Kumaraguru College of Technology

Department of Computer Science and Engineering
Coimbatore– 641006.
April 2003

SALES ORDER PROCESSING

Project work done at

HTC Global Services Inc., Chennai.

PROJECT REPORT

P-1019

Submitted in partial fulfillment of the
Requirements for the award of the degree of

Master of Computer Applications

Bharathiar University, Coimbatore

Submitted by

U.SARANYAN
Reg.No: 0038M1060

Internal Guide

Ms. P. Sudha B.E.,
Dept. of Computer Science & Engineering,
Kumaraguru College of Technology,
Coimbatore

External Guide

Mrs. R. Jayashree
Team Leader,
HTC Global Services Inc.,
Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

KUMARAGURU COLLEGE OF TECHNOLOGY

COIMBATORE – 641006

CERTIFICATE

This is certify that the project entitled

SALES ORDER PROCESSING

Done by

Mr. U. SARANYAN

Reg.No: 0038M1060

Submitted in partial fulfillment of the requirements for the award of the degree of Master of Computer Application of Bharathiar University, Coimbatore.

P. Radha 8/4/03

Guide

S. J.

Head of the Department

Submitted for the university examination held on 16.04.03

P. Radha 16/4/03

Internal Examiner

External Examiner

HTC
services, inc.

HTC SOFTWARE DEVELOPMENT CENTRE (P) LTD.
Unit 31, SDF II, Phase II, MEPZ, Tambaram, Chennai – 600 045
Tel : 22623522 / 22627534, Fax :22627713
Web Site: WWW.htcinc.com

Date : 21/03/2003

Certificate

This is to certify that U. Saranyan, final MCA student of Kumaraguru College of Technology, Coimbatore 641 006, has done his project entitled "Sales Order Processing" using Visual Basic and Oracle, under my guidance during December 2002 to March 2003.

His Project work was found to be Satisfactory. The attendance during the period was 91% and his conduct has been good.

We wish him success in all his future endeavors.

For HTC Software Development Centre

R. Jayasree
Sr. Manager - Training Division.

DECLARATION

I here by declare that the project entitled **SALES ORDER PROCESSING,** submitted to Bharathiar University as the project work of Master of Computer Application Degree, is a record of original work done by me under the supervision and guidance of **Mr. S. Viswanathan**, General Manager – Products, HTC Global Services, inc. Chennai and **Ms P. Sudha B.E., MISTE,** Lecturer, Dept.of Computer Science, Kumara guru College of Technology and this project work as not found the basis for the award of any Degree/Diploma/Associate-ship/Fellow-ship or similar title to any candidate of any University.

Place: COIMBATORE

Date: 7.04.03

Signature of the Student

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to **Dr. K. K. Padmanabhan, Ph.D.,** esteemed Principal, **Kumaraguru College of Technology** for providing me the necessary facilities in the college.

I wish to express my heartfelt thanks and a deep sense of gratitude to **Dr. S. Thangasamy, B.E (Hons), Ph.D.,** Head of the Department Computer Science and Engineering, who motivated me by his valuable ideas and suggestions.

I express my sincere thanks to **Mr. A. Muthukumar, MCA, M.Phil,** Assistant Professor, Dept. of Computer Science and Engineering without whose motivation and guidance I would not have been able to embark on a project of this magnitude.

I am greatly privileged to express my deep sense of gratitude to my guide **Ms. P. Sudha B.E., MISTE,** Lecturer, Dept. of Computer Science and Engineering, Kumaraguru College of Technology, for her valuable advice and encouragement.

I am also grateful to **Mr. S. Viswanathan, General Manager – Products, HTC Global Services, inc. Chennai.** helped me in giving route to approach the software companies and helping me in getting the project.

I am grateful to **Mrs. R. Jayashree** Team Leader of HTC Training division, for allowing me to do project under her division.

I like to express my indebtedness to **Ms. S. Jansirani** Coordinator, HTC Training division for their invaluable guidance through the entire length of my project.

I thank my Beloved Parents, Friends, department teaching and non-teaching staffs who have been a pillar of support from the start, until the completion of the project.

SYNOPSIS

The project work entitled **'Sales Order Processing'** is an application system developed for **HTC Global Services inc, Chennai.**

HTC Global Services has a very good track record in executing projects for various Middle east companies. It has provided special expertise for developing many application based systems. Sales Order Processing was one such application developed by HTC Global Services inc for one of its client in middle east.

Sales Order Processing deals with purchases and sales of products by suppliers and customers. sales and purchases mainly involve customers and suppliers respectively. Product plays the vital role in both purchases and sales.

The basic entities involved in sales order processing are customers, products and suppliers .Other features such as query operations and reports makes the application more user friendly.

CONTENTS

1. INTRODUCTION

1.1 PROJECT OVERVIEW

Sales Order Processing involves the automation of sales and purchase for customers and suppliers.

The Objectives of Sales Order Processing

Understanding

- business processes of various functions in a typical organization from a system implementer's point of view
- the inter-relationship between those functions
- the concepts of supply chain management & CRM

Appreciation of

- Verticals
- Management/Executive information systems
- Business Process Re-engineering
- IT's role in helping organizations to make better business decisions

The project consists of five main modules

- Sales
- Purchases
- Queries
- Reports
- Maintenance

The Sales module involves the order acceptance from the customer, generating the invoice for the order. Product is supplied as per the invoice. Receipts are generated as Per credit status of the customer.

The Purchase module involves stock updation. Various suppliers supply the products to stock warehouse. Queries module contains all possible queries that can be raised on the application system.

The reports module consists various reports that can be generated from the application system. Some of the main reports are Daily Sales Report, Reorder Level Report, Ageing Analysis Report, Invoice Details Report, Pending Invoice Report, Supplier Details Report, Supplier Products Report, Categories Report, Receipts Report, Product Price Report, Customer Details Report.

1.2 ORGANIZATION PROFILE

HTC Global Services, inc., was founded in 1990 in Southfield, Michigan, USA. The company also has US regional offices in Bloomington, IL, Minneapolis, MN, and Iselin, NJ. HTC's International offices are located in Malaysia, Australia, Singapore, and India. The Global Development Center is located in chennai, India with regional offices in Mumbai and Bangalore.

HTC stands for Hi Tec Consultancy. HTC is a CMM Level 3 and ISO 9001 certified company, ranked five times in the Inc. 500 List under the future 50 category.

HTC Global Services Inc. has been recently nominated to the Inc.500 Hall of Fame by Inc. magazine. The Inc. 500 is an annual list of America's fastest growing private companies. To make the Inc. 500, a company must grow at a torrid pace for five years. To make the Hall of Fame, a company must continue grow at fast for five more years, remaining one of America's elite private companies for a full decade.

Services

HTC is one of the fastest growing global companies in:

- Software Development
- Consulting
- Training
- ITES

Offering professional services such as:

- Project management
- Application outsourcing
- Offshore development
- Packaged services

Mission

HTC is a global IT solutions provider adding value to our clients and to our people through emerging technologies and dedicated to the success of our clients, employees, business partners, suppliers, community, and stakeholders.

2. SYSTEM STUDY AND ANALYSIS

The system analysis is concerned with analyzing systems with view to making them more effective either by modification or by substantial redesign.

The system analysis involves mainly in developing new information systems; this Activity involves investigation of current systems, proposing system and evaluating Possible new systems, designing in detail the new system that is agreed, implementing it, and maintaining it during its operational life.

Requirement analysis is used to analyze the knowledge about the existing system. After understanding the limitation of the existing system and the identification of the Problems, alternate system solutions are studied and recommendations are made about committing the resources required to design the system. Various studies are done in order to get the information like how the data are processed with in the organization, how data are searched for within the organization, how safe the data is used within the organization, what is the procedure for data retrieval and transit.

2.1 EXISTING SYSTEM

- The existing system uses a manual system for most of the process involved.
- Security on information of the existing system is poor.
- Credit transaction is not allowed in the existing system.
- Reports are manually prepared by the existing system.

2.2 PROPOSED SYSTEM

The proposed system should be developed in such a way to overcome the problems faced by existing system. This can be done using the latest technologies available today.

Main features of the proposed system:

- **Automatic transaction**

Most of the transaction in the proposed system are automatic .Manual work is greatly reduced. This helps in the reduction of labor, increase the perfect ness, manually created errors are reduced.

- **Report generation**

Reports are generated for the various process involved in the application system. Reports are generated in attractive manner which is in an easy readable and understandable form. Reports greatly help for administration people on making important business decision.

- **Faster access**

The Sales Order Processing system developed has faster access than previously maintained manual system. Most of the process is done automatically which increases the accessing speed.

- **More user-friendly**

The System developed is more user friendly, there is no need for the user to get understands all the levels of process, he can just logon to the system and start working.

- **High level security**

High level of security is maintained for the application system. Only the administrator can modify the user properties. All tables in the database has been given attributes such as user created, user modified, date created, and date modified. This helps to note which user on which date have modified the records.

- **Credit transactions**

The Credit transactions are made available for the customers who were not available in the previous systems. If the customer credit status is 'Yes' then he can make the payment on the credit basis and receipts are produced as per customer wish.

2.3 REQUIREMENTS OF THE NEW SYSTEM

The system has been designed in order to overcome the cons faced by existing system and hence should possess the following features

- All the transactions should be automatic.
- The Reports should be produced in an attractive manner.
- High level of security should be provided.
- The system developed should be more user friendly.
- The processing speed should be high.
- Credit transactions made should be more efficient.

2.3 USER CHARACTERSTICS

To access the application user needs a rough knowledge about using the system. Since it is a user-interface system, the events like click and select are only to be used. Therefore user need not have any prior knowledge about the system. Moreover help tips are provided wherever necessary, which facilitates users to work with ease

3. PROGRAMMING ENVIRONMENT

3.1 HARDWARE SPECIFICATION

- Pentium III processor
- 10GB hard disk
- 128Mb RAM
- CD drive/ Floppy drive
- Printer

3.2 DESCRIPTION OF THE SOFTWARES USED

Software Configuration

Operating system: Windows 98

Application : Visual Basic 6.0

Oracle 8

Visual Basic

Visual Basic is a powerful programming system for developing sophisticated, graphical application for Microsoft Windows environment. Its productivity has been enhanced by addition of a complete set of tools to simplify rapid application development and internet tackling.

