn't get through a chapter without seeing that acronym!) State the problem and identify the tools you might use. Specifically, answer these questions for your particular database:

Why do I want this database?

What kinds of information do I want to keep track of?

What are the entities (will become records) I am keeping track of?

What are the characteristics (will become fields) of each of these entities?

What kind of input features do I want? (Forms, a spreadsheet - thing?)

What will my index be?

What kinds of questions do I want to ask with this data? (Queries)

Do I need any special reports?

What software will I use to develop this database?

What tools does it have to solve each of the problems above?

(2) Create the table. To do this, you will need to create a template for the records.

Create a template for the records

This means defining all the fields that constitute a record. Think hard about this, because you don't want to change the record definition once you have started adding data to the database.

Create the fields For each field, identify the field name and type (and length if necessary)

Continue until all the fields of the prototype record are done.

(3) Add information to the database. While you are still testing, you shouldn't add too much information, because it may get messed up. You should put in enough so that you can tell it will work. You should also anticipate errors the user might make, like typing in "four" instead of putting a 4 in a numeric field. Try making some of these mistakes on purpose, and see how the database responds.

(4) Generate any forms to aid user input

There will usually be some sort of tools available to help you in this process. If the database is simple, this step may not be necessary.

(5) Create any reports you need for output

Again, this may not be necessary, or there may be a number of reports you want to generate from the database. You will probably find some kind of tool to help you with this process as well. This process may require building queries to limit the number of records shown in the report.

2.2.4 Types of Database Systems

As you have seen, databases can be very complex, and their maintenance can be more involved than some of the other applications we have examined. There is a very wide range of application software for database management.

(a) Read - only databases

These are databases that have already been established, usually by a professional programmer or team. You interact with these databases only as a user. You can make queries of such a database, and sometimes make reports from them. Some examples: the Internet search engines, on-line card catalogs, airline reservation systems.

(b) Pre-defined databases

These databases are often commercially available, and are a shortcut for people who want to manage a database, but don't want to build it themselves. Often these are aimed at a specific topic in the business or home market such as wedding preparation, video library management, invoice handling, inventory, or payroll. In such a database, all the design has been done for you, and usually a number of queries and reports are also pre-defined, although you may have the capability to create more of your own. The advantage of this type of database is that you don't have to do the hard work of defining data types, so you can concentrate on adding and manipulating data. The down side is that you are stuck with whatever design the programmer gave you. If you want something more specific to your needs, you are out of luck.

(c) Flat - file DBMS

These systems generally allow you to do the things we have been talking about, although inexpensive systems may have limited capacity in particular areas. A flat file DBMS is capable of handling only one table at a time. For home use, this is often just fine. You don't need any more to deal with your Christmas card list, or stamp collection inventory. The user-friendliness of DBMS software varies tremendously. Some systems (particularly the database packages bundled with integrated suites) are relatively easy to use and provide point - and - click interfaces. Other DBMS are nothing more than programming languages - a list of commands that you have to put together on your own. In general, DBMS applications are more involved than other standard applications.

(d) Relational DBMS

These are the mainstays of the database world. A relational database is much like a flat file database, except it allows the use of multiple tables. Imagine the following example:

A programmer has been hired by a garage to create a database for their operations. After talking closely with the owners of the garage, she notes three main needs:

(I) They want a way to keep track of each part in the inventory. When a part is used for repair, it should be noted, so the owners can order new ones.

(2) They want to keep track of the customers who use the garage. When Mrs. Jones, comes in, for example, they would like to know what services she has ordered in the past, and what has already been done to her car. They also want to send her postcards informing her of special

deals and tune-up times for her car. This will increase efficiency and customer service.

(3) They want to keep track of each transaction. This database will be closely tied to the cash register and should give a report that explains exactly what has been done to her car, and should be a very nice receipt.

At first, it may seem like three entirely different databases are necessary. Although the customer database may share some information (like part numbers) with the inventory database, it appears to be a different database. It will certainly require a different table, because the fields that describe a part in the inventory are very different than the fields that would describe a customer. Likewise, the receipt table may share some fields with other tables in the system (customer name and part number) but the fields that describe a receipt are clearly different than those that describe a part or those that describe a customer, so a third table is necessary.

What we see here is three distinct tables that share some fields with each other. These tables are distinct but related, thus the database is a relational database. (Just when you think you can count on those computer scientists to come up with a completely meaningless term, they give you one that makes sense!)

The big DBMS like Oracle, Paradox, Access, and so on are examples of relational databases. Like flat - file database management systems, these DBMS packages come in all flavors, from fairly straightforward point - and click to cryptic but very powerful programming languages.

2.2.5 Databases and Ethical Concerns

Any tool with as much power as databases can give must have some caveats, and databases certainly do. Databases are easy to build and maintain, and there is no way to keep unscrupulous people from using them as well as those that intend only good. Even when they are not deliberately used for foul purposes, databases can have unsuspected side effects.

Privacy is a major concern of the present and very near future. Although there have been databases since written language began, they were often very inefficient. There was usually little danger of the information in a database getting into the wrong hands, because computers tended to not be connected, and there was relatively little information being kept. Now the increased ease of database development along with increases in computer connectivity, processing and storage capacity have made the amount of information stored on databases increase exponentially. Now nearly every organization or corporation has some sort of database. When you give your name and address to a company by entering a contest or filling out a questionnaire, your information is almost certainly going to be entered on a database. That corporation is not always required to keep the information about you to themselves. Have you ever wondered why you get the combination of junk mail you do? Every one of those things in the mailbox has a mailing label on it generated by a database. You may have given them the address directly, or it may have been sold to the company by another company who you gave your information to.

Security of information is another concern. As more and more computers are linked via the Internet, there are more opportunities for data to be taken by those who should not have it. Be very careful using your credit card number on the Internet. Where

will it go on the way to its destination? Will it be carefully guarded in the destination database, or can somebody just break in and assume your identity? Take the same care with other personal information. Who will get this information? Do you want them to have it? The legal system is wrestling with issues of privacy over the Internet. Technology is changing more quickly than the legal system can keep up.

2.3 System Analysis and Design Concepts

Information systems are developed for different purposes, depending upon the needs of the business. Data processing systems, management information systems (MIS), and decision support systems (DSS) are all different types of computerized information systems that are analyzed and designed using the concepts and techniques of systems analysis and design. To some extent this is also true for expert systems.

2.3.1 Data-Processing Systems

Data processing systems are computerized information systems developed to process large amounts of data for routine business transactions such as payroll and inventory. Data-processing systems relieve the tedium and time-consuming aspects of manually performing necessary operational transactions, although people are still needed to input data to computerized systems.

The system run programs on an automatic basis at regular intervals. They require very little decision making once they are set up. Data processing systems support the day-to-day activities of the business.

2.3.2 Management Information Systems

Management information systems (MIS) do not replace data-processing system rather, all **MIS** include data processing. Management information systems are computerized information systems that work because of the purposeful interaction between people and computers. Management information systems require people,

software (computer programs), and hardware (computer, printers, etc.) to work. Management information systems support a broader spectrum of organizational tasks than do data processing systems, including decision analysis and decision-making.

In order to access information, users of the management information systems use a shared database. The database stores data and models that help the user interpret and use the data. Management information systems output information that is used in decision making. A management information system can help unite some of computerized information functions of a business, although an MIS does not exist as a singular structure anywhere in the business.

2.3.3 Decision Support Systems

A third class of computerized information system is the decision support system (DSS). The DSS is similar to the traditional management information system in that they both depend on a database as a source of data. A decision support system departs from the traditional management information system in that it emphasizes the support of decision making in all of its phases, although the actual decision is still the exclusive province of the decision-maker. Decision support systems are more closely tailored to the person or group using them than is a traditional management information system.

2.3.4 Expert Systems and Artificial Intelligence

Artificial intelligence (AI) can be considered the overarching field for expert systems. The general thrust of Al has been to develop machines that behave intelligently. Two avenues of research for AI understand natural language and the ability to reason though a problem to its logical conclusion. Expert systems use the approaches of AI reasoning to solve the problems put to them by business (and other) users.

2.3.5 Need for Systems Analysis and Design

Systems analysis and design, as performed by systems analysts, seeks to analyze systematically the data input, data flow, and information output within the context of a particular business. Further, system analysis and design is used to analyze, design and implement improvements in the functioning of businesses, which can be accomplished through the use of computerized information systems.

If system is installed without proper planning, it leads to great dissatisfaction with the system, and the system frequently falls into disuse. System analysis and design lends structure to the costly endeavor of analyzing and designing information systems, which would otherwise be done in a haphazard way. Systems analysis and design is a series of processes systematically undertaken to improve a business through the use of computerized information systems. A large part of systems analysis and design involves working with current and eventual users of information systems.

2.4 The Systems Development Life Cycle

Throughout this part, this part will be referring to systematic approach that analysts take to the analysis and design of information systems. Much of this is embodied in what is called the systems development life cycle (SDLC). The SDLC is a phased approach to analysis and design that holds that systems are best developed through use of specific cycle of analyst and user activities.

Analysts disagree on exactly how many phases there are in the systems development life cycle, although its systematic approach is generally lauded. This part has divided the cycle into seven phases.

2.4.1 Identifying Problems, Opportunities, and Objectives

In this first phase of the systems development life cycle, the analyst is concerned with identifying problems, opportunities, and objectives. This stage is critical to the

success of the rest of the project, since no one wants to waste subsequent time addressing the wrong problem.

The first phase requires that the analyst look honestly at what is occurring in a business. Then, together with other organizational members, the analyst pinpoints problems. Often, others will bring these up, and they are the reason the analyst was called in initially.

Opportunities are situations that the analyst believes can be improved through the use of computerized information systems. Seizing opportunities may allow the business to gain a competitive edge or set an industry standard.

Identifying objectives is also an important component of the first phase. First, the analyst must discover what the business is trying to do. Then the analyst will be able see if some aspect of information systems applications can help the business reach its objectives through addressing specific problems or opportunities.

2.4.2 Determining Information Requirements

The next phase that the analyst enters is that of determining information requirements for the particular users involved. Several tools are used to define information requirements in the business, including; sampling and investigating of hard data; interviewing; questionnaires; observing decision-maker behavior and their office environments; and even prototyping.

In this phase, the analyst is striving to understand what information users need to perform their jobs. You can see that several of the methods for determining information requirements directly involve interacting with users. This phase serves to fill in the picture that the analyst has of the organization and its objectives. Sometimes only the first two phases of the systems development life cycle are completed. This kind of study

may have a different purpose and is typically carried out by a specialist called an information analyst (IA).

2.4.3 Analyzing System Needs

The next phase that the systems analyst undertakes is that of analyzing system needs. Once again, there are special tools and techniques that help the analyst make requirements determinations. These include the use of data flow diagrams, which comprise a structured technique to chart graphically the input, processes, and output of the business's functions. From the data flow diagrams, a data dictionary is developed that lists all of the data items used in the system, as well as their specifications — such as whether they are alphanumeric, and how much space they take up when printed.

During this phase the systems analyst also analyzes the structured decisions made, which are decisions where the conditions, condition alternatives, actions, and action rules can be determined. There are three methods for analysis of structured decisions: structured English, decision tables, and decision trees.

Not all decisions in organizations are structured, but it is still important for the systems analyst to understand them. Semistructured decisions (decisions made under risk) often are supported by decision support systems. When analyzing semistructured decisions, the analyst examines the decisions based on the degree of decision-making skill required, the degree of problem complexity, and the number of criteria considered when the decision is made.

Analysis of multiple-criteria decisions (decisions where many factors must be balanced) is also part of this phase. Many techniques are available for analyzing multiple-criteria decisions including the tradeoff process, the use of weighting methods, and so on.

At this point in the systems development life cycle, the systems analyst prepares a systems proposal that summarizes what has been found, provides cost/benefit analyses of alternatives, and makes recommendations on what (if anything) should be done. If one of the recommendations is acceptable to management, the analyst proceeds along that course. Each systems problem is unique, and there is never just one correct solution. The manner in which a recommendation (i.e.,solution) is formulated is dependent on the individual qualities of each analyst, coupled with their professional training.

2.4.4 Designing the Recommended System

In this phase of the systems development life cycle, the systems analyst uses the information collected earlier in order to accomplish the logical design of the information system. The analyst designs accurate data-entry procedures so that data going into the information system are correct. The analyst also designs effective input to the information system using techniques of good form and screen design.

Part of logical design of the information system is designing the user interface. The interface is what connects the user with the system. As such, it is extremely important. Examples of user interfaces include using a keyboard to type in questions and answers, user of on-screen menus of possible user commands, use of a mouse, and many others.

The design phase also includes designing the files or database that store much of the data needed by decision-makers in the organization. A well-organized database is the basis for all information systems. In this phase, the analyst also designs output (either on-screen or printed), along with users, to meet their information needs.

2.4.5 Developing an Documenting Software

In the sixth phase of the systems development life cycle, the analyst works the programmers to develop any original software that is needed. Some of the structured techniques for designing and documenting software include the HIPO method, flowcharts, Nassi-Schneiderman charts, Warnier-Orr diagrams, and pseudocode. The systems analyst communicates to the programmer what needs to be programmed.

During this phase, the analyst also works with users to develop worthwhile documentation for software, including procedure manuals. Documentation tells users how to use software, and also what to de if software problems occur.

2.4.6 Testing and Maintaining the System

Before the information system can be used, it must be tested. It is much less costly to catch problems before the system is signed over to users. Some of the testing is completed by programmers alone, some of it by systems analysts in conjunction with programmers. A series of tests to pinpoint problems are run first with sample data and eventually with actual data from the current system.

Maintenance of the system and its documentation just begins in this phase. It is carried out routinely throughout the life of the information system. Much of the programmer's routine work is composed of maintenance work, and businesses spend a great deal of money on maintenance. Many of the systematic procedures the analyst employs throughout the systems development life cycle can help ensure that maintenance is kept to a minimum.

2.4.7 Implementing and Evaluating the System

In the last phase of system development, the analyst helps implement the information system. This involves training users to use the system. Vendors do some training, but overseeing training is the responsibility of the systems analyst.

Additionally, the analyst needs to plan for the smooth conversion of the old system to the new one.

Although evaluation is shown as part of the last phase of the systems development life cycle, this is mostly for convenience of discussion. Actually, evaluation takes place during every phase. A key criterion that must be satisfied is whether the intended users are indeed using the system. In reality, all of the phases continue in a somewhat spiraled fashion, until the actual system is arrived at.

2.5 Prototyping

2.5.1 Kinds of Information Sought

Prototyping of information systems is a worthwhile technique for quickly gathering specific information about users' information requirements. Generally speaking, effective prototyping should come early in the systems development life cycle, during the requirements determination phase, However, prototyping is a complex technique that requires knowledge of the entire systems development life cycle before it is successfully accomplished.

Prototyping is included at this point in the text to underscore its importance as an information-gathering technique. When using prototyping in this way, the systems analyst is seeking initial reactions from users and management to the prototype; user suggestions about changing the prototyped system or cleaning it up as it was resented; possible innovations for it; and revision plans for which parts of the system need to be done first, or which branches of an organization to prototype next.

(1) Initial user reactions

As the systems analyst presenting a prototype of the information system, you are keenly interested in users' and management's reactions to the prototype. You want to know in detail how they react to working with

the prototype, and how good the fit is between their needs and the prototyped features of the system. Reactions are gathered through observation, interviews, and feedback sheets (possibly questionnaires). They are each person's opinion about the prototype as he or she interacts with it. Through gathering reactions, the analyst discovers many perspectives about the prototype, including whether users seem happy with it, and whether there will be difficulty in selling or implementing the system.

(2) User suggestions

The analyst is also interested in user and management suggestions about refining or changing the prototype as it is presented. Suggestions are garnered from those experiencing the prototype as they work with it for a specified period. The time that users spend with the prototype usually is dependent on their dedication to and interest in the systems project.

Suggestions are the product of users' interaction with the prototype as well as their reflection on their interaction. The suggestions obtained from users should point the analyst toward ways of refining the prototype, changing it, or "cleaning it up" so that it better suits users' needs.

(3) Innovations

Innovations for the prototype (which, if successful, will be part of the finished system) are part of the information sought by the systems analysis team. Innovations are new system capabilities that have not been thought of prior to interaction with the prototype. They go beyond the current prototyped features by adding something new and innovative.

(4) Revision plans

Prototypes preview the future system. Revision plans help identify priorities for what should be prototyped next. In situations where many branches of an organization are involved, revision plans help to determine which branches to prototype next.

Information gathered in the prototyping phase allows the analyst to set priorities and redirect plans inexpensively, with a minimum of disruption. Because of this, prototyping and planning go hand in hand.

2.5.2 Guidelines for Developing a Prototype

Once the decision has been made to prototype, there are four mainguidelines to observe when integrating prototyping into the requirements determination phase of the systems development life cycle. They are to:

(1) Work in manageable modules,

(2) Build the prototype rapidly,

(3) Modify the prototype in successive interactions, and

(4) Stress the user interface.

As you can see, the guidelines suggest ways of proceeding with the prototype that are necessarily interrelated. Each guideline is explained in an upcoming subsection.

(1) Working in manageable modules

When prototyping some of the features of a system into a workable model, it is imperative that the analyst work in manageable modules. One of the distinct advantages of prototyping is that it is not necessary (or desirable) to build an entire, working system for prototype purposes.

An example of manageable modules was discussed in an earlier section. Recall that a manageable module is one that allows interaction with

its features, yet can be built separately from other system modules. When features are deemed not as important, they are purposely left out of the initial prototype.

(2) Building the prototype rapidly

At the heart of successfully prototyping an information system is the rapidity with which it is done. Recall that one of the complaints voiced against following the traditional systems development life cycle was that the interval between requirement determination and delivery of a complete system was far too long to effectively address evolving user needs.

Analysts can use prototyping to shorten this gap by using traditional information-gathering techniques to pinpoint salient information requirements, then quickly making decisions that bring for the a working model. In effect, the user sees and uses the system very early in the systems development life cycle instead of waiting for a finished system to gain hands-on experience.

After brief analysis of information requirements using traditional methods such as interviewing, observation, and research into archival data, working modules for the prototype are constructed. The prototype should take less than a week to put together; two or three days are preferable and possible. Remember that in order to build a prototype this quickly, you must use special tools such as an existing database management system, and software that allows generalized input and output, interactive systems, and so on. All of these tools permit speed of construction that is impossible with traditional programming.

It is important to emphasize that at this stage in the life cycle, the analyst is till gathering information about what users need and want from the information system. The prototype becomes a valuable extension of traditional requirement determination. The analyst assesses user feedback about the prototype in order to get a better picture of information needs.

Putting together an operational prototype rapidly, early in the systems development life cycle, allows the analyst to gain valuable insight into how the remainder of the project should go. By showing users very early in the process how parts of the system actually perform, rapid prototyping guards against over committing resources to a project that eventually will become unworkable.

Modifying the prototype

A third guideline for developing the prototype is that its construction must support modifications. Making it modifiable means creating the prototype in modules that are not highly interdependent. If this guideline is observed, less resistance is encountered when modifications in the prototype are necessary.

The prototype is modified several times, going through several iterations. Changes in the prototype should move the system closer to what users say is important. Each modification necessitates another evaluation by users.

As with the initial development, modifications must be accomplished swiftly, usually in a day or two, in order to keep the momentum of the project going. However, the exact timing of modifications depends on how dedicated users are to interacting with modified prototypes. Systems

analysts must encourage users to do their share by evaluating changes rapidly.

The prototype is not a finished system. Entering the prototyping phase with the idea that the prototype will require modification is a helpful attitude. It also demonstrates to users that their feedback is necessary if the system is to improve.

(4) Stressing the user interface

The user's interface with the prototype (and eventually the system) is very important. Since what you are really trying to achieve with the prototype is to get users to further articulate their information requirements, they must be able to interact easily with the system's prototype. For many users the interface is the system. It should not be a stumbling block.

For example, at this stage, the goal of the analyst is in designing an interface that allows the user to interact with a minimum of training and which allows a maximum of user control over represented functions. Although many aspects of the system will remain undeveloped in the prototype, the user interface must be well developed enough so those users can pick up the system quickly and not be put off. Online, interactive systems using screen output are ideally suited to prototypes.

Many of the intricacies of interfaces must be streamlined or ignored altogether in the prototyping phase. However, if prototype interfaces are not what users need or want, or if systems analysts find they do not adequately allows system access. Then they too are candidates for modification.

2.5.3 Users' Roles in Prototyping

The users' role in prototyping can be summed up in two words: honest involvement. Without user involvement, there is little reason to prototype. The precise behaviors necessary for interacting with a prototype can vary, but it is clear that the user is pivotal to the prototyping process. Realizing the importance of the user to the success of the process, the systems analysis team must encourage and welcome input, and guard against their own natural resistance to changing the prototype.

(a) Interaction with the prototype

There are three main ways a user can be of help in prototyping:

(1) Experimenting with the prototype

(2) Giving open reactions to the prototype,

(3) Suggesting additions and/or deletions to the prototype.

All of the foregoing stem from the users' initial and successive interaction with the prototype.

(b) Experimenting with the prototype

Users should be free to experiment with the prototype. Unlike a mere list of system features, the prototype allows users the reality of hands-on interaction.

Users need to be encouraged to experiment with the prototype. The final system will be delivered with documentation stating how the system is to be used, and this in effect constrains experimentation. But in the prototyping stage, the user is free from all but minimal instruction on how to use the system. When this is the case, experimentation becomes necessary to make the prototype work.

Analysts need to be present at least part of the time when experimentation is occurring. They can observe users' interactions with the system, and they are bound to see interactions they never planned. Some of the variables you should observe include: user reactions to the prototype; their suggestions for changing or expanding the prototype; their innovations for using the system in completely new ways; and any revision plans for the prototype that aid in setting priorities. When revising the prototype, analysts should circulate their recorded observations among team members, so that everyone is fully informed.

