Client / Server Based GUI Applications

RESUME TRACKING

LIBRARY INFORMATION MANAGEMENT SYSTEM

HARDWARE INVENTORY CONTROL SYSTEM

DISSERTATION SUBMITTED IN PARTIAL FULFILMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF COMPUTER APPLICATIONS

OF BHARATHIAR UNIVERSITY

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By

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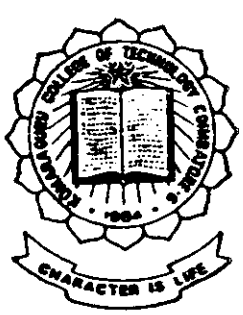

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Kumaraguru College of Technology

Coimbatore - 641 006

JUNE 1996

CERTIFICATE

This is to certify that this project work entitled

"CLIENT/SERVER BASED GUI APPLICATIONS"

submitted to Kumaraguru College of Technology, Coimbatore (affiliated to Bharathiar University) in partial fulfillment of the requirements for the award of the Degree of Master of Computer Applications is record of original work done by Mr. C.R. SRINIVASAN, Reg No. 9338M0197 during his period of study in the Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore under my supervision and guidance and this project work has not formed the basis for the award of any Degree/Diploma/Associateship/Fellowship or similar title to any candidate of any University.

Professor and Head *Staff in-charge*

Submitted for University Examination held on 1 / · /1996

Internal Examiner *External Examiner*

DECLARATION

I here by declare that this project work entitiled

"CLIENT/SERVER BASED GUI APPLICATIONS"

submitted to kumaraguru College of Technology, Coimbatore(affiliated to Bharathiar University) is a record of original work done by me under the supervision and guidance of Prof. P. SHANMUGAM M.Sc. (Engg.) *M.S.(Hawai),S.M.I.E.E.E., M.I.S.T.E., Head of the Department, Department of Computer Science and Engg, Kumaraguru College of Technology, Coimbatore and that this project work has not formed the basis for the award of any Degree / Diploma / Associateship / Fellowship / or similiar titile to any candidate of any University.*

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This is to certify that Srinivas Ramarao has completed his project in partial fulfilment of the requirements for the degree of Master of Computer Applications with Oracle Software India Pvt. Ltd - India Development Center, Bangalore, India.

The project was completed during the period January 1996 - June 1996. His work was found satisfactory in all regards and we recommend that appropriate credit be given to his work.

The project report has been reviewed by us and has been found to be satisfactory regarding content and is ready to be submitted to the University.

June 5, 1996
Date

Anand Adkoli
Project Guide

June 5, 1996
Date

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SYNOPSIS

The project includes three different client-server based GUI applications. The Oracle IDC had needs to have GUI interface for its Resume Tracking, Library Information Management System(LIMS) and Hardware Inventory Control System(HICS) applications.

Resume Tracking is the process of tracking the incoming resumes, the results of the scanning of resumes, the details of interviews that was conducted for the candidates after their resumes have passed the scanning phase and generate the reports

LIMS is an application which tracks all the resources of the Library and Information Center of IDC. It provides interface for storing the details of the resources, their circulation details i.e. issue,reservation or return, track the details of the employees who are involved in the circulation and generates reports.

HICS is an application that tracks all the details of the hardware resources of the company. It provides interface for storing details of the items, systems and locations, shift items between systems, assign systems to locations and generate reports.

The applications are developed in the following environment.

RDBMS - ORACLE

Server - Oracle7

Front-ends - Oracle Forms 4.5* & Reports 2.5*.

* A product of the Oracle's Developer/2000 product suite.

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OBJECTIVE

The objective behind this project work is to learn and apply the RDBMS concepts in application programming. RDBMS technology has made many advances and has grown into a distinct area of computing in its own right. RDBMS along with the client-server technology promises to leverage the enormous potential of the ever-increasing inter-connected LAN environments. The one RDBMS which is most popular & proved more suitable for this field is Oracle. I have attempted to understand and apply RDBMS concepts as implemented by Oracle.

Chapter II

INTRODUCTION

Oracle Corporation

ORACLE is one of the most popular RDBMS in the world. The company, ORACLE Corporation, is the leading provider of software for managing the information. Oracle was founded in 1977 with a vision of finding faster, easier, less expensive, and more powerful ways to manage and access information. It built the first commercial relational database system. It sold the first products employing SQL (structured query language), currently the industry standard. It pioneered portable software that today runs on practically all hardware, from PCs to mainframes, to interactive television set-top boxes. In recent years, it has championed parallel software as the breakthrough that will power very large database applications like data warehousing and video-on-demand.

Oracle's central product - the database - has emerged as the key building block of the data highway. It is capable of managing huge quantities and varieties of information. It is the correct software tool for constructing the new systems that will bring numbers, text, images, audio, and full-motion video into every office and home.

Oracle India Development Center

This project has been completed at the Oracle Corporation's India Development Center(IDC). IDC has been set up as a strategic move on the part of Oracle Corporation to expand its development resources to meet the corporation's ambitious growth plans. Established within Oracle Software (India) Pvt. Ltd., the center started its operations from temporary offices at the Holiday Inn on April 1, 1994, with a strength of four. Today IDC is in Embassy Point, 150 Infantry Road, Bangalore, with a 100 strong workforce.

Created as a multi-technology competence center, IDC is working with a number of development groups and business units within Oracle Corporation. While organizationally part of the Product & Platform Technologies Division, IDC is also carrying out joint projects with Oracle Corporation's Server Technologies Division and Office Automation Division.

IDC had needs to have GUI interface for some of its operations; Library Information Center, Hardware Inventory Control System and HR- Resume Tracking. This project is a sincere effort to fulfill these needs using the Oracle7 Server with Forms 4.5 and Reports 2.5 as the MS-Windows based GUI front-ends. The objective of the project is to manage consistent and error-free information in the database and provide the user with the necessary interface to access the database and utilize it to the maximum extent. This is inline with my objectives to learn RDBMS concepts via application programming.

Product suites of Oracle

Database products

The core product of Oracle is the Oracle 7 database engine*. It runs on more hardware platforms than any other major software product, so it can be used enterprise-wide, on everything from PCs to supercomputers. It uses industry standard SQL queries and transactions that can automatically access data stored on multiple servers. It provides sophisticated features, demanded by data professionals, to offer unparalleled performance and data security. It is the only commercial database today to scale from the desktop, to the data center, to interactive television networks and set-top boxes -- providing unlimited power while minimizing training requirements for developers, users, and system administrators.

Client-server development tools

Oracle has released a complete set of client/server development tools for the end-user to manage information efficiently. This set includes Oracle Developer/2000, Oracle Designer/2000, Oracle Discoverer/2000,Oracle Power Objects and Oracle Objects for OLE. This forms a complete and integrated family of tools for document automation and developing next-generation client/server applications.

The project is done using the products; Forms 4.5 and Reports 2.5 of the Oracle Developer/2000 suite with Oracle7 as the backend server. Developer/2000 provides the ability to rapidly and productively

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* It supports character sets from 26 languages.

build sophisticated systems which scale from workgroup to enterprise. With a common repository, flexible modeling and methodology support, a unified client and server development environment, and a portable open architecture, Designer/2000 and Developer/2000 are the industry s only second generation client/server design and development tools.

Developer/2000 Features

Productivity

A few clicks of the mouse gives the applications instant read-and-write database access that is bug and maintenance free and is optimized for the client/server environment. Developer/2000 also sets new ease of use and productivity standards for client/server GUI tools through the use of rapid application design (RAD) techniques, object orientation and unified client and server support. The Developer/2000 interface uses a powerful and easy-to-learn combination of object navigators, tabbed dialogs and property palettes to make the creation of GUI applications extremely simple. Developer/2000 incorporates a set of advanced forms, reports, graphics and online documentation tools, all built from the ground up to ensure the robustness and scalability that complex applications demand.

Client/Server Scalability

Scalability comes easily to Developer/2000 developers. It is inherent in the architecture of the product. It is explicit in the un-paralleled support for server functionality such as array fetch, database cursors, bind variables, savepoints and sequences. It is definitive in the drag-and-drop client/server partitioning of procedures and it is evident in the embedded features that allow Developer/2000 customers to scale from 5 to 5,000 users, from megabytes to gigabytes of data, and from decision support to complex OLTP applications. Developer/2000 uses PL/SQL(programming language extension of SQL) for all programming, allowing one to fully exploit the power of the Oracle7 database and client platform.

Portability

Applications built using MS-Windows, Apple Macintosh, or Motif can be deployed in any of these environments or on character-mode terminals. Benefit from the assurance that the applications will be

compatible with both the existing and future computing environments. Developer/2000 applications are also fully portable across national languages. The applications can be distributed worldwide in a number of languages. Recoding, and the translation management capabilities can be used to ensure fast and accurate localized deployment.

Unified Client/Server Editing and Debugging

Customizing the Developer/2000 applications is as easy as modifying the server objects. The PL/SQL debugger and interpreter can be used to quickly isolate and correct application errors. To partition application logic, simply drag the client object onto a server, and it becomes a stored procedure or database trigger.

Complete GUI Support

Developer/2000 delivers portable applications with native look and feel on Windows, Macintosh and Motif, and character mode. Appealing and intuitive applications can be built using toolbars, combo boxes, dynamic lists, radio groups, buttons, and other GUI widgets, and easily enhance them with images and graphics. On Windows, one can integrate the Developer/2000 applications with other components through OLE 2.0 (Object Linking and Embedding), OLE Automation, VBX (Visual Basic) controls, and DDE (Dynamic Data Exchange). Developer/2000 incorporates powerful charting and data visualization tools that use a combination of charts, drawings, and images to present information in an intuitive format, as well as support for multimedia objects such as video, images, and sound in a variety of multimedia format standards.

Model-Driven Development

Developers have the option of using Designer/2000 to generate complete Developer/2000 applications from repository definitions. One can create complex, documented, standardized, maintenance-free applications more quickly with these suites.

Effortless Integration

Developer/2000 guarantees flexibility through an open architecture that extends the capabilities of the applications. Generate forms and reports from models stored in the Designer/2000 repository, and modify them in the same way as any other Developer/2000 applications. One

can also reverse engineer Developer/2000 applications into the Designer/2000 repository.

Team Development

The Developer/2000 applications can share application logic and user interface objects, allowing the developer to define and enforce team development standards, and reuse application objects or code in a snap. Store PL/SQL procedures in centralized libraries for reuse by multiple applications and developers.

Heterogenous Data Access

Developer/2000 is designed to not only exploit the powerful capabilities of an Oracle7 database, but also to access all data in an organization, regardless of its format or location. One can use the Open Client Adapter, Oracle Open Gateway technology, or application programming interfaces (APIs) to communicate with the data sources of choice, including DB/2, SQL Server, DB2/400, Access and Rdb.

Forms 4.5 Features

Productivity-Driven Development

At the heart of the Developer/2000 development environment is the object navigator, an intuitive structural browsing and editing interface that allows developers to easily locate, inspect, and manipulate all application objects. One can use the speed search and global search and replace capabilities to quickly find objects, making application maintenance a breeze even if one's business requirements are constantly changing. A simple drag-and-drop operation is all one needs to reuse objects and object classes within or between applications or, of course, between client and server.

Development the Declarative Way

Developer/2000 uses its powerful declarative features to create, in a matter of minutes, applications that include query, insert, update, and

delete operations. That's literally a few mouse clicks to build an application that not only establishes all the database interaction based on server definitions, but provides a complete query-by-example interface, adds database constraints into the application, incorporates a toolbar for performing database operations, a menu to invoke operations from, and all the message and error handling one would otherwise have to code. One can built Master-detail or master-detail-detail using some mouse-clicks and least amount of coding. Codes required for maintaining these relationships are automatically generated and embedded into the modules.

Accessible Object Orientation

Developer/2000 blends all the object-oriented benefits one expects into its interface without imposing a long learning curve on developers. Define property classes using a unique objects-by-example approach for property and method inheritance, and create object groups to maximize the reuse of application code and objects. Developer/2000 imposes no convoluted concepts and no complicated actions on developers. Object orientation is just a click, a drag, and a drop away.

Exploiting GUI's to the Limit

Not only is Developer/2000 (and its applications) completely portable, it also provides one with the tools needed to interface with them the applications in each environment. On Windows, incorporate any Visual Basic 3.0 (VBX) custom control into the applications or tap into native functions or APIs by calling DLLs directly from PL/SQL. Developer/2000 can be used as an OLE 2.0 container for seamless integration of spreadsheets, documents, media clips, drawings, and other components into the application. Alternatively, send data to and receive data from any DDE server.

Reports 2.5 Features

Productivity Through Declarative Development Developing complex reports in Developer/2000 is quick and intuitive. Just define queries and their relationships in the point-and-click interface of the data modeller, select a report format from the pictorial gallery of report styles, and then run the report. Choose from a variety of layout styles including

tabular, form, form letter, master-detail, multi-column mailing label, and matrix, and combine as many styles as you need in a single report.

Unlimited Report Customization

Customizing the reports is easy. One can use PL/SQL to perform aggregate computations, restrict output, implement conditional control, and dynamically format data. Enhance report appearance with the WYSIWYG graphical layout editor and use the output previewer to see exactly how ther report will appear on paper prior to printing it. Leverage the Full Power of SQL Developer/2000 reports support unlimited database queries containing textual and image data.

Many Platforms, Many Features

On Windows, Developer/2000 reports act as OLE 2.0 containers, from either the design or runtime environment, for OLE-aware applications containing, for example, spreadsheets, drawings, or media clips. Support for native Windows Help, Search/Replace, and Toolbars makes the Developer/2000 reporting environment familiar to many users. Reports can also run as batch jobs on servers. Regardless of the platform, the ability to generate, preview, print, and mail either GUI or ASCII reports from a single runtime executable makes Developer/2000 the tool of choice for all enterprise-wide reporting demands.

Database Connectivity Features

Open Data Access

Developer/2000 incorporates an open client adapter that forms a function bridge between the Oracle Application Programming Interface (API) and the ODBC SQL API. This bridge enables Developer/2000 applications to transparently access ODBC-compliant databases such as Microsoft SQL Server, Microsoft Access, Rdb, DB2/400 and a number of other databases. Developer/2000 applications built against one database can be deployed against another through the consistent read and write functionality provided.

Full SQL Support

Developer/2000 provides full ANSI SQL support including DML and DDL syntax, although this may be limited by the database being

accessed and the ODBC driver being used. Transaction processing is handled through either deferred (manual) or automatic commit and rollback functionality. PL/SQL can be used as a procedural extension to the SQL being used. Full support for multilingual applications is also provided - retrieve data from multiple databases using different character sets, yet view them in a single familiar format.

Transparent Connectability

Little or no additional system configuration is necessary to access different databases from a Developer/2000 application. Access any ODBC-compliant databases just like one would access an Oracle database, by simply entering @odbc:data_source_name in the connect string in place of the traditional Oracle connect string.

Robustness

As the computer industry moves through the first wave of GUI client/server applications, one truth is paramount: there's more to GUI client/server than just a good GUI. Development tools of the future must be able to support the productivity needs of large-scale development efforts, the scalability needs of enterprise-wide applications, the maintenance demands of constantly changing requirements, and the reality of heterogeneous environments. Developer/2000 delivers on all of these and fulfills the promise of second generation client/server development.

Client-Server Interface

SQL*Net is Oracle's network interface software that allows ORACLE products to communicate with each other over a network. In a client-server architecture, where clients run on a separate computer from the database server, SQL*Net provides the communication between the ORACLE client and the ORACLE server. The communication between these two products takes place over a network. The server process that listens for and accepts incoming connection requests from client applications is called the listener process. ORACLE listener processes start up ORACLE database shadow processes to handle subsequent communication with the client.

Chapter III

PROJECT OVERVIEW

This project is a collection of three different applications namely the Library Information System, Hardware Inventory Control System and the Resume Tracking system for the Human Resources division of IDC developed using the Oracle RDBMS and the products Forms 4.5 and Reports 2.5 of the Developer/2000 suite. An attempt was made to explore & apply a wide variety of features available with Developer/2000 and take advantage of Oracle7. An overview of these three applications is presented below.

Resume Tracking :

Resumes are received at IDC from various sources. These resumes are forwarded to the Human Resources Group. The HR has to keep track of these resumes for the subsequent references and needs. The HR will record resumes, give them for scanning and get feedback from the scanners. Based on the feedback given by the scanner, appropriate action is taken i.e. those meant for rescan are sent for rescan, those rejected are sent regret letters and those marked for pursue are taken up for fixing interviews and so on. Resumes are also put on hold for future requirements and hold letters are sent out to these candidates informing them of our interest in pursuing them at a later date. Interviews are fixed for those candidates whose resumes are marked for pursue. Based on the outcome of the interviews the candidate is offered or rejected of offer. RETRACK is developed with the idea of providing the user with an interface for entering the details of any process regarding a resume. It also provides procedures which helps the user to know about the details of scanning & interviews as required.

Library Information Management System (LIMS) :

LIMS is developed with the idea of providing GUI interface for tracking the various resources in the Library & Information Center. The Library & Information Center at IDC has Books,Software, Periodicals and Video Cassettes. These resources can be issued to any individual at IDC. On issue, the details of the employee and the details of an item along with the date of issue are recorded. When

an item is returned the entry for that item in the register is closed by putting the return date with the signature of the employee. These registers are the sole records for the library to know about the status of any of the above mentioned resources in the library. LIMS is developed in focus of managing these information in the database through proper user-interface funtionalities.

Hardware Inventory Control System (HICS) :

The company purchases hardware resources for its various needs. These resources are checked and serially numbered at STP before reaching IDC. When the items reach IDC, their details are entered on a System Tracking Sheet. The tracking sheet contains details about the System and the items that are attached to it. These details are basically maintained for submitting them before the audit council and to have the proper information about all the hardware resources within the company. HICS provides an user-interface to enter these details into a database and retrieve it at times of need. HICS is also built with procedures to effect changes in the status of a system and also to manage the shifting of items from one system to another.

A detailed explanation about the objectives, needs, the solution, design and implementation issues are presented in the following sections.

Chapter IV

DETAILED DESCRIPTION

Resume Tracking Application

Objective

The objectives of the package are to provide an user-friendly interface for tracking the resume details, validate the data before transferring it to the database and provide maximum functionalities to access the information stored in the database.

System Study

The Human Resources is responsible for managing the details of all resumes and the proceedings regarding any of it. The procedure adopted by the HR division of IDC for this is presented below.

Objective

The objective is to identify and employ the right person for the company's manpower requirements.

Inputs

Resumes are received at IDC from various sources such as :

- General/Casual job seekers (i.e. resumes hand delivered, e-mailed, sent through post)
- Response to the Advertisements
- Through Approved Headhunters
- Employee Referrals
- Through other contacts
- Through Campus Interviews for which there is separate guidelines.