"Visual" refers to method used to create the graphical user interface (GUI), that uses illustrations, rather than writing numerous lines of code to describe the appearance, function and location of interface elements. "Basic" refers to the BASIC programming language, a widely preferred language by many programmers for its simplicity. Visual Basic has

evolved from the original BASIC language and now contains several hundred statements, functions, and keywords, many of which relate directly to the Windows GUI.

Comparisons with the earlier version of Visual Basic reveal that Visual Basic 2.0 was faster and easier than its predecessor. Visual Basic 3.0 added a simple way to access some of the most powerful database systems available through ODBC. Visual Basic 4.0 added the cutting edge 32 bit development system and set the wheels in motion to turn Visual Basic into a full-fledged Object Oriented programming language. Visual Basic 5 introduces us to the New World of ActiveX technology, a unique way to harness the internet.

Visual Basic 6.0, it is possible to work with ADO (Active X Data Objects) which features a simpler object model than DAO or RDO. Data Environment is the new Active X designer that enables the user to visually manage database connection and commands.
A substantial amount of work to enhance internet capabilities has been done in this version.

Oracle Environment

Every business enterprise maintains a large volume of data for its operations. With more and more people accessing this data for their work the need to maintain its integrity and the relevance increases. Normally with the traditional methods of storing data and information in files the chances that the data loses its integrity and validity are very high.

Oracle 8 is highly "Object Relational Database Management System. It offers capabilities of both relational and object oriented database system. In general, objects can be defined as reusable software

codes. These are location independent and perform a specific task on any application with little or no change to the code.

Oracle products are based on the "client – server technology". This concept involves segregating the processing of the application between two systems. One performs all activities related to the database (Server) and the other performs activities that help user to interact with the application (client)

The tools of oracle are so user friendly that the person with minimum skills in the field of computer can access them with ease. The main tools are

Tools of Oracle

- **SQL * PLUS**
- **PL / SQL**
- **FORMS**
- **REPORTS**

SQL*PLUS:

SQL* Plus is a structured query language supported by oracle. Through SQL* Plus we can store, retrieve, edit and run SQL commands and PL / SQL blocks. Using SQL * Plus we can perform calculation, list columns for any table and also format query results in the form of a paper.

PL / SQL:

PL /SQL combine the data manipulating power of SQL with data processing power of procedural languages.

FORMS:

This is a graphical user interface tool for generating and executing form based applications. A form basically comprises of blocks and fields. Multiple tables can be accessed over a single form, based on the application with the help of transaction commands. We can build, generate and run an Oracle forms application.

REPORTS:

Reports are an application development tool for oracle, used for developing, displaying and printing reports. We can create a wide variety of reports, which have various modes.

About the Operating System

Windows 98 is a 32-bit, preemptive multitasking operating system that belongs to the Microsoft Windows family of the operating system products. This operating system is
being used in the project for the following reasons.

Windows 98 Server is enabled to work as a network operating system. Unlike previous versions of Windows, Windows 98 really is a complete, true operating system in itself, not relying on Dos for lower level function. When computer with Windows 98 starts up, it starts immediately in Windows 98.

Windows 98 is a 32-bit operating system with a graphical interface. It is not a revision of any of the other Windows operating systems such as Windows operating systems such as windows for workgroups 3.x, but rather an entirely new operating system.

The feature provided includes

Portability: unlike most operating systems, Windows 98 can run on a variety of platforms. This flexibility can be a great advantage when implementing a computer
strategy for an organization.

Multitasking Operations: From the perspective of the end user, multitasking means that Different type of applications can run simultaneously. While the user is working on one application can be running in the background.

File Systems: Windows 98 supports a variety of file systems, including FAT, NTFS and VFAT.

Security: Windows 98's security features such as a mandatory logon procedure, memory protection and auditing and limited network access have been developed.

Support for many clients: A wide variety of clients can serve as workstation on a Windows 98 network such as Windows 3.x, Windows Workgroups, MS-DOS,
Windows NT Workstation.

Storage space: Windows 98 supports a virtually limitless amount of memory and hard disk space.

RAM: Windows 98 supports 4 gigabytes.
Hard Disk Space: Windows 98 supports 16 hex bytes.

4. SYSTEM DESIGN AND DEVELOPMENT

4.1 INPUT DESIGN

Input design is a part of overall system it is the phase that requires careful attention and is the most important one objective during input design are as follows:

a. Achieve high level accuracy
b. Ensure input is free of ambiguity

The input design involves converting the user-originated inputs into a c computer-based format. The aim of input design is to make data entry easier, logical error free. It helps us to filter errors in the input data that otherwise entered into the database might have brought in a lot of consistency.

Input design involves capturing data, verifying and then passing them on to system. After choosing input medium, attention is focused on designing of error handling, control, and grouping and validation procedures.

During the application development, care has been taken to make our system extremely user-friendly and organize our screens such that the possibilities of making error are maintained.

List of possible values, display item, alert, and popup menu. This makes system less error prone to errors, as the input is selected rather than typing.

Warnings and wrong entries such as program number with a character, negative value. Each and every field entered by user is verified with appropriate validation procedure.

Input Types

One of the early activities of input design is to determine the nature of input data. The different types of inputs handled by our system are:

External : Prime input to the system

Internal : Communication with the system

Operational : Programming team communicating with the system.

Computerized : Input to the computer media from other internal sources.

Interactive : Input entered during a dialog.

User has to input all the values in Maintenance form to get the respective information during the process. The various Maintenance forms available are

Customer Maintenance

Product Maintenance

Category Maintenance

Supplier Maintenance

Each Maintenance form has their respective values to be entered.

The Customer Maintenance form has the following fields to be entered

Customer Code

Customer Name

Address

Phone

E-Mail

Credit Status.

The Product Maintenance form has the following fields to be entered

Product Code
Product Name
Quantity Available
Reorder Level
Last Ordered Date
Category Code

The Supplier Maintenance form has the following fields to be entered

Supplier Code
Supplier Name
Address
Phone
E-Mail

The Category Maintenance form has the following fields to be entered

Category Code
Category Name
Comments
Product Active or Not
Active Date

All these maintenance forms have common operations such as Add, Modify, Update, Delete, First, Previous, Next, Last, Exit.

4.2 OUTPUT DESIGN

Output is the heart of all software design. The developed system will be said successfully only if the output system provides the necessary reports in necessary format. The other important factor related with output design is user's estimation. Every user of the system estimates it only based on the output given by the system, so to keep our software in high grade we need to compose an efficient output design.

Characteristics of the output design

- Fit for user needs – The output will produce what the user needs and provides outputs on time which helps in decision making.
- The outputs should abstract the complexity of the system.
- The output should be accurate and easy to understand.
- Output should be properly formatted.
- Output design should support for making hard copies and backups.

4.3 DATABASE DESIGN

Data are raw facts that we use to represent information. Processed Data is information. Data must be manipulated (Organized, formatted, Summarized, etc.) before it can be used as information.

Database is used to store data in an organized fashion, which allows us to access and manipulate data. The techniques and data structures used to organize and manipulate data in databases are collectively known as Data Modeling.

Data Base Management System (DBMS) serve to manipulate and maintain databases. When industry's need for information was small, database tended to be simple and informal. But as the need for up-to-date

information increased, automated DBMS were developed based on groups of formalized data modeling rules called Data Models.

Three types of data model available are:

- Hierarchical
- Network
- Relational

Hierarchical Database Model

The hierarchical database model is the oldest approach to databases. It evolved from sequential file structures in which little effort was to isolate the logical data structure from the physical data structures on the storage media.

Network Database Model

The Network data model is similar to the hierarchical data model, except that its records are not limited to only one superior. A record may have many superior records and many subordinates that are linked to the record's superior.

Relational Database Model

The relational data model was first described by E.F Codd in 1970; one year after the Data Base Task Group (DBTG) published its first proposal. In the relational data model, entity types are referred to as relations. The relational model was an attempt to simplify Database structure. It represents all data in the database as simple row-column tables of data values and where all database operations work on these tables.

Relations

A relation is formal term for a table. A relational database is defined as a collection of tables called Relations. In relational terms, a record (row) is called tuple, and the fields (columns) are called attributes.

The number of tuples is called Cardinality and the number of attributes is called Degree. Every table must have some column or combination of columns that uniquely identify each row in the table.

This column is called the Primary Key of the table. A Domain is a pool of values from where one or more attributes (columns) draw out their actual values. In relational systems, missing or unknown information can be represented as Null.

Relational Operators

The relational model is based on solid foundation of relational algebra. Relational algebra consists of a collection of operators that operate on relations. Each operator takes one or two relations as its input and produces a new relation as its output. The main objective of relational algebra is data retrieval. The relational operators are Project, Cartesian Product, Union, Intersect, Difference and Join.

Relationship

Relationship refer to the mapping of relations. The various types of relationships are

- One-to-One
- One-to-Many
- Many-to-One
- Many-to-Many

Normal Forms

Normalization results in the formation of tables that satisfy certain specified constraints, and represents certain Normal forms. Several normal forms have been identified. The most important and widely used are

- First Normal Form (1NF)
- Second Normal Form (2NF)
- Third Normal Form (3NF)
- Boyce-Codd Normal Form (BCNF)

The organization of data in a database aims to achieve three major objectives: data integration, data integrity and data independence.

Data integration:

In a database, information from several files is coordinated, accessed and operated upon as through it is in a single file. Logically, the information is centralized; physically, the data may be located on different devices and in widely scattered geographical locations, connected through data communication facilities.

Data integrity:

Occurrence changes are made to data in one file but not a copy of the same data in another file, when same file is stored in different storage area in a system.

Data independence

Data independence is the insulation of the application programs from the changing aspects of the physical data organization.

Data Dictionary

Tables store two types of information in the database user data and system data. Application will access user data most often, this is the data which get inserted, updated or deleted through the database application.