III. RESEARCH METHODOLOGY

3.1 Analyzing User Requirement

Getting the user requirements processes according to the JAD concept. First, to define the project team, the meeting is set in the room at the Dusit thani hotel. The participants, such as executive committee, project manager, user, secretary, IT staff and system analysts come to join in the morning. The project manager writes the day's agenda on a flip chart. The secretary or scribe is seated in a corner at a microcomputer, preparing to take notes on the day activities. Users and the manager begin to enter in groups and seat themselves around a U-shaped table. The project manager as a session leader opens the meeting with a welcome and a brief run-down of the agenda. The first day will be devoted to a general overview of the current system and the major problems associated with it. The next two days will be devoted to an analysis of the current system. The last two days will be devoted to an analysis of reports.

The session leader introduces the executive committee as a corporate sponsor who talks about the organizational unit and the current system as related to the system analysis study and the importance of upgrading the current system to meet changing business conditions. He leaves, and the JAD session leader takes over. The system analyst begins a presentation of key problems with the system that have already been identified. After the presentation, the session leader opens the discussion to the users and managers in the room.

The problems that are found in the existing system include the problem of old record and document keeping, the business process redundancy, and the fact that the old system was not flexible and took more time to generate reports. They try to solve these problems. And nowadays, there is more competition in the tour agency business. To

reduce the cost of organization and make more profit are the objectives of an agency. To use a computer system instead of a manual systems can reduce the cost of salary for employees and give customers good service.

Below is a summary of user requirements:

(1) Data redundancy, to reduce redundancy of data.

(2) Accuracy data, to manage database to be accurate.

(3) Reduce documentation, to reduce cost of paper or documentation.

(4) Generate management report, to generate reports to management level for making decisions.

(5) One stop shopping, to provide comfortable and quality service for the customer.

The JAD will continue like this for its duration. Analysts will make presentations, help lead discussions of form and report design, answer questions from users and managers, and take notes on what is being said. After each meeting, the analysis team will meet, usually informally, to discuss what has occurred that day and to consolidate what they have learned. Users will continue to contribute during the meetings and the session leader will facilitate, intervening in conflicts, seeing that the group follows the agenda. When the JAD is over, the session leader and assistants must prepare a report that documents the findings in the JAD and is circulated among users and analysts.

3.2 Context Diagram and Data Flow Diagram

3.2.1 Basic DataFlow Notation

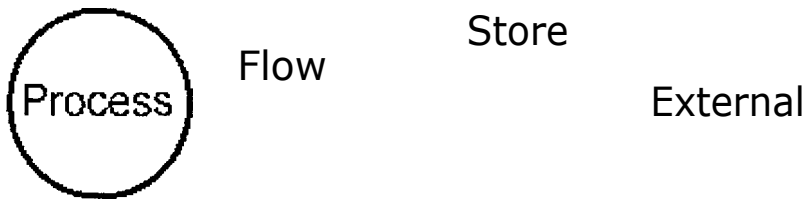

Figure 3.1. Basic DataFlow Notation.

Processes

Circles ("bubbles") labeled with actions represent functions that transform inputs into outputs.

Data Flows

Directed arrows labeled with data type represent data moving through the system

Data Stores

Bars (also boxes and ellipses) labeled with data type represent data or aggregates of data that must be remembered for a period of time (typically implemented as files or database)

Externals/Terminators

Boxes represent external entities (source/sink) with which the system communicates (e.g., individuals, groups, external computer systems)

3.2.2 A Typical DataFlow Diagram

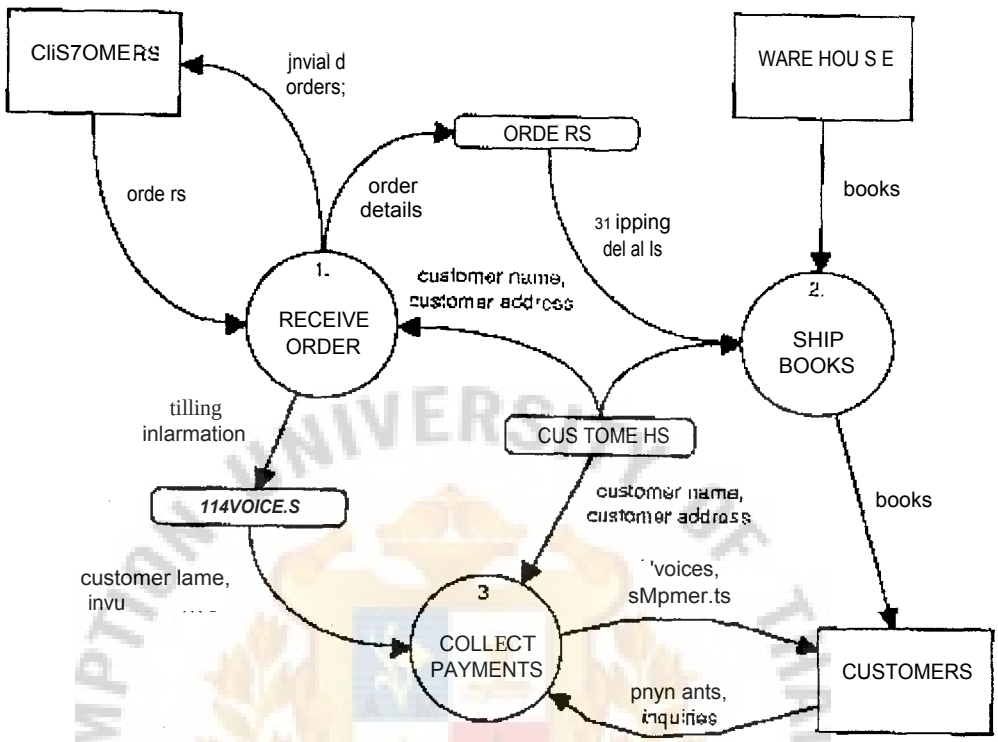

Figure 3.2. A Typical of DataFlow Diagram.

3.2.3 Levels in a Set of Diagrams

The Context Diagram shows the relation (data flows in and out) of the "system" to external entities.

Diagram first level decomposition of system into major processes (e.g., input, transform, and output) contains 2-10 processes but do not suddenly show a huge amount of detail or show a trivial decomposition hides external entities but maintains in/out flows data stores are shown here (and at lower levels).

Subdiagrams / Process Descriptions provide more detail about a process.

Process descriptions use 10-40 lines of structured text. Both "balance" in/out flows with higher level names are usually related to a parent (e.g., parent, child).

Data Dictionary definitions of flows, stores data on in/out flows of processes.

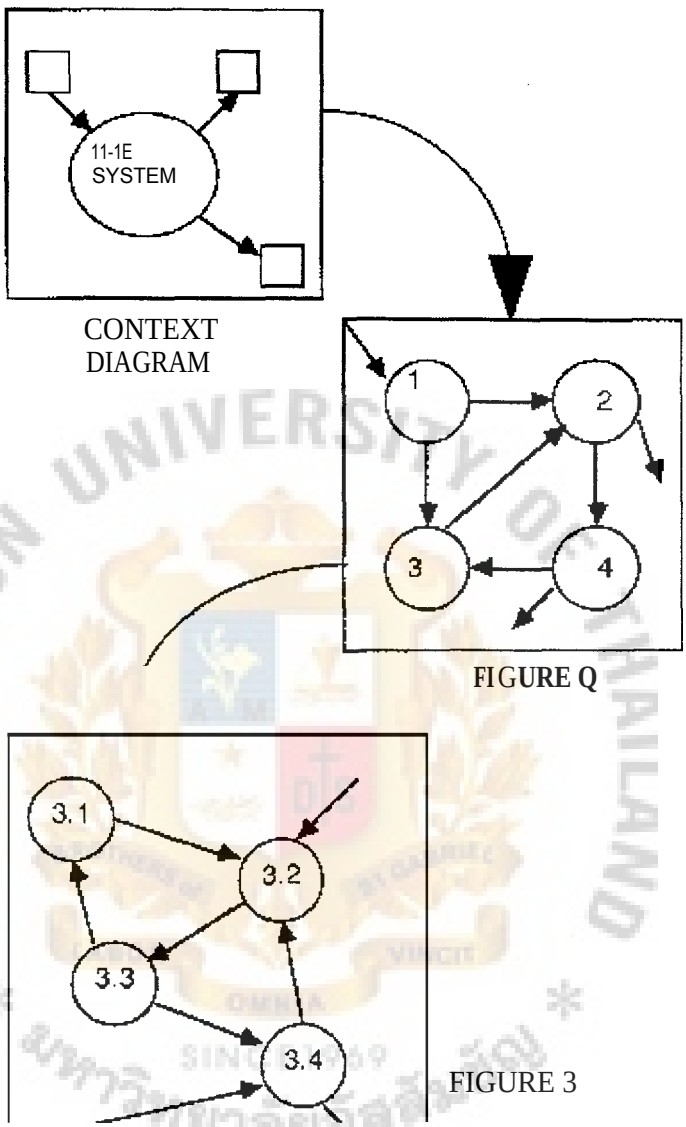

Figure 3.3. Leveled DataFlow Diagram.

3.2.4 Rules for Drawing DataFlow Diagrams

Drawing Diagrams

Each process should have both input and output.

Each store probably has both input and output

Diagrams must be balanced across levels.

Flows in/out of context diagram = flows in/out of diagram 0

All parent/child diagrams must be balanced.

Naming in Diagrams

ALL elements should be named.

Use meaningful/specific names (not "Transform Data")

Data flows are named after the flowing data

3.2.5 Evaluation and Refinement of a System Description

Evaluation Criteria

Completeness

Are all requirements met?

What if too few/many are met?

Is the system boundary correct?

Consistency

Do all components fit together?

Do all levels balance?

Correctness

Is the system description syntactically correct?

Is the system description semantically correct?

Communication

Can people (users, developers,...) understand the description?

Are good names used?

3.3 Entity Relationship Model

The E-R (entity-relationship) data model views the real world as a set of basic objects (entities) and relationships among these objects.

It is intended primarily for the DB design process by allowing the specification of an enterprise scheme. This represents the overall logical structure of the DB.

IV. SYSTEM DEVELOPMENT

4.1 Context Diagram and Data Flow Diagram

This part will show the analysis and design for a tour agency management system.

The context diagram of a tour agency management system is shown in Figure 4.1, the overall Shindai billing system is shown in Figure 4.2 (DFD level 0), the customer information is shown in Figure 4.3 (DFD level 1), and the reserving ticket and generate invoice (core process) is shown in Figure 4.4 (DFD level 1).

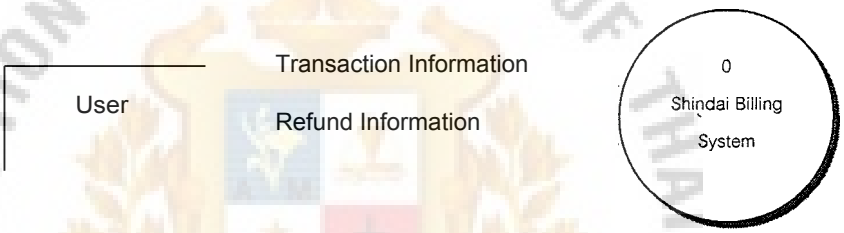

Figure 4.1. Context Diagrams.

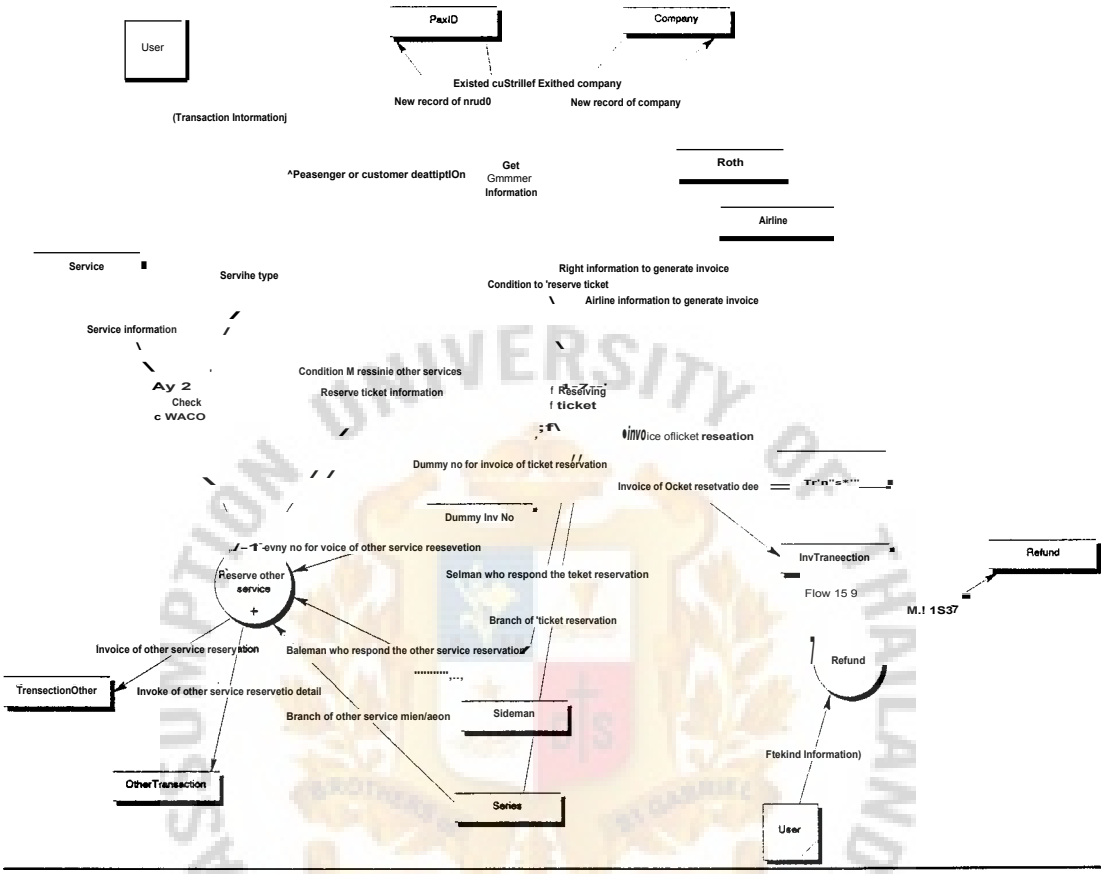

Figure 4.2. DFD (Level 0) Shindai Billing System.

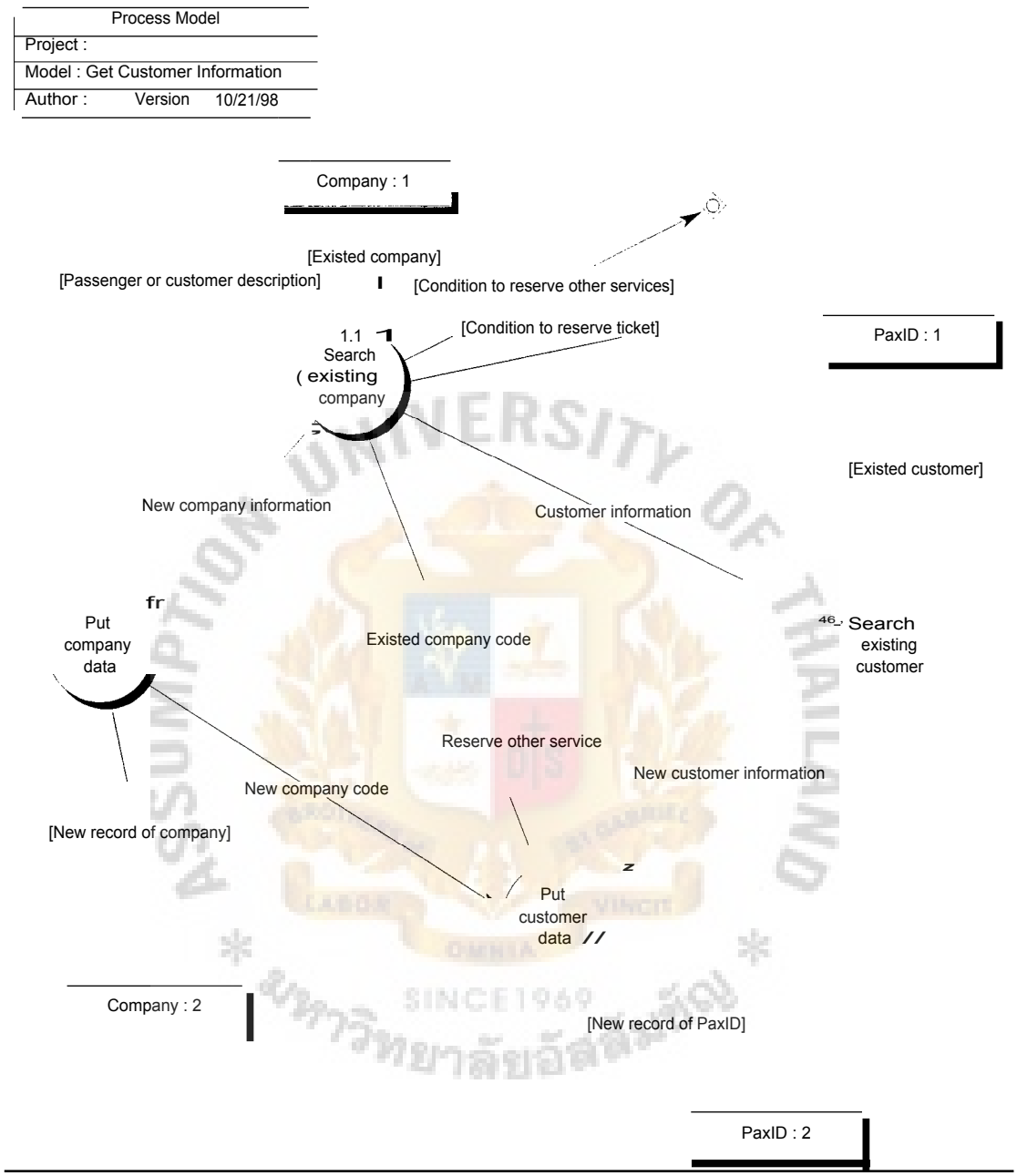

Figure 4.3. DFD (Level 1) Get Customer Information.

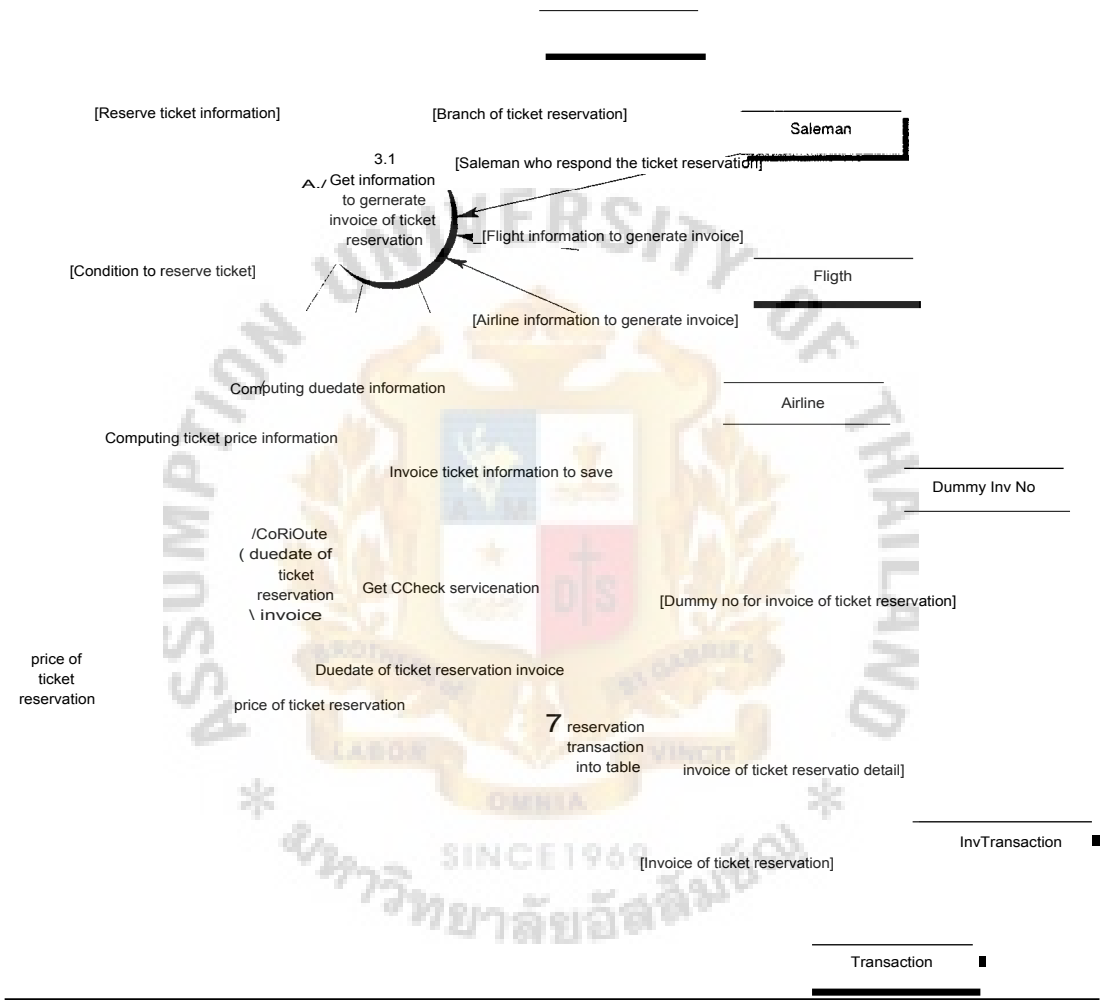

Figure 4.4. DFD (Level 1) Reserving Ticket.

4.2 Entity relationship diagram

The entity relationship diagram of the Shindai billing system is shown in Figure 4.5.