The Steps

Receipt Of Resumes

- Resumes received at IDC and forwarded to the Human Resources Group

- If a candidate is referred by an IDC employee, the employee has to fill in the 'Employee Referral Form' and forward the same to the Human Resources Group.

- A rubber stamp containing the following information is affixed on the resume by HR.

Recd on	Entered on	Entered by
Scanner	Scan date	Pur/Rej/Hold/Rescan
Rescan by	Rescan date	Pur/Rej/Hold

- The date of receipt is written on the resume and the relevant information is entered into the database and the status is also recorded on the resume.

Scanning

- The resumes are filed and on every Tuesday and Friday, the file is given to one scanner each for scanning. On top of the file, the Scanner Metric Sheet is filed which gives details of the number of resumes to be scanned, the number of pursues, the time taken for scanning and other related details. This Metric Sheet is filled up by the scanners after scanning.

- When the scanned resumes are received back, appropriate action is taken i.e. those meant for rescan are sent for rescan, those rejected are sent regret letters and those marked for pursue are taken up for fixing interviews. Resumes are also put on hold for future requirements and hold letters are sent out to these candidates informing them of our interest in pursuing them at a later date.

Interviewing

- Interviews are generally fixed over telephone or by e-mail. In case no telephone number is given in the resume, a telegram is sent fixing interview time and date.

- A day before the interview, resumes of candidates scheduled for interview the next day are given to one of the interviewers and the other is informed of this.

- Interviews are generally held at the office premises of IDC, except for outstation candidates.

- Candidates from and around Madras City are called for the initial interview at Madras and the Interviews are generally conducted by the Manager who is stationed at Madras, at a location mutually agreed to by the candidate and the Interviewer.

- Candidates shortlisted for second interview are scheduled for interview with the Executive Director except in cases where an intermediate interview is recommended for specific skill-set. Shortlisted candidates for final interview are scheduled for an interview with the Executive Director. At times the Executive Director may also recommend interview by a specific PM/PL.

- If the candidates to be pursued, from a particular Metro city are more than five, a committee consisting of a Program Manager and the Executive Director visits that city and the interviews are conducted at a Hotel. Since the Executive Director is also one of the interviewer in many of these cases, generally this is considered as the final interview and decision to make offer/reject is usually taken without a second interview. There could be cases where a detailed technical second interview is needed if the Project Manager is not in the same area of specialisation as the candidate. In these cases, the candidates are called to Bangalore for a final interview.

Reference Checks

- If references are not given by the candidates in the resume, the same is obtained while conducting the first/second round of interview by the interviewers if they desire to pursue the candidature.

- Reference check is made on all the candidates who are shortlisted for final interview. These checks are done either before the final interview or before making the offer.

- Reference check includes integrity issues in addition to technical skills, managerial skills and other job related aspects.

Communication To Candidates

- Candidates rejected after scanning are sent 'Direct Reject' letters immediately. This is done on all Monday's or the first working day in the week.

- If resumes are found good/Candidates are found good after interview but suitable vacancies do not exist, a letter is sent to these candidates informing them of our interest and a possibility of our considering their candidature after sometime.

- Candidates who are rejected after the first/second/final round of interview are sent a regret letter within 3/4 days.

- Candidates selected for employment in the company are sent an offer of employment with the standard terms and conditions. Candidates who accept the offer are sent the following information prior to their joining.

Standards

Outputs

- Direct rejects - resumes not meeting our skill-set requirements and fails on scanning stage.

- Rejects after Interview - Candidate's performance in interview not upto our expectations

- On hold - Candidate found good after interview but no vacancy immediately

- Offers - Candidate found suitable and offer of employment made

- Acceptance/Non-acceptance of offer by candidate

- Joins - Candidate accepts offer and joins

Completion Criteria

Controls And Approvals

- No resumes are sent for scanning unless the relevant information is entered in the database and an application number given for the resume.

- No interviews are scheduled unless the resume is scanned and marked for pursue by the authorised persons

- No offers of employment are made unless the Reference Checks are carried out

- Travel expenses reimbursement is given on authorisation from the Human Resources Executive and the reimbursement is subject to production of proof of travel

- Offer of employment is made only after approval from the Executive Director except in cases of On-Campus recruitment.

Formats

- Employee Referral Form
- Scanner Metric Sheet
- Resume Tracking Sheet
- Regret letter for Direct rejects (on scanning)
- Hold letter (for those marked for pursue at a later date)
- Regret letter for rejects after interviews
- Reference Check form
- Offer of employment

Quality Records

- Rubber stamp (giving details upto Pursue stage)
- Scanner Metric Sheet
- Resume Tracking Sheet
- Monthly Reports

Proposed Solution & Goals

After a thorough study of the system the various needs are ascertained and the effort to find a solution starts here. The proposed solution has the following picture.

The details of resumes are divided into three categories. They are Personal details, Qualification details and the Experience details. These details have to be entered into the database on receipt of a resume. In order to uniquely identify a particular resume, a serial number is given to it when it is first entered into the database. The three categories are stored into separate tables with the serial number given to that resume. This serial number can be later used to associate the Qualification and Experience details with the personal details.

The scanning and interview details are grouped separately into two different tables. The scanning details are entered into the database by the HR after getting the feedback from the scanners. The interview details are entered into the database after the interviews are conducted and the details are received by the HR division.

The serial number plays a key role in this package. The various details associated with a resume which are scattered in five different tables are grouped only with the use of the serial number given to that resume. Each group of details are stored the respective tables along with the serial number given to the resume.

The major goals for this package are identified as

⇒ allow the user to enter details of a resume in one go.
⇒ associate the various details using a unique serial number.
⇒ Validate the user from entering inconsistent data.

Application Design

Data Design

The structure for the tables and the various fields needed are identified and are created in the database. The tables created for this application are given under **Section-I of Appendix A** .

Forms Design

The forms design includes the designing of the user-interface forms and the processes to be incorporated in the forms. The

package consists of five basic forms which are used to track data entered by the user. They are Candidate Personal Details, Qualification Details, Experience Details, Scan Details and Interview Details forms. For the screen layouts of these forms refer to **Section-I of Appendix B**. The basic objective is to track the

- ◊ details of the candidate as given in the resume.
- ◊ Scanning details.
- ◊ Interview details.
- ◊ Results after scanning and interviews.

and to

- ◊ generate appropriate reports.

These forms are designed in such a way that the details entered in all the forms are associated with the person whose details are presently in the candidate personal form. The steps in entering the details of a resume are as follows.

- ◊ Enter the personal details from the resume in the candidate personal form.

- ◊ Navigate to the Qualification Details form. Enter the qualification details in this form.

- ◊ Navigate to the Experience Details form and enter the experience details from the resume.
- ◊ Return to the candidate personal form.

- ◊ Select the save button. This results in the following operations.
  a) Generate the next sequence number.
  b) The sequence number is assigned to the serial number in all the forms.
  c) The details are stored into the tables with the given serial number.

The serial numbers are used as the key value to identify the candidate details. After resumes are entered into the database they are given for scanning. Scanning is done by the appropriate person who is in charge of that.

The scanners will give their feedback to the HR through the scanner metric sheet , with the results of the scan. The details include

serial numbers of resumes and the respective status given to resumes after scanning. The following are the list of status that are usually assigned to resumes.

PUR - The candidate is eligible for an interview.
REJ - The candidate is rejected for now.
DRJ - The candidate is found not at all suitable and is directly rejected from further consideration.
HLD - The candidate will be considered for future recruitment needs.

After receiving these details from the scanner they are entered in the Scan details form. The steps to enter the details are as follows.

- ◊ Navigate to the candidate personal details.
- ◊ Query for the particular resume.
- ◊ Navigate to the Scan details form.
- ◊ Enter details of the scanning.
- ◊ Return to the personal form.
- ◊ Select the 'Save' button to save the details. Before saving the serial number in the personal form is assigned to the scan details record.

The scanner id can be selected from a popup list by the user. In the scanning details form there is a field called 'reference' which takes the values; 'Advertisment' , 'Head Hunters' or 'Employee Reference. If it is advertisement then the name of the newspaper or magazine and the date of advertisement are also entered. This information is basically used to find the response for the source of reference.

- ◊ If the status is REJ or DRJ then Reject letters are sent to those candidates.
- ◊ If the status is HLD then Hold letters are sent to those candidates.
- ◊ If the status is PUR, it means that these candidates are eligible for further scanning or interviews.

These letters are generated using the reports designed in the package. There would be one or in some cases there may also be a second interview. If the candidate passes these interviews then he is

called for a final interview. The Chief Executive would conduct the final interview and decide whether to offer or reject the candidates' application.

The details of all the scans and the interviews are entered into the database using the Scanning and Interview details forms. For each scanning and interview a record is created in the database.

All the forms are integrated. Data can be retrieved on all the forms by executing a query in the Candidate Personal Form which is the first navigable form. When a query is executed on the Candidate Personal Form the other details of the records queried are automatically populated on the other forms. Since this automatic population is provided the user is able to query all the details with a single operation.

Reports Design

The various reports that have been designed for this application are

- Reject Letters
- Hold Letters
- Details of Scanning
- Interview details
- Resumes received

The letter reports are the frequently taken ones. As mentioned in the system study on a particular day the letters are sent to all the candidates informing them about the result after the scanning. The letter reports are designed using the Form Letter Report format in the Reports Designer. Other reports are are not scheduled, but also taken regularly to know the performance of the system.

Development and Implementation

The completion of the design process initiates the next step of development and implementation. After the design is completed the tables are created first. These tables are the core for the development of the user interface. The processes as identified from the design of forms are developed using the Oracle Forms 4.5 and the reports are developed using the Oracle Reports 2.5.

The application is tested with sample data before implementing it at the user site. In the testing process the main issues taken into consideration are

- ◊ Data Validation and security.
- ◊ User-friendliness.
- ◊ Process validation.
- ◊ Report formats.

and

- ◊ Preparing the Feedback information on the testing process.

After completing the testing process the application is implemented at the user site and the users are given training on how to use the system. If, after testing there are some changes found to be made then they are incorporated into the application before implementation.

Meeting the goals

The main perspective of developing an application is to attain the goals set before starting the development process. Throughout the application development process this criteria is taken into care. The goals are achieved by utilizing the features of the front-ends and through a good programming practice. The features used to attain the goals are

- ⇒ Procedures and Functions.
- ⇒ Libraries
- ⇒ Triggers for validation and security.
- ⇒ Buttons and Toolbars for user-friendly interface.

  &
- ⇒ Powerful report features.

Future enhancements

The application provides interface for the current requirements of the system. The enhancements can be made by including more functionalities in forms for a higher level of user-friendly interface and provide more reports as desired by the user.

Library Information Management System

Objective

The objective of the system is to provide an user-interface which is friendly, could track the resources of the library properly, and keep track of the circulations of all the resources.

System Study

The Library & Information Center keeps track of books, Software, Periodicals and Video Cassettes. It also keeps track of all the circulations of these resources using Issue Registers. The explanation of the Library manages all these resources is given in the subsequent paragraphs.

Objective

Provide Maximum Information to Maximum number of people all the time.

About the Library

The library consists of Books, Software, Periodicals(includes Magazines and Journals), and Video Cassettes. All these resources are available for issue to any individual within IDC. The procedure adopted by the Library & Information Center in managing these resources is discussed below.

Books Management :

The library contains nearly 1500 books. The books include Manuals, User's and Developer's Guides published by Oracle, books authored by famous authors published by Oracle and other publications, and some books which are taken from major libraries outside. All the books that reach the library are entered into the register and given unique accession numbers. The accession number is basically a sequence number which uniquely identifies any book.

When a book is issued an entry is made in the Issue Register with the following details.

* Accession no. * Employee-id
* Employee name * Date of issue.
and * Employee's signature.

When a book is returned the entry for that book is closed by entering the details like return date with the employee's signature.

Management of Software :

The library also manages the software that are available within IDC. All the software are given unique identification numbers. This id is basically a serial number which is given to the software when it reaches the library. The details of the software are entered into the register as soon as it is received. The details are

* Title * Media * Sets
* Number of media * Description.

On issue of a media of software, the details of the employee and the date of issue are entered into the register. When it is returned the details of the employee who returned it are deleted for that item.

Video Cassette Management :

The library also manages Video Cassettes of the Company. These video cassettes contain the video clippings of presentations, demos and something official. All the video cassettes are given unique serial number for identification. The following details are entered for each video cassette in the register.

* Serial Number * Title
* Copies * Notes

When a video cassette is issued to an employee the employee details along with serial no and title of the video cassette are entered. Then this entry is deleted when the employee returns the video cassette.

Management of Periodicals :

The Library also receives Periodicals (Magazines & Journals) regularly. The back issues of these periodicals are available for issue to any Oracle staff. The Periodicals are identified by their name and

the date/period of issue. When one of these is issued, the following details are entered into the Issue Register.

* Title
* Date of Issue
* Employee id and
* Date / Period of Issue
* Employee Name.

When returned the return date is put in the respective entry with the signature of the Employee returning it.

Formats

* Issue Register - For recording the issue of resources.
* Gate Pass - Issued along with the book for check out at the security desk.

Proposed Solution and Goals

The tables for application are designed for the management of all the resources in the library. The tables are correlated when they belong to the same resource. The tables associated with a single resource are associated by a common field. The following table gives the identification key for all the resources.

Resource	Association Key
Books database	Accession Number of the Book
Software database	Serial Number of the software
Video Cassette	Serial Number of the video cassette.

The goals of the application are as follows :

* provide user interface for tracking the details of the resources of the library.
* validation and security
* provide maximum functionalities for accessing the data from the database.
* minimize the data entered by the user.
  &
* generate reports as required for the user.

Application Design

Data Design

The needs for the design as identified from the system study are as follows. The tables are to be designed for the various resources to incorporate for entering the details of the sources, Issuing the resources and reservation (only in the case of Books). Taking these issues into consideration the tables are designed. The listing of these tables are given under **Section-II of Appendix A**.

Forms Design

The forms design is the process designing the forms and also identifying the processes to be incorporated in them. The Management of each resource in the library are done with the help of a separate set of forms. The forms design for the management of the library resources are explained under the respective headings below.

Books Management :

The Books Management basically consists of 5 forms. They are the Books Entry form, Books Issue Form, Books Reserve Form, Circulation Form and Employee Register Form. For the screen layouts of these forms refer **Section-II of Appendix B**.

Books Entry Form :

This form is where the user has to register the new books into the database. The user can query for any book in this form. In this form the user is given a 'parallel query option' in order to view any book within the queried set. A List Item is used to effect this function. When a query is executed the titles are selected into a list item and list item is displayed on the screen. When the user changes the list item to a desired value the details for that book are populated in the fields. Thus the user can realise a parallel query option.

The order in which the user registers a book into the database is as follows.

- ◊ Enter details of the book.

- ◊ Select the 'Save' Button on the same screen.
- ◊ User is prompted with the accession numbers that will be assigned to the books. If the user accepts, the following takes place. If not the selection is void.
- ◊ The entry is registered through the following steps.
  a) Check the number of copies(say n).
  b) Then n copies of this record are saved in the database with Copyno from 1 to n.
  c) Each copy is given accession numbers in a using a sequence generator.

In this form there is a 'Status' button which when selected displays the status of the Book like 'Book is issued' or 'Book available for issue/reservation'.

Books Issue Form :

This form is used to register the issue of a book. In the case of an issue the user has to follow the steps listed below.

- ◊ Navigate to this form from the main menu.
- ◊ Enter the Accession no. and the system automatically displays the title and copyno of that book. If the book with the entered accession number is already issued then the user is prompted with a message.
- ◊ Select the employee-id and name from a popup list.
- ◊ Date of Issue(system date) and Due date(15 days from system date) are populated automatically.
- ◊ Select the 'Save' button to effect the issue. On selection the issue details are saved to the circulation table. Before saving, the accession number and date of issue are added onto the corresponding employee record.

Books Reserve Form :

This form is used to reserve a particular book. The steps involved in the reservation process are as follows.

- ◊ Navigate to the form from the main menu.

- ◊ Enter the accession number desired. Accession number is validated. The system then populates the title and the copyno for that book. If the book is already reserved taken by the user is prompted with a message and not allowed to carry on further . The system also validates by not allowing the user to reserve a book which is available for Issue.

- ◊ Enter employee id and name by selecting them from a list.

- ◊ The system date is taken as the date of reservation .

- ◊ Select the 'Save' button to commit the reservation into the database. If the employee has already reserved for five books then the system does not allow this reservation to happen and prompts the user with a message. If not, the reservation details are saved onto the circulation table. Before saving the accession number and date of issue are added onto the corresponding employee record.

Circulation Form :

The circulation form is based on the circulation table which contains details about all the circulations. A circulation entry contains the issue and reservation details of a particular book. In this form the user can perform the following operations.

- ◊ Query for a particular desired circulation.

- ◊ This is form is used to delete any circulation. Whenever a book is returned the circulation details are to be deleted to make the book available for future issue. So, when a issued book is returned the particular book is queried on this form and by selecting the 'Delete' button the circulation can deleted. This book is then available for issue.

- ◊ In this form the user can only query but he cannot update or insert any record for security purpose.

Employee Register Form :

The employee form is associated with the Employee table. It gives details about all the employees. It contains the empid,empname, accession numbers of all the books taken by that employee along with the date of issue and the accession numbers of all the books reserved by that employee along with the date of reservation. In this form the details of any employee can be queried and seen. The user can view the details of the books by double-clicking on any of the accession numbers on the form.

Software Management :

The software management contains three basic forms. They are Software Entry Form, Issue of Software and Log Register Form.

Software Entry Form :

This form is associated with the swlib table. The following operations are designed in this form.

- ◊ Create new entries. In the creation process first the user should enter the details and select the 'Save' button. On selection new serial number(s) are given and the details are stored onto the database. There is a field called 'sets' in which the no. of copies is entered. Before saving, required number of copies for that software are created with the same details. Serial nos. and setno(s) are assigned and then all these records are committed onto the database.

- ◊ Query & Update any existing software details.

Issue of Software Form :

This form is associated with the swreg table. The issue of any software must be registered through this form. The software is available on media like cd-rom & floppy diskettes. In the following portions the reference to software refers to a cd-rom or floppy diskette containing the software. The issue of software involves the following steps.

- ◊ Enter the serial no of the software. The system automatically populates the values in software name, set no, version, media type and num media. If the s/w has already been issued then the user is prompted with a message and not allowed to proceed further until a valid serial no is entered.

- ◊ Enter the employee id and employee name by selecting them from the popup list.

- ◊ Select the 'Save' button to issue the s/w. On selection the issue details are saved in the swreg table.

When a software is returned the entry for that software should be queried for and by selecting the 'Returned' button the issue entry can be deleted from the database. Now that software becomes available for issue.

Log Register Form :

The log register form is associated with the swlog table. When a software is returned the entry of that software is removed from the database by using the 'Returned' button on the Issue of Software form. Before removing the entry the details about the issue are inserted into the Log reg table. This table is established for the purpose of future reference.