Oracle needs to maintain large amount of system data, which describes the database system and is used by the oracle during its operation in system tables that are created and managed by oracle.

System data is used to manage the database. It contains description of all the objects in the system, including the tables, columns, views, indexes and synonyms. The set of tables that oracle uses for the system uses of the system data is called Data Dictionary.

Table Specification for S.O.P

1. Customers:

Field	Description	Type	Size	Precision
Ccode	Customer Code	Varchar2	5	
Cname	Customer Name	Varchar2	35	
Caddr	Customer Address	Varchar2	200	
Ccredit	Credit allowed or not	Char	1	
Cphone	Phone Number	Varchar2	30	
Cmail	Mail Id	Varchar2	30	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

2. Products:

Field	Description	Type	Size	Precision
Pcode	Product Code	Varchar2	5	
Pname	Product Name	Varchar2	30	
Qty_Available	Available Quantity	Number	5	
R_Level	Reorder Level	Number	2	
L_ord_date	Last Ordered Date	Date		
Cat_Code	Category Code	Varchar2	5	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

3. Categories

Field	Description	Type	Size	Precision
Cat_Code	Category Code	Varchar2	5	
Cat_Name	Category Name	Varchar2	30	
Comments	Description	Varchar2	50	
Active	Active or not	Char	1	
Active_Date	Active modified date	Date		
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

4.Order Master

Field	Description	Type	Size	Precision
Ord_no	Order number	Varchar2	5	
CCode	Customer code	Varchar2	5	
Ord_date	Date on which Order is placed	Date		
Ord_status	Pending/Complete	char	1	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

5.Order Details

Field	Description	Type	Size	Precision
Ord_no	Order number	Varchar2	5	
PCode	Product code	Varchar2	5	
Qty_Ordered	Quantity ordered	Number	5	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

6. Product_Price

Field	Description	Type	Size	Precision
Pcode	Product Code	Varchar2	5	
Fdate	From this date	Date		
Tdate	To this date	Date		
Price	Price of the product	Number	8	2
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

7. Suppliers:

Field	Description	Type	Size	Precision
Scode	supplier Code	Varchar2	5	
Sname	Supplier Name	Varchar2	35	
Saddr	Supplier Address	Varchar2	200	
Sphone	Phone Number	Varchar2	30	
Smail	Mail Id	Varchar2	30	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

8.Supplier Product

Field	Description	Type	Size	Precision
Supplier_Code	Supplier Code	Varchar2	5	
Product_Code	Product Code	Varchar2	5	
Date_Of_Supply	Date Of Supply	Date		
Qty_Supplied	Quantity Supplied	Number	5	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

9. Invoice Master:

Field	Description	Type	Size	Precision
Invoice_Code	Invoice Code	Varchar2	5	
Order_Code	Order Code	Varchar2	5	
Ccode	Customer Code	Varchar2	5	
Inv_Date	Invoice Date	Date		
Inv_value	Invoice Value	Number	10	2
Pstatus	Supplied fully or not	Char	1	
Istatus	Payment completed or not	Char	1	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

10.User Master:

Field	Description	Type	Size	Precision
Username	User Name	Varchar2	20	
Password	Password	Varchar2	25	

11. Invoice Detail:

Field	Description	Type	Size	Precision
Inv_Code	Invoice Code	Varchar2	5	
Pcode	Product Code	Varchar2	5	
Qty_ordered	Quantity Ordered	Number	3	
Price	Price of the product	Number	8	2
Qty_Supplied	Quantity Supplied	Number	3	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

12. Receipts:

Field	Description	Type	Size	Precision
Rcode	Receipt Code	Varchar2	5	
Amt_Received	Amount Received	Number	10	2
Rdate	Receipt Date	Date		
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

13. Invoice Product Supply:

Field	Description	Type	Size	Precision
Inv_Code	Invoice Code	Varchar2	5	
Pcode	Product Code	Varchar2	5	
Dt_Supply	Date of supply	date		
Qty_Supply	Supplied Quantity	Number	4	
Date_Created	Date created	Date		
Date_Modified	Date modified	Date		
User_Created	User created	Varchar2	30	
User_Modified	User modified	Varchar2	30	

4.4 PROCESS DESIGN

The process design helps us to understand, how flow takes place in application.

The Hierarchy Chart gives the details of the various modules involved in the system. It helps us to know hierarchy of modules i.e. parent child relationship.

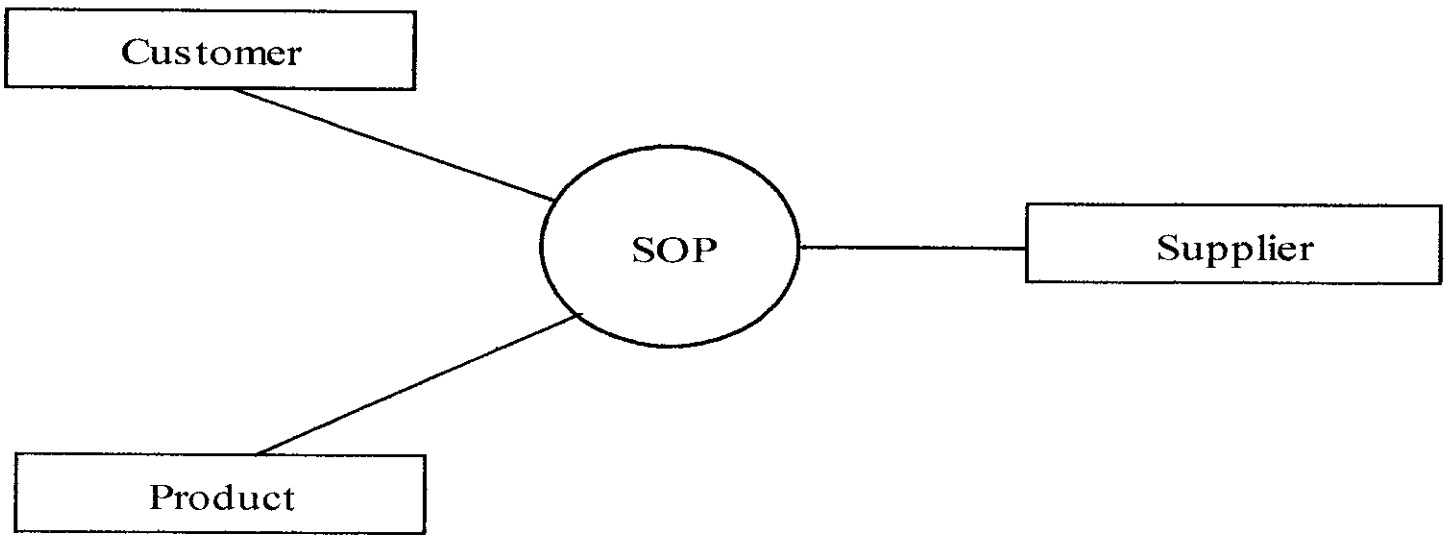
The Context Diagram shows basic entities involved in the Sales Order Processing. The Customer, Product, Supplier are the basic entities involved in the system.

The Detailed DFD shows how the data flows through out system between various entities and data stores.

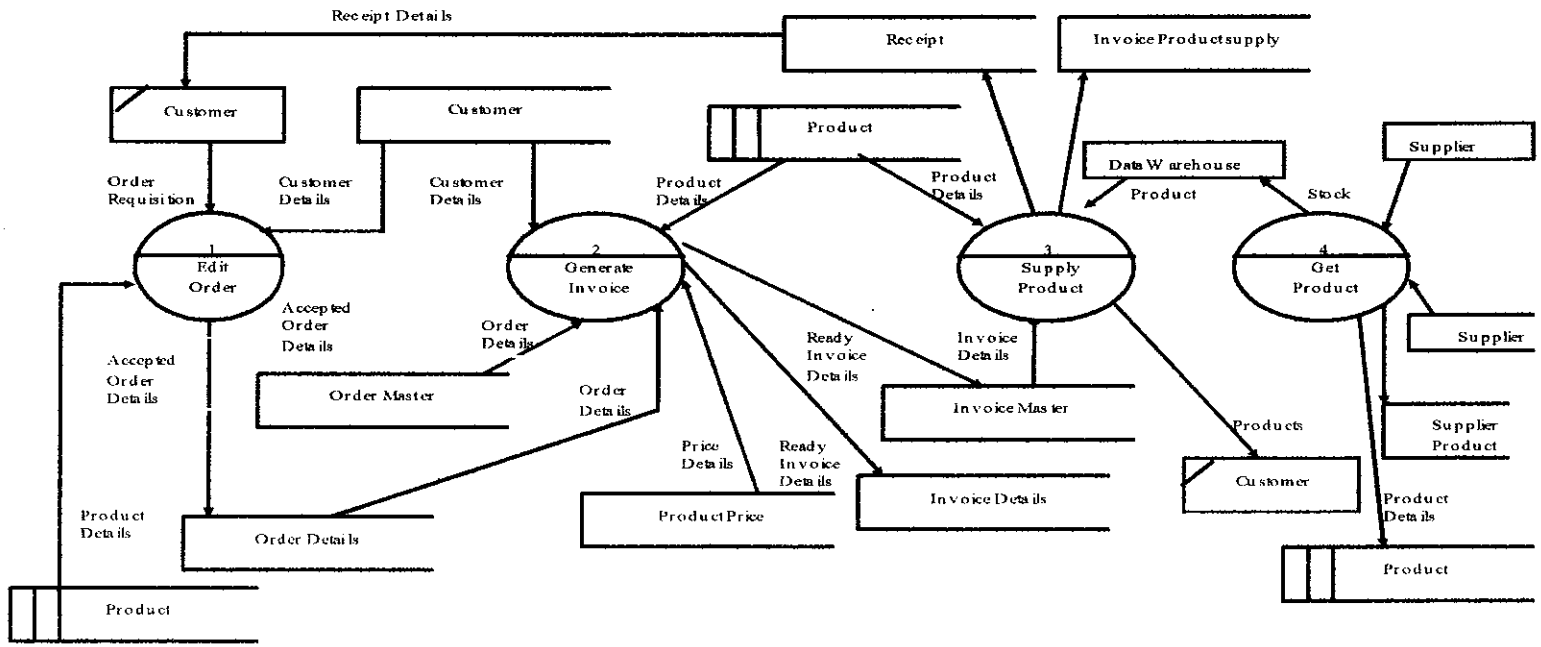
The Entity Relation ship diagram shows how entities are related and what type relation ship exists between the entities.