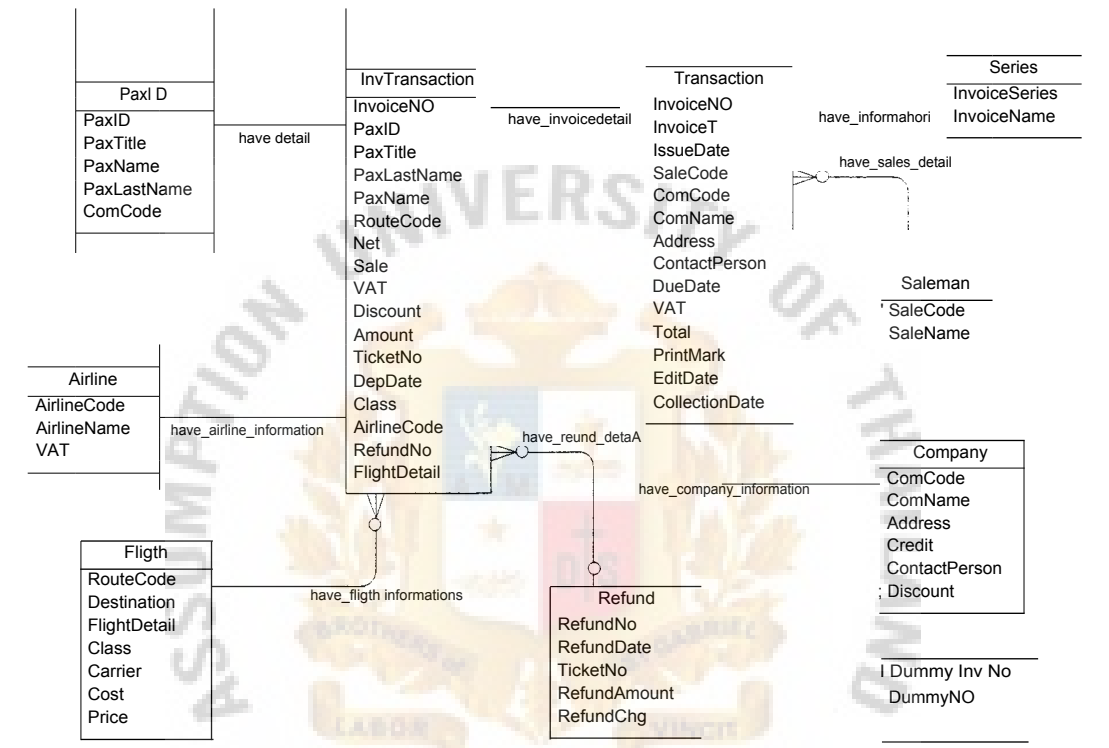

Figure 4.5. Entity Relationship Model.

4.3 Hardware & Software Requirement

For the new system, the preparing of hardware specification and software specification to support this system is the major concern because the cost in this part is expensive and it will be used for a long period of time. So we should provide them with the following:

4.3.1 Hardware Requirement

(1) Computer Server

(a) Pentium II 300 MHz processor

(b) 64 MB ECC memory

(c) 4.2 GB HDD

(d) 2MB standard video memory (up to 1280x1024, 256 color)

(e) 1.44 MB disk drive

(f) CD-ROM 40x

(g) 10/100TX NIC PCI LAN adapter

(h) 15" SVGA, non-interlaced, MPR-2 emission standard color monitor

(2) Micro Computer

(a) Inten Celeron 266MHz

(b) Ram 32MB

(c) 2.5GB UATA HDD

(d) 2MB EDO Video RAM

(e) 1.44 MB disk drive

(f) 3Com 10/100Base-T

(g) Monitor 14" SVGA

(h) Desktop models

(3) Dot Matrix Printer

(a) 24 Pin, Impact Dot Matrix

(b) 10 character/inch at draft mode

(c) Parallel Interface

(4) Uninterrupted Power Supply

(a) 600 VA Capacity (For Server) and 1KVA

(b) Stabilizer mode 220 VA

(c) Back up time 60 minutes at full load

(5) Hub & Lan-card & UTP line.

4.3.2 Software Requirement

(1) Network Operating System

(a) Microsoft Windows NT Server, 5 users for Computer Server

(b) Microsoft Window95, 5 sets

(2) Database Management System

(a) Microsoft Access for Windows

4.3.3 Hardware Configuration

The hardware configuration is the major concept for the new system to be implemented and should be provided to support the future system. The good design for hardware configuration design is the following:

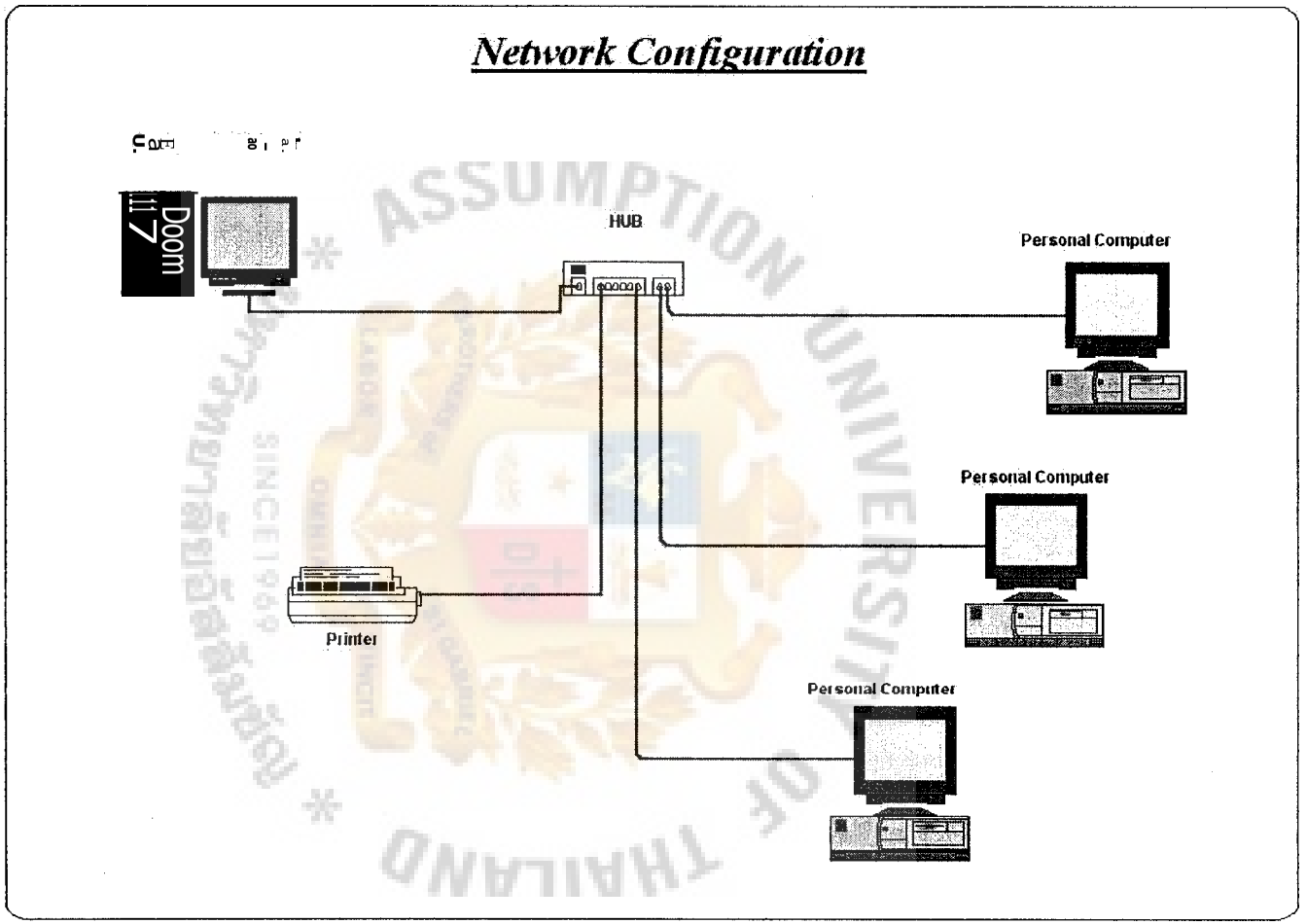

Figure 4.6. Network Configuration.

4.4 Security & Control

In Shindai company, there are many employees who work the whole day, so the most important thing that should be considered is security-control to maintain computer system and data.

The basic concepts that are used are functional and group-level, where the functional is the operation system for each process in the hotel. And group-level is for each person who works in the some task, set as a group. In each group which has some work, we separate levels for the authorization process.

For the Shindai company, there are 2 departments is Accounting Management and Front office. In each department, there is a manager and employees, so the manager is like a leader of each group and employees are as members in each group. The security system uses a login id and Password for each login id. The authorization is different:

Login_id : Functional, Level

f f

XX

Password : xx_____

Owner password

For this group, the Manager has the highest capability to authorize processes and staff members have lower authorization. All above are security for the authorization program.

The other security measurements are as follows:

(1) Check for authorization

For each person who logon to the program, there is a different authorization and priority to process their job at the same time.

(2) Keep logon Record

To set a program to keep the security of each logon id, who ever uses a program writes the record every time that someone changes or updates a record file.

(3) To keep back up data file

The computer administration who maintain this computer system should back up the data file into media such as diskette, CD-ROM or tape in a daily, weekly or monthly-record.

4.5 Cost and Benefit Analysis

The existing system is as follow

In the Shindai company, the existing system for the front desk is manually operated. When a customer comes in, for a reservation, the front desk will ask them to fill in the form and keep that information as a document. So they need to manage a system for collecting, searching, reporting or updating that information. Sometimes, they use a long time to do those processes, and the accuracy of the data is a problem. So they try to solve all of these problems by using a computer system to manage organization, to manage data collection, create reports and use this program to input all information. To compare the cost benefit of this system for the first time, they need more resources such as hardware, software, and training-course for their employees. But for long term, they will get more benefits and to be able to solve problems that occur.

The starting costs include:

(1) Hardware, Software, Cable line

(2) The installation cost

(3) The cost of providing support during implementation

(4) The cost of any necessary remodeling

Ongoing costs include:

(1) The system maintenance cost

(2) The cost of Backup system

(3) Training cost

(4) Accessories cost, include paper, diskettes, printer, ribbon

(5) The addition equipment cost

To consider all of the costs and compare for the future, this system can save costs, not only in labor reduction benefit, but it also increases time management, accuracy, and completion of work.

4.5.1 The Cost of Hardware and Software

The cost of whole system includes hardware cost, software cost, implementation cost and maintenance cost (include training cost) that are needed for this travel agencies' system. It's made more comfortable and more efficient.

(1) Hardware cost

(a) Computer Server 1 set = 145,000 Bahts

(b) Micro computer 4 set = 195,000 Bahts

(c) Dot Matrix Printer 1 set = 15,000 Bahts

(d) Uninterrupted Power supply 2 set = 24,000 Bahts

Total of Hardware part = 379,000 Bahts

(2) Cabling System cost

(a) Hub and Lan = 16,000 Bahts

(b) UTP cable = 4,000 Bahts

Total of Cabling system = 20,000 Bahts

(3) Software cost

(a) Network Operating System = 41,500 Bahts

(b) Database management system = 6,000 Bahts

Total of Software part = 47,500 Bahts

Total of Investment = 446,500 Bahts

Payback Period = $\frac{I}{(1-T)R}$

Where I = Investment

T = Tax rate

R = Annual Saving

Payback Period = $\frac{446,500}{(1-0.3)(240,000)}$ years

= 2 Years 8 Months

I = 511,500

T = 0.3

R = 240,000

For Shindai Agencies, the old system uses 5 persons and the new system uses 3 persons, so that can reduce 2 persons. Average salary for each person is 10,000 bahts. Cost saved for 2 persons is 20,000 bahts/month and 240,000 bahts/year.

4.5.2 Tangible Benefits

Tangible benefits are advantages measurable in value (Bahts), saved time, and reduced resources that accrue to the organization through use of the information system. After implementation of the new system for Shindai company we will accept that benefits are as follows:

(1) More efficient work, increase in speed of processing for each department to connect to each others for some information or sending data to storage. To be able to decrease the amount of employee time needed to complete task.

(2) Reduce work. For the computer system, we provide the system to process some work instead of manual work such as summary reports so employees can save their time.

(3) Reduce increasing employee. For each year, they need more employees to support their business so the cost will increase every year. To solve this problem, they decided to use computer system instead.

(4) Reduce document form. They can keep data in a computer system instead of paper and document form.

4.5.3 Intangible Benefits

Some benefits that are gained by the organization from the use of an information system are difficult to measure but they are important. These benefits are known as intangible benefits. Shindai agencies' benefits can be summarized as follows:

(1) To get more accurate information for management and planing.

(2) To forecast or improve management planing activities.

(3) Becoming more competitive in customer services.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Nowadays, each tour agency tries to develop their work or business process for more efficiency and comfort and to give the best service.

The computer system implementation is a way to improve their business for global competition and to solve many problems of the manual system.

The Shindai billing system is a system that is developed to improve the business process of the Shindai bus Service Company.

Its consists of many sub systems so this system is developed to hold more data and complicated data. The new system is developed to help the manual system that has complications, duplications, and takes time. The new system will be economic, comfortable and efficient.

5.2 Recommendations

5.2.1 Information System

For this project, the database will be Microsoft access database sharing. For 2-3 years, it can hold data and in the future the database should be changed to a high performance database, such as Oracle or SQL base, to hold more volume of data.

5.2.2 Operation System

In the future, the organization should give the training about this system to new employee and when many users use this system it should ensure system security and system integrity.

5.2.3 Management System

The new system can download data to interface with Microsoft Excel to generate graphs to management level for decision making.

APPENDIX A

SCREEN DESIGN

Figure A.1. Login Screen.

Figure A.2. Main Menu Screen.

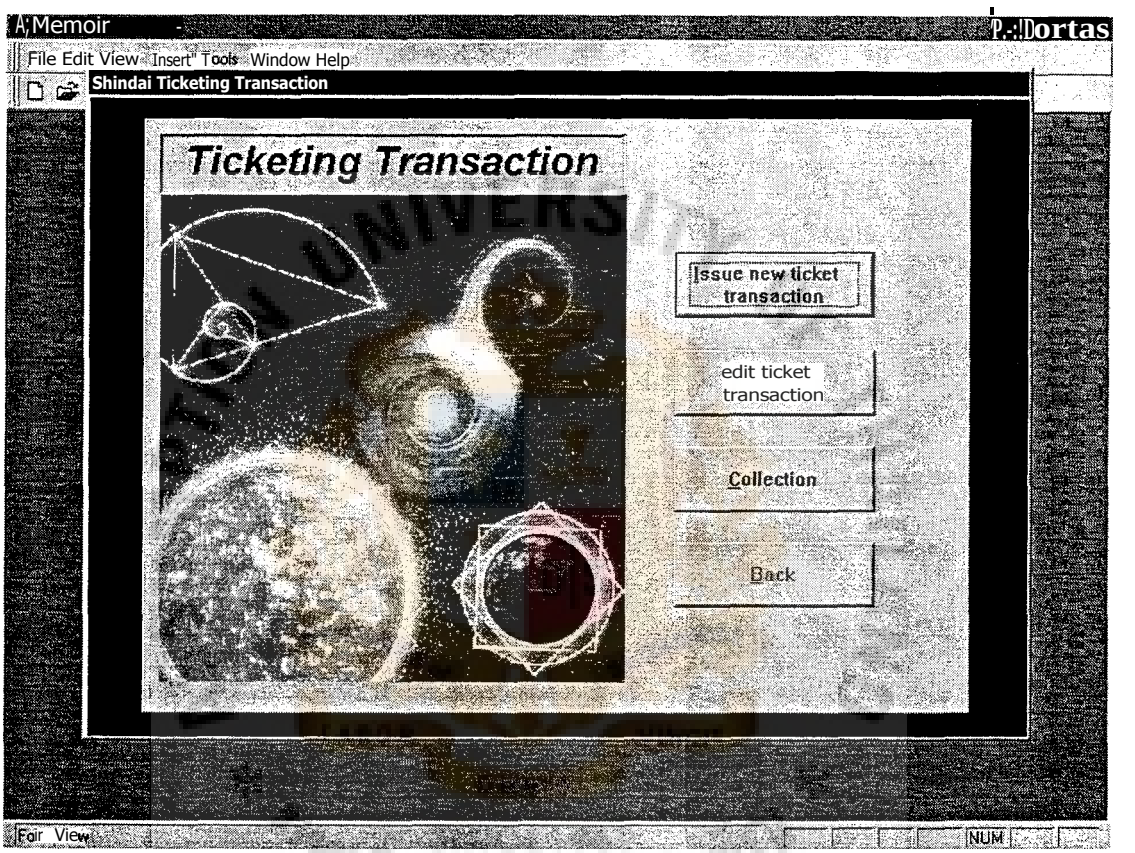

Figure A.3. Ticketing Transaction Screen.

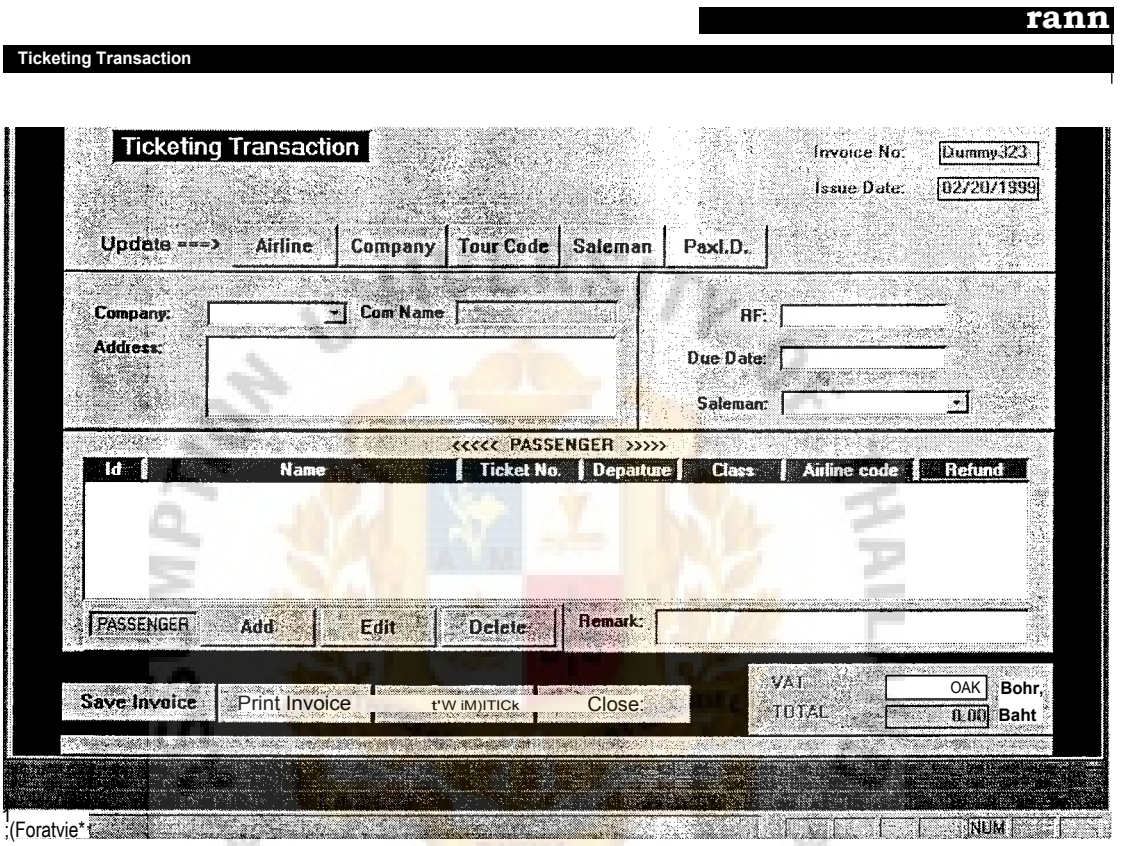

Figure A.4. Issue New Ticket Transaction Screen.

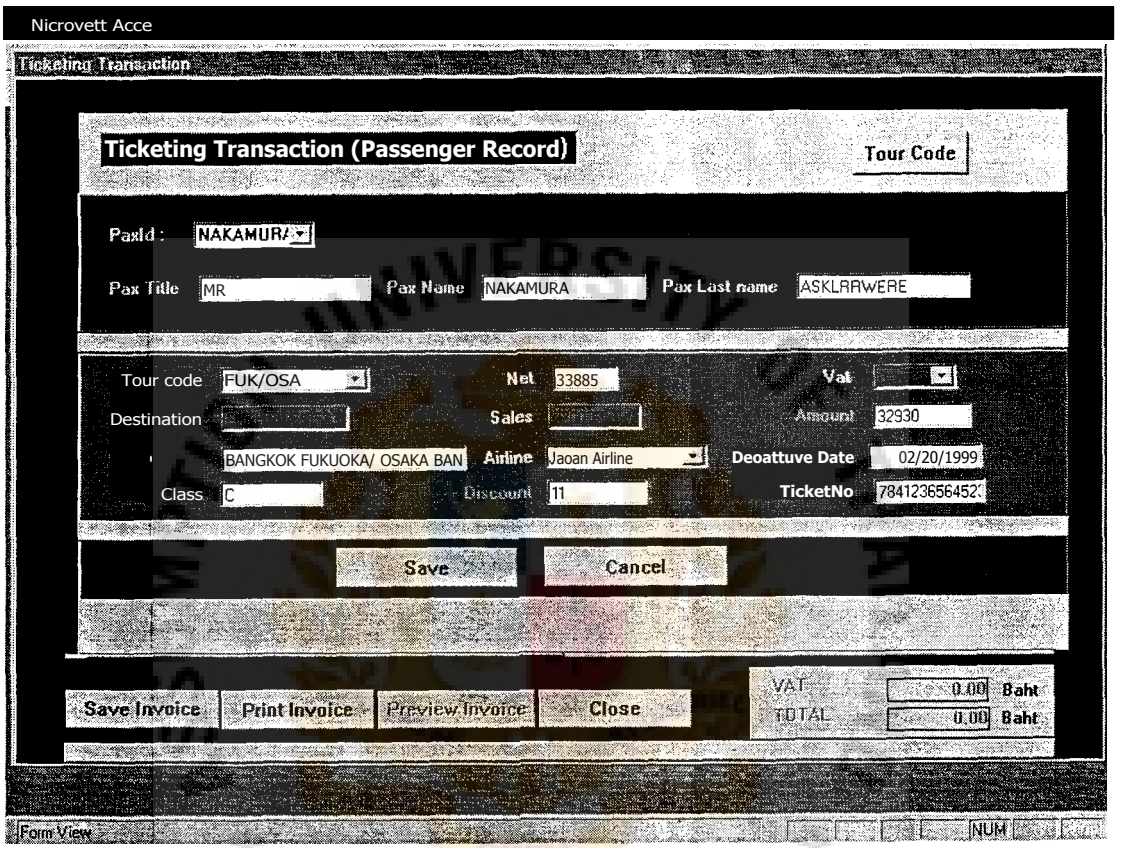

Figure A.S. Ticketing Transaction Passenger Record Screen.