Video Cassette Management :

This module has two forms. They are VC Entry form and VC Issue form.

VC Entry Form :

The VC Entry Form is associated with the VC_mast table. This form allows the user to create new entries for video cassettes and to view the existing video cassette details. The steps to follow while creating new entries are as follows.

- ◊ Enter details of the new Video Cassette.

- ◊ Select the 'Save' button on the form.

◊ Saving Process :

Assign the number of copies to n.
'n' records with the same details are inserted with serial no and copyno being assigned sequentially.
The transactions are committed.

VC Issue Form :

This form is associated with the VC Issue Reg table. It is used for issuing a video cassette. The user can navigate to this form from the VC Entry Form. On navigation so this form is populated with values for the serial no on the VC Entry Form. If already issued , all the fields will get populated otherwise only some fields are populated. Then the user can enter the details of the employee taking the video cassette and select the 'Save' button on the form. On selection the details are saved onto the database.

When a video cassette is returned then the issue entry is deleted from the VC Circulation Form. The steps include

◊ Query for the particular Video Cassette.

◊ Select the 'Returned' button.

◊ On selection the issue entry is deleted from the database and the video cassette is marked available for issue.

Periodicals Management

This module of the package is designed with a single form. This module is the simplest of all the forms in this package. The form is called the 'Periodicals Form'.

Periodicals Form

In this form the provisions for the entry and issue are incorporated. The user has to enter the details of a Periodical and use the 'Save' button to create a record in the table. The issue process takes the following steps.

◊ Query the periodical which is to be issued on the form.
◊ Enter the employee details employee-id and employee name along with is issue date.
◊ Select the 'Save' button the commit the issue details.

The following steps effect the return of a periodical.

- ◊ Query the record containing the periodical which is being returned.
- ◊ Select the 'Returned' button to effect the return of that periodical. Selecting this button would result in the following operations. Clear the employee-id,employee-name, issue-date and due-date fields and save the details on to the database.

To identify whether a periodical is issued or not the user can query for that periodical and see whether there are details in the employee-id,employee name, issue date and due date fields. If these fields contain valid values then the periodical is issued. Otherwise the periodical is not issued to anyone and is available in the library.

Reports Design

The various reports that have been designed are

- ♦ Selected List of Books.
- ♦ Overdue Books.
- ♦ Video Cassette Listing.
- ♦ Overdue software.
- ♦ Software Listing.

The reports are designed in the format as required for the user. The reports can be invoked through the menus that are built in the package.

Development and Implementation

The completion of the design process initiates the next step of development and implementation. After the design is completed the tables are created first. These tables are the core for the development of the user interface. The processes as identified from the design of forms are developed using the Oracle Forms 4.5 and the reports are developed using the Oracle Reports 2.5.

The application is tested with sample data before implementing it at the user site. In the testing process the main issues taken into consideration are

- Data Validation and security.
- User-friendliness.
- Process validation.
- Report formats.
  &
- Preparing the Feedback information on the testing process.

After completing the testing process the application is implemented at the user site and the users are given training on how to use the system. If, after testing some changes are found to be made then they are incorporated into the application before implementation.

Meeting the goals

The main perspective of developing process is to attain the goals set before starting the application. Throughout the application development process this criteria is taken into care. The goals are achieved by utilizing the features of the front-ends and through a good programming practice. The features used to attain the goals are

⇒ Procedures and Functions.
⇒ Common Libraries
⇒ Triggers for validation and security.
⇒ Buttons and Toolbars for user-friendly interface.
⇒ Menu interface.
  &
⇒ Powerful report features.

Future Enhancements

The package is developed to incorporate all the current requirements. In the future the system can be enhanced to provide more funtionalities as required and it could be improved by providing more reports. The changes can be made easily because of the flexible structure used in the design of the package.

Hardware Inventory Control System

Objective

The objectives of the package are to provide an user-friendly interface for tracking the hardware resources, validate the data before transferring it to the database and provide maximum functionalities to access the information stored in the database.

System Study

Objective

To maintain all the information about the Hardware resources within the company.

Inputs

- New items purchased through vendors.
- Systems Installed.
- Location Information.

Receipt of Items

The hardware resources purchased by Oracle come through the STP. All the items before reaching Oracle are serially numbered at STP. When the items enter IDC the details about the items are entered into a tracking sheet with system id as -1. These items are ones which are available for use.

Assignment of Items

The items which are attached to a system are entered in the tracking sheet of the system they are attached to. The System Tracking sheet contains information of a system and the items attached to it. In the case of an independent item like printer or modem a system tracking sheet is prepared with a new system id and the item is entered in the same sheet. In this case, the system cannot have more than one item excepts the printer or modem itself.

Shifting Items

The items attached to one system may be detached from the system and attached to some other system. In this case in the tracking sheet of the source system, a note is made of the transfer against the transferred item's entry. A new entry for the item is made in the tracking sheet of the system to which the item is attached to. In this entry a note is made of the transfer from which system.

Recording the transactions

The details of the items are entered into the database as and when they are received. Items are given serial numbers when they are entered into the database. The items which are not attached to any system are attached to a dummy system. When the items get connected to a system the system id is put in the items's record. The sequence number given to items and the system are unique and used to identify the them anytime in the future.

When the items are grouped as a system then the system as a whole is given a serial number called the system id. This is unique and this sequence number along with the details of the system are used to identify it.

The information about the location where a system is installed and used are also recorded in the system tracking sheet. The information includes the ioport-no, username and the development-group to which the user belongs.

Standards

- System Tracking Sheet.
- System and Location Report.
- System details.

Proposed Solution & Goals

The application would use three different tables namely the items, system and location. The items table contains details of all the

items currently in the company. The system table contain details of all the systems installed and a dummy system for unused items. The location table would contain the details of all the locations to which the systems are connected to.

The items are given unique sequence numbers called as the item id. The systems are given unique sequence numbers called as the system id. The locations are identified by a unique value called ioport address. The items and system table are associated by the system id column. The system and location tables are associated by the ioport column.

The goals of the application are as follows :

- ⇒ provide user interface for tracking the item,system and location details.
- ⇒ validation & Security
- ⇒ provide maximum functionalities for accessing the data from the database.

Application Design

Data Design

The system requires to have details of items, system and Location. The details are all associated by one or more factors, for example, the items are associated with systems and the systems are associated with the locations they are connected to. Hence the tables are designed in such a manner to accommodate these details and their relations. The structure of the tables used in this application are presented under **Section-III of Appendix A.**

The items and system table are associated by the system id column. In the items table the system id column of each row has a system id of the system to which the item is attached to. This system id should be present in the system table. If an item is not attached to any installed system then the system id for that item would have a value '-1' which is a dummy system.

The system and location table are associated by the ioport column which contains the ioport address of a location. In the system table each system (i.e. each row) has the ioport value of the

location to which it is connected to. Again, a location with this ioport value must be present in the location table for a system to be connected to a location.

Forms Design

The forms design is the process of designing of User-Interface and the design of the procedures required to implement the application. There are basically three forms. They are Items Entry Form, System cum Location Form and the Shift Items Form. For the screen layouts of these forms, refer to **Section-III of Appendix B**. The first two are used get data from the user and the third one is used for shifting the items from one system to another.

Any system can be assigned only to an existing location. The location is identified by the ioport-id in the Location table. Any items can be assigned only to an existing system. A system is identified by the system-id, a sequence no. given to that system when it was created using the System cum Location form.

Items Entry Form

This form is associated with the Items table. It is used to enter new items into the database and to view details about the items already entered into the database. The steps involved in creating the items are as listed below.

- ◊ Enter the details of an item in the Item details form.
- ◊ Select the 'Save' button on the form. On selection the item id is assigned the next sequence number from a sequence generator. Then the details are inserted into the table.
- ◊ All the items when created are assigned to a dummy system with system id as '-1'.

System cum Location Form

This form is used to create new entries for system and location tables and edit details of the system and location. There are two blocks 'System' and 'Location' in which details of the system and location can be entered respectively. After the details have been entered, selecting the appropriate 'Save' button inserts the data into the database. Sequence numbers are assigned to systems when they

are created using a sequence number generator. A system can be assigned only to an existing location. So to have a system installed first the location entry must be created. The ioport-id is given by the user for any location. In this form the following option is built-in.

◊ If the user is in the system block and has populated some records in it then the location details for that system can be populated in the location block by double clicking on the ioport field in the system block and vice versa.

Shift Items Form

This form is used for shifting the items from one system to another. After the newly arrived items have been entered into the database using the Items Entry Form they can be attached to the desired system using this form. The steps involved in the shifting process are as follows.

◊ Query the target system to which the items are to be attached on the first screen using the 'Query' button.

◊ Select the 'Attach' button to navigate to the next screen.

◊ Query the items which are to be shifted to the target system queried on the first screen.

◊ Set the check box value to 'True' for those items which have to be attached to the target system (and detached from the system the items are currently attached to).

◊ Select the 'Done' button on this screen.

◊ This attaches the selected items to the target system, navigates to the first screen and displays the target system with the old items and the newly attached items.

Reports Design

The various reports that have been designed are

- System and Location details report.
- System with Attached Items.

- Selected Items List.

The reports can be invoked through menus that are designed in the application.

Development and Implementation

The completion of the design process initiates the next step of development and implementation. After the design is completed the tables are created first. These tables are the core for the development of the user interface. The processes as identified from the design of forms are developed using the Oracle Forms 4.5 and the reports are developed using the Oracle Reports 2.5.

The application is tested with sample data before implementing it at the user site. In the testing process the main issues taken into consideration are

- ◊ Data Validation and security.
- ◊ User-friendliness.
- ◊ Process validation.
- ◊ Report formats.
  &
- ◊ Preparing the Feedback information on the testing process.

After completing the testing process the application is implemented at the user site and the users are given training on how to use the system. If after testing if some changes are found to be made then they are incorporated into the application before implementation.

Meeting the goals

The main perspective of developing is to attain the goals set before starting the application. Throughout the application development process this criteria is taken into care. The goals are achieved by utilizing the features of the front-ends and through a good programming practice. The features used to attain the goals are

⇒ Procedures and Functions.

⇒ Common Libraries
⇒ Triggers for validation and security.
⇒ Buttons and Toolbars for user-friendliness.
⇒ Powerful report features.

Future Enhancements

The package is developed with all the current requirements being incorporated into it. In the future the system can be enhanced to provide for more funtionalities when required and it could be improved by providing more reports. The changes can be made easily because of the flexible structure used in the design of the package.

Chapter V

BENEFITS

As a project trainee at Oracle IDC, I have benefited a lot. I have been provided with many facilities during the time of my project *. The major facilities are

- E-mail access - through which I could communicate to anyone on the internet over electronic mail via Oracle Office(a product of Oracle).

- Access to World Wide Web - This enabled me to have access to lots of information available on the WWW and learn new skills and gain addition knowledge on the state-of-the-art technology.

- Unrestricted Worktime - I could use these resources around the clock. No restrictions of working hours were imposed for my project work.

- In-house Training - Being a trainee, I could utilize the unique skills of the experienced trainers at Oracle.

- Access to Library books & software.

- Above all I had experienced a great time being a trainee in an IT firm which is currently the world's leading provider of software for managing the information.

These facilities helped me understand and have sound knowledge of state-of-the-art technology. Being at Oracle, I have really gained a lot of skills and information. I certainly believe that this experience will help me to lift my career in the field of RDBMS, especially in Oracle.

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* This has given me exposure to some state-of-the-art tools used in the current-day workplace.

Chapter VI

SUMMARY

The project has been a creditable experience for me. During my project work I learnt the RDBMS technology and concepts. The project also helped me to learn Oracle7 Server concepts, SQL Language, PL/SQL and the Developer/2000 products Forms 4.5 and Reports 2.5. The guidance given by the technical professionals at Oracle have really helped me to learn and understand the concepts easily and apply them at times of need. I believe that all that I have learnt at Oracle will definitely help me to build a strong career in the field of RDBMS.

Chapter VII

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Appendix A

(Table Structures)

Section - I

TABLES USED FOR TRACKING RESUMES

Table - CANDIDATE_PERSONAL.
Primary Key - SERIAL _ NO.
Description - This table contains the personal details of all the candidates who has applied.

Column Name	Null?	Column Type
SERIAL_NO	NOT NULL	NUMBER(10)
NAME	NOT NULL	CHAR(50)
CURR_ADDRESS1	NOT NULL	CHAR(40)
CURR_ADDRESS2		CHAR(40)
CURR_ADDRESS3		CHAR(40)
CURR_ADDRESS4		CHAR(40)
CURR_ADDRESS5		CHAR(40)
CURR_ADDRESS6		CHAR(40)
CITY_CODE		CHAR(3)
AGE		NUMBER
DOB		DATE
PHONE_OFF		CHAR(20)
PHONE_RES		CHAR(20)
PERM_ADDRESS1		CHAR(40)
PERM_ADDRESS2		CHAR(40)
PERM_ADDRESS3		CHAR(40)
PERM_ADDRESS4		CHAR(40)
PERM_ADDRESS5		CHAR(40)
PERM_ADDRESS6		CHAR(40)
DETAILS		VARCHAR2(1)
TOTAL_EXP		NUMBER(5)
GENDOR		CHAR(1)
SHORT_NAME		VARCHAR2(30)

Table - CANDIDATE_QUALIFICATION.
Primary Key - SERIAL _ NO.
Description - This table contains qualification details of the candidates.

Column Name	Null?	Column Type
SERIAL_NO	NOT NULL	NUMBER
QUALIFICATION		CHAR(40)
CLASS_OR_PERC		CHAR(10)
YEAR_OF_PASS		CHAR(4)
UNIVERSITY		CHAR(40)

Table - **CANDIDATE_EXPERIENCE.**
Primary Key - **SERIAL _ NO.**
Description - **This table contains the experience details of all the candidates.**

Column Name	Null?	Column Type
SERIAL_NO	NOT NULL	NUMBER
ORGANIZATION		CHAR(40)
FROM_DATE		DATE
TO_DATE		DATE
DESIGNATION		CHAR(40)
AREA_OF_WORK		VARCHAR2(3)

Table - **APPLICATION_PROCESS_MAST.**
Primary Key - **SERIAL _ NO.**
Description - **This table contains the scanning details for the candidates whose resumes are scanned at least once.**

Column Name	Null?	Column Type
SERIAL_NO	NOT NULL	NUMBER
RECD_AT_IDC		DATE
SCANNER		CHAR(8)
SCAN_DATE		DATE
STATUS		CHAR(3)
RET_SCAN_DATE		DATE
REFERENCE		VARCHAR2(30)
DATE_OF_ENTRY		DATE

Table - APPLICATION_PROCESS_DETAIL.
Primary Key - SERIAL _ NO.
Description - This table contains the interview details for candidates who have attended at least one interview.

Column Name	Null?	Column Type
SERIAL_NO	NOT NULL	NUMBER
INTERVIEWER		CHAR(8)
INTER_DATE		DATE
INTER_TIME		CHAR(6)
COMMENTS		CHAR(60)

Section - II

TABLES USED IN LIBRARY INFORMATION MANAGEMENT SYSTEM

Table Name - LIB_MAST
Primary Key - Accession Number(ACCNO).
Description - Contains details about all the books in the library.

Column Name	Null?	Column Type
ACCNO	NOT NULL	NUMBER(6)
TITLE		VARCHAR2(100)
AUTHORS		VARCHAR2(75)
PUBLISHER		VARCHAR2(50)
YEAROFPUB		VARCHAR2(10)
COLLATION		VARCHAR2(10)
SERIES		VARCHAR2(50)
ISBN		VARCHAR2(15)
KEYWORDS		VARCHAR2(50)
NOTES		VARCHAR2(100)
CALLNO		VARCHAR2(20)
COPYNO		NUMBER(3)
COPIES		NUMBER(3)
SUBJECT		VARCHAR2(50)

Table Name - CIRCULATION
Primary Key - Accession Number (ACCNO)
Description - Contains details about all the Circualations of the books from the library.

Column Name	Null?	Column Type
ACCNO	NOT NULL	NUMBER(6)
TITLE		VARCHAR2(100)
COPYNO		NUMBER(2)
CHECKED		VARCHAR2(1)
EMPID		VARCHAR2(8)
EMPNAME		VARCHAR2(30)
CHKDATE		DATE
RETDATE		DATE
RESERVED		VARCHAR2(1)
RESID		VARCHAR2(8)
RESNAME		VARCHAR2(30)
RESDATE		DATE

Table - EMPLOYEE
Key - Employee Id(EMPID).
Description - Contains all details about the books issued to and reserved by the employees.

Column Name	Null?	Column Type
EMPID	NOT NULL	VARCHAR2(8)
EMPNAME		VARCHAR2(30)
IANO1		NUMBER(6)
IDATE1		DATE
IANO2		NUMBER(6)
IDATE2		DATE
IANO3		NUMBER(6)
IDATE3		DATE
IANO4		NUMBER(6)
IDATE4		DATE
IANO5		NUMBER(6)
IDATE5		DATE
RANO1		NUMBER(6)
RDATE1		DATE
RANO2		NUMBER(6)
RDATE2		DATE
RANO3		NUMBER(6)
RDATE3		DATE
RANO4		NUMBER(6)
RDATE4		DATE
RANO5		NUMBER(6)
RDATE5		DATE
ICOUNT		NUMBER(2)
RCOUNT		NUMBER(2)

Table - SWLIB
Primary Key - Serial _ Number.
Description - This contains details about all the software available in the Library.

Column Name	Null?	Column Type
SERIAL_NUMBER	NOT NULL	NUMBER(8)
NAME	NOT NULL	VARCHAR2(100)
VERSION		VARCHAR2(15)
BOX_NO		VARCHAR2(10)
NUM_MEDIA		VARCHAR2(15)
MEDIA_TYPE		VARCHAR2(20)
SETS		NUMBER(5)
DESCRIPTION		VARCHAR2(1000)
SETNO		NUMBER(5)

Table - **SWREG**
Primary Key - **Serial _ Number.**
Description - **This table contains details of all the circulations of the software issued from the library.**

Column Name	Null?	Column Type
SERIAL_NUMBER	NOT NULL	NUMBER(8)
NAME		VARCHAR2(30)
SETNO		NUMBER(5)
EMPID		VARCHAR2(8)
EMPNAME		VARCHAR2(30)
ISSDATE		DATE
VERSION		VARCHAR2(15)
MEDIA_TYPE		VARCHAR2(20)
NUM_MEDIA		VARCHAR2(15)

Table - **SWLOG**
Primary Key - **Serial _ Number.**
Description - **This table contains all the previous issue details of software from the library.**

Column Name	Null?	Column Type
SERIAL_NUMBER	NOT NULL	NUMBER(8)
NAME	NOT NULL	VARCHAR2(30)
VERSION		VARCHAR2(15)
BOX_NO		VARCHAR2(10)
NUM_MEDIA		VARCHAR2(15)
MEDIA_TYPE		VARCHAR2(20)
SETS		NUMBER(5)
DESCRIPTION		VARCHAR2(1000)
EMPID		CHAR(6)
EMPNAME		CHAR(30)
ISSDATE		DATE
RETDATE		DATE
SETNO		NUMBER(5)

Table - VC_MAST
Primary Key - Serial _ No.
Description - This table contains details of all the video cassettes in the Library.