SALES ORDER PROCESSING

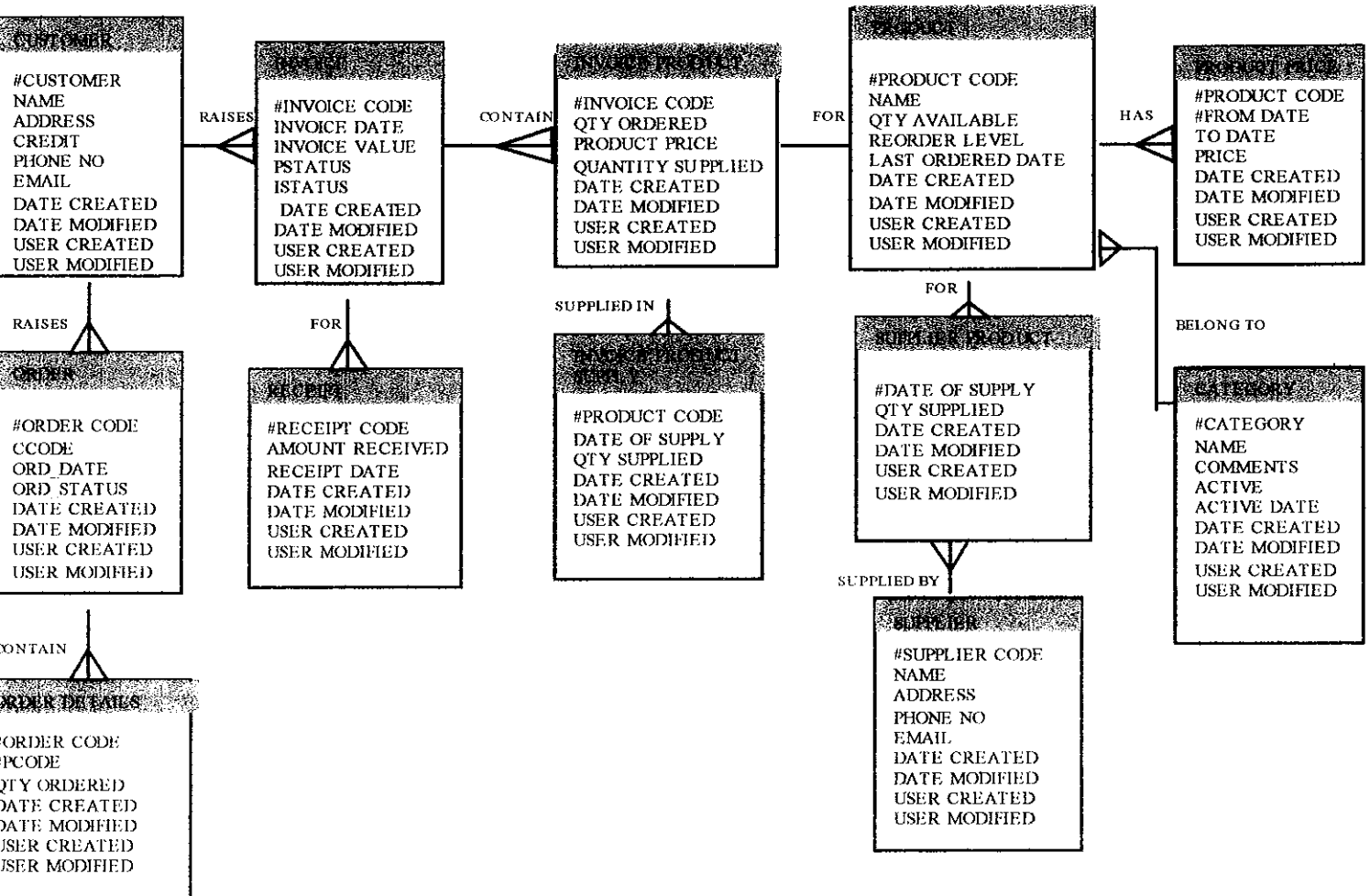
Context Diagram



LEVEL 1 DFD


Receipt Details
Receipt
Invoice Productsupply
Customer
Customer
Product
Data Warehouse
Supplier
Order Requisition
Customer Details
Customer Details
Product Details
Product Details
Product
Stock
1 Edit Order
2 Generate Invoice
3 Supply Product
4 Get Product
Accepted Order Details
Order Details
Ready Invoice Details
Invoice Details
Supplier
Accepted Order Details
Order Master
Order Details
Invoice Master
Products
Supplier Product
Price Details
Ready Invoice Details
Customer
Product Details
Order Details
Product Price
Invoice Details
Product Details
Product
Product

ER DIAGRAM FOR S.O.P



5. SYSTEM IMPLEMENTATION AND TESTING

Implementation is concern with those tasks leading immediately to a fully operational system. It involves programmers, users and operations management, but its planning and timing is a prime function of the system analysis. It includes the final testing of the complete system to user satisfaction, and supervision of the initial operations of the new system.

5.1 SYSTEM IMPLEMENTATION

In implementing the theoretical design is turned into a working system and then to monitor the operation of the system to ensure that it continues effectively and efficiently. It involves careful planning, investigation of the current system and it's constraints on implementation. The system is implementation only after the through test is done on each of its subsystem and checking for, whether it is working according to the specification.

Implementation consists of

- Necessary changes are made to this system as described by the users.
- Implementation of a computer system to replace a manual system.
- Implementation of a new computer system to replace the existing one.
- Developed package is tested using local machine as server and also with real server.
- All the errors are corrected.
- Hardware and software utilities are installed.

Since the project consists of several modules. The modules cannot be implemented individually. The other modules are integrated for the successful implementation.

5.2 SYSTEM TESTING

Testing begins at the module level and works 'outward' towards the integration of the entire computer based system. Different testing techniques had followed at different point in time. Verification and Validation ensure the software quality assurance (SQA).

The system was tested for validation of fields, which were not allowed to be empty while user enters details. Logging schemes were tested through filter, which was between server and clients. Traffic analysis was tested to make the synchronizing so that a limited number of users can access the resource, which will avoid the slowness of the server

And more over the system tested under white box testing and again in black box testing. The system was tested against users needs now and then, which help to the system development is estimated period, and also it played a vital role for successful implementation. Through testing bugs were debugged and the system was for flexibility and for future enhancement.

Software is developed for a long use in the future so it is necessary that well planned testing be done to overcome the errors. Static Analysis is used to investigate the structural properties of the source code. Dynamic test cases are used to investigate the structural properties of the source code by executing the program on the test data.

Unit Testing

Unit testing comprises the set of tests performed by an individual programmer prior to integration of the unit into a larger system. The situation is illustrated as follows,

Coding & Debugging ------ > Unit testing ------ > Integration testing

A program unit is usually small that the programmer who developed it can test it in a great detail and that will be possible when the unit is integrated into an evolving software product. There are four categories of test a programmer will typically perform on a program unit.

- Functional test
- Performance test
- Stress test.
- Structure test.

Functional test cases involve exercising the code with nominal input values for which the expected results are known, as well as boundary values like maximum values, and values on just the functional boundaries and special values such as logically related inputs, the identity matrix, files of identical elements, and empty files.

Performance test determines the amount of execution time spent in various parts of the unit, program throughput, and response time and device utilization by the program unit. A certain amount of performance tuning may be done during unit testing; however, caution must be exercised to avoid expending too much of fine tuning of a program unit that contributes little to overall performance of the entire system. Performance testing is most productive at the subsystem and system levels.

Stress test is those tests designed to intentionally break the unit. A great deal can be learned about the strengths and limitations of the program by examining the manner in which a program unit breaks.

Structure test are concerned with the exercising the internal logic of the program and traversing particular execution paths. The functional, performance and stress testing are called as Black Box testing.

Unit testing focuses on verification. In the smallest unit of software design the module unit testing is done for each module to ensure that it functions properly as unit. In unit testing, the module interface is tested to ensure that information properly flows into and out of program under test.

Unit test is done to recover errors of the following types.

- Erroneous initialization.
- Incorrect variable names.
- Inconsistent data type.
- Underflow, overflow and addressing exceptions.
- Computation errors.

Integration Testing

Integration testing is a systematic technique for constructing the program structure while at the same time conducting tests to recover errors associated with interface. Bottom up integration is the traditional strategy to integrate the components of the software system into a functional as a whole. Bottom up integration consists of unit testing, followed by subsystem testing, and followed the individual modules of the system. Modules are tested in isolation from one another in an artificial

environment as "Test Harness" which consists of the diver programs and data necessary to exercise modules.

Acceptance Testing

Acceptance testing involves planning and execution of functional test, performance tests and stress tests in order to demonstrate that the implemented system satisfies the requirements. It is not unusual for two sets of acceptance tests to be run, those developed by quality assurance group and those developed by the customer.

In additional to functional and performance tests, stress tests are performed to determine the limitations of the system. Typically, acceptance tests will incorporate tests cases developed during unit testing and integration testing. Additional test cases are added to achieve the desired level of functional, performance and stress testing of the entire system.

5.3VALIDATION TESTING

Sales Module

Invoice Generation

1) Category Code – Attach a List for Category Code
2) Invoice Code – System Generated
3) Customer Code – Attach a list for Customer Code ,Customer Name and Customer Address.

4) Product Code – a) Should be chosen for the selected category only. Attach a list for product code, name and rate. Rate should be refered from the Product Price table.
   b) Product Code can also be chosen first without choosing the category which will be updated automatically.
5) Quantity – Should be entered
6) Amount – Should be calculated when the quantity is changed
7) Invoice Value – Should be modified as a row is inserted or update or deleted
8) Delete check box – All rows which should be cancelled should be marked

Buttons:

1) Add – Add a new product row
2) Delete - Delete all rows which are marked for deletion
3) Ok – Submit Invoice
4) Cancel – Cancel the Invoice

Note:

If Credit Allowed is **'No'** for customer the product should be ordered only for available quantity.