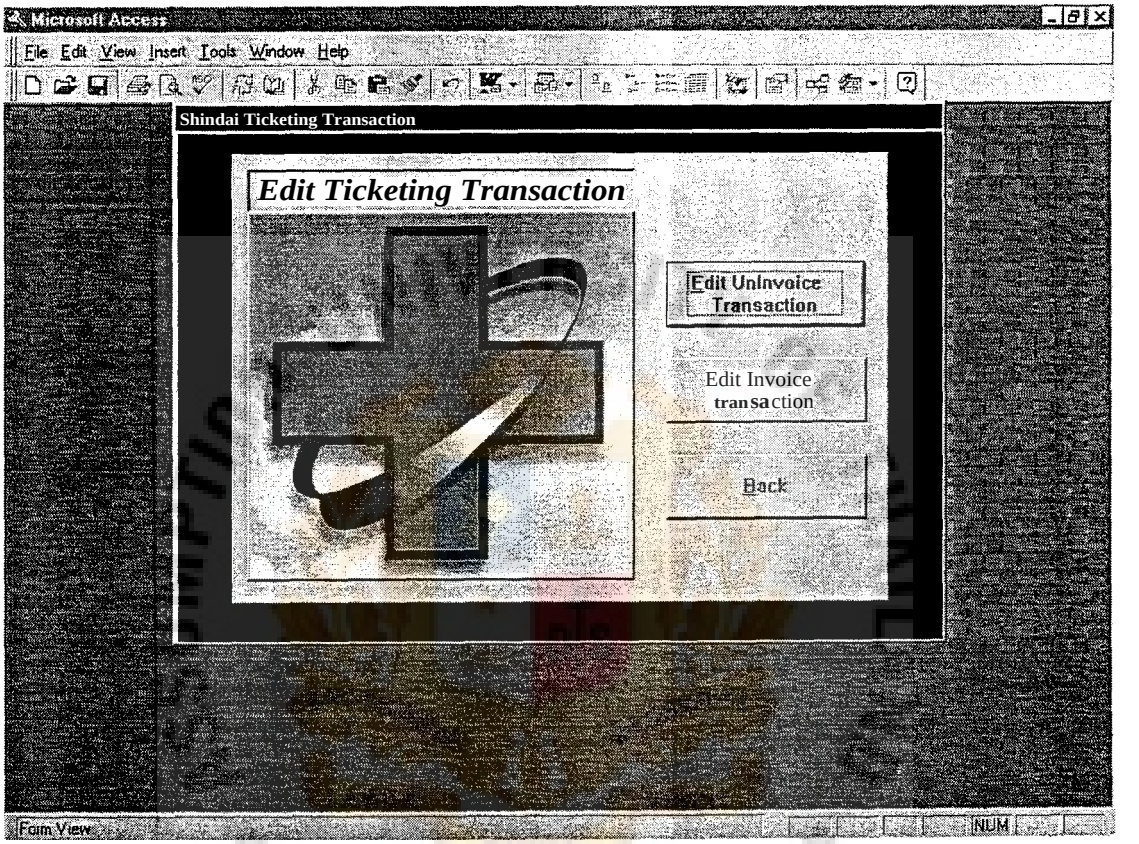

Figure A.6. Edit Ticketing Transaction Screen.

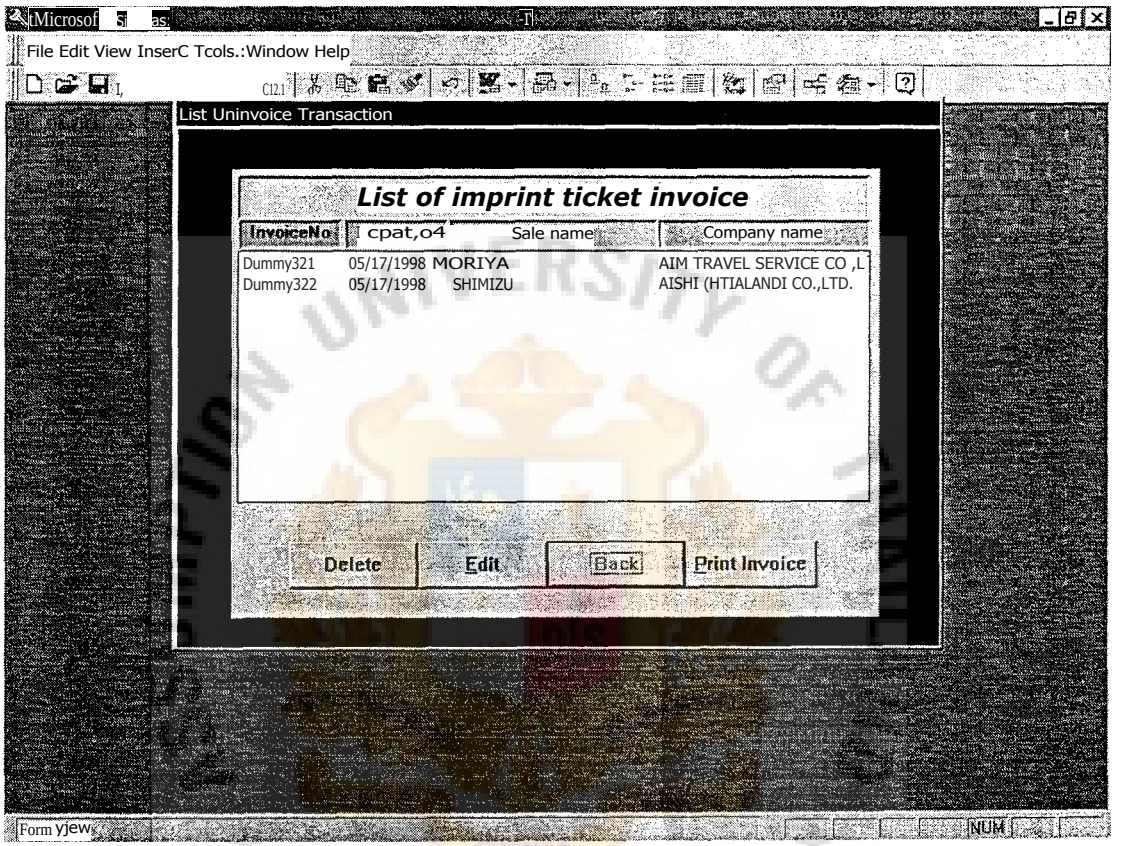

Figure A.7. List Ticket Uninvoice Transaction Screen.

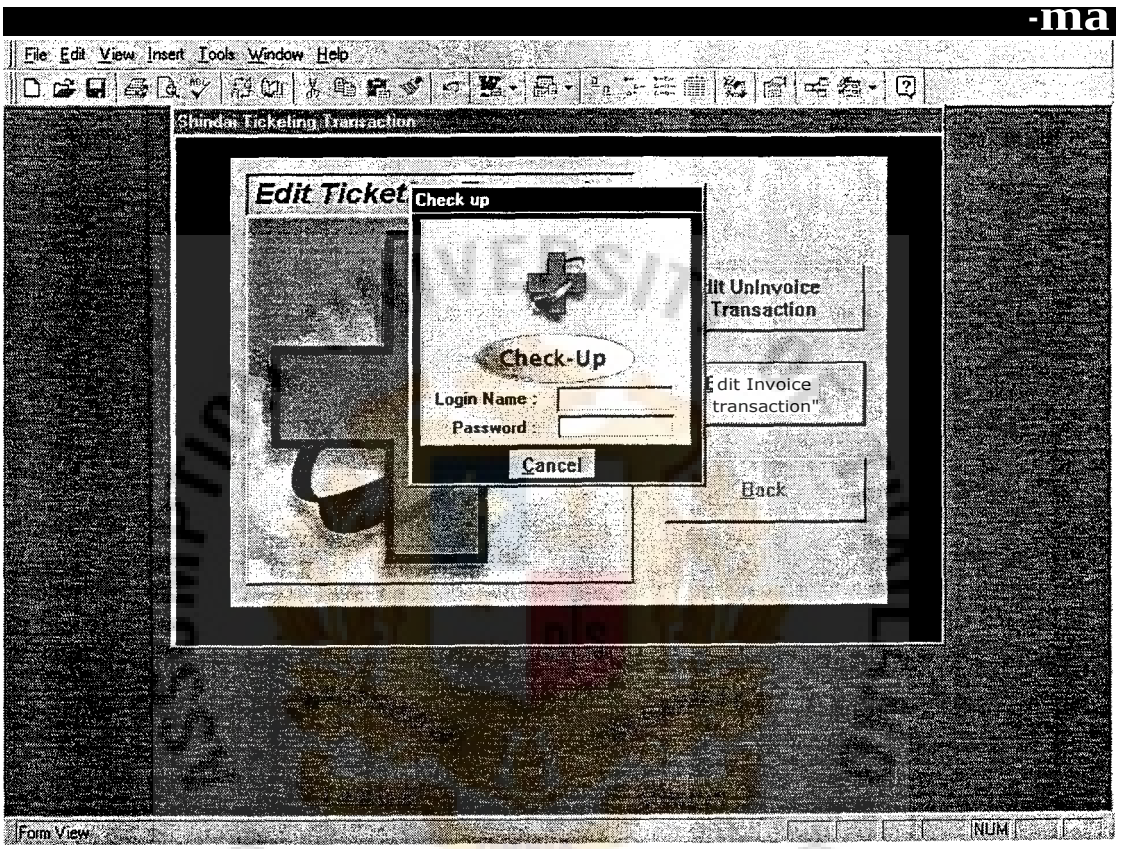

Figure A.8. Check Username and Password for Edit Invoice Transaction Screen.

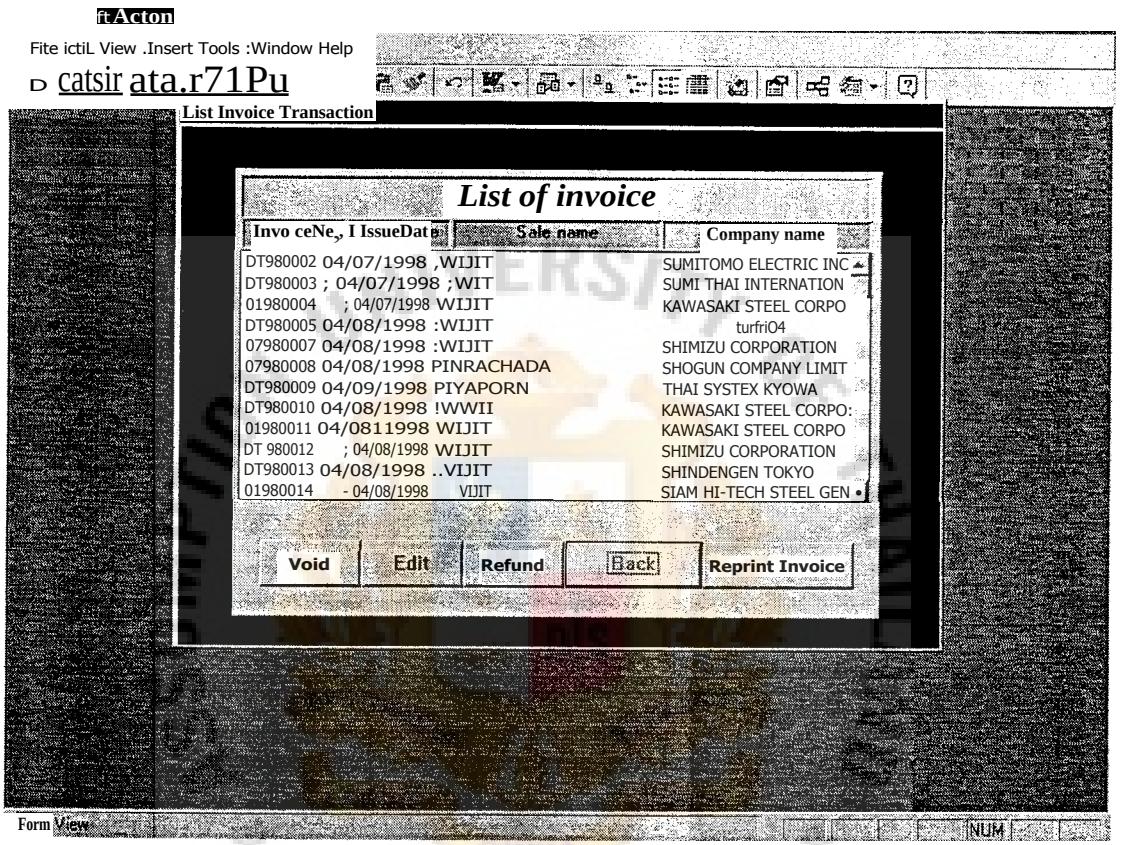

Figure A.9. List Ticket Invoice Transaction Screen.

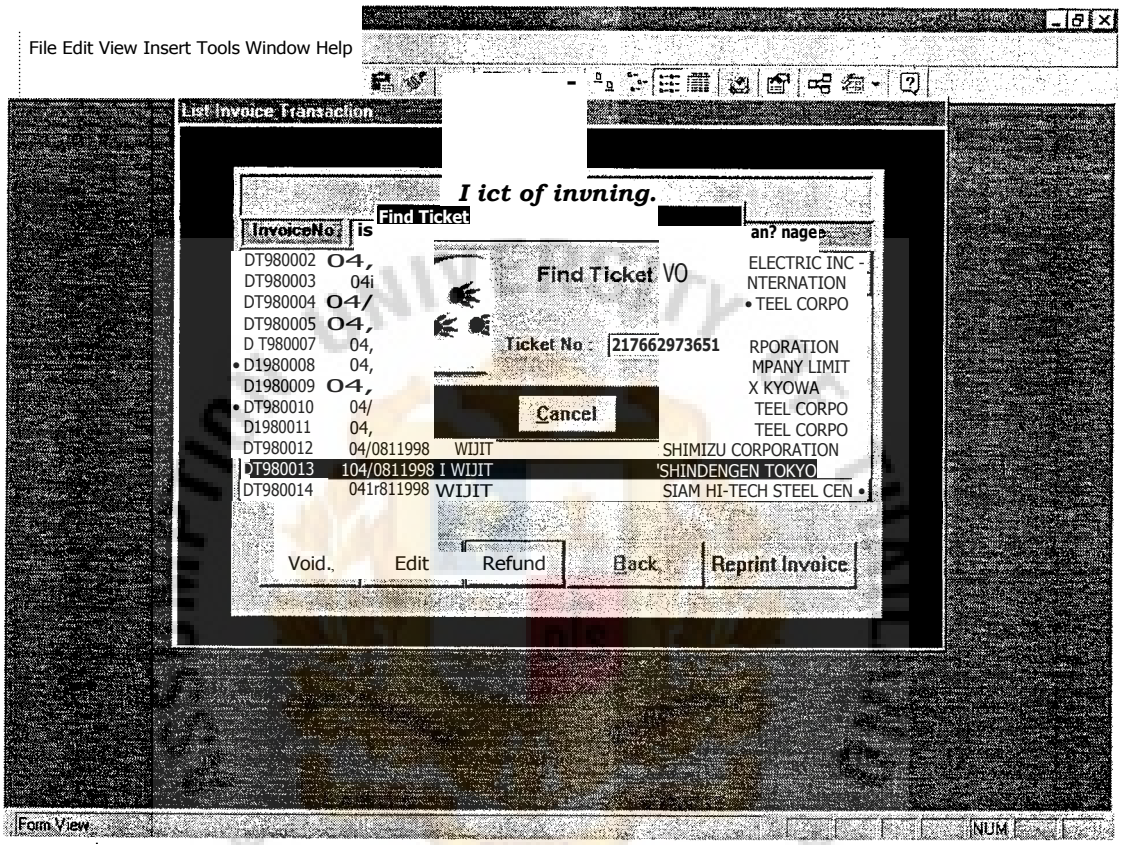

Figure A.10. Find Ticket Number for Refund Screen.

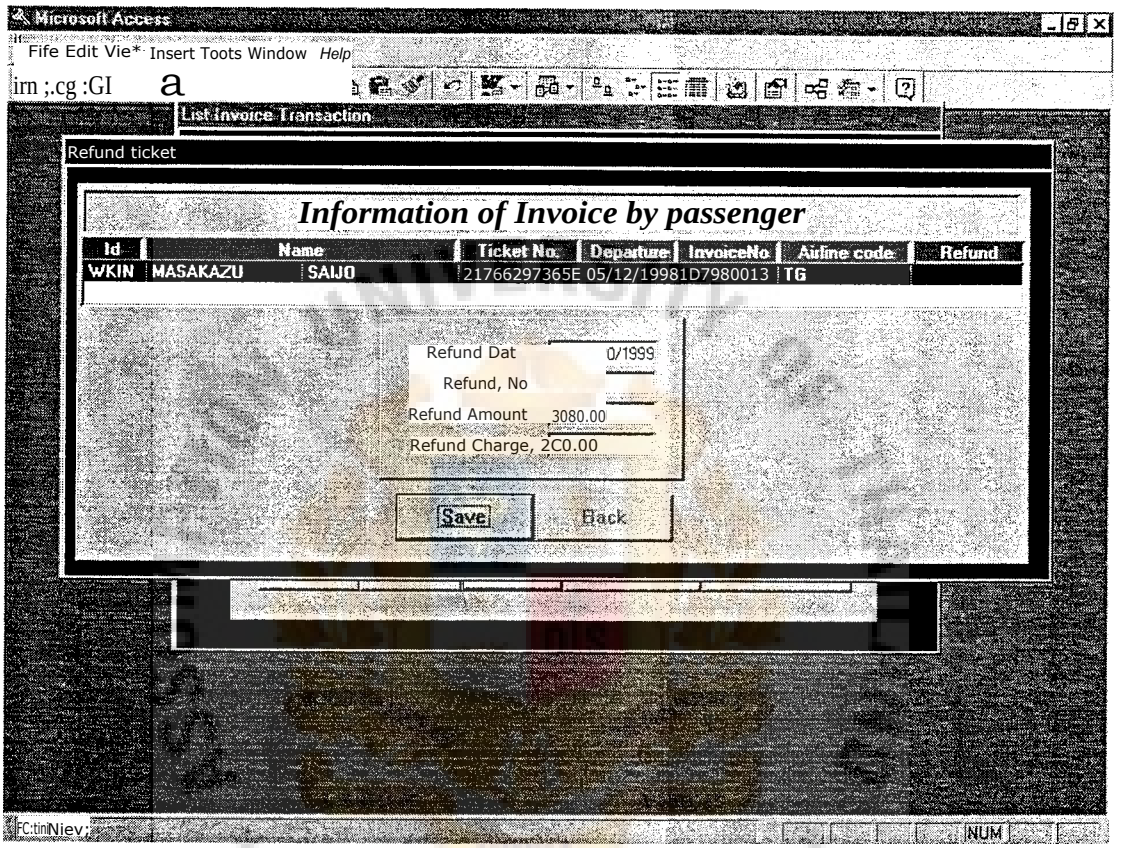

Figure A.11. Refund Ticket Screen.

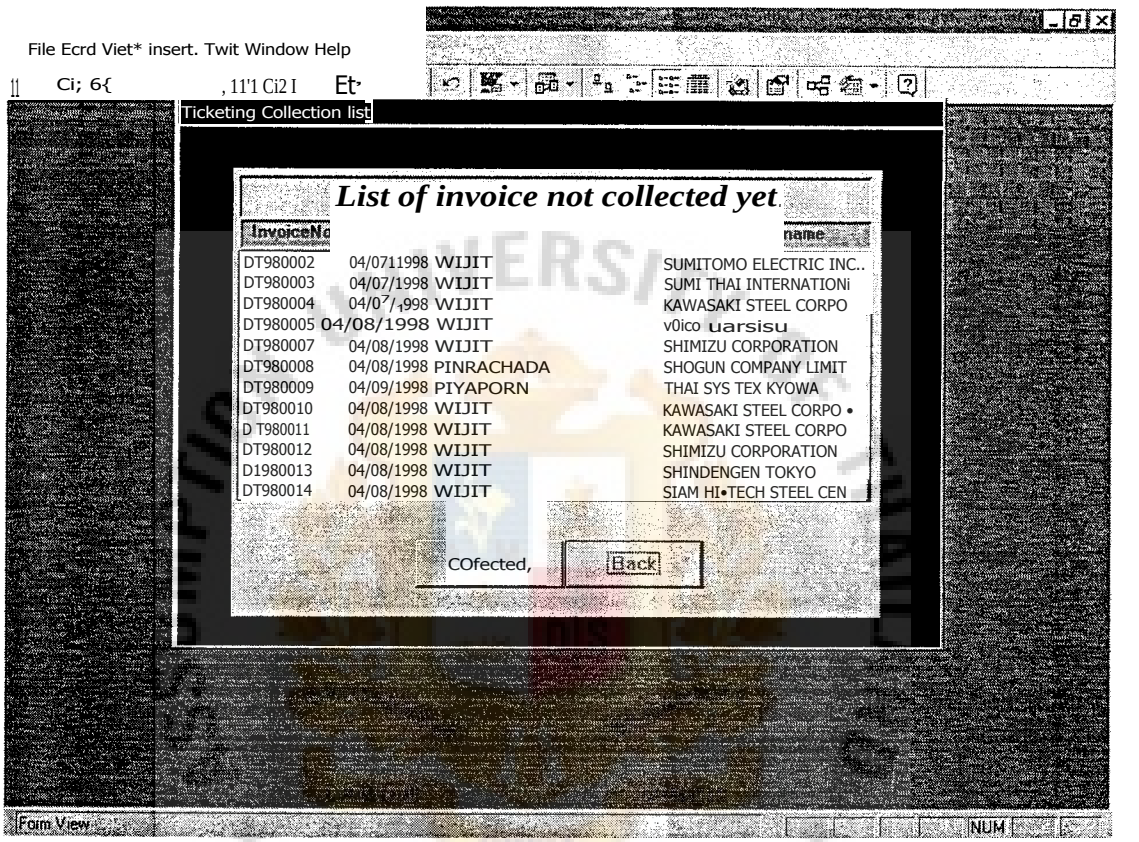

Figure A.12. List of Invoice Uncollected Screen.