Column Name	Null?	Column Type
SERIAL_NO	NOT NULL	NUMBER(5)
TITLE	NOT NULL	VARCHAR2(150)
COPIES		NUMBER(3)
COPYNO		NUMBER(3)
NOTES		VARCHAR2(100)

Table - VC_ISSUE_REG.
Primary Key - Serial _ No.
Description - This table contains details of all the issues of Video Cassettes from the library.

Column Name	Null?	Column Type
SERIAL_NO	NOT NULL	NUMBER(5)
TITLE	NOT NULL	VARCHAR2(150)
COPYNO		NUMBER(3)
EMPID		VARCHAR2(8)
EMPNAME		VARCHAR2(30)
ISSUE_DATE		DATE
DUE_DATE		DATE

Table - **PERIODICALS**
Description - **Contains details of all the periodicals and their circulation.**

Column Name	Null?	Column Type
TITLE	NOT NULL	VARCHAR2(60)
ISSUE_DATED		VARCHAR2(30)
EMPID		VARCHAR2(8)
EMPNAME		VARCHAR2(30)
DATE_OF_ISSUE		DATE
DUE_DATE		DATE

Section - III

Tables used in Hardware Inventory Control System

Table - ITEMS.
Primary Key - ITEM_ID
Description - This table contains details about all the items available for use within the company.

Colum Name	Null?	Column Type
ITEM_ID	NOT NULL	NUMBER(10)
SYSTEM_ID		NUMBER(8)
SERIAL_NUMBER		VARCHAR2(30)
PURCHASE_ORDER		VARCHAR2(30)
BOND_NUMBER		VARCHAR2(30)
STP_ENTRY_DATE		DATE
MAKE_MANUF		VARCHAR2(30)
MODEL		VARCHAR2(30)
LOCAL_SUPPLIER		VARCHAR2(30)
CATEGORY		VARCHAR2(30)
INSTALLED_BY		VARCHAR2(8)
INSTALL_DATE		DATE
FIRST_INSTALLED		DATE
VALUE		NUMBER
WARRANTY		VARCHAR2(8)
WARRANTY_START		DATE
WARRANTY_END		DATE
AMC_PROVIDER		VARCHAR2(30)
DESCRIPTION		VARCHAR2(30)

Table - SYSTEM.
Primary Key - System_Id.
Description - This table contains details about all the systems installed within the company.

Column Name	Null?	Column Type
SYSTEM_ID	NOT NULL	NUMBER(8)
IOPORT		VARCHAR2(5)
HOSTNAME		VARCHAR2(10)
IP_ADDR		VARCHAR2(15)

DESCRIPTION VARCHAR2(60)

Table - LOCATION.
Primary Key - IOPORT.
Description - This table contains details about all the locations existing within Oracle.

Column Name	Null?	Column Type
IOPORT	NOT NULL	VARCHAR2(5)
USERNAME		VARCHAR2(8)
DEV_GROUP		VARCHAR2(20)

Appendix B

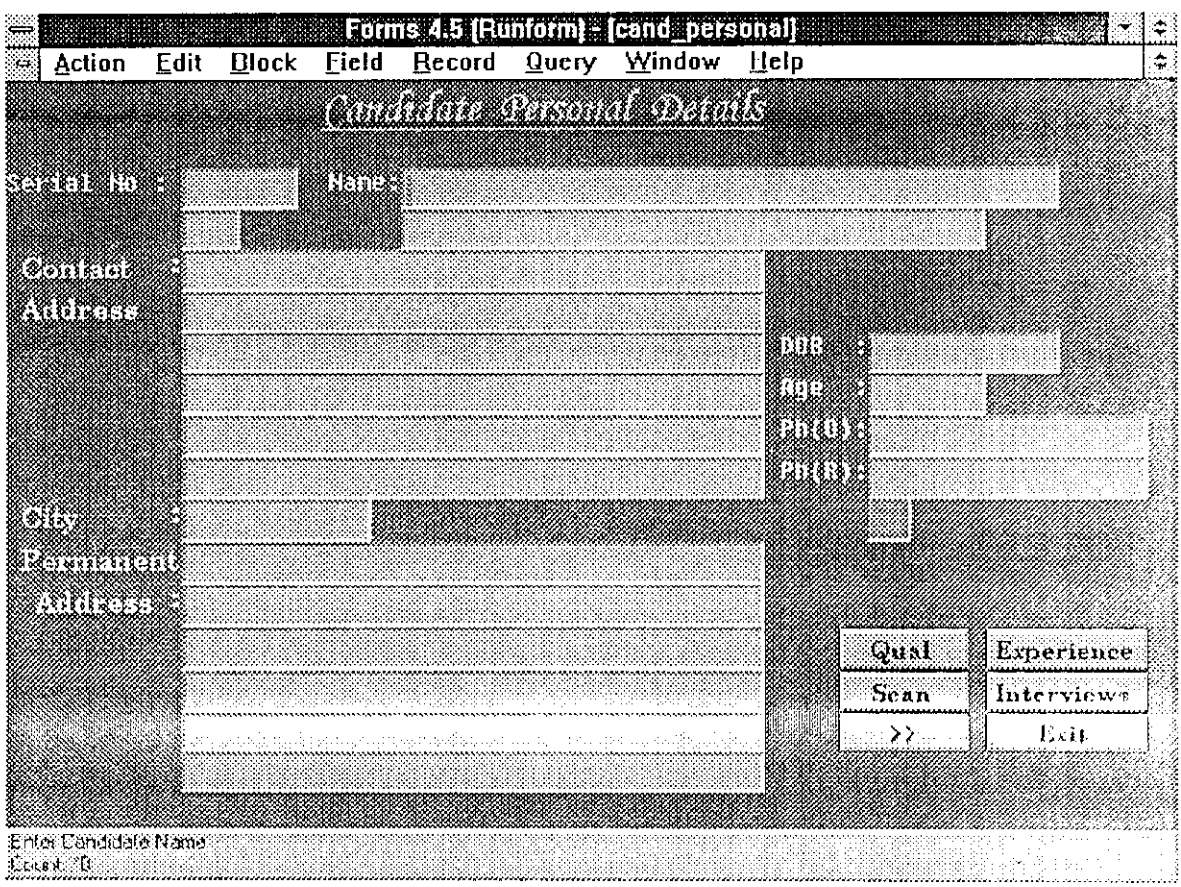
(Screen Layouts)

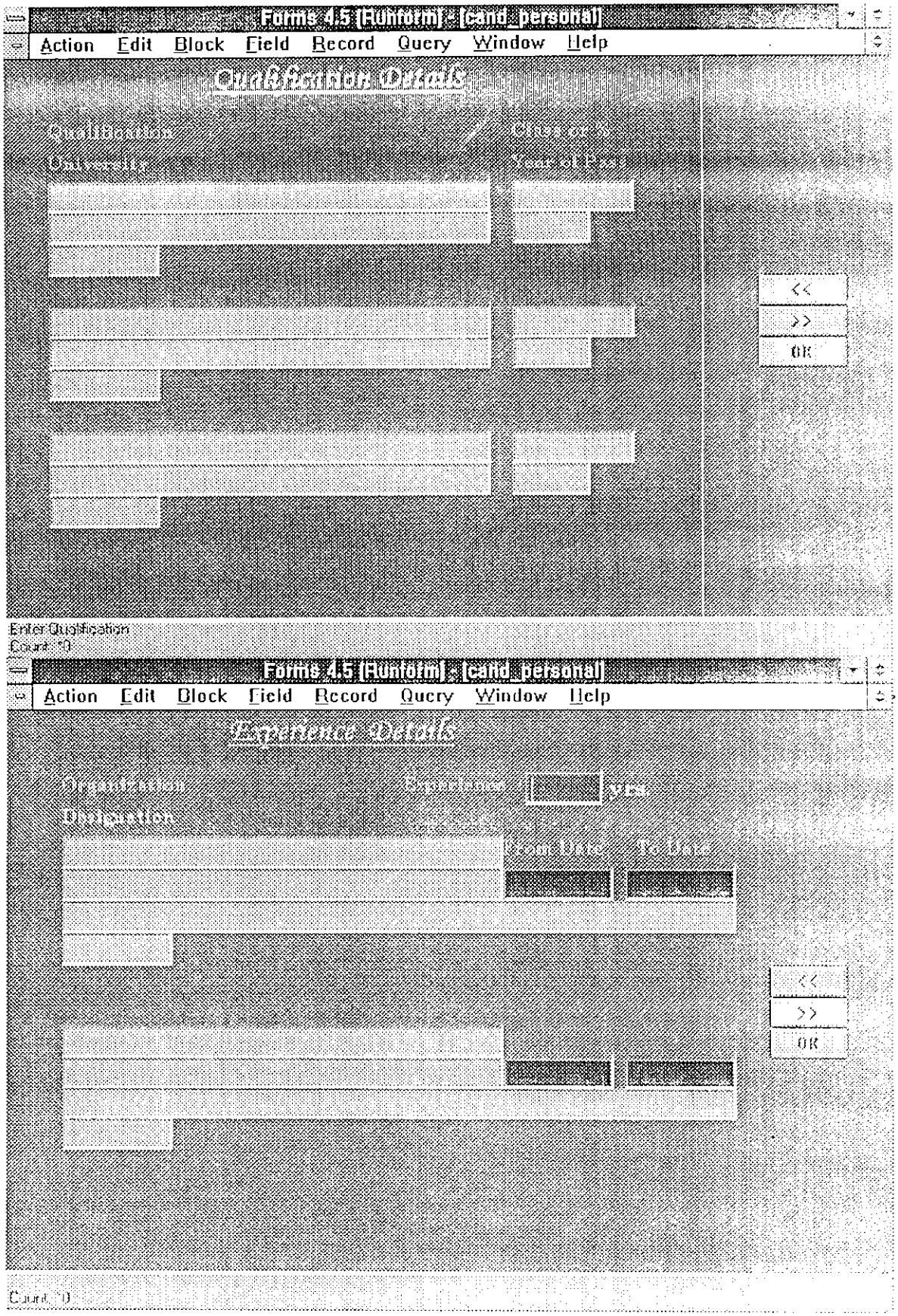
Section I

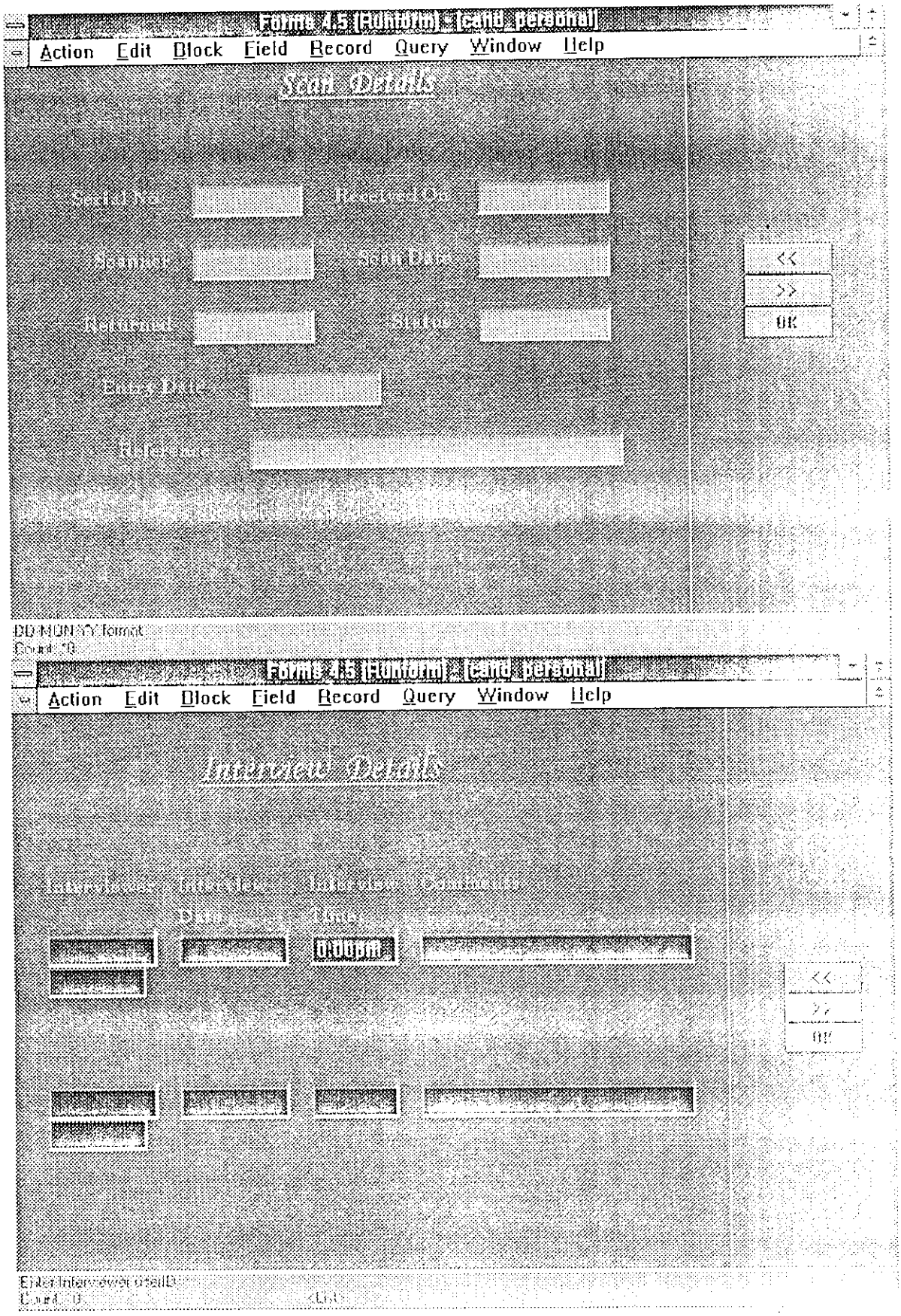
Resume Tracking Application

List of Forms :

1. Candidate Personal Details
2. Candidate Qualification
3. Candidate Experience
4. Scanning Details
5. Interview Details




Forms 4.5 [Runform] - [cand_personal]
Action Edit Block Field Record Query Window Help
Qualification Details
Qualification
University
Year of Pass
<<
>>
OR
Enter Qualification
Count: 0
Forms 4.5 [Runform] - [cand_personal]
Action Edit Block Field Record Query Window Help
Experience Details
Organization
Designation
Years
Duration
From Date
To Date
<<
>>
OR
Count: 0

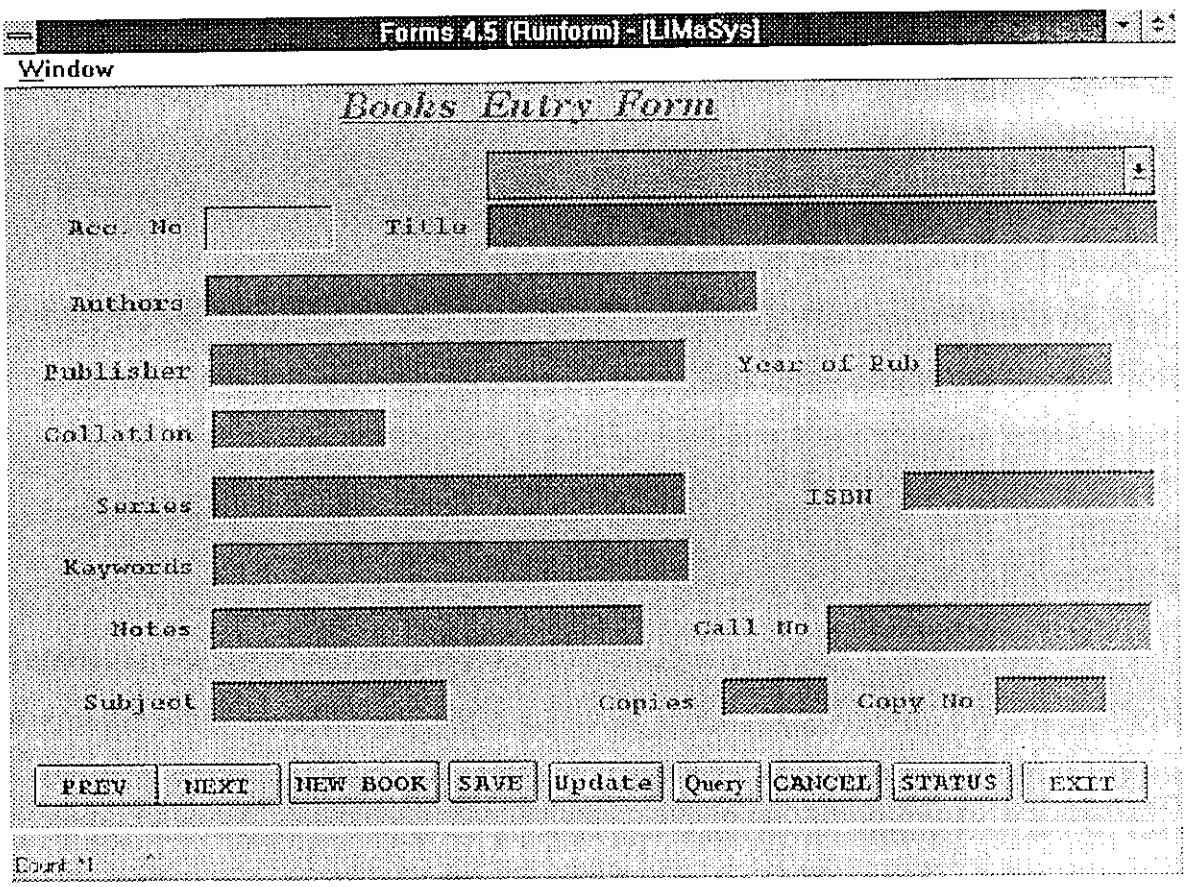

Forms 4.5 [Runform] - [card_personal]
Action Edit Block Field Record Query Window Help
Card Details
<<
>>
OK
Forms 4.5 [Runform] - [card_personal]
Action Edit Block Field Record Query Window Help
Interview Details
<<
>>
OK