Order number can be any dummy number inserted into the column

Receipt Generation

1) Receipt Code – Should be system generated
2) Invoice Code – Attach a list displaying the Invoice code, the customer code and name. The customer code and the Customer name should be update automatically.
3) Invoice Value – Should be automatically displayed for the selected invoice code
4) Amount Received – Should be accepted from the user.

Buttons

1) Ok – Receipt should be generated
2) Cancel – Receipt should be cancelled

Note

If Ok Button is selected , if Credit Allowed is **'No'** for customer then the Product details should be added in the Product Supply table and the receipt should be generated and product table updated. PStatus and IStatus for Invoice_Master must be set to '**Yes**'.

If Ok Button is selected , if Credit Allowed is **'Yes'** for customer then the receipt should be generated for the amount received. The Product supply should be done through the Product supply menu item.

Product Supply

1) Invoice Code – Attach a list displaying Invoice Code, Customer Code and Customer Name. Update the Customer Code and Name automatically.
2) Product Code – Attach a list displaying the product code for those products which had to supplied and which are available in stock.
3) Quantity – Should be entered by the user.

Buttons

1) Add – Adds a new row for the Product
2) Ok – Update the Invoice_Product_Supply table with the details.
3) Cancel – Cancel the operation.

Note

The Invoice's list should display the invoice codes of the customers whose credit allowed is 'Yes' and Pstatus is 'No'.

The list should be updated automatically as the products are selected.

Alert Message should be provided if the quantity entered is greater than the quantity on hand.

Add should be disabled when once the list is empty.

One row should be present by default in the detail block.

Purchase Module

Stock Update

1) Supplier Code – Attach a list to display the supplier code and name. Update the supplier name and address based on the option selected.
2) Product Code – Attach a list to display the product code, name and rate of the products.
3) Quantity – Enter the quantity supplied.

Buttons

1) Ok – The stock should be updated in the product table and the supplier product table.
2) Cancel – Cancel the order.

Queries module

Invoice

1) Invoice Code – Attach a list to display the invoice code.

Note

Based on the invoice code , all the details including the products ordered should be displayed.

Receipt

1) Receipt Code – Attach a list to display the invoice code.

Product - Details

1) Product Code – Attach a list to display all the product code and display the details of the selected product.
2) Product Name – Attach a list to display all the product names and display the details of the selected product.

Note

The Query can be made either by selecting the product code or product name.

Product-Price

1) Product Code – Attach a list to display all the product code and display the details of the selected product.
2) The rate of the product through the various years should be displayed.

Customer -Details

1) Customer Code – Attach a list to display all the customer code and display the details of the selected customer.
2) Customer Name – Attach a list to display all the Customer names and addresses and display the details of the selected customer.

Note

The Query can be made either by selecting the customer code or customer name.

Customer-Payment Due

1) Customer Code – Attach a list to display all the customer code for those customers who credit status is 'Yes' and Istatus is 'No' and display the details of the selected customer.
2) Customer Name – Attach a list to display all the Customer names and addresses as condition mentioned above and display the details

Note

The Query can be made either by selecting the customer code or customer name.

The Payment due should be checked for the customer who had not paid the dues for more than 90 days.

Supplier-Details

1) Supplier Code – Attach a list to display all the supplier code and display the details of the selected supplier.
2) Supplier Name – Attach a list to display all the Supplier names and addresses and display the details.

Note

The Query can be made either by selecting the supplier code or supplier name.

Products Supplied

1) Supplier Code – Attach a list to display all the supplier code and display the details of the selected supplier.
2) Supplier Name – Attach a list to display all the Supplier names and addresses and display the details.

Note

The Query can be made either by selecting the supplier code or supplier name and display all the products supplied by the supplier.

Reports Module

Daily Sales

The report should be generated based on the system date.

Reorder Level

The report should query only for the records whose quantity on hand is less than or equal to the reorder level.

Ageing Analysis

The report should display the details of all the products which had not been purchased for the past 6 months.

Invoice Details

The report should query only for all the invoices generated between start and end date.

The from-date and to-date should be accepted as parameter from the user.

Pending Invoice

The report should be generated for all the invoice which are pending i.e. whose Pstatus is 'No'.

Supplier Details

The report should display the details of all the suppliers.

Supplier Products

The report should display the details of all the products supplied by the supplier. The supplier code should be accepted as a parameter from user.

Categories

The report should display the details of all the categories.

Receipts

The report should display the details of all the receipts generated between from date and to date. The dates should be accepted from the user as parameters.

Product-Details

The report should display the details of all the products.

Product-Price

The report should display the various price details for a product.

The product code is accepted from the user as parameter.

All Customer

The report should display the details of all the customers

Customers With Due

The report should display the details of all the customers who have pending payment to be made.

6. SCOPE OF FUTURE OF DEVELOPMENT

Any system that has been designed today becomes obsolete the next day itself in the present world of computers. Hence the system is designed in such a way that any future enhancements required by the organization can be easily updated with out going for new one.

The future developments that can be done to the system are

- The application system can be hosted on the web.
- The cash transactions can be made online.
- High level of securities with the help of fire walls can be implemented.
- Marketing research can be done with help of the reports.
- Reports can be generated using Actuate.

7. CONCLUSION

The project entitled as Sales Order Processing has been developed and implemented successfully. The application system was tested with the user requirements and verified for the validity. The software requirements have been met. Needed Documents were generated and adequate documentation has been provided for maintenance of the system.

The system is designed in such an extendable fasl.ion to incorporate the future changes into the system easily. The various user friendly features are introduced in this project. The system is developed according to the requirements specified by the organization.

BIBLOGRAPHY

Books:

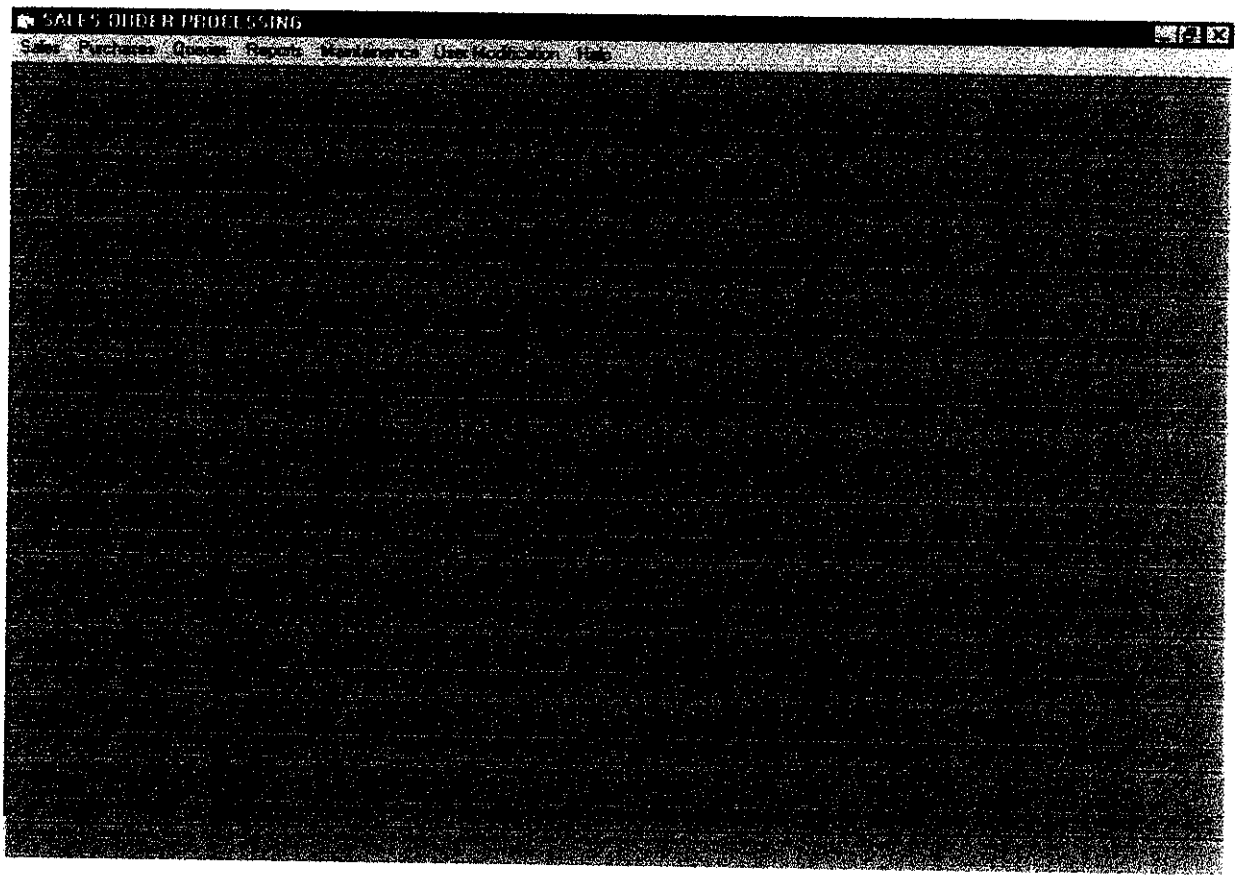
1. "Visual Basic 6 from ground up", by Cary Cornell, Tata McGraw Hill, 1998.

2. "Oracle Complete Reference" Oracle Corporation 1999.