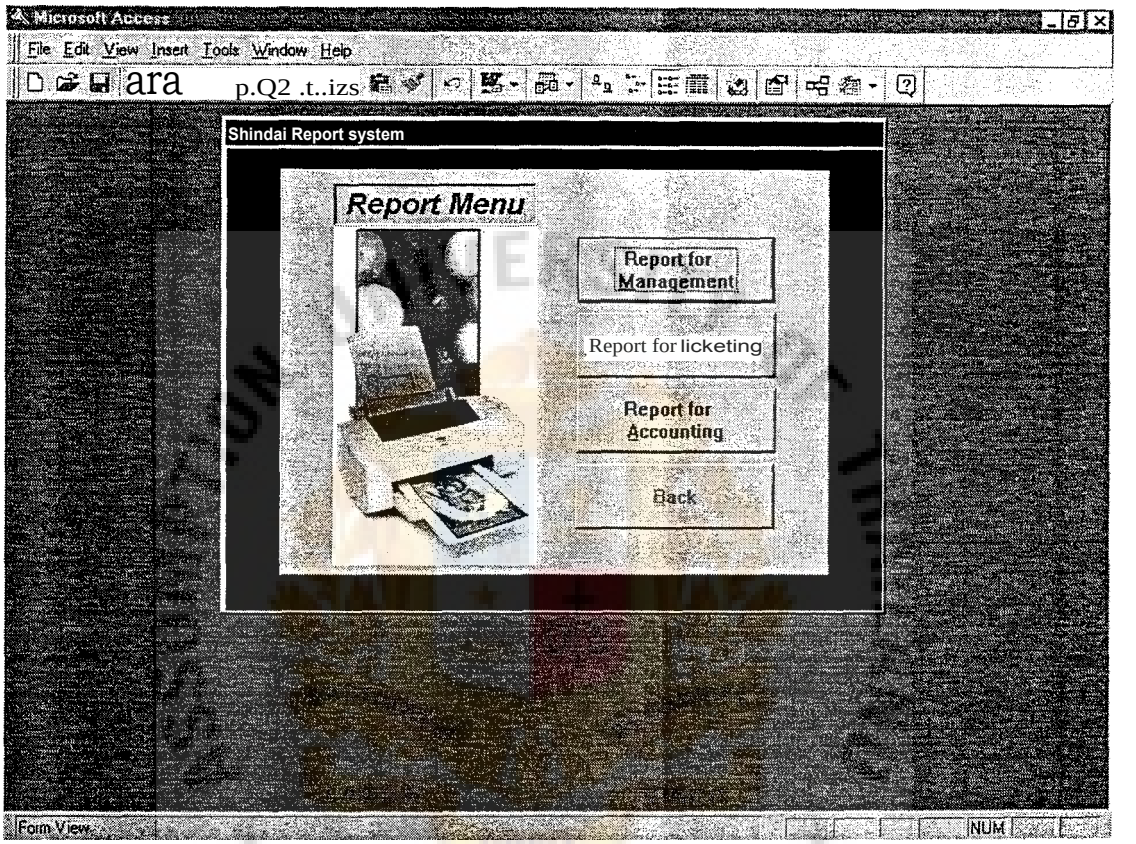

Figure A.13. Report System Menu Screen.

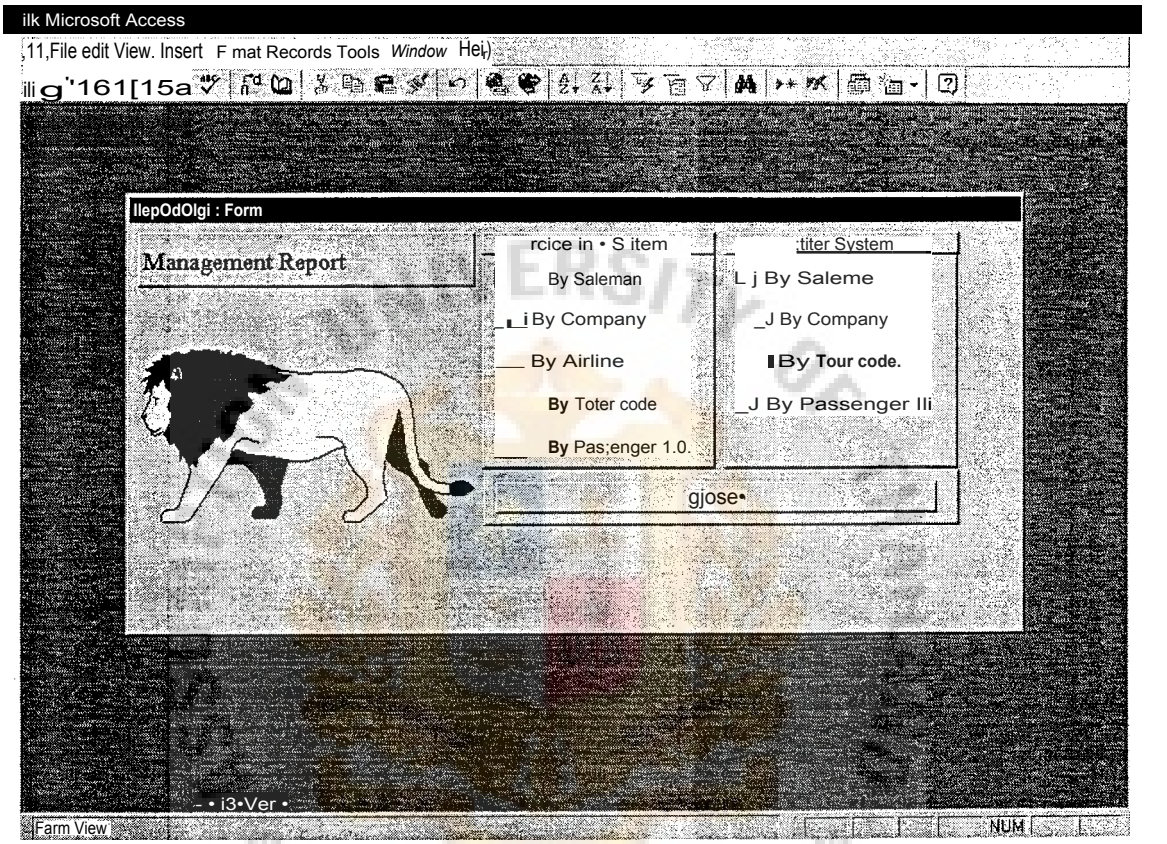

Figure A.14. Report for Management Menu Screen.

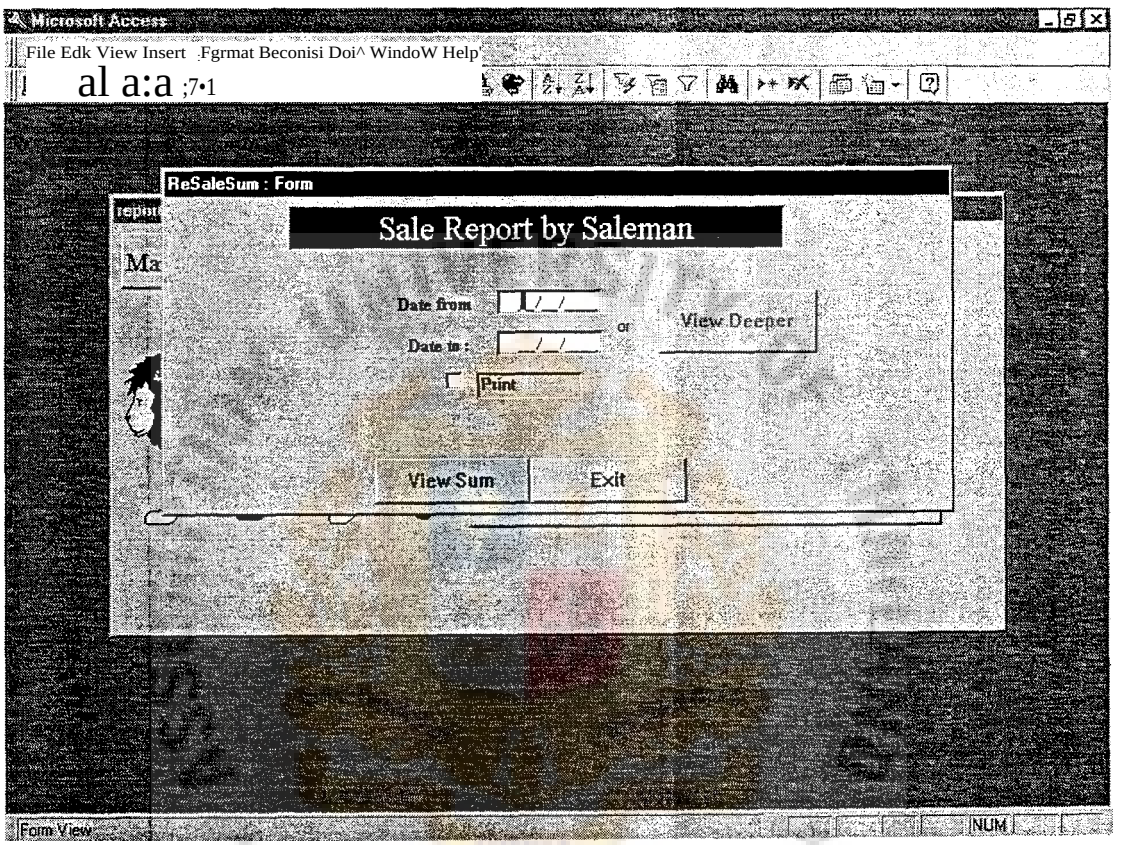

Figure A.15. Selection Screen of Sale Report Group by Salesman.

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Figure A.16. Selection Screen of Sale Report Group by Company.

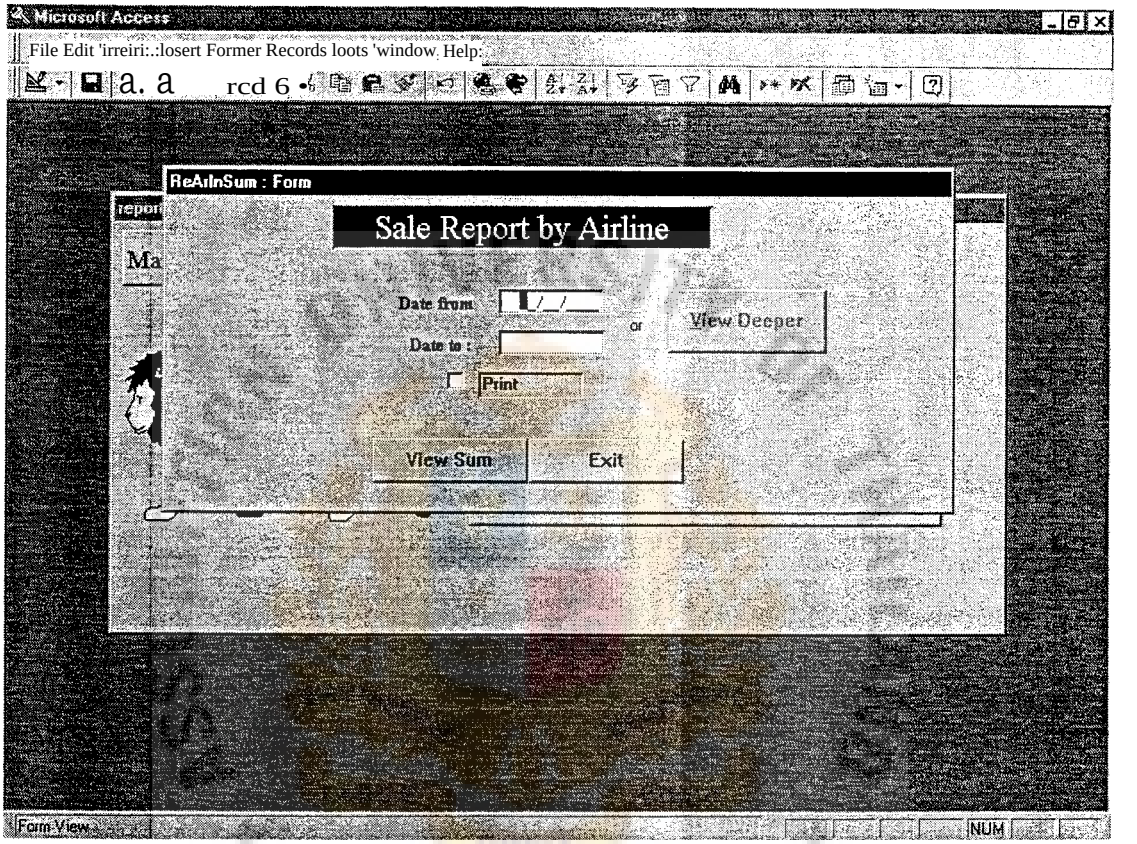

Figure A.17. Selection Screen of Sale Report Group by Airline.

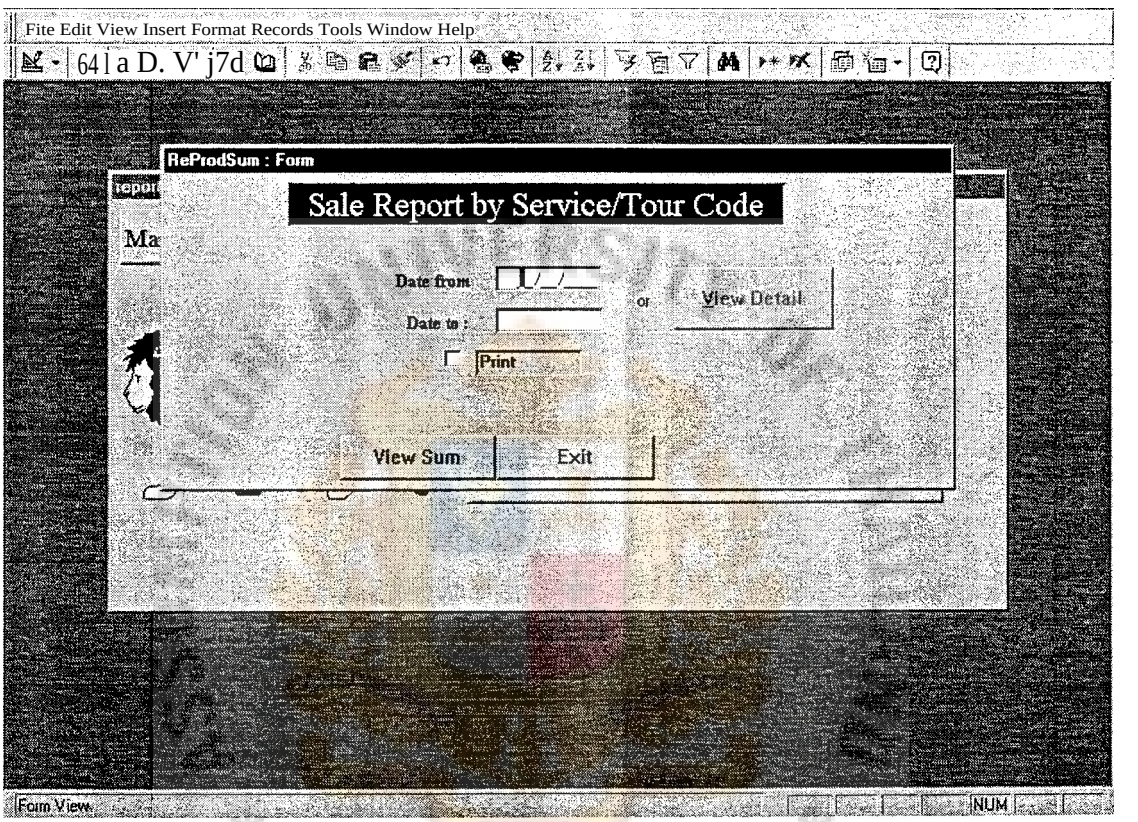

Figure A.18. Selection Screen of Sale Report Group by Tour Code.

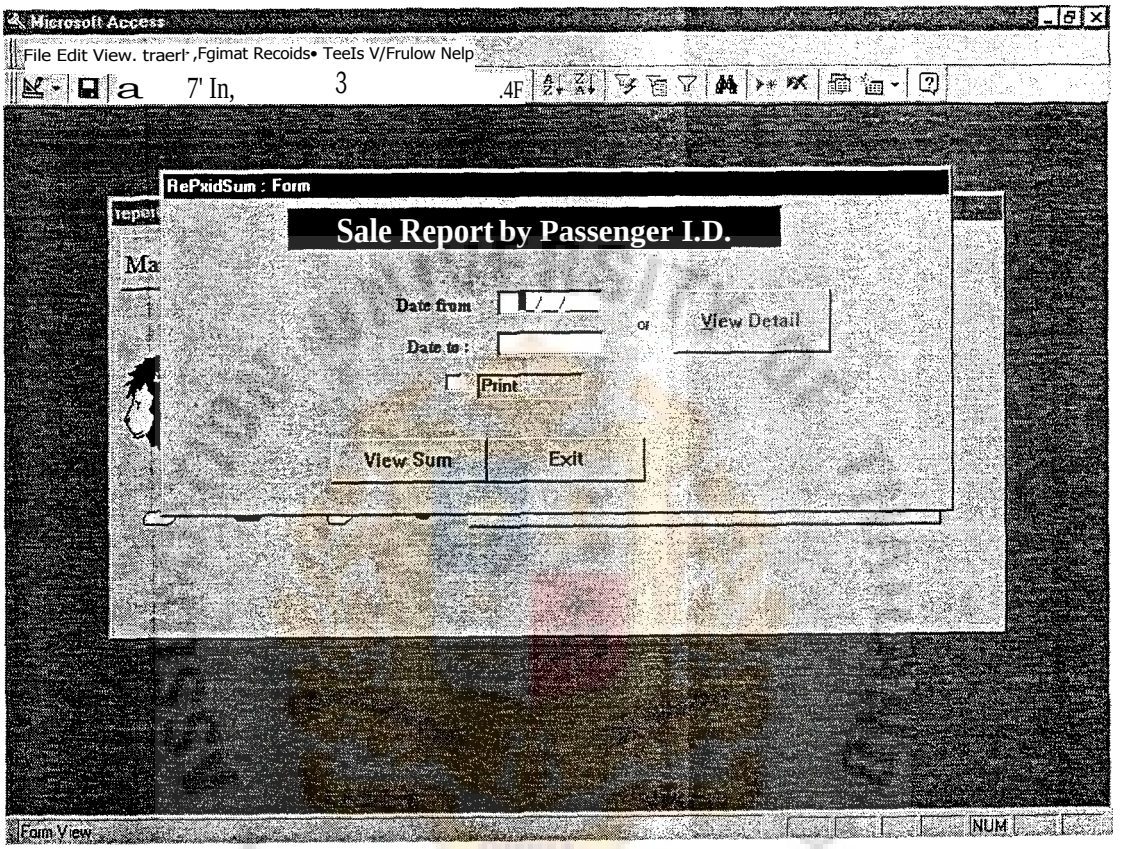

Figure A.19. Selection Screen of Sale Report Group by Passenger ID.

Figure A.20. Ticketing Report Menu Screen.

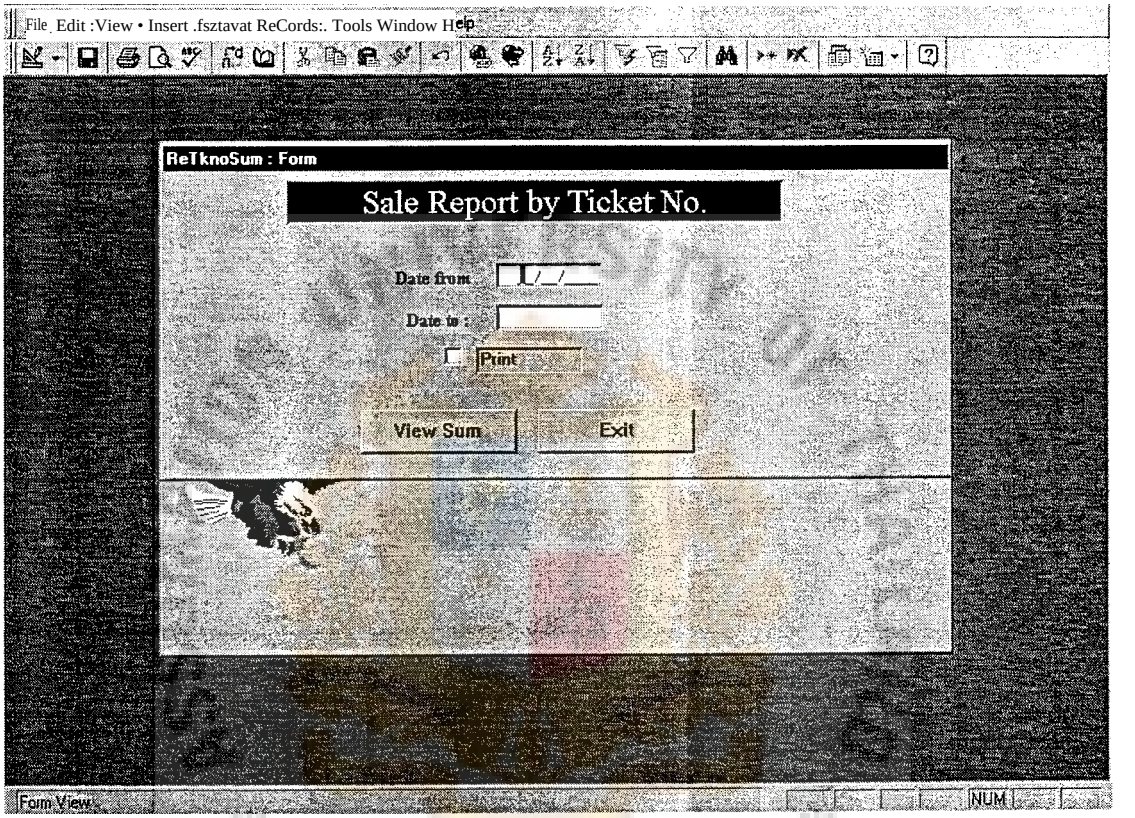

Figure A.21. Selection Screen of Sale Report Group by Ticket Number.