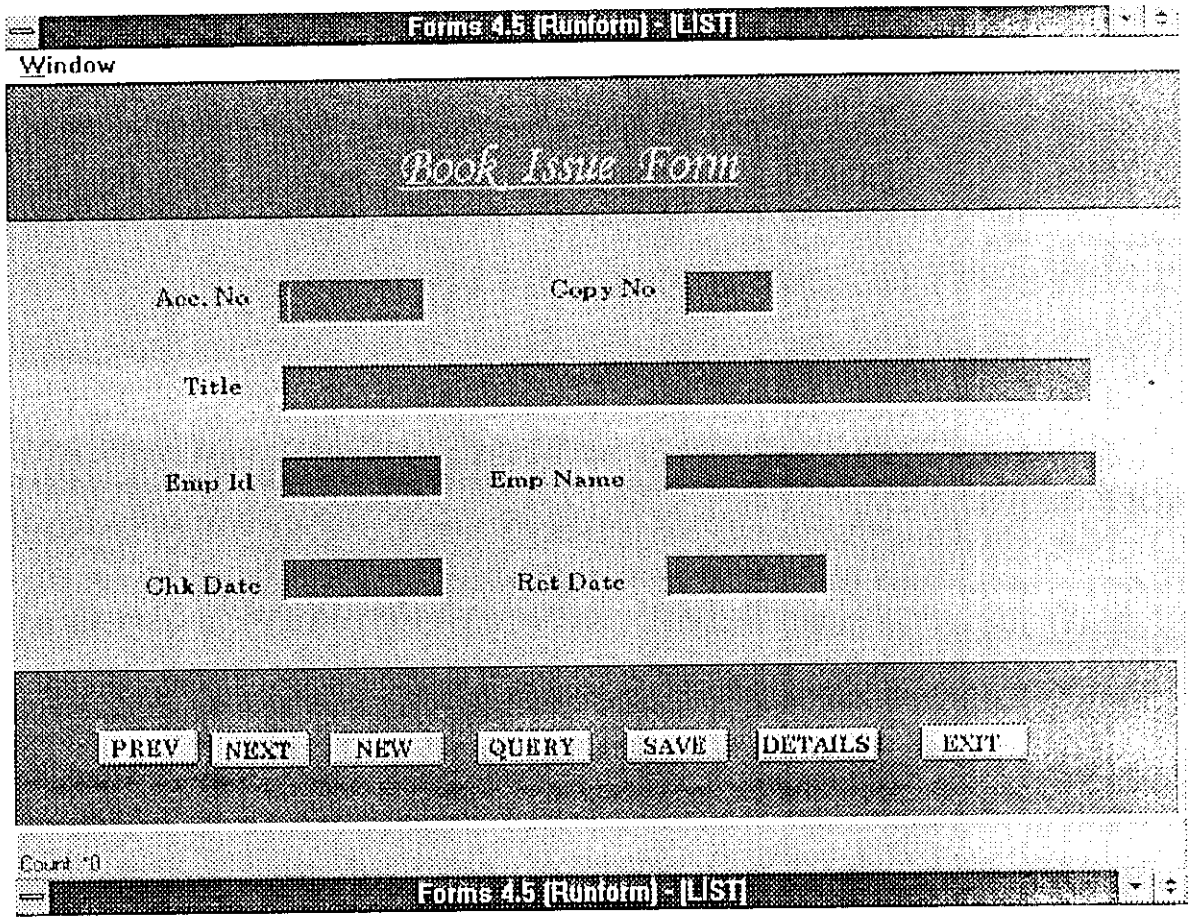
Section II

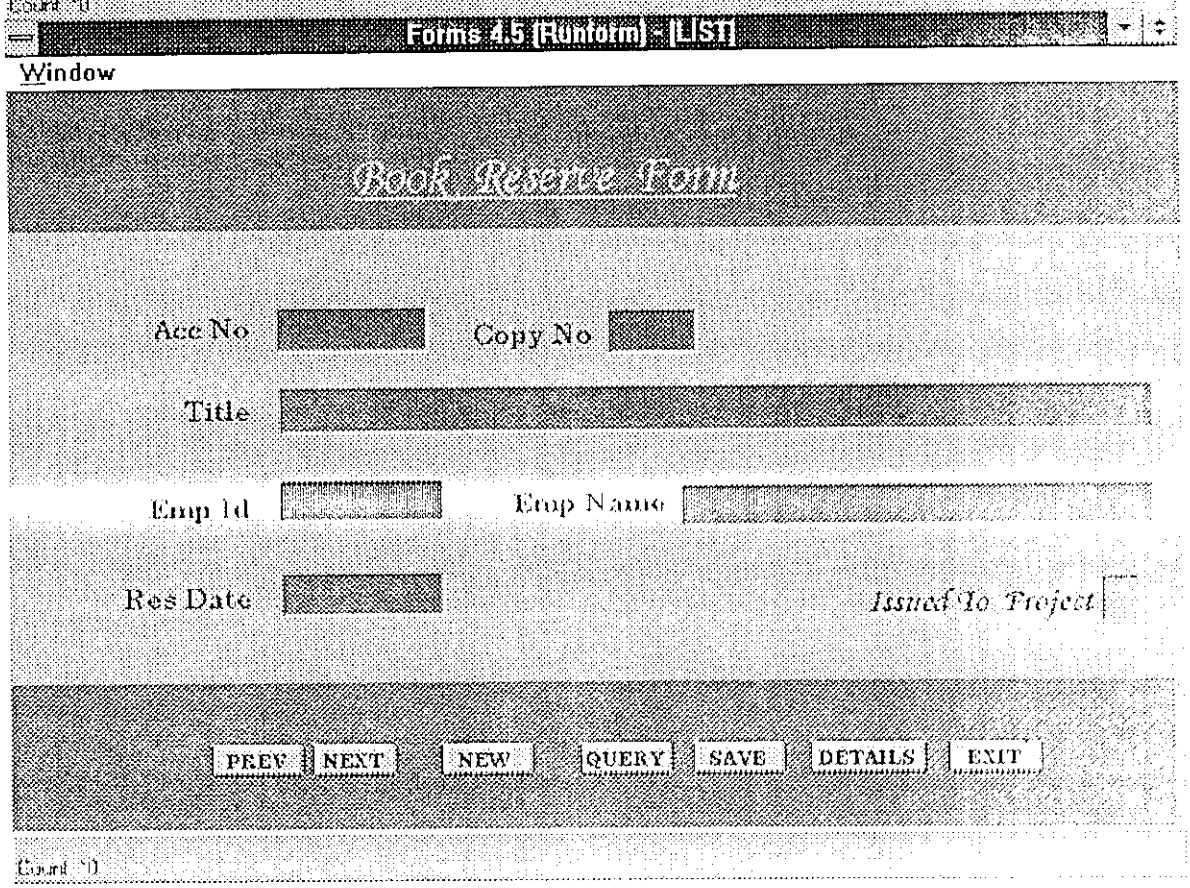
Library Information Management System

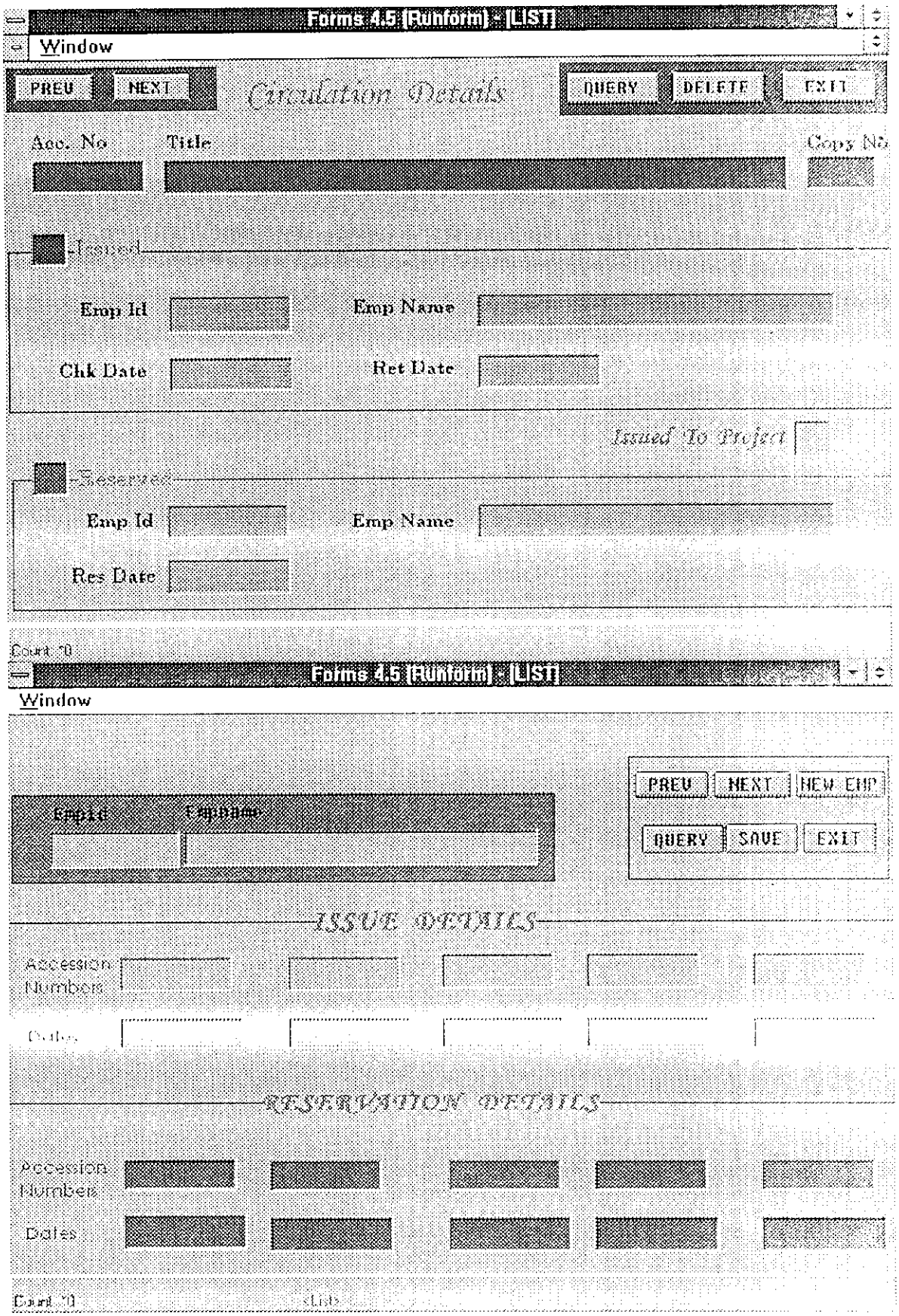
Forms for Books Management :

1. Books Entry Form.
2. Books Issue Form.
3. Books Reserve Form.
4. Circulation Form.
5. Employee Form.



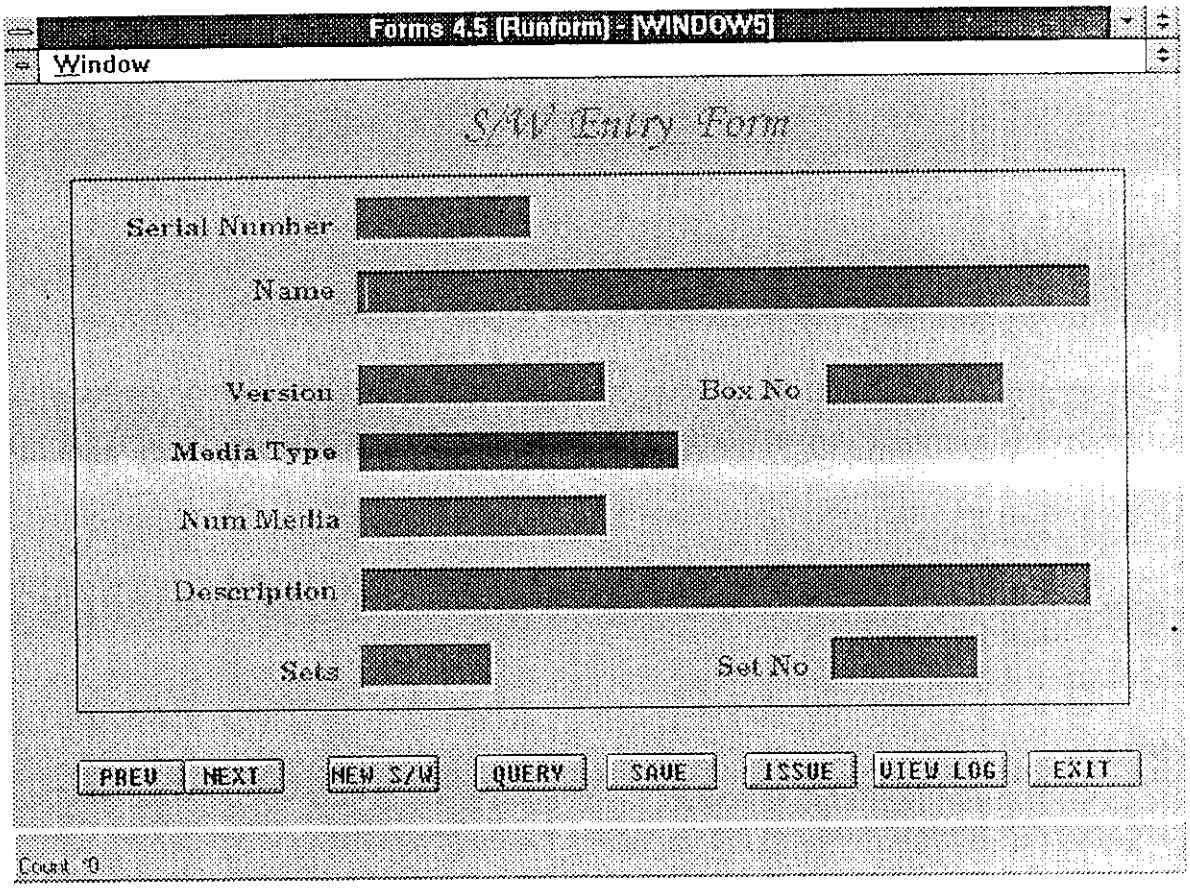

Forms 4.5 [Runform] - [LIST]
Window
Book Issue Form
Acc. No
Copy No
Title
Emp Id
Emp Name
Chk Date
Ret Date
PREV
NEXT
NEW
QUERY
SAVE
DETAILS
EXIT
Count *0

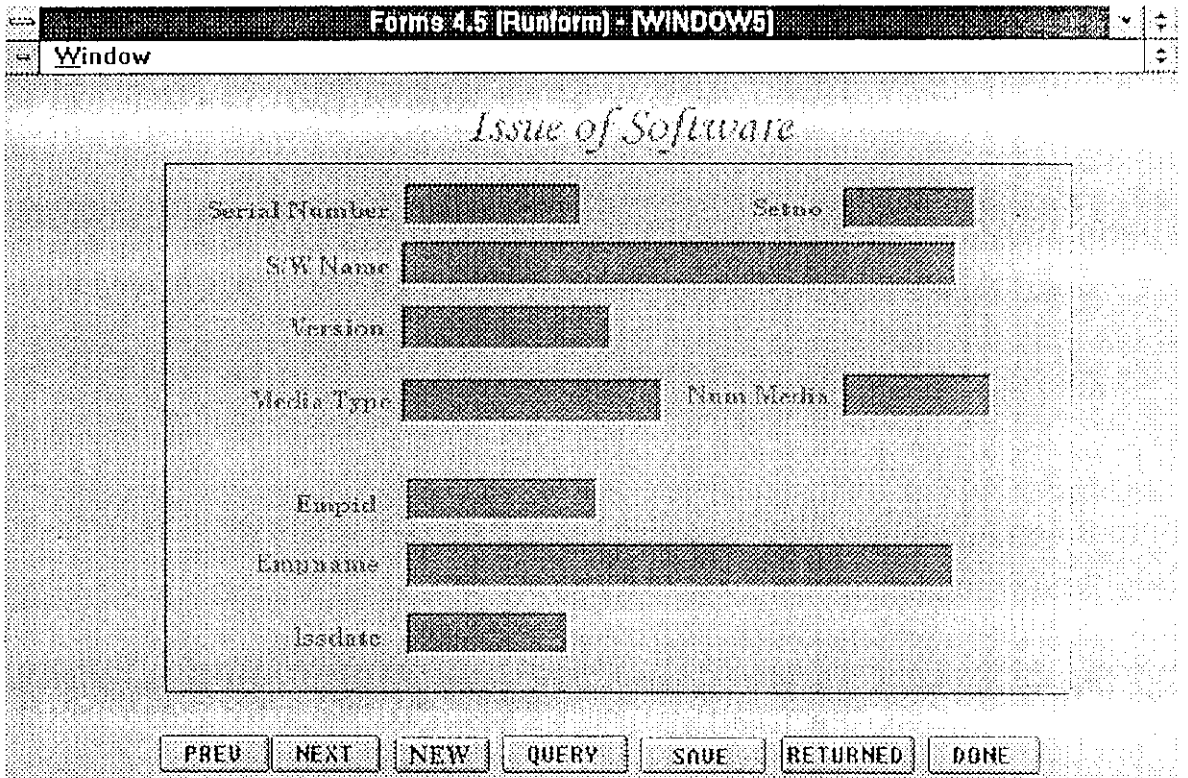

Forms 4.5 [Runform] - [LIST]
Window
Book Reserve Form
Acc No
Copy No
Title
Emp Id
Emp Name
Res Date
Issued To Project
PREV
NEXT
NEW
QUERY
SAVE
DETAILS
EXIT
Count *0


Forms 4.5 [Runform] - [LIST]
Window
PREV
NEXT
Circulation Details
QUERY
DELETE
EXIT
Acc. No
Title
Copy No
Issued
Emp Id
Emp Name
Chk Date
Ret Date
Issued To Project
Reserved
Emp Id
Emp Name
Res Date
Count 20
Forms 4.5 [Runform] - [LIST]
Window
PREV
NEXT
NEW EMP
QUERY
SAVE
EXIT
Empid
Empname
ISSUE DETAILS
Accession Numbers
Dates
RESERVATION DETAILS
Accession Numbers
Dates
Count 20
<List>