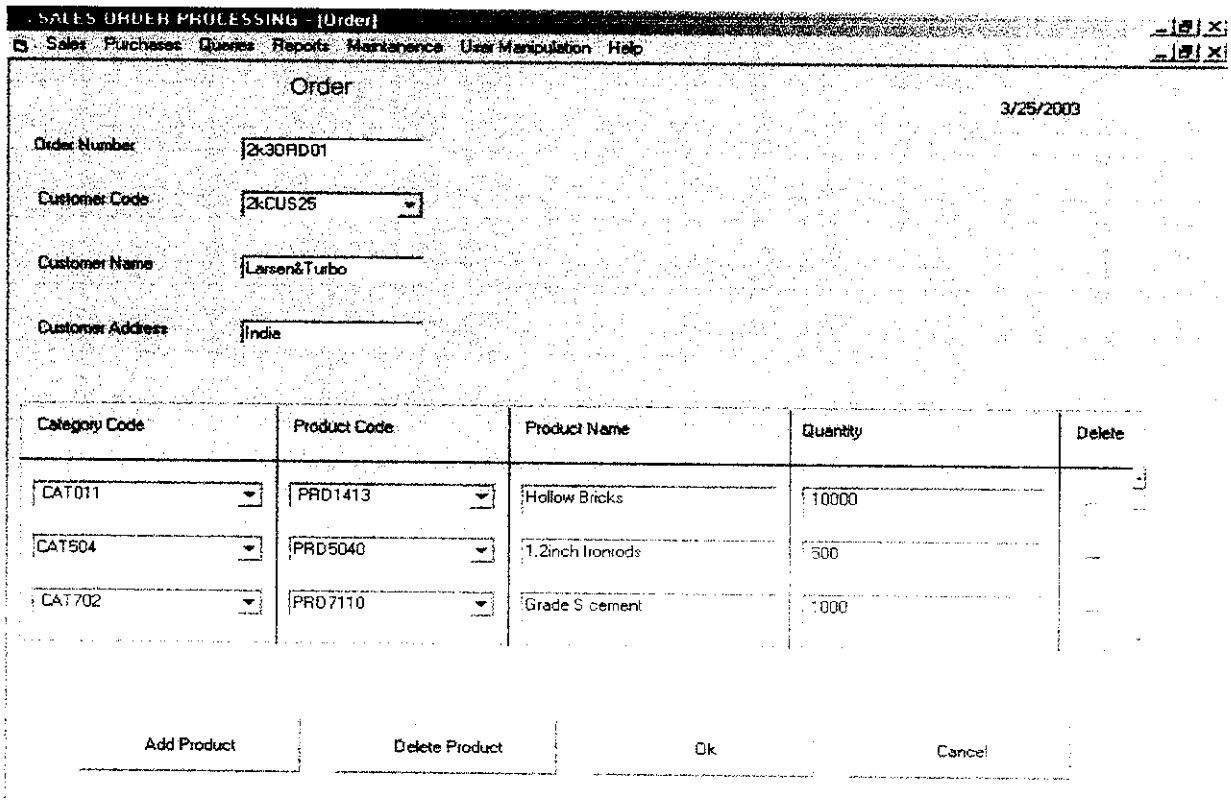
3. "Software Engineering", by R. S. Pressman, Tata McGraw Hill 1997.