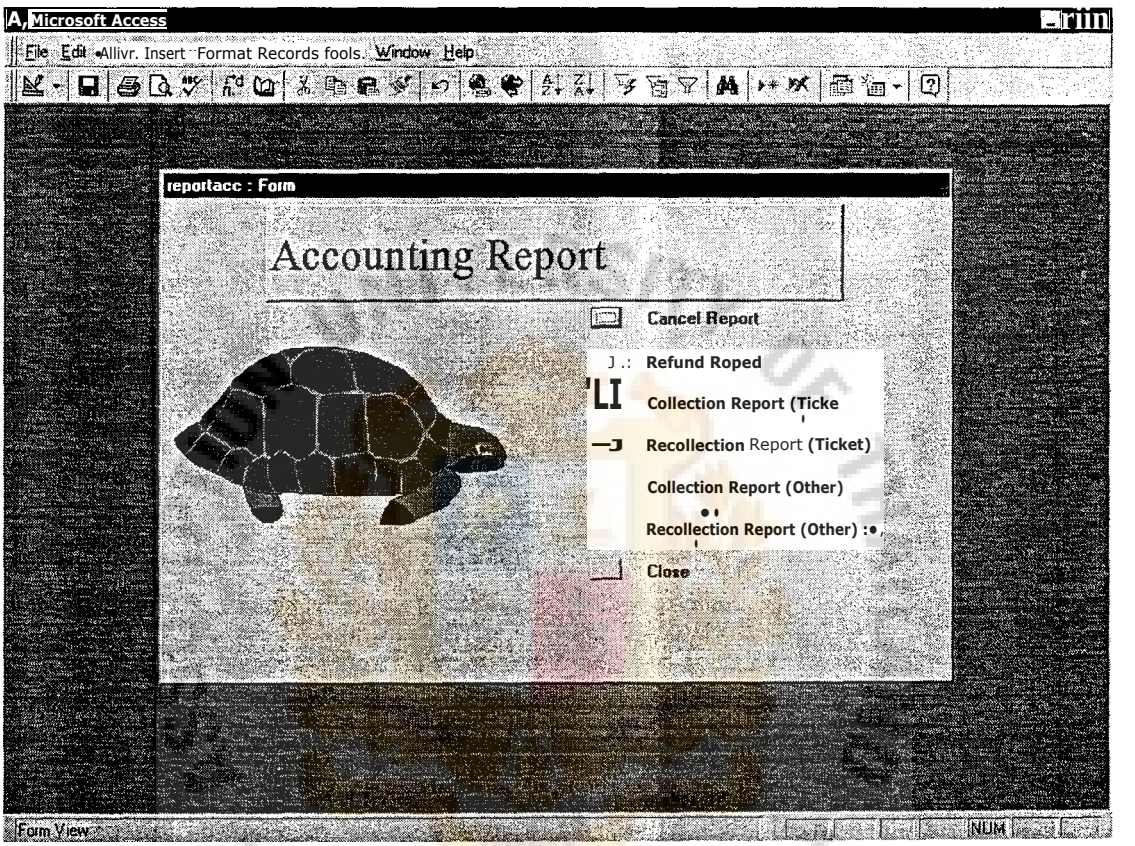

Figure A.22. Accounting Report Menu Screen.

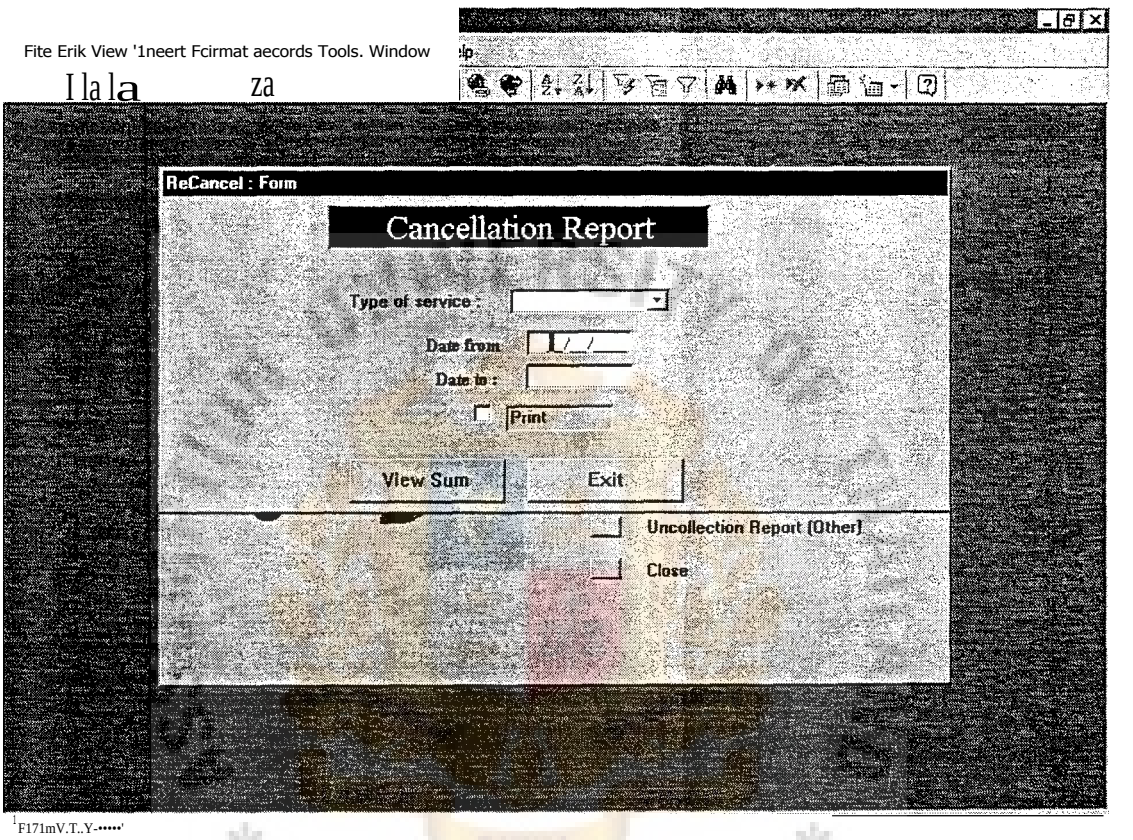

Figure A.23. Selection Screen of Cancellation Report.

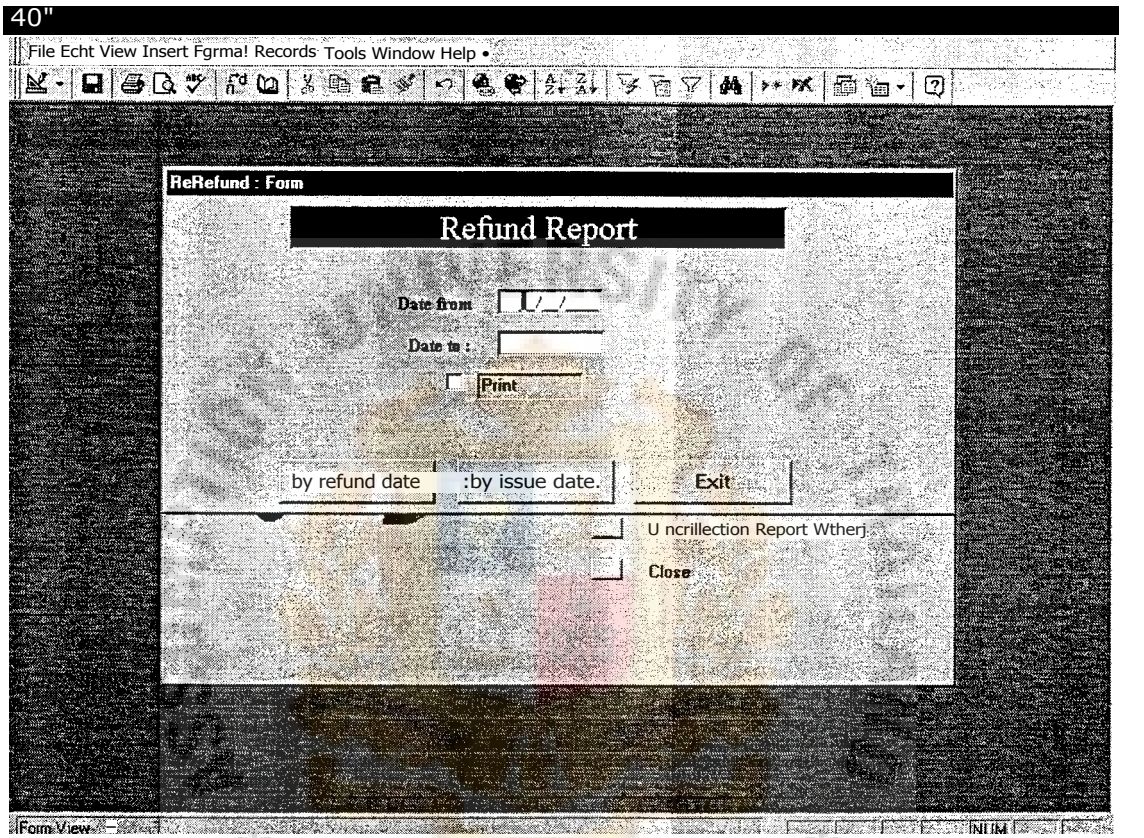

Figure A.24. Selection Screen of Refund Report.

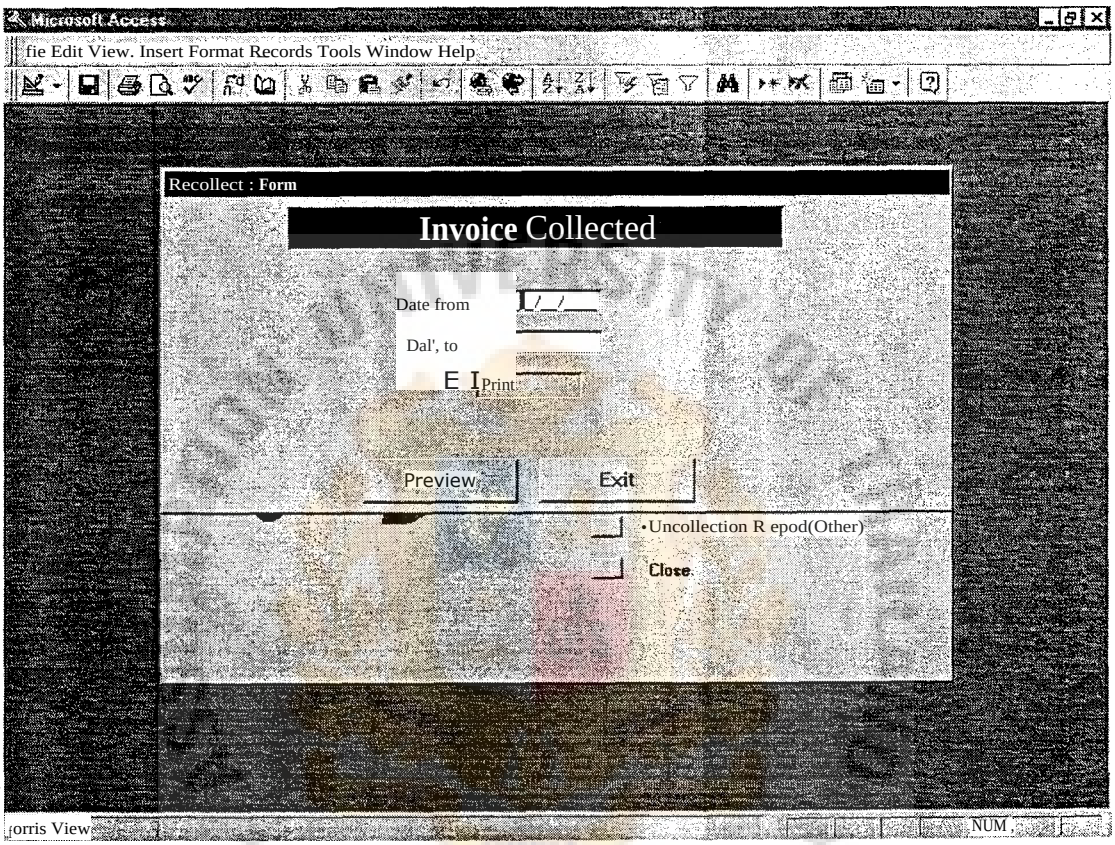

Figure A.25. Selection Screen of Invoice Collected Report.

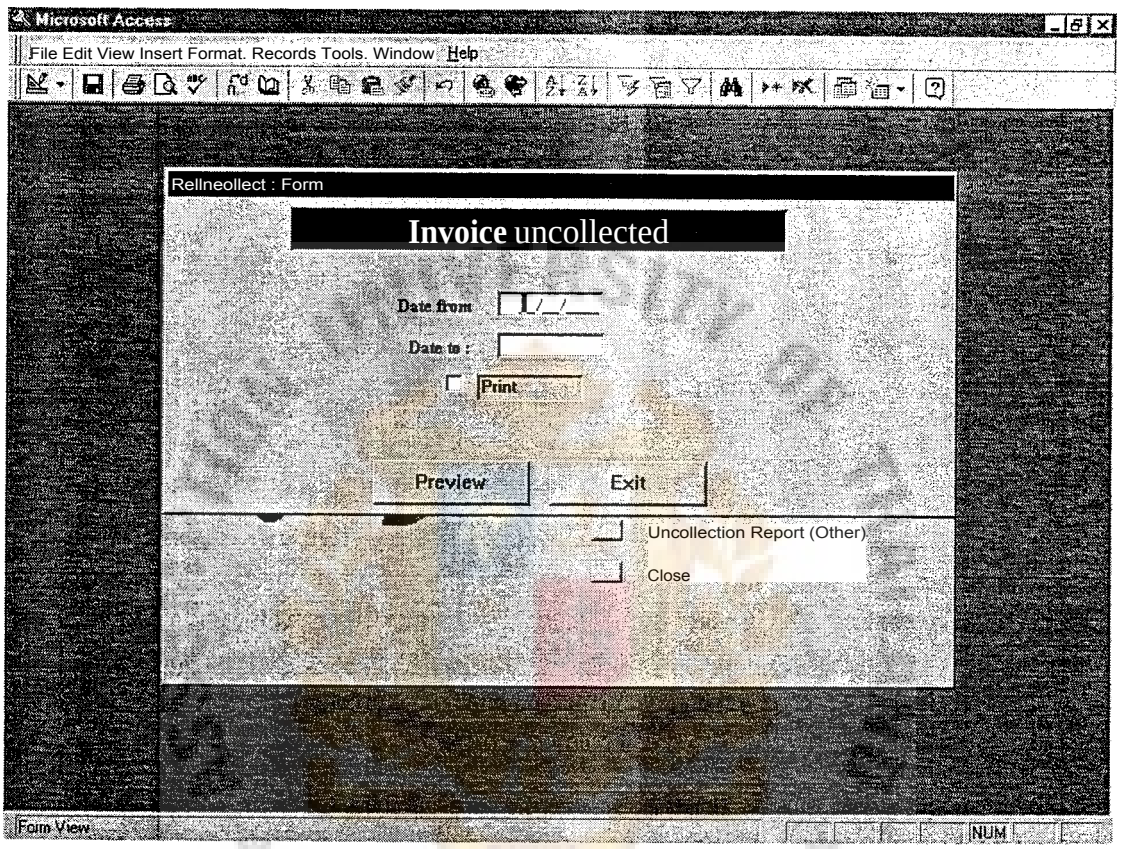

Figure A.26. Selection Screen of Invoice Uncollected Report.

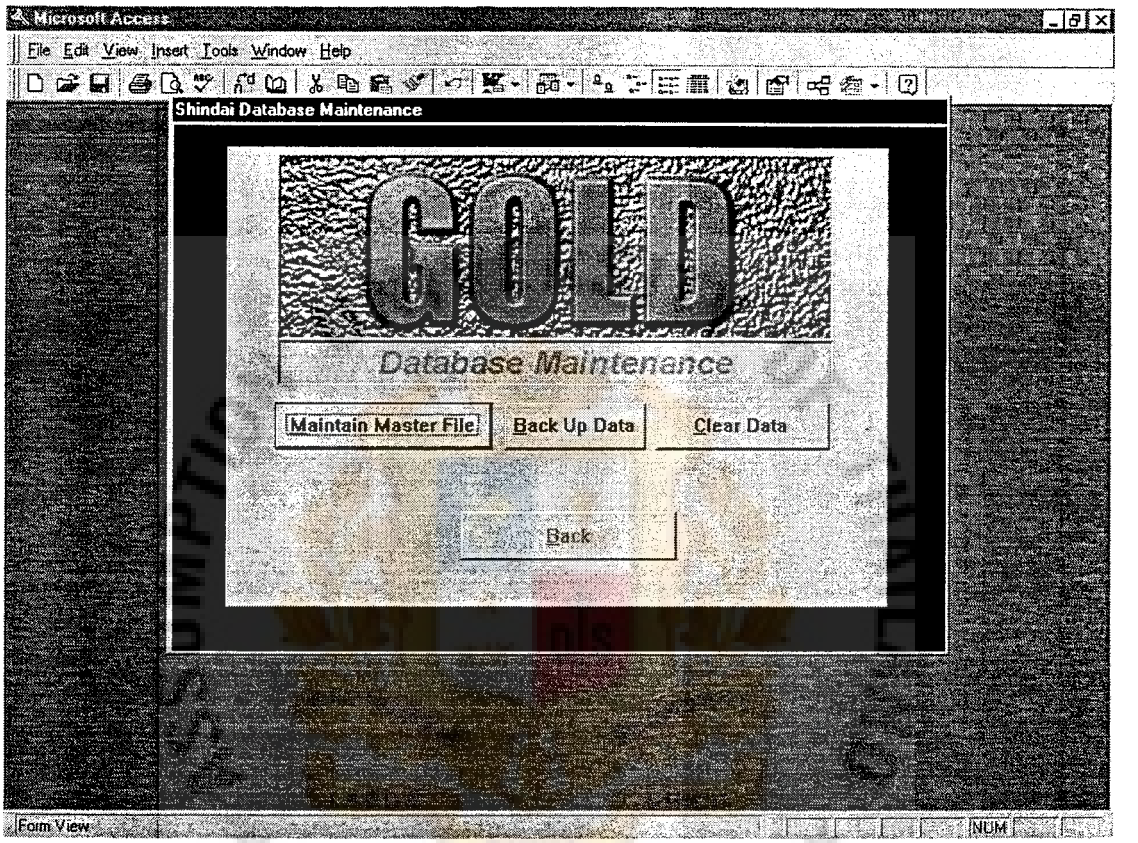

Figure A.27. Database Maintenance Menu Screen.

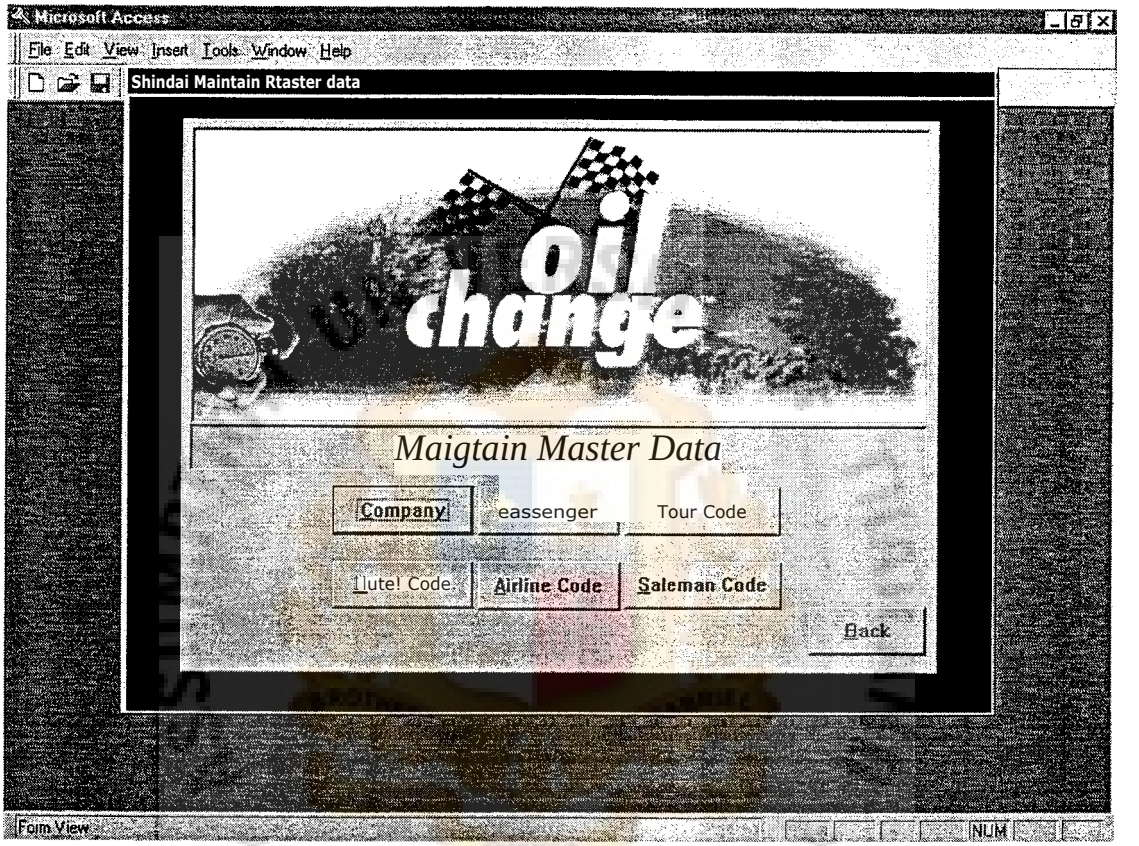

Figure A.28. Maintain Master Data Menu Screen.