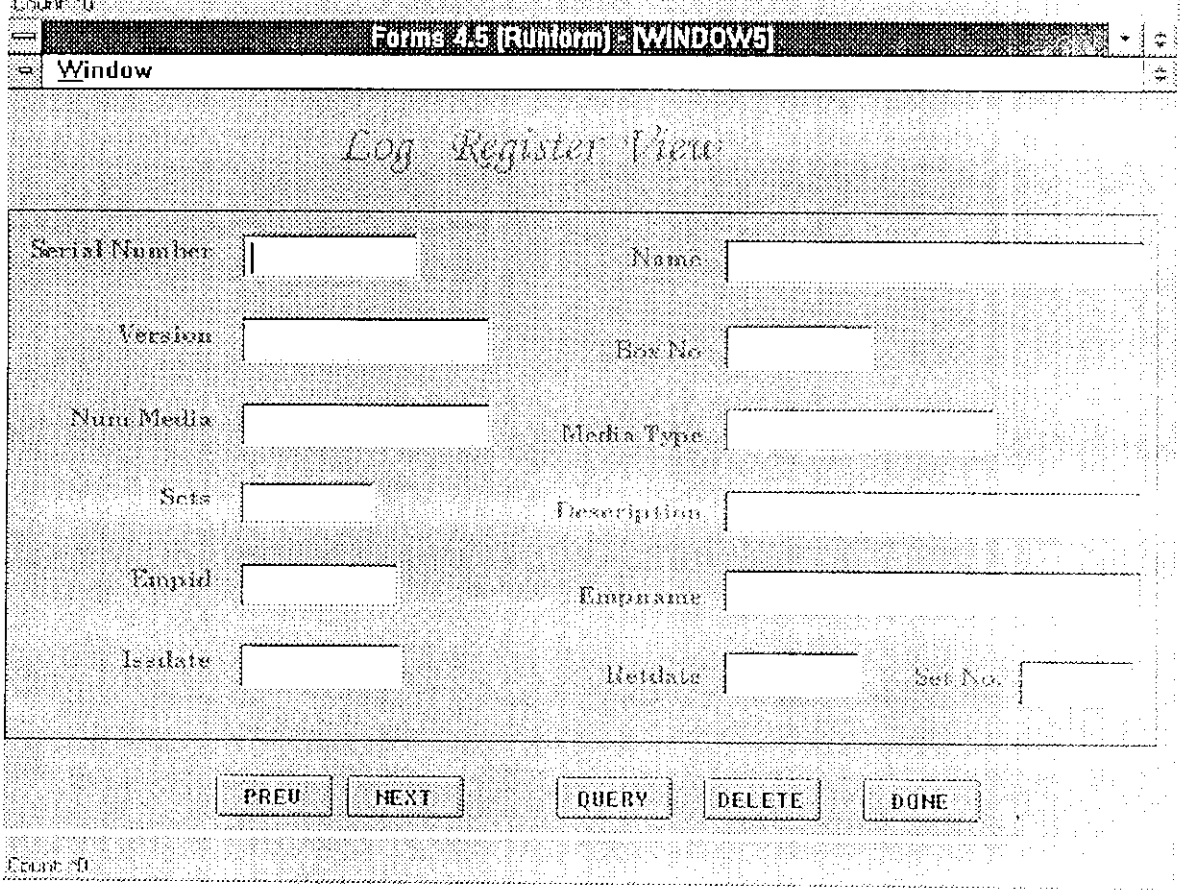
Forms for Software Management :

1. Software Entry Form.
2. Software Issue Form.
3. Software Log Form.





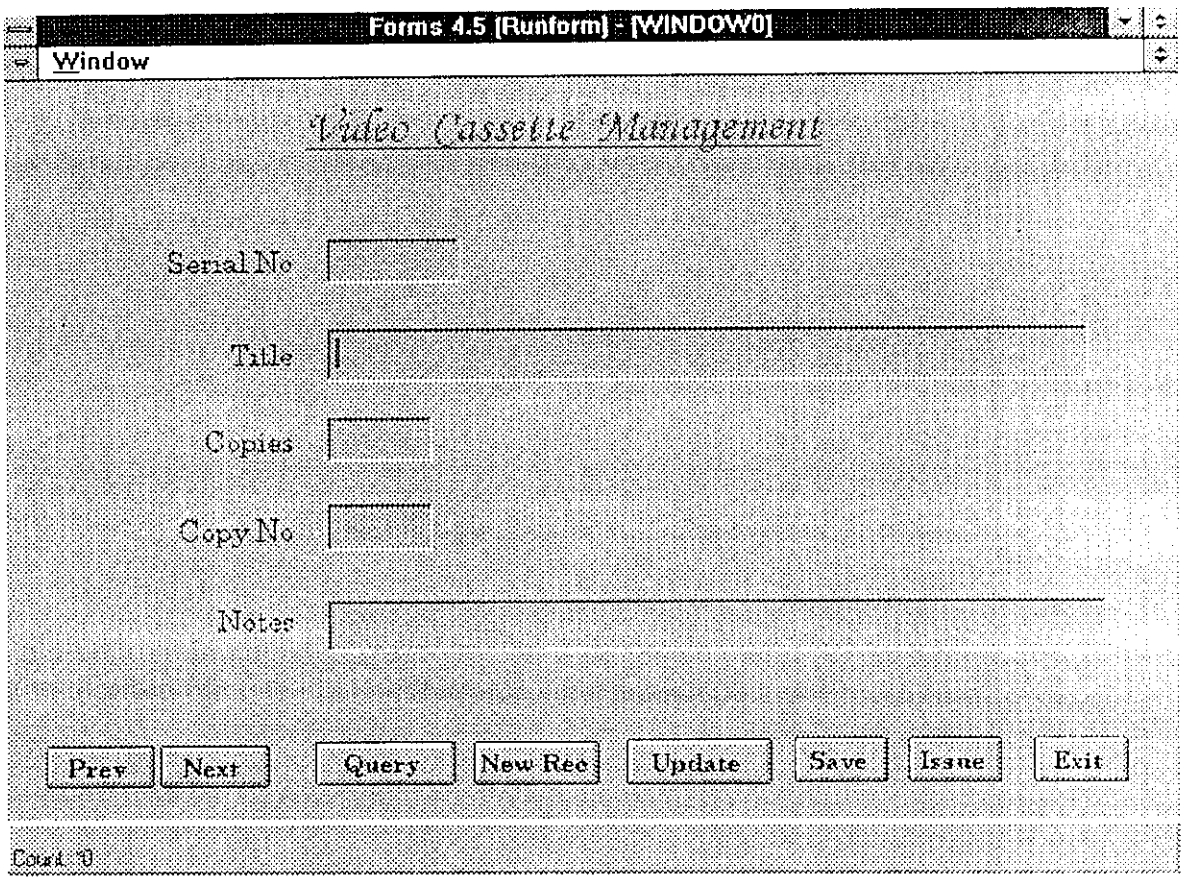
Count 0

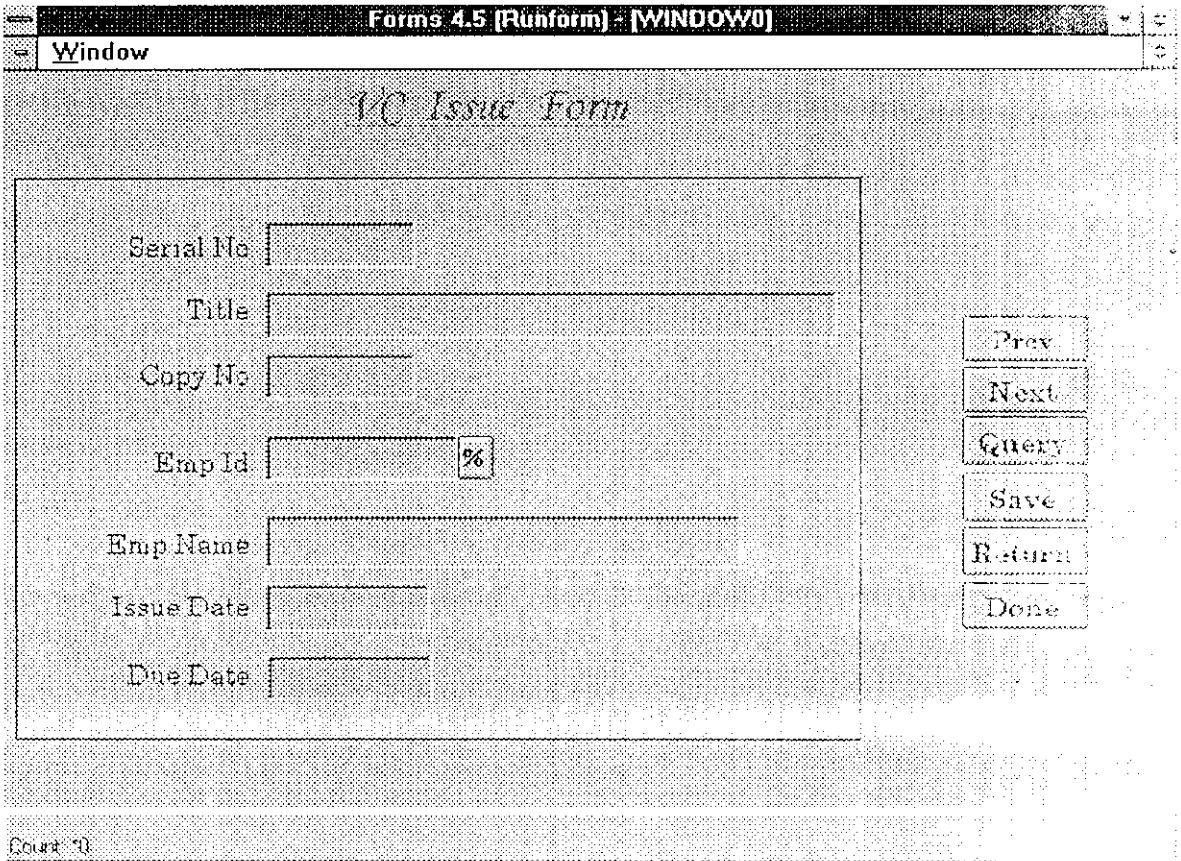


Count 0

Forms for Video Cassette Management :

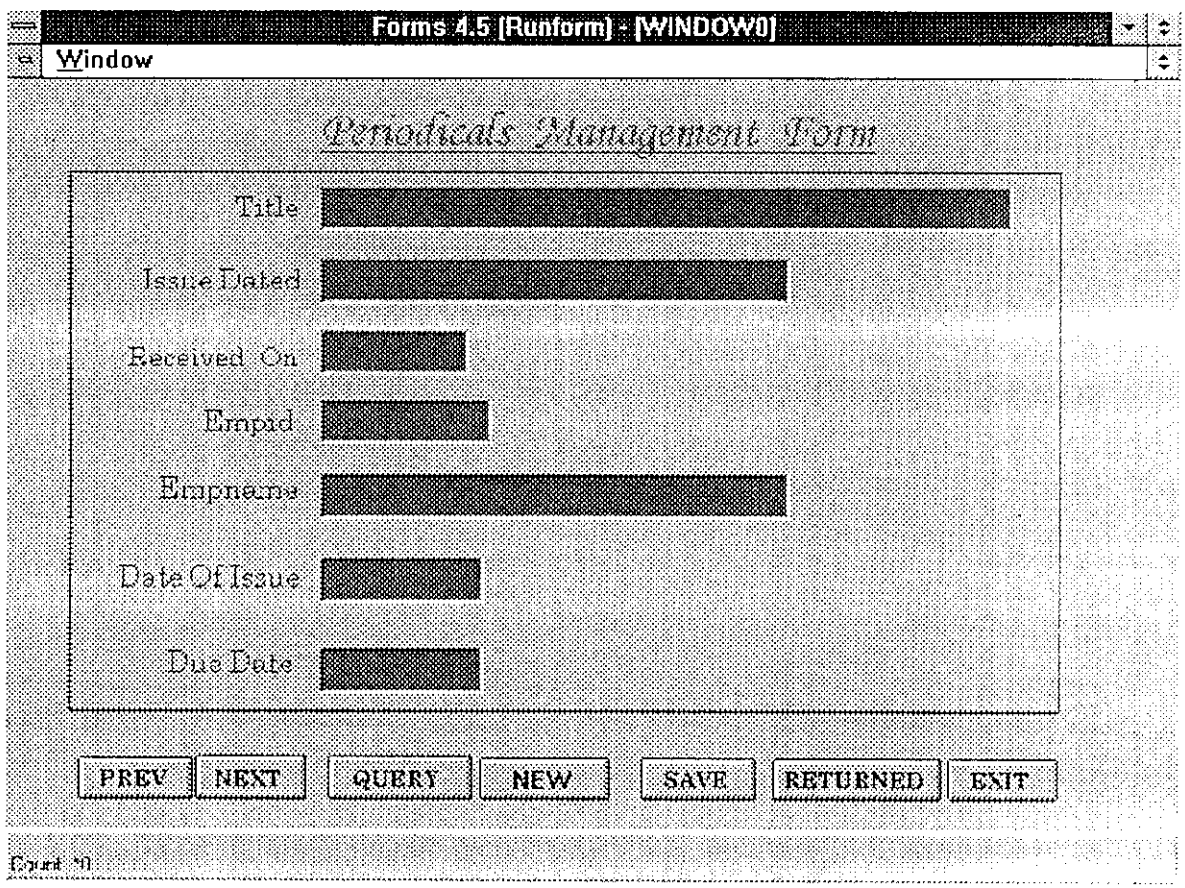
1. VC Entry Form.
2. VC Issue Form.




Forms 4.5 (Runform) - [WINDOW0]
Window
IC Issue Form
Serial No
Title
Copy No
Emp Id
%
Emp Name
Issue Date
Due Date
Prev
Next
Query
Save
Return
Done
Count 0

Form for Periodicals Management :