User Login Screen

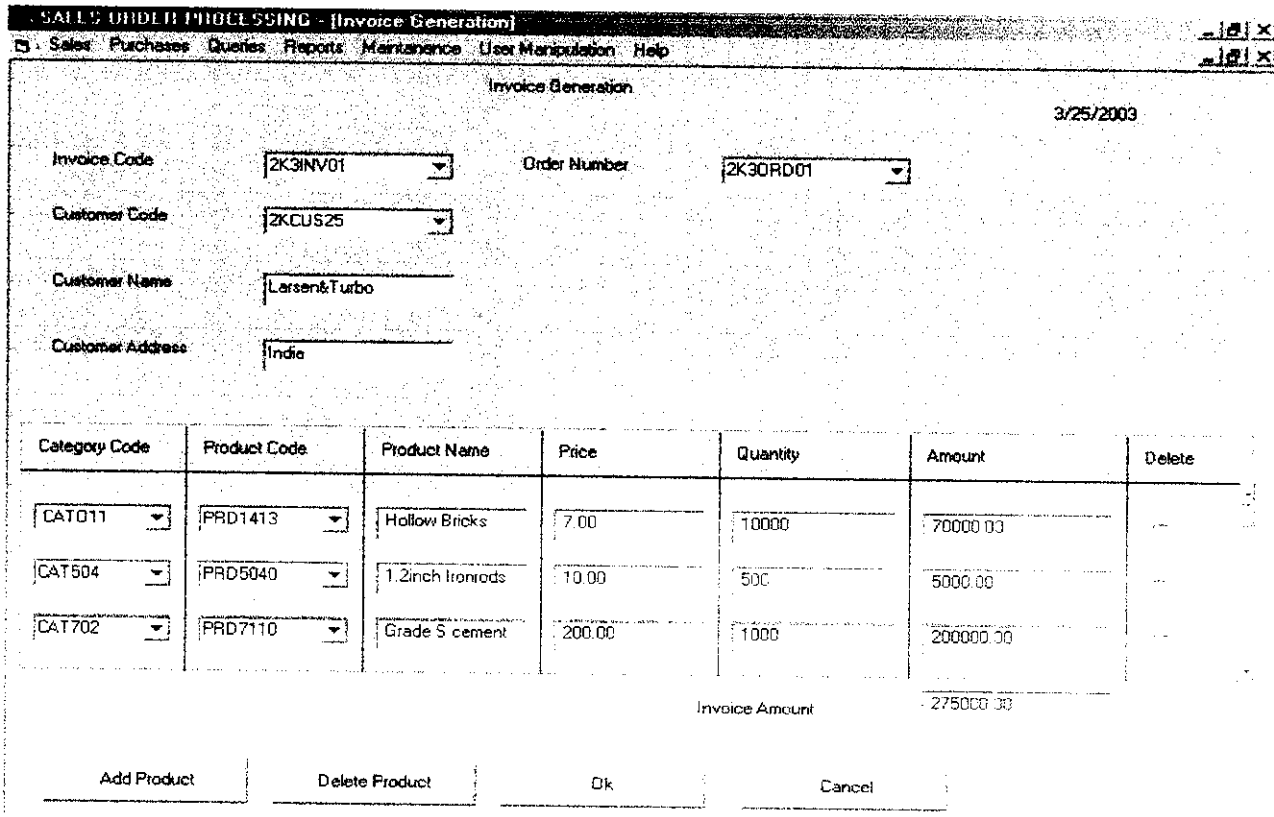
Administrator Login Screen



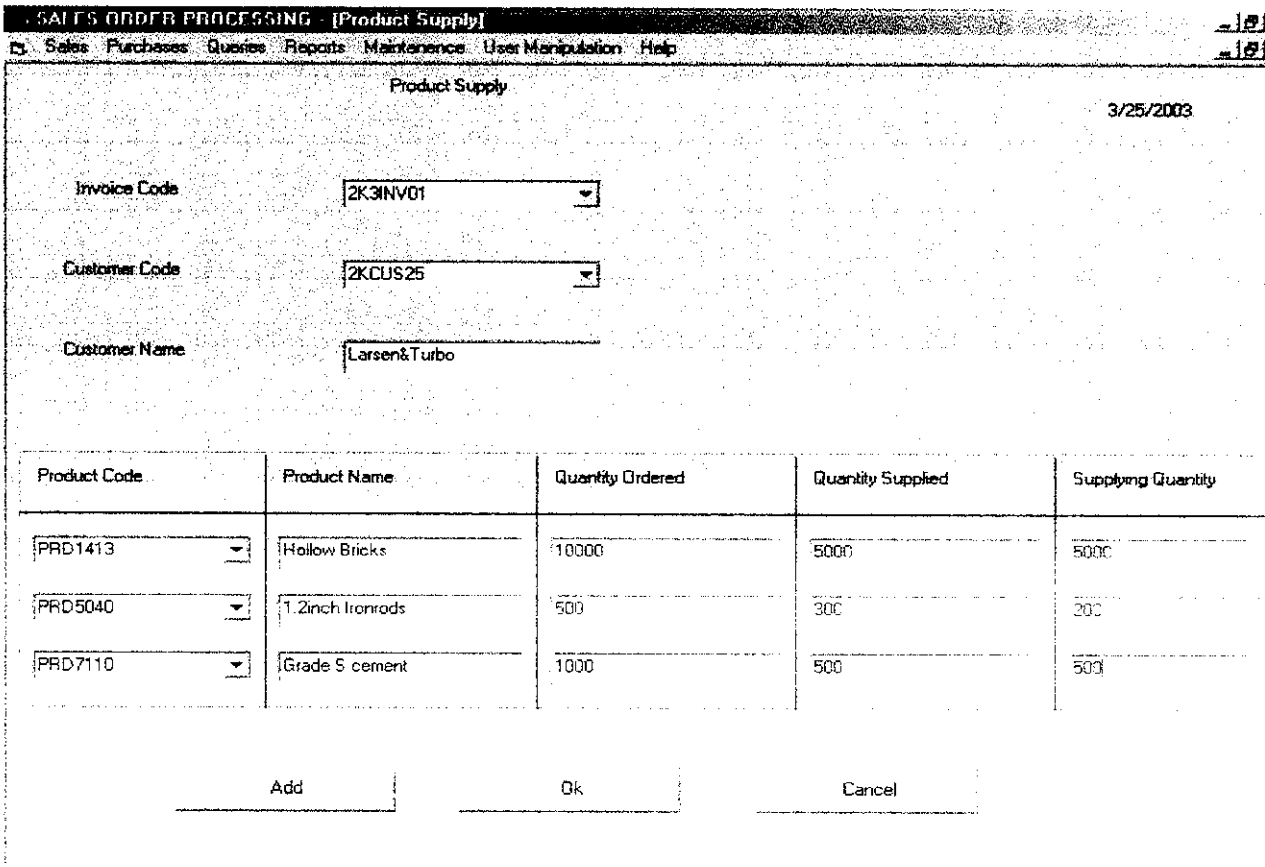
Order Screen



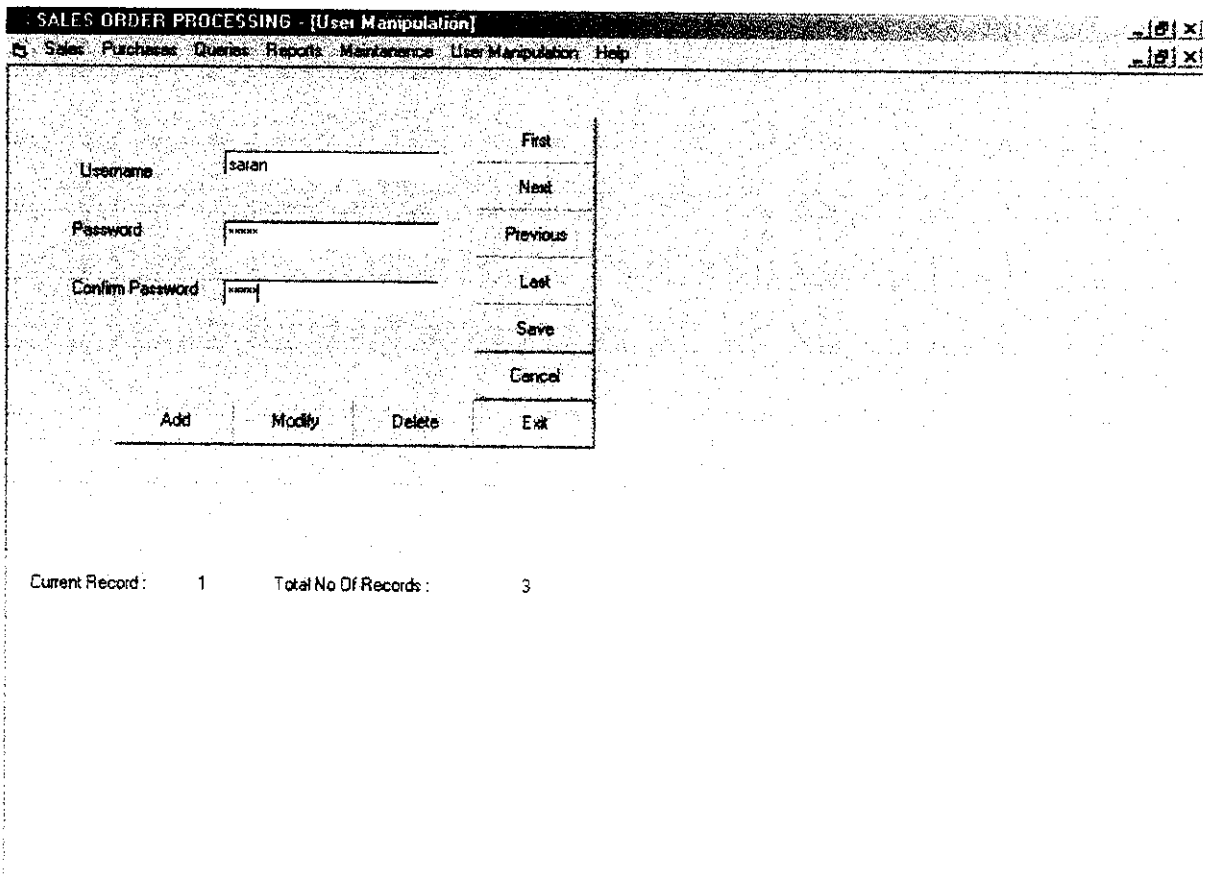
Invoice Generation Screen



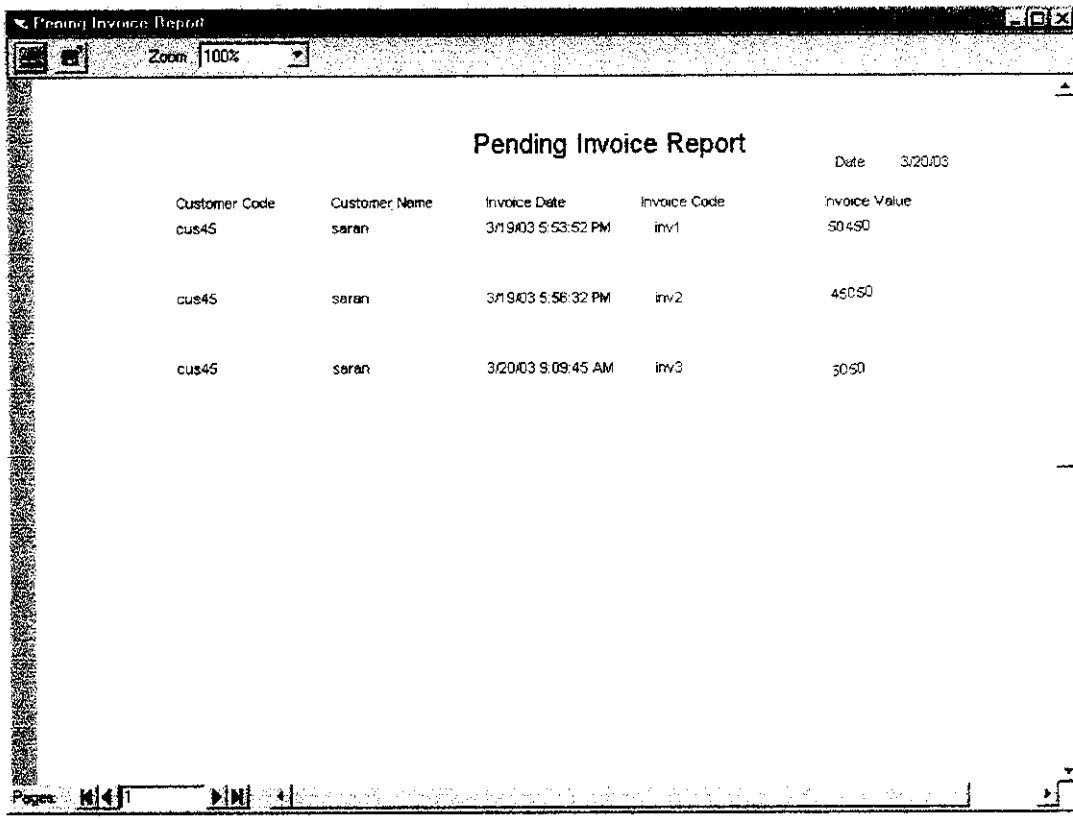
Product Supply Screen



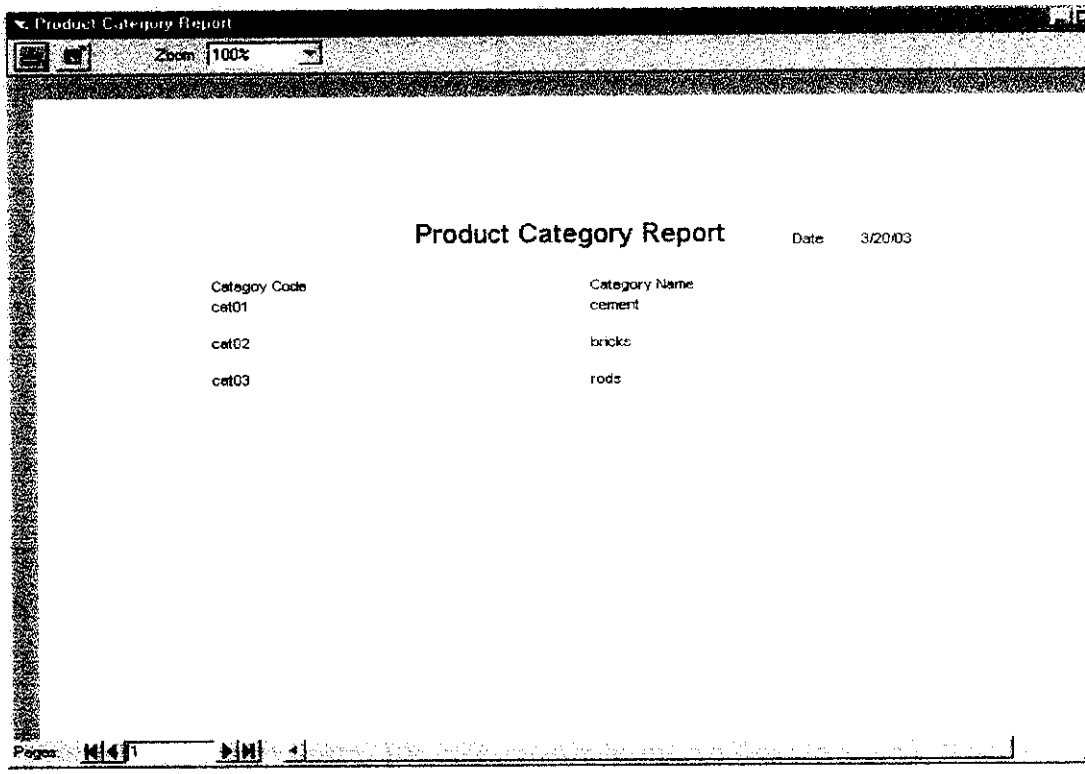
User Manipulation Screen