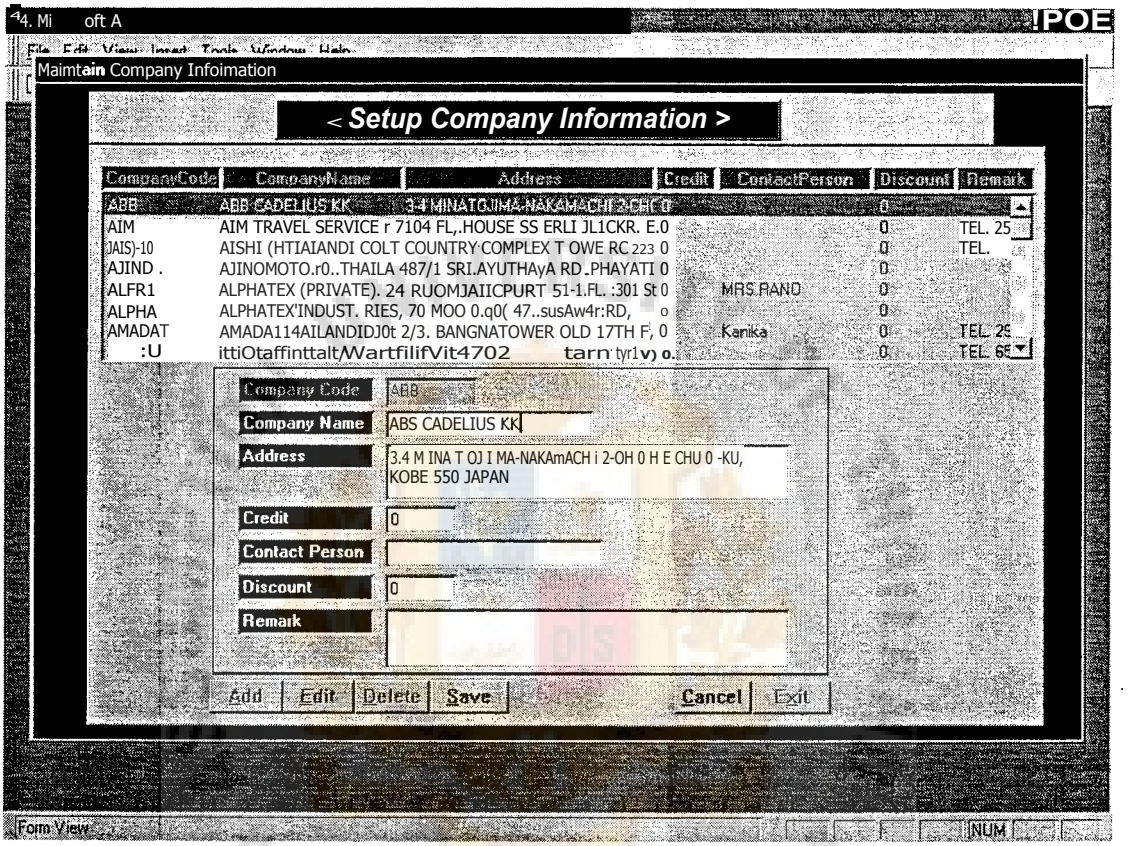

Figure A.29. Maintain Company Information Screen.

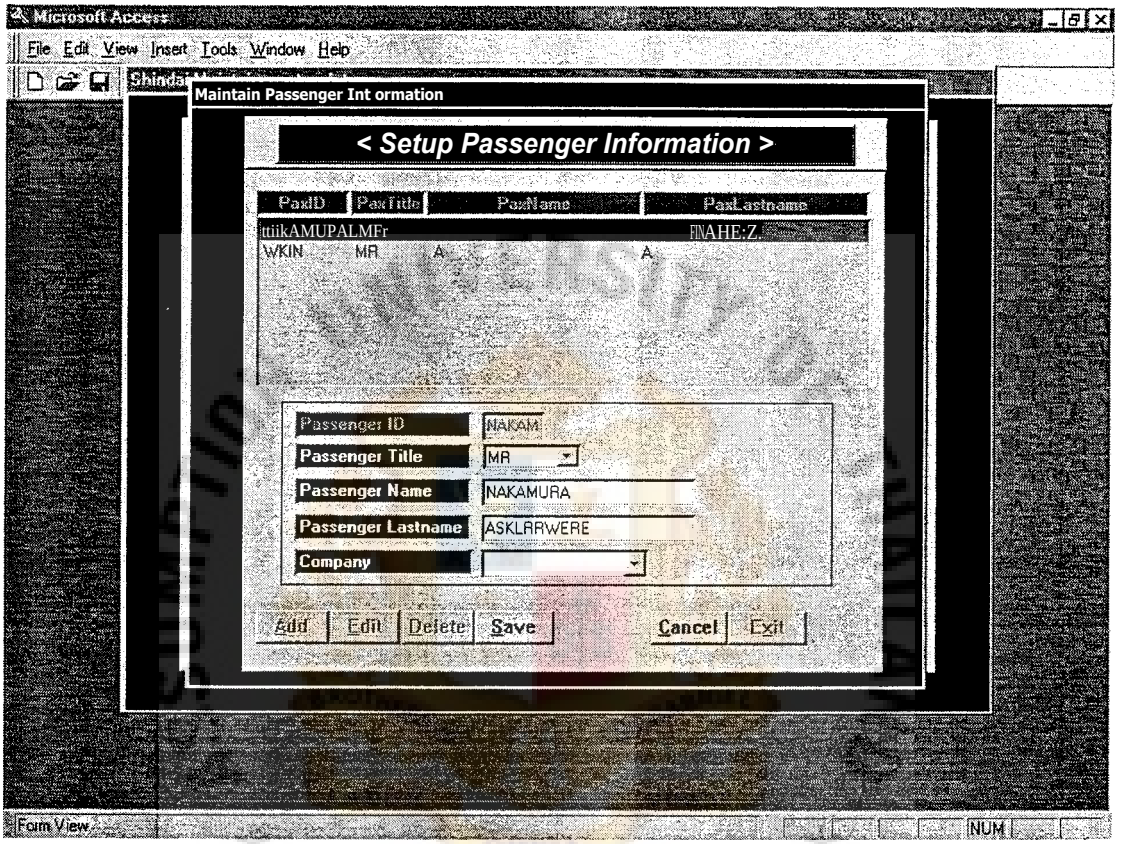

Figure A.30. Maintain Passenger Information Screen.

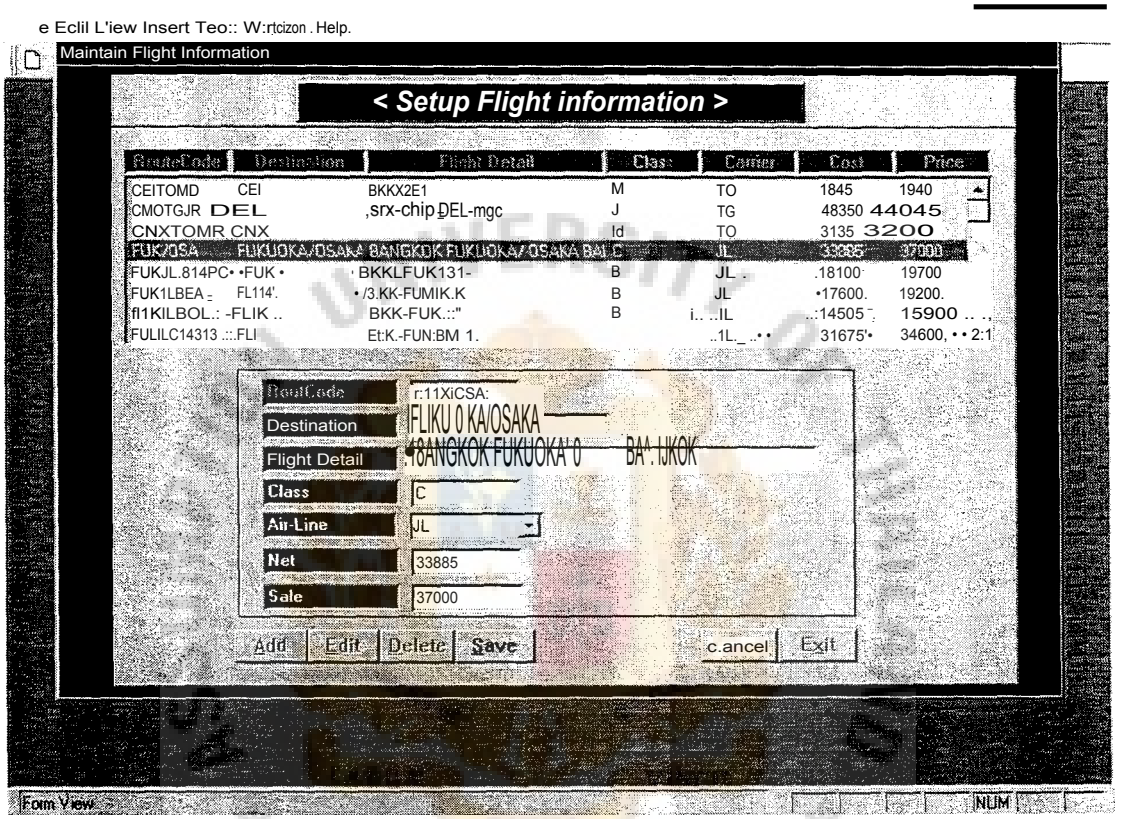

Figure A.31. Maintain Flight Information (Tour Code) Screen.

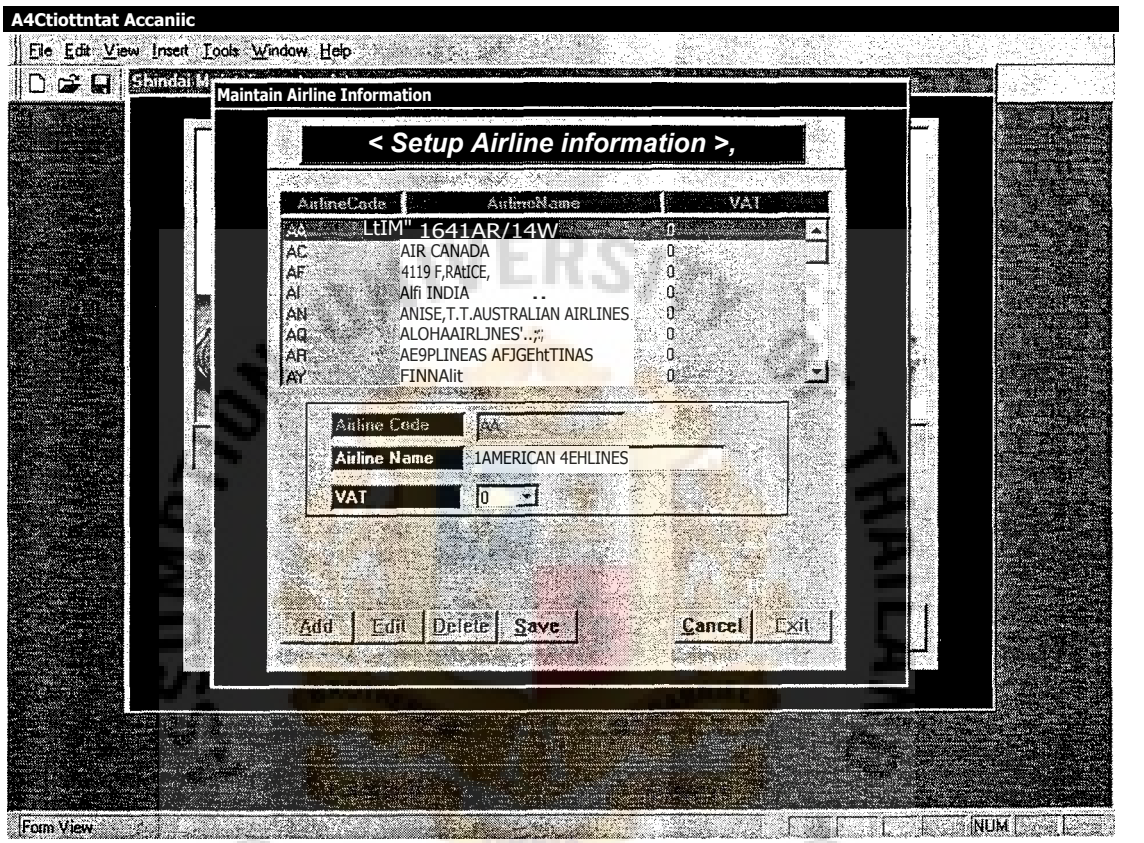

Figure A.32. Maintain Airline Information Screen.

Figure A.33. Maintain Salesman Information Screen.

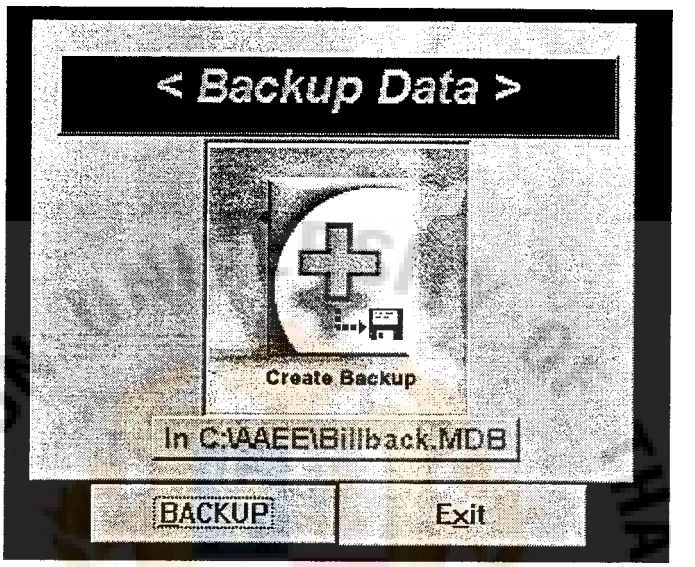

Figure A.34. Backup Database Menu Screen.

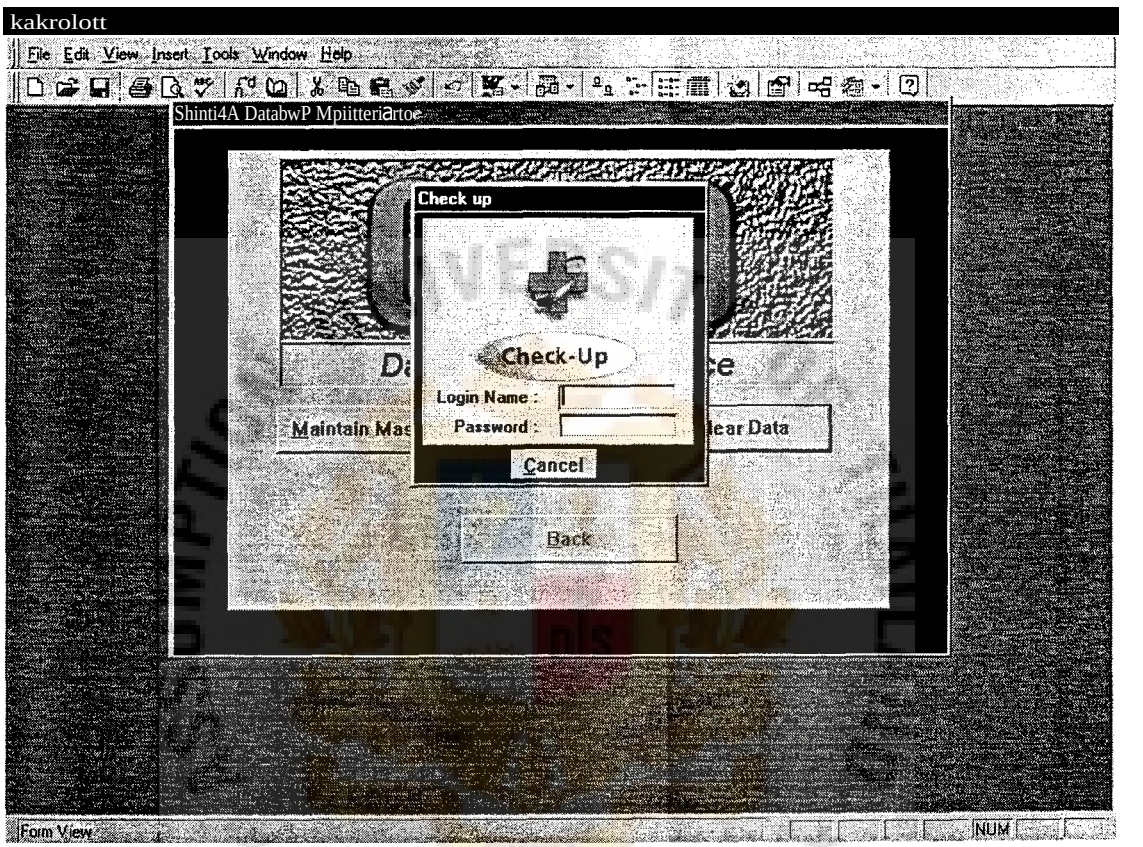

Figure A.35. Check Username and Password for Clear Database Screen.

APPENDIX B

REPORT LAYOUT

Sale Report by Salesman

From : 01/01/1998 To : 31/12/1999

Code	Saleman name	#	Margin	Sale	Net	Profit
GO	SHIMIZU	57	6.91%	**1,452,356.0**	1,352,040.0	100,316.00
JIT	WIJIT	149	7.40%	**2,435,070.0**	2,254,820.0	180,250.00
MO	MORIYA	85	7.10%	**1,499,309.0**	1,392,872.0	106,437.00
PAN	WICHAI	16	4.79%	**269,580.00**	256,675.00	12,905.00
PUM	PIYAPORN	16	2.67%	**218,570.00**	212,735.00	5,835.00
TA	JIRAPORN	61	3.77%	**231,193.00**	222,485.00	8,708.00
YUI	PINRACHADA	41	6.39%	**311,765.00**	291,835.00	19,930.00
		Total		**6,417,843.0**	5,983,462.0	434,381.00

Figure B.1. Sales Report Group by Salesman.

Sale Report by Company

From : 01/01/1998 To : 31/12/1999

	Code	Company	#	Margin	Net	Sales	Profit
1	AJINO	AJINOMOTO CO., THAILAND LTD.	1	6.07%	78,500.00	83,575.00	5,075.00
2	AL.PRI	ALPHATEX (PRIVATE)	2	4.59%	44,270.00	46,400.00	2,130.00
3	AMADAT	AMADA (THAILAND) CO.,LTD.	6	8.13%	59,090.00	64,320.00	5,230.00
4	AMSCO	11S411 tOLIIUTIJEINGIalgt1 Y1f1G1	18	4.93%	29,215.00	30,730.00	1,515.00
5	ANSCO	ASIA NATIVE STARCH	3	4.83%	4,035.00	4,240.00	205.00
6	AOI	AOI RESTAURANT	2	8.38%	23, 730.00	25,900.00	2,170.00
7	APRE	APRE (THAILAND) CO.,LTD.	1	8.42%	33,885.00	37,000.00	3,115.00
8	ARS	ARS CHEMICAK (THAILAND)	2	4.98%	5,150.00	5,420.00	270.00
9	ASCOT	uSgn mann 5utmatuziuttua rltll	3	7.34%	24,370.00	26,300.00	1,930.00
10	BARA–S	ABARA SUMI-THAI LEASING	1	8.29%	16,600.00	18,100.00	1,500.00
11	BBTHAI	BB THAI CONSTRUCTION	2	7.72%	13,335.00	14,450.00	1,115.00
12	BO.TRVL	B.O. TRAVEL AGENCY	1	4.05%	16,600.00	17,300.00	700.00
13	CHRIST	CHRISTY DESIGN LABORATORY	1	8.29%	16,600.00	18,100.00	1,500.00
14	CONTEC	CONTECH PROJECT	1	5.00%	3,135.00	3,300.00	165.00
15	DAIKIN	DAIKIN INDUSTRIES (THAILAND)	17	8.50%	296,045.00	323,540.00	27,495.00
16	DAIWA	DAIWA INSTITITE OF RESEARCH	1	7.37%	6,285.00	6,785.00	500.00
17	DESCON	DES-CON INTERNATIONAL	1	5.00%	3,135.00	3,300.00	165.00
18	DUSIT	DUSIT THANI HOTEL	4	5.00%	15,200.00	16,000.00	800.00
19	EASE	EASE TRAVEL CO.,LTD.	46	2.36%	140,130.00	143,513.00	3,383.00
20	EBARA	EBARA CORP.	1	8.99%	11,535.00	12,675.00	1,140.00
21	EKARAT	EKART DAIHEN TRANSPOMER	2	10.84%	69,900.00	78,400.00	8,500.00
22	FAMILY	FAMILY MART CO.,LTD.	3	8.99%	127,215.00	139,785.00	12,570.00
23	HAMA	HAMA CORPORATION	2	8.56%	44,985.00	49,195.00	4,210.00
24	HANWA	HANWA THAILAND CO.,LTD.	5	8.09%	93,470.00	101,700.00	8,230.00
25	HI.COM	HITACHI COMPRESSOR	1	9.00%	23,660.00	26,000.00	2,340.00
26	HITACH	HITACHI CABLE CO.,LTD.	1	8.27%	17,795.00	19,400.00	1,605.00
27	HOKOFI	HOKOFISHING	9	4.97%	252,125.00	265,320.00	13,195.00
28	IDC	INTERNATIONAL DIGITAL	2	-41.22%	23,590.00	16,705.00	-6,885.00
29	JEFSA	JEFSA CENTRAL INC.	1	8.52%	8,050.00	8,800.00	750.00
30	JUST	JUST SERVICE CO.,LTD.	1	3.31%	17,500.00	18,100.00	600.00
31	KATAYAMA	KATAYAMA CORPPORATION	1	8.38%	17,500.00	19,100.00	1,600.00
32	KAWA	KAWASAKI STEEL	3	8.69%	45,420.00	49,740.00	4,320.00
33	KINTETSU	KINTETSU WORLD EXPRESS	1	8.12%	18,100.00	19,700.00	1,600.00
34	KITA.P	KITAMURA PAINTING	1	8.42%	33,885.00	37,000.00	3,115.00
35	KWAST	KAWASAKI STEEL	4	7.39%	64,815.00	69,985.00	5,170.00
36	MARUBE	MARUBENI THAILAND (VIETANE	3	4.55%	2,730.00	2,860.00	130.00
37	MARUYO	MARUYO NISHIYO CO.,LTD.	3	8.63%	178,245.00	195,070.00	16,825.00
38	MATSUS	MATSUSHITA ELECTRIC WORKS	6	6.49%	120,030.00	128,360.00	8,330.00
39	MCA	M.0 ALUMINIUM (THAILAND)	2	8.19%	91,760.00	99,950.00	8,190.00
40	MGE	MGE ELECTRONICS SIAM	5	6.98%	47,115.00	50, 650.00	3,535.00

Figure B.2. Sales Report Group by Company.