1. Periodicals Management Form.

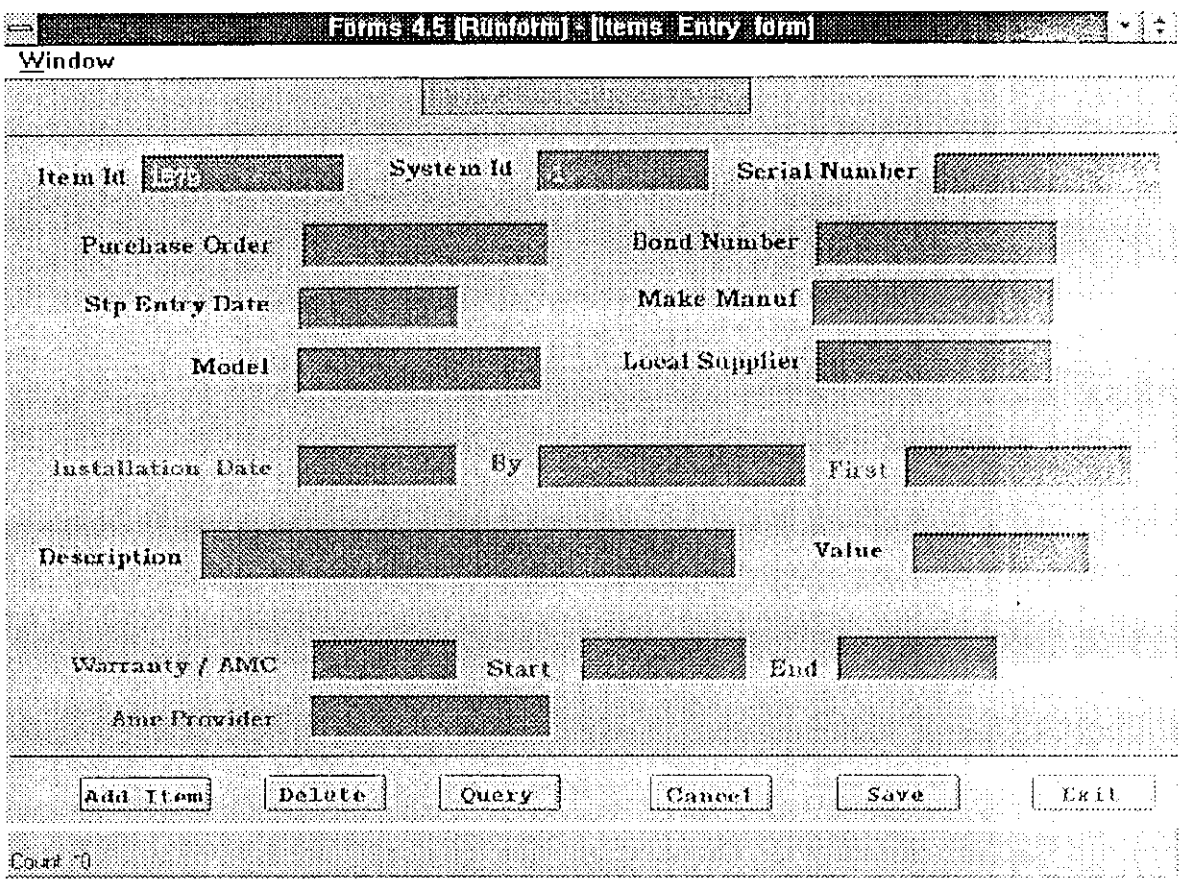


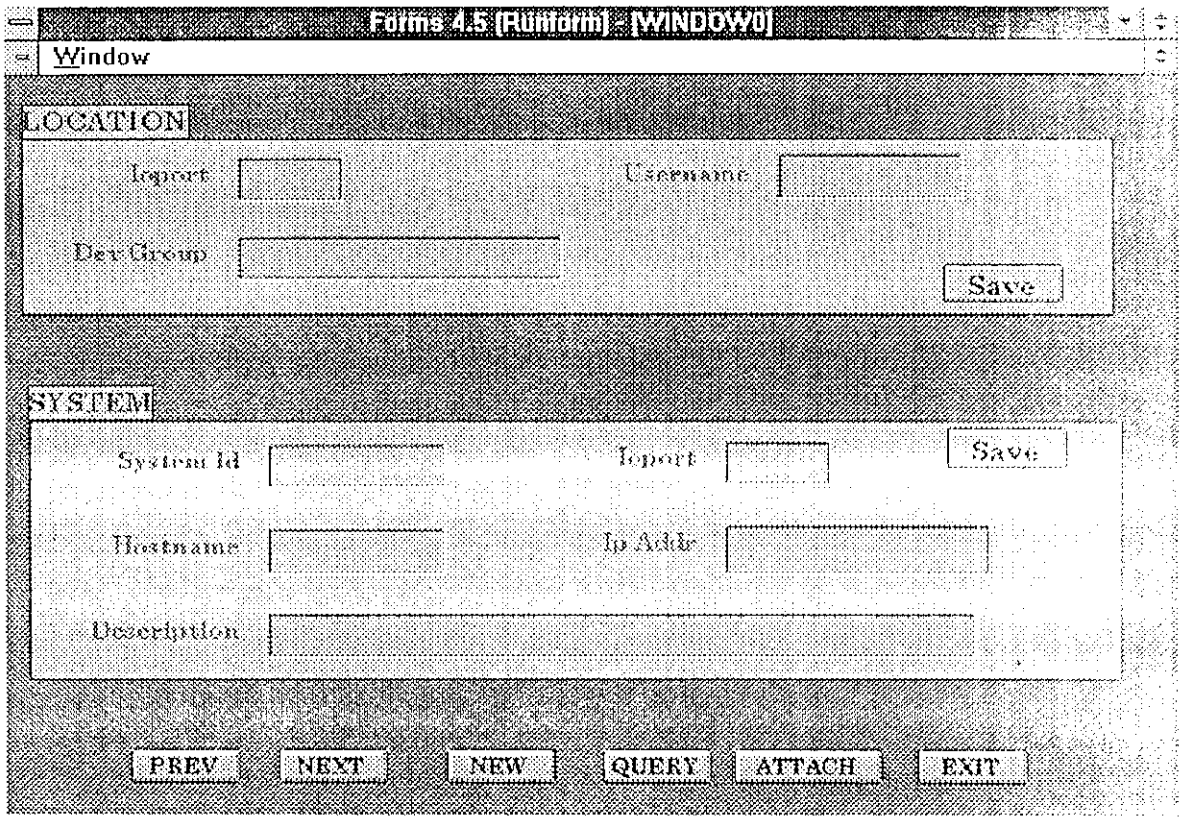
Section III

Hardware Inventory Control System

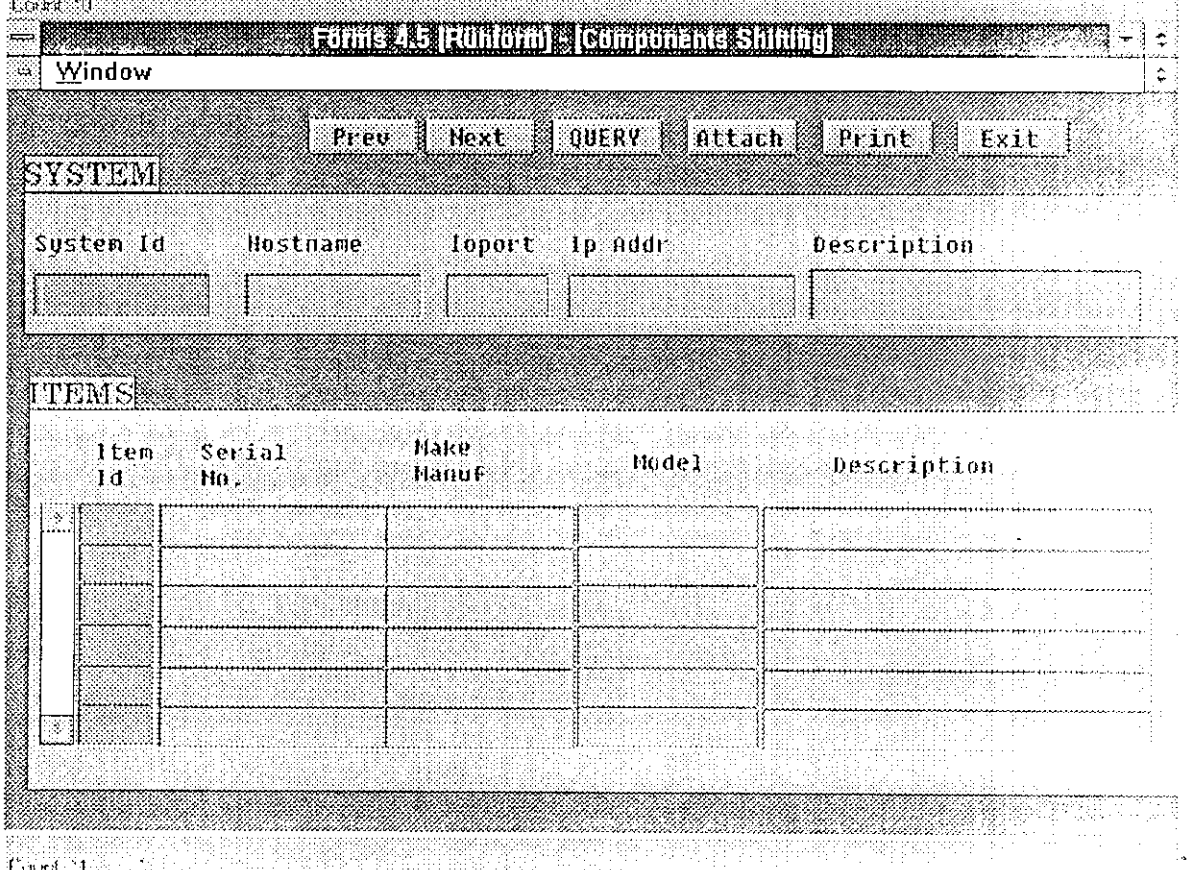
List of Forms for HICS :

1. Items Entry Form.
2. System cum Location Form.
3. Shift Items Form.

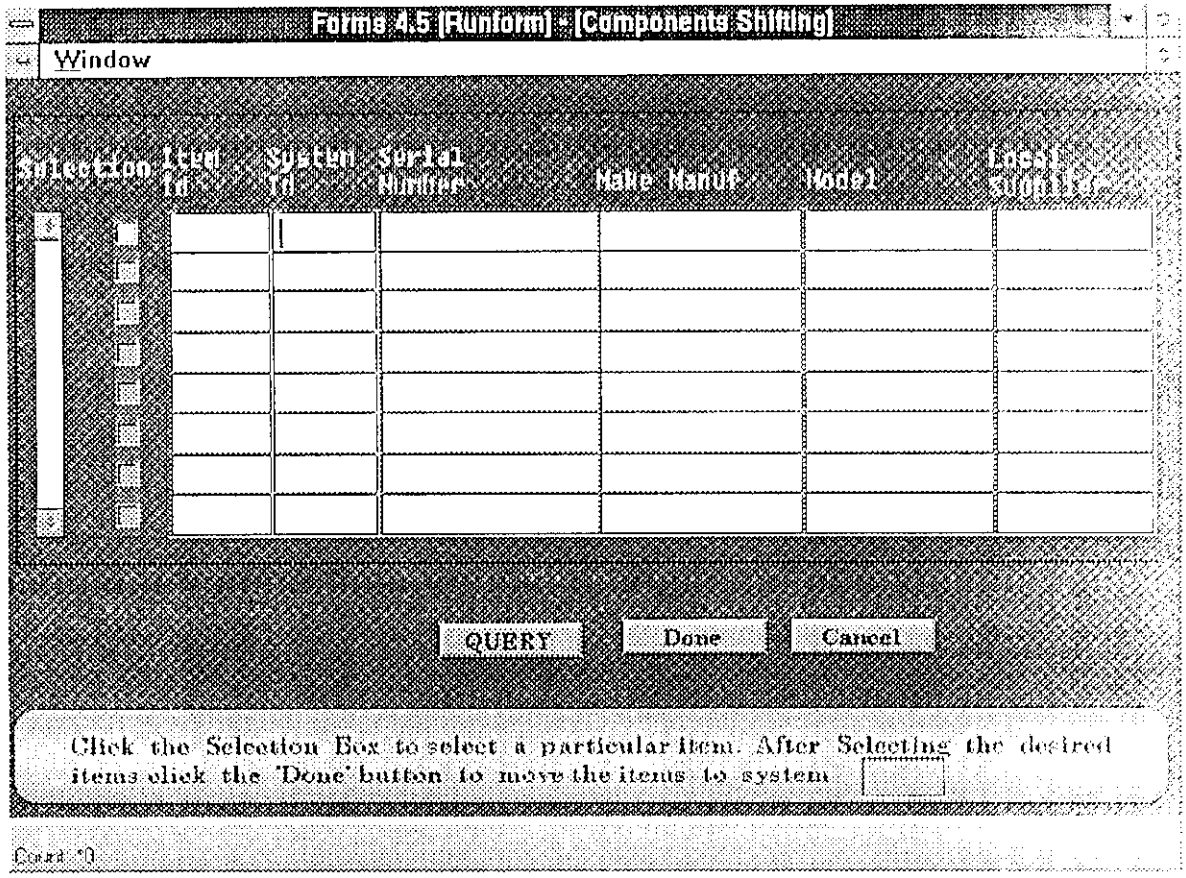



Forms 4.5 (Runform) - [WINDOW0]
Window
LOCATION
Ioport
Username
Dev Group
Save
SYSTEM
System Id
Ioport
Save
Hostname
Ip Addr
Description
PREV
NEXT
NEW
QUERY
ATTACH
EXIT

Card 0


Forms 4.5 (Runform) - [Components Shifting]
Window
Prev
Next
QUERY
Attach
Print
Exit
SYSTEM
System Id
Hostname
Ioport
Ip Addr
Description
ITEMS
Item Id
Serial No.
Make Manuf
Model
Description

Card 1


Forms 4.5 [Runform] - [Components Shifting]
Window
Selection
Asset ID
System ID
Serial Number
Make Manuf
Model
Locat Shift
QUERY
Done
Cancel
Click the Selection Box to select a particular item. After Selecting the desired items click the 'Done' button to move the items to system
Count 0

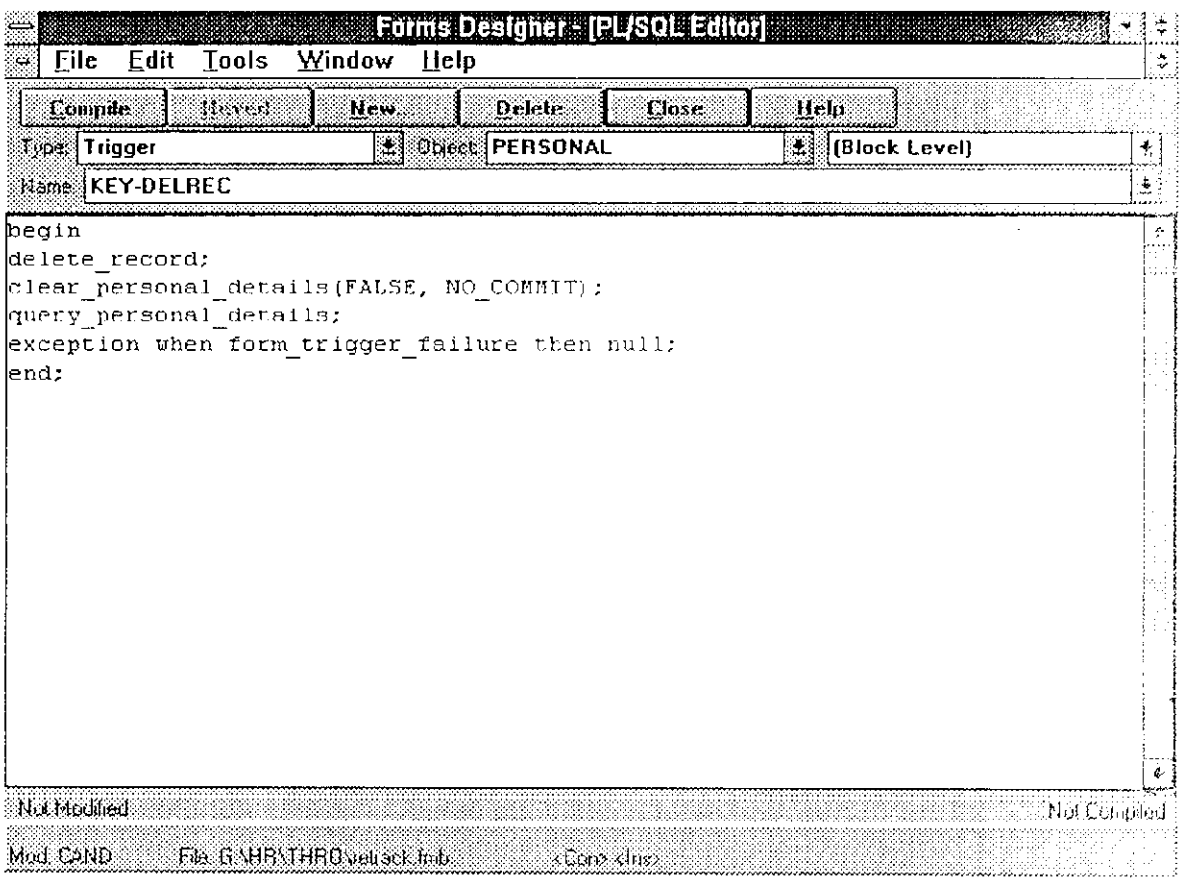
Appendix C

(Triggers and Program units)

SAMPLE TRIGGERS AND PROGRAM UNITS

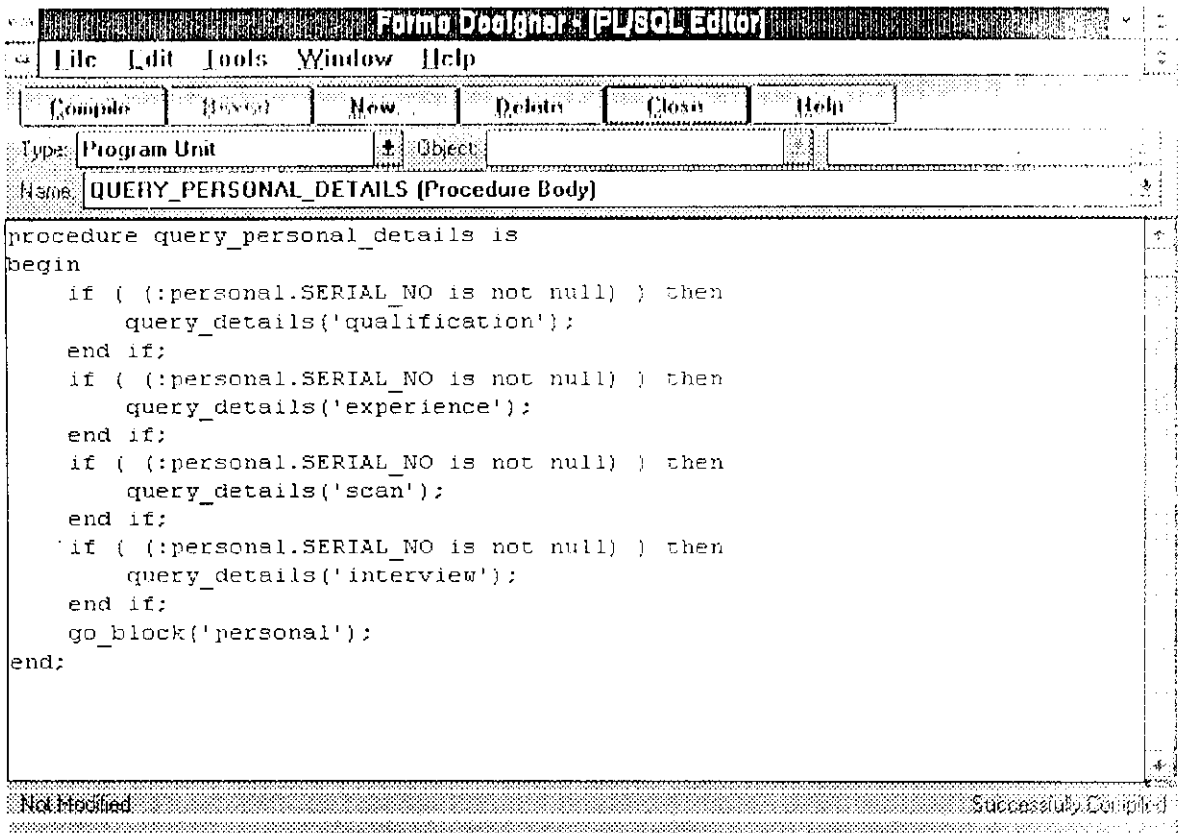
A Sample Trigger From the Resume Tracking Application.

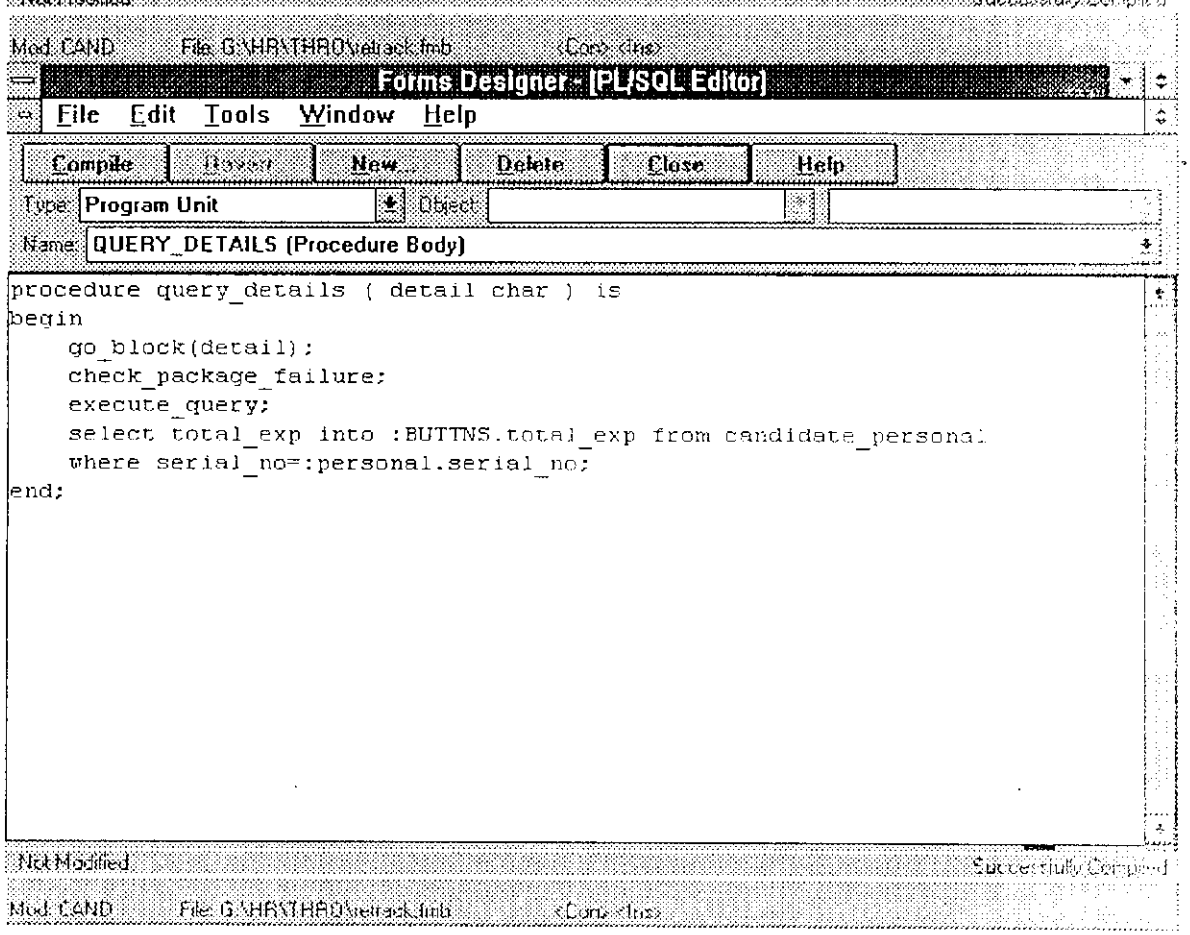
Purpose : Delete a record on the Personal Details Form.
Triggered When : Key for 'Delete Record' is Pressed.



The following page contains two sample program units from the Resume Tracking Application.