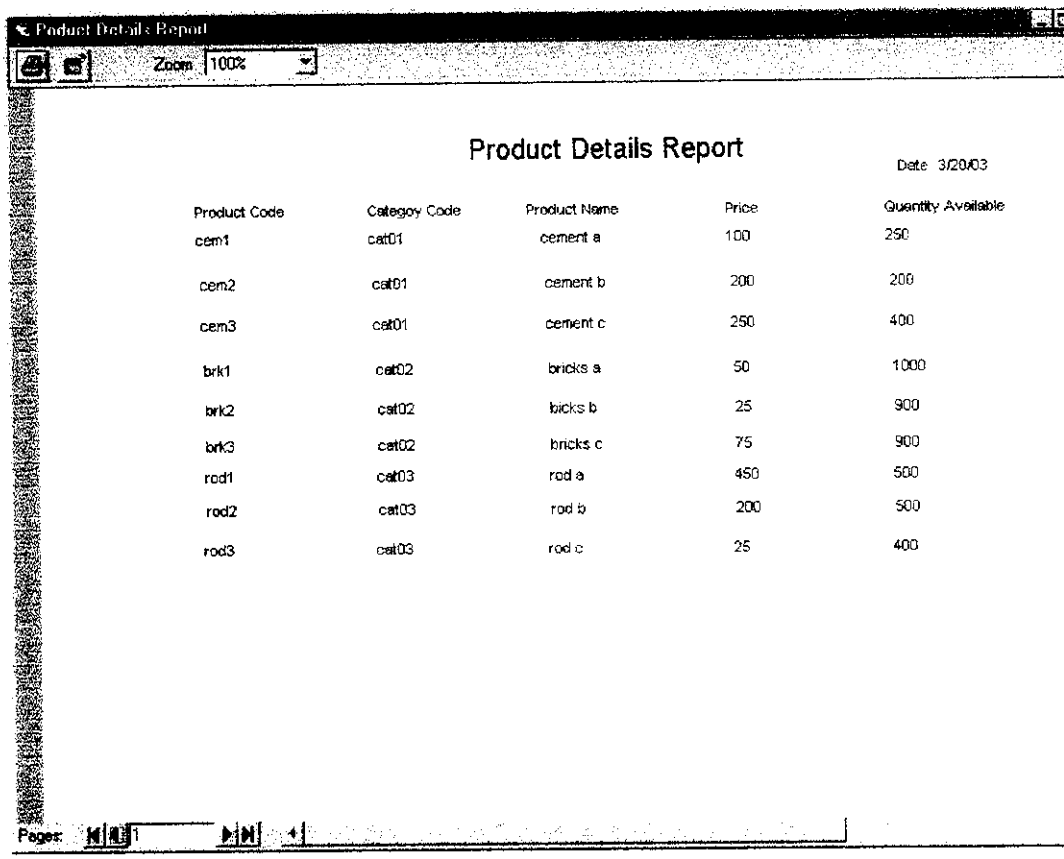
Pending Invoice Report



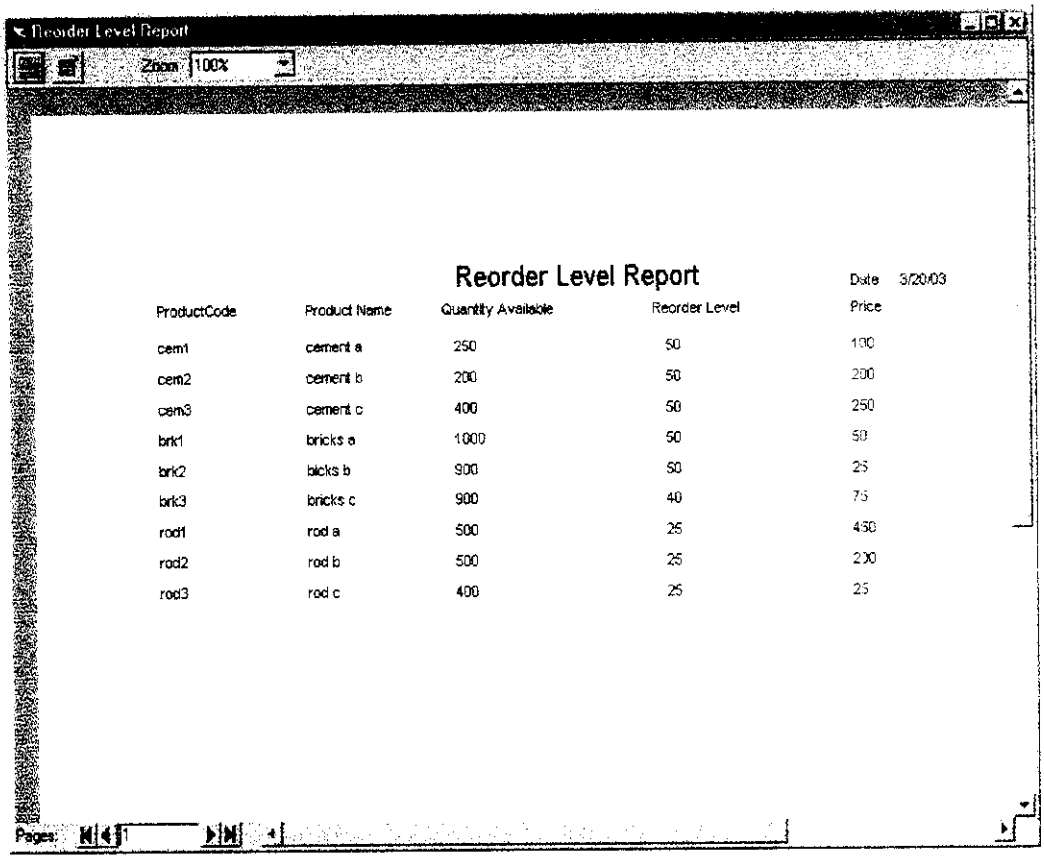
Product Category Report



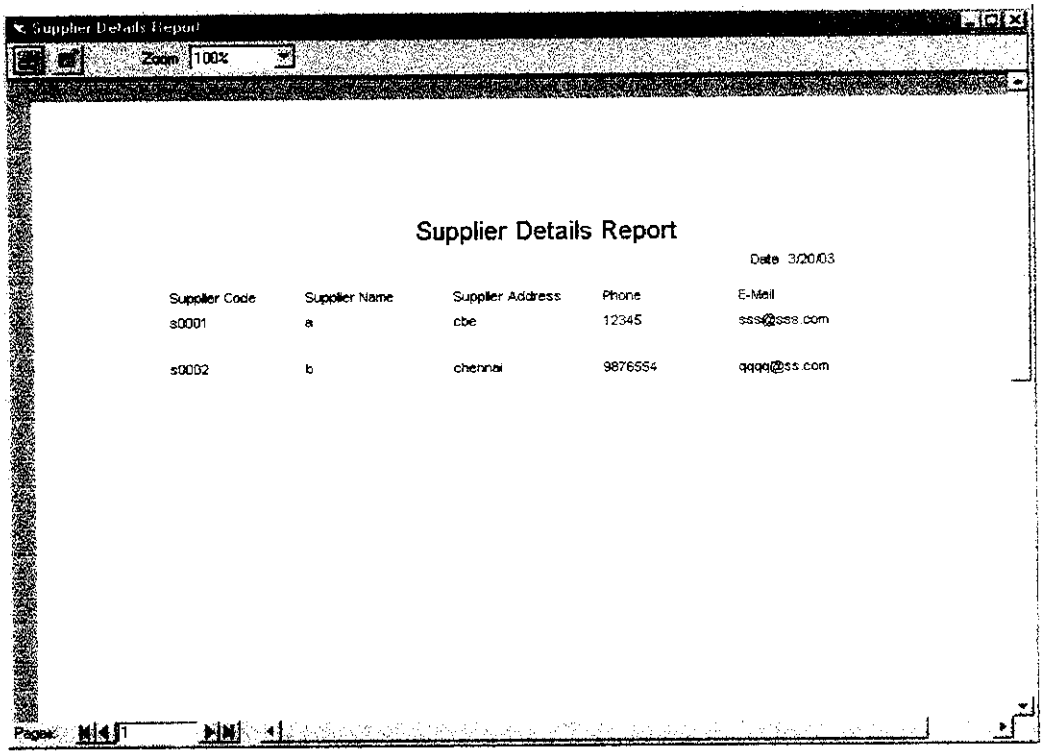
Product Details Report



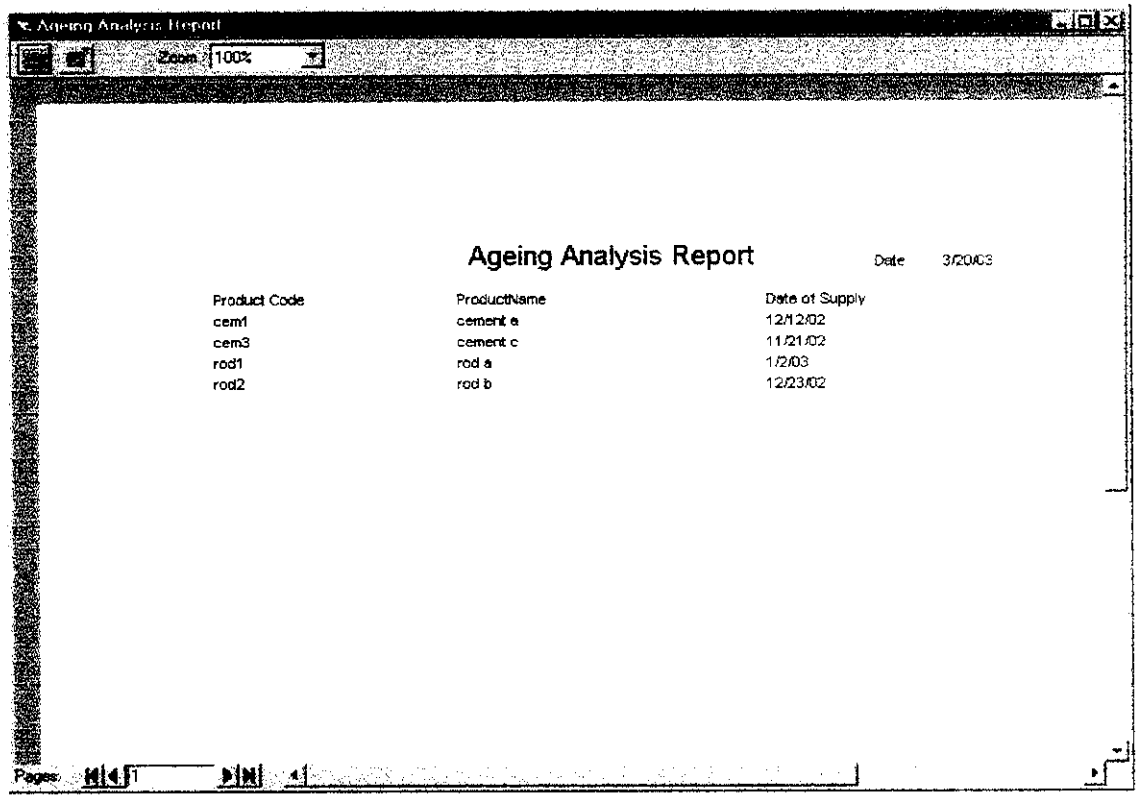
Reorder Level Report



Suppliers Details Report



Ageing Analysis Report



Customers Report