41	MISUMI	MITSUMI	3	10.45%	52,340.00	58,445.00	6,105.00
42	MIT.ES	MITSIAM ESTATE	1	5.00%	3,800.00	4,000.00	200.00
43	MIT–CO	MISUBISHI CORPORATION	1	5.68%	16,600.00	17,600.00	1,000.00
44	MITCOM	MITSUI SIAM COMPONENTS	1	8.12%	18,100.00	19,700.00	1,600.00
45	MIT–S	MITSIAM INTERNATIONAL LTD.	1	8.17%	74,475.00	81,100.00	6,625.00
46	MIT–TE	MITSU&CO.,LTD(TELECOM	1	4.98%	14,505.00	15,265.00	760.00
47	MIT–TH	MITSUI (THAILAND) CO.,LTD.	2	10.57%	31,300.00	35,000.00	3,700.00
48	NISSHI	NISSHI-STC FLOUR MILING	1	8.42%	33,885.00	37,000.00	3,115.00
49	NP.ME	NIPPON MEAT	1	8.08%	14,845.00	16,150.00	1,305.00
50	NTT	NIPPON TELEGRAPH &	2	11.96%	69,900.00	79,400.00	9,500.00
51	NTTI	NTTI (THAILAND) CO.,LTD.	1	5.00%	3,800.00	4,000.00	200.00
52	OPTICAL	TOKYO	1	7.92%	8,135.00	8,835.00	700.00
53	OTA	OTA SHOJI CO.,LTD.	8	8.16%	93,600.00	101,920.00	8,320.00
54	0TH.	OTH.	30	7.20%	369,130.00	397,760.00	28,630.00
55	S.BANK	SAKURA BANK	4	8.48%	72,187.00	78,879.00	6,692.00
56	S.SMP	SONY MAGNETIC PRODUCTS	16	5.39%	186,605.00	197,245.00	10,640.00
57	SANDEN	SANDEN COMMERCIAL	5	7.85%	68,060.00	73,860.00	5,800.00
58	SANWAB	THE SANWA BANK LTD.	4	11.12%	20,025.00	22,530.00	2,505.00
59	SEIKI	uSiTh T,7Jfl inJiJThJ (la olsr-molneo	1	6.59%	21,275.00	22,775.00	1,500.00
60	SET	S E T CO.,LTD.	2	5.00%	10,070.00	10,600.00	530.00
61	SHI.CO	SHIMIZU CORPORATION	10	7.75%	113,835.00	123,395.00	9,560.00
62	SHIMIZU	THAI SHIMIZU CO.,LTD.	1	8.90%	44,045.00	48,350.00	4,305.00
63	SHIN.T	SHINDENGEN TOKYO	1	9.00%	48,655.00	53,465.00	4,810.00
64	SHOGUN	SHOGUN COMPANY LIMITED	4	5.51%	105,430.00	111,575.00	6,145.00
65	SIAMHI	SIAM HI-TECH STEEL CENTER	3	8.06%	52,500.00	57,100.00	4,600.00
66	SICCO	SICCO	6	4.96%	14,940.00	15,720.00	780.00
67	SINOAS	SINO ASIA	1	8.03%	18,335.00	19,935.00	1,600.00
68	SMP.SI	SMP SIAM CO.,LTD.	1	8.42%	33,885.00	37,000.00	3,115.00
69	SNC	S N C HOLDING CO.,LTD.	4	8.29%	54,015.00	58,900.00	4,885.00
70	STAND	STANDART CHARTER BANGK	5	0.55%	39,780.00	40,000.00	220.00
71	SU.IND	SUMITOMO ELECTRIC	2	8.25%	35,570.00	38,770 00	3,200.00
72	SUMI.0	SUMITOMO CONSTRUCTION	5	9.61%	36,060.00	39,895.00	3,835.00
73	SUMI-T	SUMI THAI INTERNATIONAL	27	5.23%	535,245.00	564,811.00	29,566.00
74	SUMITR	SUMITRONICS	2	8.60%	16,260.00	17,790.00	1,530.00
75	T SPF	THAI SPF PRODUCTS CO.,LTD.	1	8.12%	18,100.00	19,700.00	1,600.00
76	T.CHEM	THAI CHEMICAL CO.,LTD.	4	8.36%	112,170.00	122,400.00	10,230.00
77	T.NA	THAI NAKAHARA CO.,LTD.	1	5.00%	3,135.00	3,300.00	165.00
78	T.SUMI	THAI SUMICON	3	8.12%	54,300.00	59,100.00	4,800.00
79	TECOR	TEIJIN CORD THAILAND CO.,LTD.	1	3.74%	33,885.00	35,200.00	1,315.00
80	TEIJIN	TEIJIN POLYEATER	2	3.23%	60,000.00	62,000.00	2,000.00
81	THAISY	THAI SYSTEX KYOWA	1	0.00%	19,400.00	19,400.00	0.00
82	TOKAID	TOKAI DYENTG CO.,(THAILAND)	4	8.56%	62,725.00	68,600.00	5,875.00
83	TOYOEN	TOYO ENGINEERING	1	8.36%	6,245.00	6,815.00	570.00

Figure B.2. Sales Report Group by Company. (Continued)

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84	T-S	THAI STEEL SALES	1	8.12%	18,100.00	19,700.00	1,600.00
85	TUNA	SIAM TUMA SUPPLY CO.,LTD.	2	8.49%	49,600.00	54,200.00	4,600.00
86	UTOKU	nSiTn olvrn (1JS:11tG1111E1)	6	6.28%	26,405.00	28,175.00	1,770.00
87	VANGUARD	VANGUARD FOODS (THAILAND)	7	4.95%	14,870.00	15,645.00	775.00
88	VANLEE	VAN LEER PACKAGING	1	8.32%	8,870.00	9,675.00	805.00
89	WK	WKIN	8	3.47%	305,330.00	316,315.00	10,985.00
90	YAMADA	THAI YAMADA-GIKUKU	11	8.68%	84,510.00	92,540.00	8,030.00
91	YOKOO	YOKOO APPLIED CO.,LTD.	2	12.64%	54,950.00	62,900.00	7,950.00
92	YUI		41	5.77%	574,660.00	609,860.00	35,200.00
93	YUSHIN	YUSHIN PRECISION EQUIPMENT	1	7.37%	6,280.00	6,780.00	500.00
		Total			**5,983,462.00**	**6,417,843.00**	**434,381.00**

Figure B.2. Sales Report Group by Company (continued).

Sale Report by Airline

From : 01/01/1998 To : 31/12/1999

Airline	Code	#	**Sales**		Net	Profit
AIR FRANCE	***AF***	1	**21,740**	9.88%	19,785	1,955
BRITIST AIRWAYS	***BA***	3	**179,950**	8.48%	165,880	14,070
ROYAL BRUNEI AIRLINES	***Bi***	1	**8,485**	9.84%	7,725	760
CHAINA AIRLINES	***CI***	1	**15,700**	8.99%	14,405	1,295
Cathay Pacific Airways	***CX***	1	**24,435**	5.51%	23,160	1,275
EMIRATES	***EK***	1	**64,260**	9.11%	58,895	5,365
Japan Airline	***JL***	88	**2,391,294**	7.26%	2,229,402	161,892
LUFTHASA GEMAN	***LH***	1	**9,675**	9.08%	8,870	805
MALASIAN AIRLINE	***MH***	4	**61,270**	2.10%	60,010	1,260
ALL NIPPON AIRWAYS	***NH***	30	**903,045**	5.92%	852,565	50,480
Northwest Airline	***NW***	1	**81,100**	8.90%	74,475	6,625
Bangkok Airways	***PG***	9	**55,250**	6.43%	51,910	3,340
Singapore Airline	***SO***	17	**208,745**	6.45%	196,090	12,655
Thai International	***TG***	262	**2,327,889**	7.74%	2,160,635	167,254
United Airline	***UA***	3	**45,830**	8.78%	42,130	3,700
MYANMAR AIRLINES	***UB***	1	**6,500**	8.51%	5,990	510
VIETNAM AIRLINES	***VN***	1	**12,675**	9.88%	11,535	1,140
Total			6,417,843		5,983,462	434,381

Figure B.3. Sales Report Group by Airline.

Sale Report by Service/Tour Code

From : 01/01/1998 To : 31/12/1999

Code	Service/Tour	Number of	Margin	Sale	Net	Profit
CMBTGJR	BKK-CMB-DEL-BKK	1	8.90%	48,350.00	44,045.00	4,305.00
CNXTGMR	BKK-CNX-BKK	14	4.45%	45,935.00	43,890.00	2,045.00
FUK/OSA	BANGKOK FUKUOKA/	1	8.42%	37,000.00	33,885.00	3,115.00
FUKJLBHR	BKK-FUK-BKK	3	5.97%	65,620.00	61,700.00	3,920.00
FUKJLCR	BKK-FUK-BKK	1	8.42%	37,000.00	33,885.00	3,115.00
FUKTGMHR	BKK-FUK-BKK	1	13.79%	23,200.00	20,000.00	3,200.00
FUKTGMYR	BKK-FUK-BKK	2	13.79%	46,400.00	40,000.00	6,400.00
HANVNCR	BKK-HAN-BKK	1	8.99%	12,675.00	11,535.00	1,140.00
HDYTGMR	BKK-HDY-BKK	4	2.86%	16,110.00	15,650.00	460.00
HDYTGMRC	HDY-HKT-BKK	1	2.21%	1,355.00	1,325.00	30.00
HKTTGMR	BKK-HKT-BKK	37	3.92%	143,255.00	137,645.00	5,610.00
JRP	JAPAN RAIL PASS 7 DAYS	1	9.00%	8,579.00	7,807.00	772.00
KHHTGJR	BKK-KHH-BKK	2	8.49%	54,200.00	49,600.00	4,600.00
KKCTGMO	BKK-KKC	5	4.72%	5,300.00	5,050.00	250.00
KKCTGMR	BKK-KKC-BKK	10	4.95%	21,200.00	20,150.00	1,050.00
KTMTGMR	BKK-KTM-BKK	1	8.49%	14,200.00	12,995.00	1,205.00
KULMHQR	BKK-KUL-BKK	1	8.52%	8,800.00	8,050.00	750.00
NAKTGMO	BKK-NAK	3	3.93%	1,655.00	1,590.00	65.00
NGOJLBHR	BKK-NGO-BKK	1	8.12%	19,700.00	18,100.00	1,600.00
NGOTGMHR	BKK-NGO-BKK	2	8.38%	38,200.00	35,000.00	3,200.00
NSTTGMO	BKK-NST	2	4.80%	3,540.00	3,370.00	170.00
OSAJLBHR	BKK-OSA-BKK	3	6.54%	43,370.00	40,535.00	2,835.00
OSAJLC+BR	BKK-OSA-BKK	1	3.74%	35,200.00	33,885.00	1,315.00
OSAJLCR	BKK-OSA-BKK	2	6.52%	72,500.00	67,770.00	4,730.00
OSATGJR	BKK-OSA-BKK	1	10.84%	39,200.00	34,950.00	4,250.00
OSATGMHR	BKK-OSA-BKK	4	7.11%	76,000.00	70,600.00	5,400.00
OSATGMRCHD	BKK-OSA-BKK	3	8.74%	48,900.00	44,625.00	4,275.00
OSATGMYR	BKK-OSA-BKK	1	11.89%	22,700.00	20,000.00	2,700.00
OTH.	FUK-FKS-FUK	234	6.40%	4,296,046.00	4,021,065.00	274,981.00
PENTGMR	BKK-PEN-BKK	1	8.38%	6,800.00	6,230.00	570.00
PHSTGMR	BKK-PHS-BKK	3	2.17%	5,535.00	5,415.00	120.00
SINSQYE	BANGKOK SINGAPORE	1	7.37%	6,780.00	6,280.00	500.00
SINSQYR	BKK-SIN-BKK	1	7.37%	6,785.00	6,285.00	500.00
SINTGMR	BKK-SIN-BKK	2	8.60%	17,790.00	16,260.00	1,530.00
SINTGMYE	BKK-SIN-BKK	2	8.60%	17,790.00	16,260.00	1,530.00
TYOJLBHR	BKK-TYO-BKK	9	7.71%	176,515.00	162,900.00	13,615.00
TYOJLBYOBI	TYO-BKK-TYO	1	4.62%	32,500.00	31,000.00	1,500.00
TYOJLBYR	BKK-TYO-BKK	1	4.31%	23,200.00	22,200.00	1,000.00
TYOJLC+YYR	BKK-TYO-BKK	1	5.21%	44,735.00	42,405.00	2,330.00
TYOJLCO	BKK-TYO	1	8.27%	19,400.00	17,795.00	1,605.00
TYOJLCR	BKK-TYO-BKK	10	8.62%	398,785.00	364,410.00	34,375.00
TYONHBHR	BKK-TYO-BKK	4	6.13%	70,735.00	66,400.00	4,335.00
TYONHBO	BKK-TYO	1	8.33%	12,000.00	11,000.00	1,000.00
TYOTGJ+PR	BKK-TYO-BKK	1	8.93%	5,205.00	4,740.00	465.00
TYOTGJR	BKK-TYO-BKK	4	9.24%	154,040.00	139,800.00	14,240.00
TYOTGMYR	BKK-TYO-BKK	1	13.79%	23,200.00	20,000.00	3,200.00
UBPTGMR	BKK-UBP-BKK	2	4.98%	5,620.00	5,340.00	280.00
URTTGJO	BKK-URT	3	1.99%	5,020.00	4,920.00	100.00

Figure B.4. Sales Report Group by Flight (Tour Code).

URTTGJOC	BKK-URT	1	2.22%	1,263.00	1,235.00	28.00
URTTGJOI	BKK-URT	1	1.96%	255.00	250.00	5.00
URTTGJR	BKK-URT-BKK	2	1.99%	10,030.00	9,830.00	200.00
URTTGMR	BKK-URT-BKK	5	4.90%	17,850.00	16,975.00	875.00
USMPGYRT	BANGKOK SAMUI	6	4.99%	30,150.00	28,645.00	1,505.00
UTHTG M 0	UTH-BKK	2	4.29%	2,330.00	2,230.00	100.00
UTHTGMOC	UTH-BKK	3	2.34%	1,920.00	1,875.00	45.00
UTHTGMR	BKK-UTH-BKK	14	3.78%	35,420.00	34,080.00	1,340.00
	Total			6,417,843.00	5,983,462.00	434,381.00

Figure B.4. Sales Report Group by Flight (Tour Code) (continued).

Sale Report by Passenger **I.D.**

From : 01/01/1998 To : 31/12/1999

Pax I.D.	*It*	**Sales**		Net	Profit
WKIN	425	**6,417,843**	7.26%	5,983,462	434,381
Total		**6,417,843**		**5,983,462**	**434,381**

Figure B.5. Sales Report Group by Passenger ID.

Sale Report by Ticket No.

From : To :

Ticket	Airline	Compan	Invoice	Date	Salema	Name	Sale	Net	Profit
1316629736593	JL	YUI	DT980058	04/17/1999	MO	MR. MITSUHISA	32,500.00	31,000.00	1,500.00
1316629736597	JL	SANDEN	DT980068	04/20/1999	JIT	MR.FUKUJI	19,700.00	18,100.00	1,600.00
1316629736619	JL	HOKOFI	DT980070	04/20/1999	JIT	MR.FUMIAKI	18,625.00	17,795.00	830.00
1316629736627	JL	MIT-TE	DT980069	04/20/1999	JIT	MR. TAKAKO	15,265.00	14,505.00	760.00
2056629736617	NH	TEIJIN	DT980067	04/20/1999	PAN	MR. TATSUO	31,000.00	30,000.00	1,000.00
2174289598	TG	AMSCO	DT980060	04/17/1999	YUI	MS. PREECHA	555.00	530.00	25.00
2174289598534	TG	AMSCO	DT980060	04/17/1999	YUI	MS. SANKOSIK	555.00	530.00	25.00
2174289598547	TG	ANSCO	DT980061	04/17/1999	YUI	MR. NAGANO	1,060.00	1,010.00	50.00
2176629736592	TG	MISUMI	DT980052	04/16/1999	JIT	MR. TAKEHIRO	19,100.00	17,500.00	1,600.00
2176629736615	TG	AMADAT	DT980073	04/20/1999	JIT	MR. ATSUHIKO	16,150.00	14,845.00	1,305.00
2176629736616	TG	KAWA	DT980072	04/20/1999	JIT	MR. KURIHARA	8,900.00	8,135.00	765.00
2176629736623	TG	IDC	DT980053	04/20/1999	PUM	MR.TAMAKI	9,890.00	17,345.00	-7,455.00
2176629736626	TG	HOKOFI	DT980071	04/20/1999	JIT	MR. SHINCHI	23,560.00	22,355.00	1,205.00
2326629736599	TG	JEFSA	DT980059	04/17/1999	MO	MR. NOGIWA	8,800.00	8,050.00	750.00
4289598537	TG	ARS	DT980064	04/17/1999	YUI	MR. PIRIYANAN	2,120.00	2,015.00	105.00
4289598548	TG	AMADAT	DT980054	04/17/1999	YUI	MS. HEMAPAN	3,300.00	3,135.00	165.00
4289598549	TG	AMADAT	DT980054	04/17/1999	YUI	MR. SIRIWIT	3,300.00	3,135.00	165.00
4289598550	TG	ANSCO	DT980063	04/17/1999	YUI	MR. YUSUKE	1,060.00	1,010.00	50.00
6186629736598	SO	DAIWA	DT980057	04/17/1999	MO	MR. HASHIMOTO	6,785.00	6,285.00	500.00
6629736600	JL	YUI	DT980056	04/17/1999	MO	MR. YOSHIFUMI	37,000.00	33,885.00	3,115.00
						Total	259,225.00	251,165.00	8,060.00

Figure B.6. Sales Report Group by Ticket Number.

Cancellation

From : 01/01/1998 To : 31/12/1998

Date	Invoice No.	Company	Saleman	VAT	Profit
04/08/1998	DT980006	SUMI THAI	PIYAPORN	0.00	17,345.00
04/20/1998	DT980065	INTERNATIONAL	PIYAPORN	0.00	9,890.00

Figure B.7. Invoice Cancellation Report.

Refund Report by Refund Date

From : 01/01/1997 To : 31/12/1999

Refund Date	Refund No.	Company	Invoice No.	Issue Date	Sale	VAT	Net	Refun Charge
02/19/1998	1	THAI NAKAHARA	DT980336	05/07/1997	3300	0	3135	21

Figure B.8. Refund Report Sorted by Refund Date.

Refund Report by Issue Date

From : 01/01/1997 To : 31/12/1999

Issue Date	Invoice No.	Company	Refund Date	Refund No.	Sale	VAT	Net	Refun Charge
05/07/1997	DT980336	THAI NAKAHARA	02/19/1998	1	3300	0	3135	21

Figure B.9. Refund Report Sorted by Issue Date.

Collected Report

From : 01/04/1998 To : 30/04/1998

InvoiceNo:	IssueDate:	ComName:	DueDate:	Total:	Collectdate:
DT980001	04/07/1998	SONY MAGNETIC	04/07/1998	34725	04/29/1998

Figure B.10. List of Invoice Collected Report.

UnCollected Report

From : 01/01/1998 To : 31/12/1999

InvoiceNo:	IssueDate:	ComName:	DueDate:	Total:
DT980002	04/07/1998	SUMITOMO ELECTRIC	04/07/1998	6815
DT980003	04/07/1998	SUMI THAI INTERNATIONAL	04/07/1998	3920
DT980004	04/07/1998	KAWASAKI STEEL	04/07/1998	53825
DT980005	04/08/1998	1.131/1119sti u3 it! vlt1	04/08/1998	22775
DT980007	04/08/1998	SHIMIZU CORPORATION	04/07/1998	2810
DT980008	04/08/1998	SHOGUN COMPANY	04/08/1998	37320
DT980009	04/09/1998	THAI SYSTEX KYOWA	04/09/1998	19400
DT980010	04/08/1998	KAWASAKI STEEL	04/07/1998	14500
DT980011	04/08/1998	KAWASAKI STEEL	04/07/1998	8885
DT980012	04/08/1998	SHIMIZU CORPORATION	04/07/1998	64260
DT980013	04/08/1998	SHINDENGEN TOKYO	04/08/1998	53465
DT980014	04/08/1998	SIAM HI-TECH STEEL	04/08/1998	38000
DT980015	04/08/1998	DAIKIN INDUSTRIES	04/08/1998	22700
DT980016	04/08/1998	SAKURA BANK	04/08/1998	37000
DT980017	04/08/1998	AMADA (THAILAND)	04/08/1998	2620
DT980018	04/08/1998	ABARA SUMI-THAI	04/08/1998	18100
DT980019	04/08/1998	iiiiivi	04/08/1998	1060
DT980020	04/08/1998	SHOGUN COMPANY	04/08/1998	5205
DT980021	04/08/1998	CHRISTY DESIGN	04/08/1998	18100
DT980022	04/08/1998	HANWA THAILAND	04/08/1998	37000
DT980023	04/08/1998	HANWA THAILAND	04/08/1998	8000
DT980024	04/08/1998	SAKURA BANK	04/08/1998	14200
DT980025	04/08/1998	OTH.	04/08/1998	7485
DT980026	04/08/1998	HANWA THAILAND	04/08/1998	37000

Figure B.11. List of Invoice Uncollected Report.

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