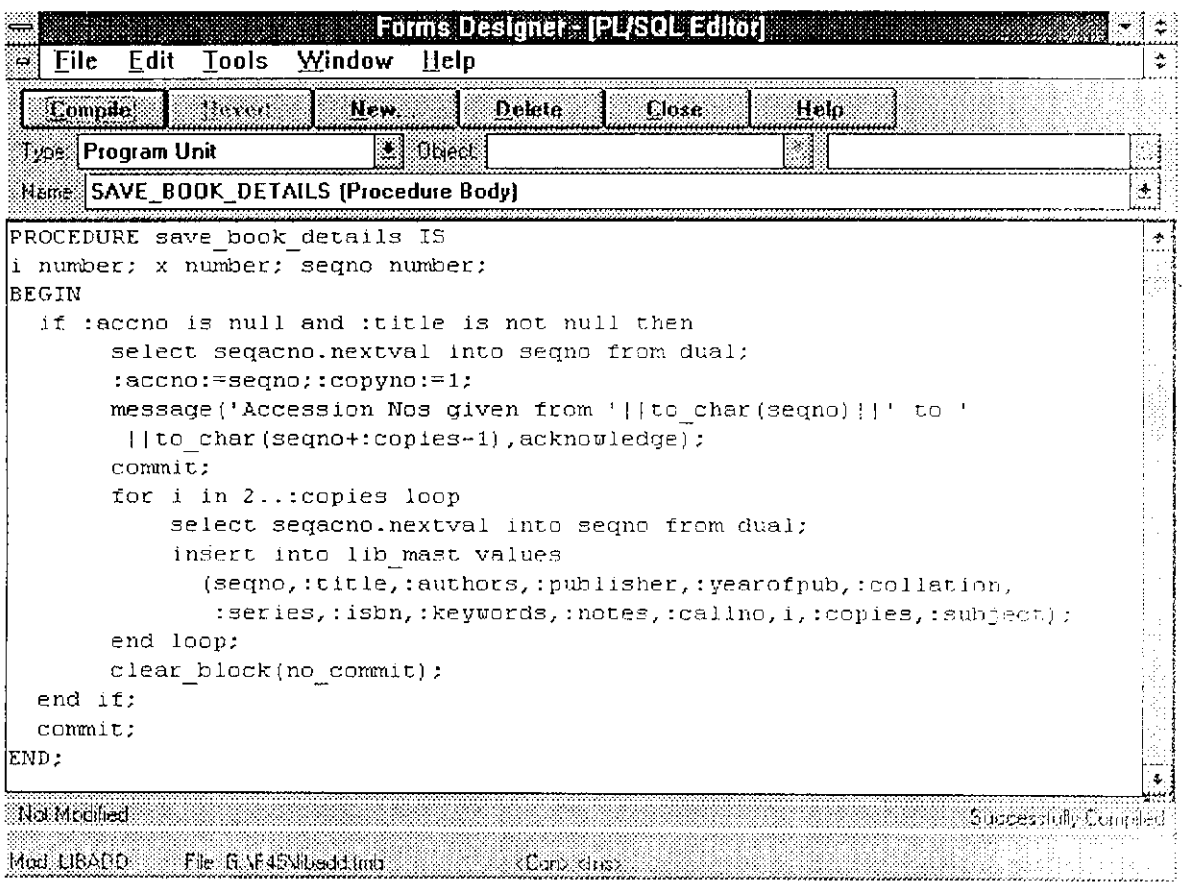
Thes two are used to populate the forms with the details of the Resumes Queried on the 'Candidate Personal Form'.


Forms Designer - [PL/SQL Editor]
File Edit Tools Window Help
Compile Revert New... Delete Close Help
Type: Program Unit
Object:
Name: QUERY_PERSONAL_DETAILS (Procedure Body)
procedure query_personal_details is
begin
if ((:personal.SERIAL_NO is not null)) then
query_details('qualification');
end if;
if ((:personal.SERIAL_NO is not null)) then
query_details('experience');
end if;
if ((:personal.SERIAL_NO is not null)) then
query_details('scan');
end if;
if ((:personal.SERIAL_NO is not null)) then
query_details('interview');
end if;
go_block('personal');
end;
Not Modified
Successfully Compiled


Mod CAND File: G:\HR\THRO\retrack.fmb <Con> <Ins>
Forms Designer - [PL/SQL Editor]
File Edit Tools Window Help
Compile Revert New... Delete Close Help
Type: Program Unit
Object:
Name: QUERY_DETAILS (Procedure Body)
procedure query_details (detail char) is
begin
go_block(detail);
check_package_failure;
execute_query;
select total_exp into :BUTTNS.total_exp from candidate_personal
where serial_no=:personal.serial_no;
end;
Not Modified
Successfully Compiled
Mod CAND File: G:\HR\THRO\retrack.fmb <Con> <Ins>

A sample Program Unit used in the Library application.

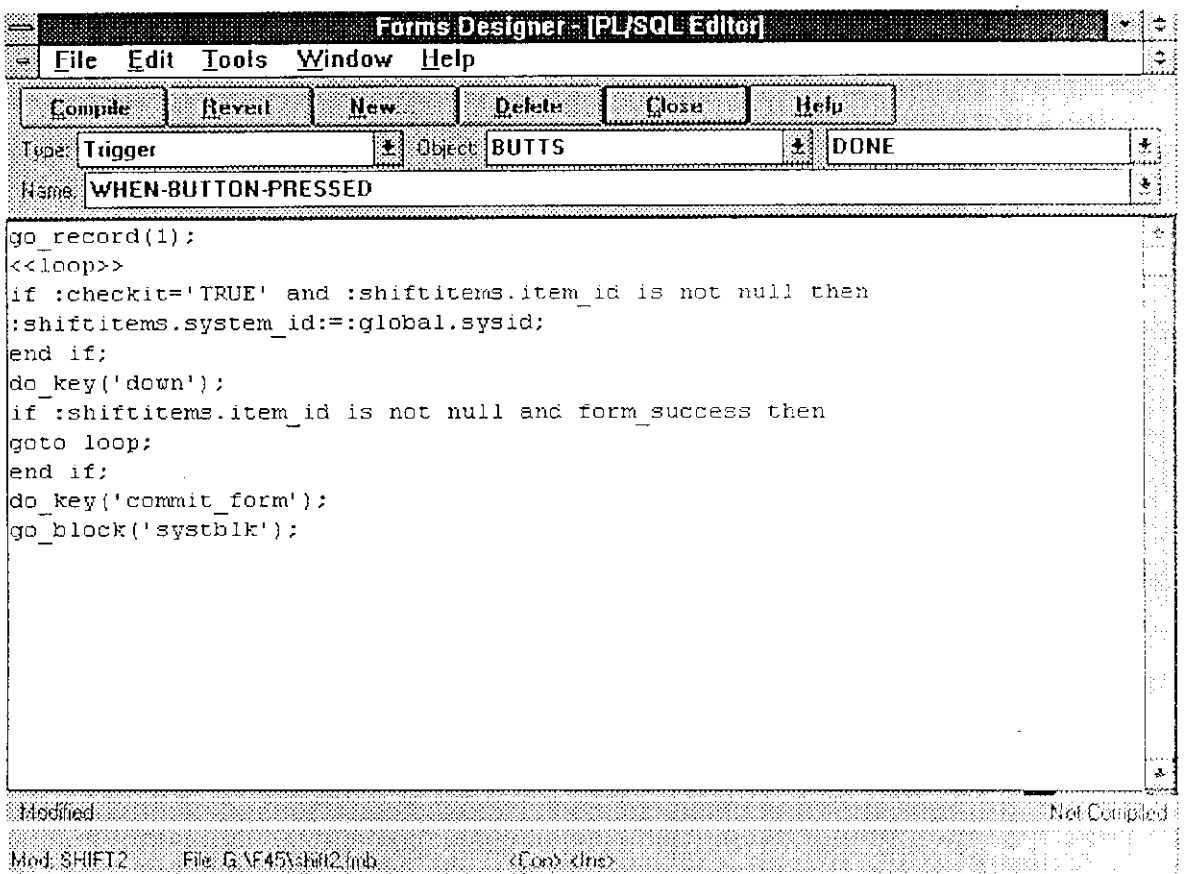
Purpose : Save Book details.
Called from : When-Button-Pressed Trigger of the 'Save' button on the 'Books Entry Form'.



A Trigger used in the Hardware Inventory Control System.

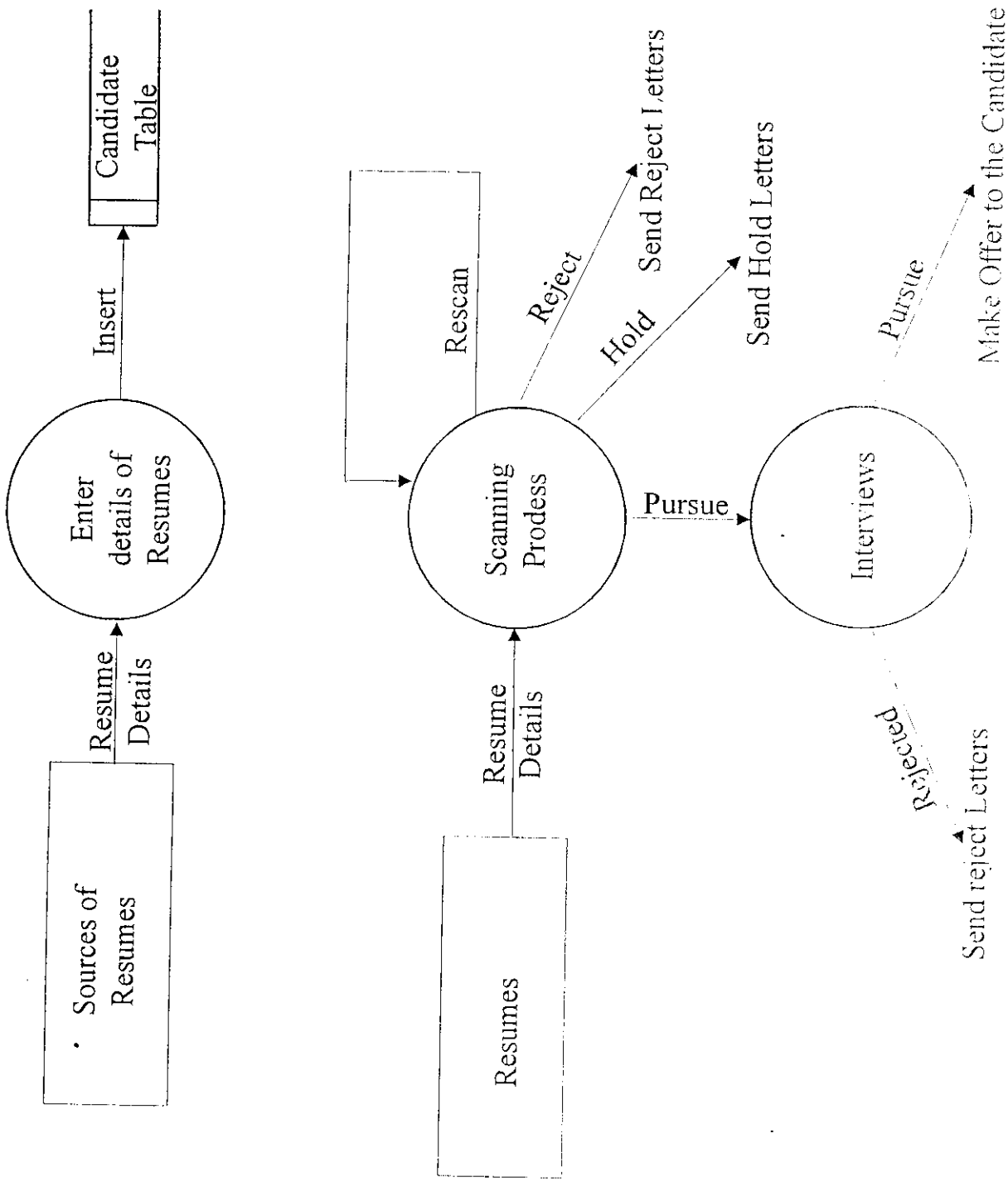
Purpose : Attach Items selected on the shift items form to the destination system.

Triggered when : 'Done' button on the 'shift items form' is pressed.

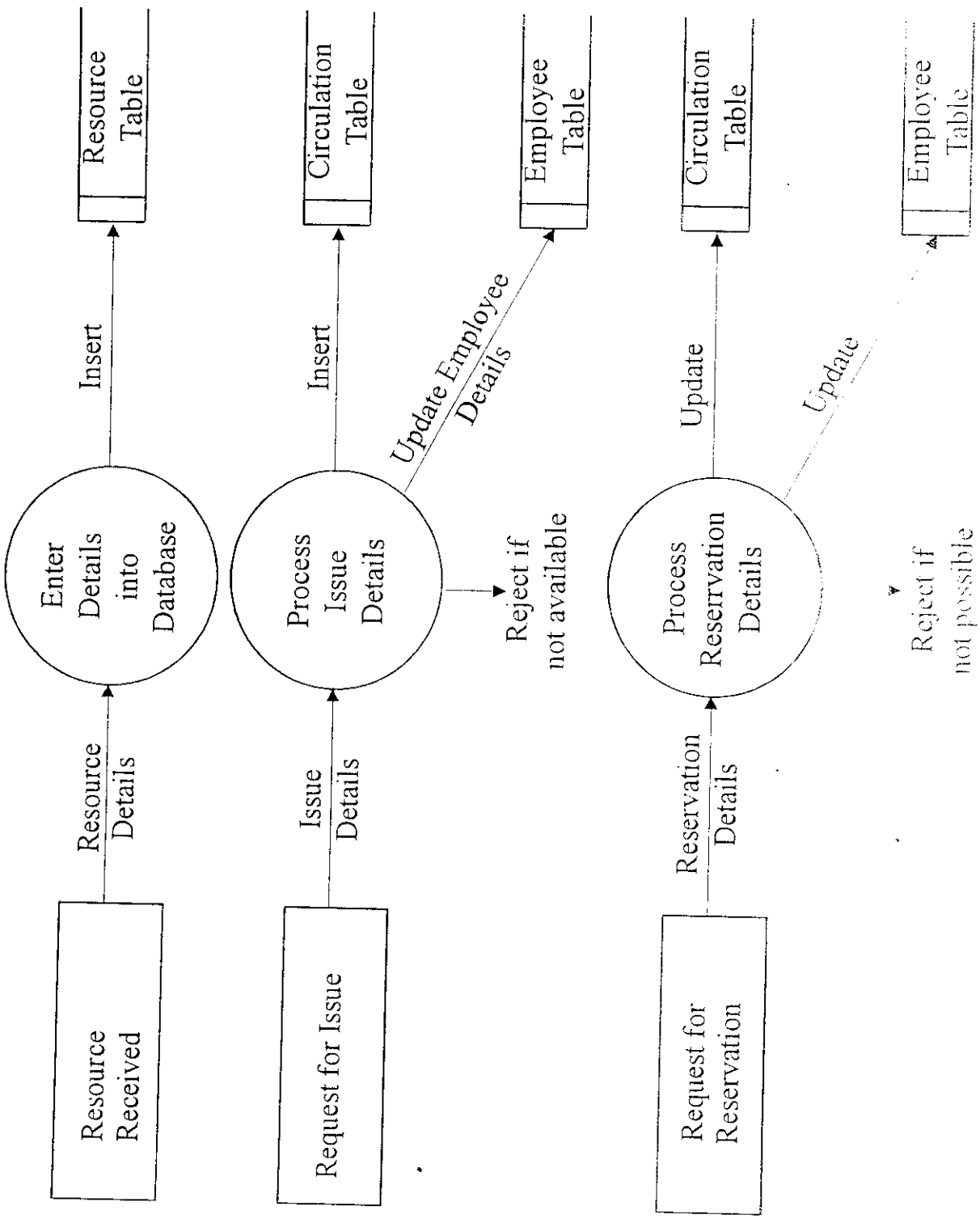


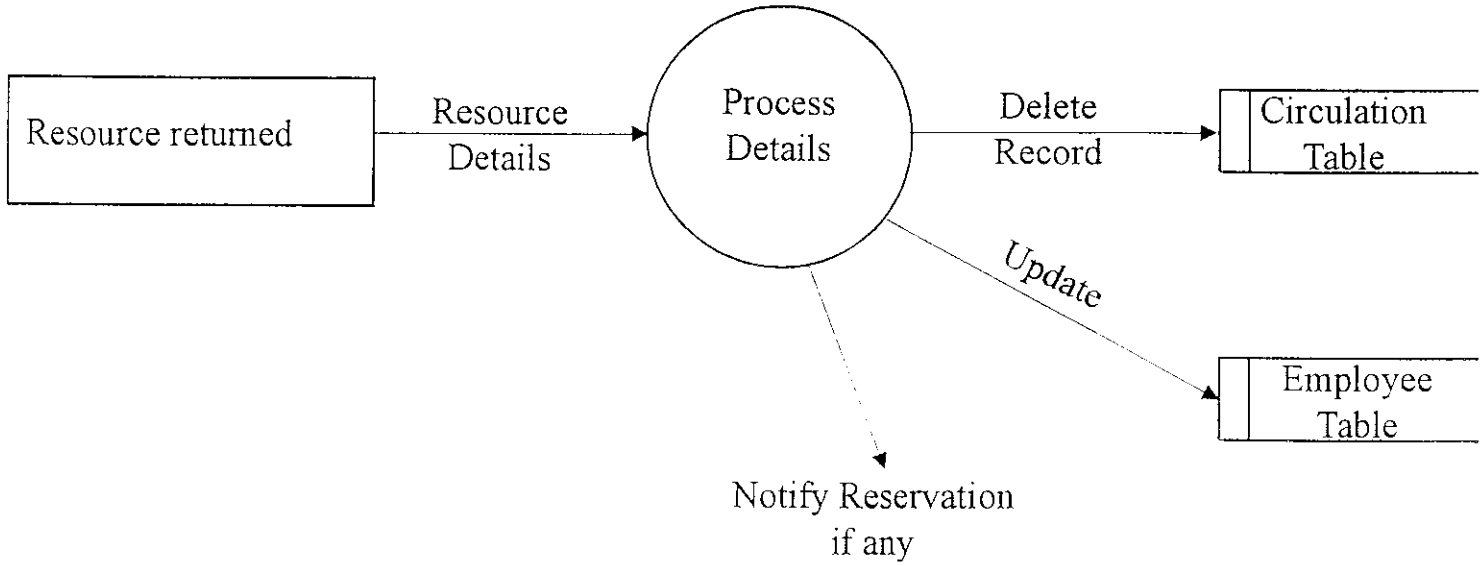
Data Flow Diagrams

Resume Tracking System



Library Information Management System





"Resource" refers to a book or a software or a periodical or a video cassette.

Hardware Inventory Control System