P- 990

Kumaraguru College of Technology

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

HUMAN RESOURCE MANAGEMENT SYSTEM

Project work done at

EASTBAY TECHNOLOGIES PVT LTD.,
Chennai.

PROJECT REPORT

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

Master of Computer Applications

Bharathiar University, Coimbatore

Submitted by

KARTHIKEYAN.P
Reg.No: 0038M1031

Internal Guide

Mr. N. KANNAN., M.C.A.,
Dept. of Computer Science & Engineering
Kumaraguru College of Technology,
Coimbatore

External Guide

Mr. J. OHM PRAKASH
Eastbay Technologies Pvt Ltd.,
Chennai

CERTIFICATE

CERTIFICATE

This is to certify that the project work entitled

HUMAN RESOURCE MANAGEMENT SYSTEM

Submitted to the

Department of Computer Science and Engineering

Kumaraguru College of Technology

In partial fulfillment of the requirements for the award of the degree of Master of Computer Applications is a record of original work done by Karthikeyan.P, Reg.No.0038M1031 during his period of study in the Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore under my supervision and this project work has not formed the basis of 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 .....

Internal Examiner **External Examiner**

power of computing

EASTBAY TECHNOLOGIES PVT. LTD.

28/03/2003

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the project work entitled **"HUMAN RESOURCE MANAGEMENT SYSTEM"** is the bonafide work done at the company by **P.KARTHIKEYAN** who is currently pursuing his MCA degree at **Kumaraguru college of Technology.**

I also certify that the project was successfully completed by him. During the period of work from Dec'-02 to March-03 his attendance and commitment to the work was exemplary.

Director

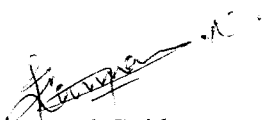
1542, 1st Floor, H-Block, 5th Street, 11th Main Road, Anna Nagar, Chennai - 600 040. India
Phone : +91.44.616 2245 Fax : +91.44.616 2298 E-mail : info@eastbaytec.com Web : www.eastbaytec.com

DECLARATION

DECLARATION

I hereby declare that the project work, 'HUMAN RESOURCE MANAGEMENT SYSTEM ' submitted by me (Karthikeyan.P, 0038M1031) towards the fulfillment of the degree of Master of Computer Applications from Bharathiar University has not formed the basis for the award of any degree, diploma or association of similar titles. The project work is done independently by me under the guidance of Mr.N.Kannan (Internal Guide) and Mr.J.Ohm prakash (External Guide).

Karthikeyan.P



Internal Guide

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

I take this opportunity to extend my heartiest gratitude to the Dr.K.K.Padmanabhan, principal., Kumaraguru College of Technology, Coimbatore., for giving me this opportunity to do a project.

I express my profound gratitude to Dr.S.Thangasamy HOD, CSE Dept.,Kumaraguru college of Technology for his support and encouragement in bringing out this project.

I express my sense gratitude and sincere thanks to Mr.C.K.Sai Saravanan, Director.,East Bay Technologies., Chennai., for giving me an opportunity to do a project in their esteemed organization.

I also pay my sincere thanks to Mr.Ohm Prakash HR, East Bay Technologies, Chennai for his support and guidance he offered.

I gratefully acknowledge and express thanks to my internal guide Mr.N.Kannan M.C.A, Lecturer., Kumaraguru College of Technology for his valuable support and constant encouragement to complete this project.

I finally thank my friends and all those good people who have helped me to complete this project.

P.Karthikeyan.

CONTENTS

INTRODUCTION

1. INTRODUCTION

1.1 ORGANIZATION PROFILE

EAST BAY TECHNOLOGIES PVT LTD., a software development cum consulting company was founded in the year 2000.Its mainline of business are providing customized solutions in the area of retailed, manufacturing, financial etc. The company actively involves in application development in the area of Client/server, Internet technologies and mainframe applications. EAST BAY has experienced a very good growth due to its technical excellence. Its clients are from top Corporate to Maintenance companies.

1.1.1 CORE SEGMENTS

Software Development

BPO Services

Project Consulting

Resource Augmentation.

1.1.2 PARTIAL LIST OF CLIENTS

Mphasis Software Ltd.

Mascon Global Services Ltd.

Mascot Systems Ltd.

Infosys Technologies Ltd.

Tata Consultancy Services

EDS (Electronic Data Systems).

E-FUNDS International India P Ltd.

Psinet Consulting Solutions.

Comdus Solutions.

1.2 SYNOPSIS

The project HUMAN RESOURCE MANAGEMENT SYSTEM an application project , is a computerized system for human resource management. Before this project is launched ,company was managing its resources manually and in an unorganized way. The Resumes are handled manually and there is no proper database to store those details and above all it consumed more man hours. The company wanted a new method to maintain activities such as managing Human resources and Client services with Resource augmentation. It also wanted to monitor and asses its operational performance then and there. Previously there was no option for this and now with this project, designed to handle the resume details in a proper database is able to achieve those comfortably in quicker times.

OBJECTIVES OF HRMS.

- To fulfill all requirements made by human resource dept.
- Make system, 100% user friendly
- Generate necessary information for managerial purpose and report system to monitor the performance
- To give screen restriction through password

SYSTEM ENVIRONMENT

2. SYSTEM ENVIRONMENT

2.1 SOFTWARE

The following details show the software used for the development of HRMS.

Operating system : Windows NT 4.0

RDBMS : MS SQL SERVER 7.0

Front end tool : Visual Basic 6.0

2.2HARDWARE

The following details show the hardware requirements met for the development of HRMS.

System type : IBM compatible PC

CPU : Pentium III

LAN : Ethernet

Floppy Drive : 1.44 MB

Hard Disk Drive : 4 GB

RAM : 64 MB

Cache : 256 KB

Printer : HP Desk jets

SYSTEM STUDY

3.SYSTEM ANALYSIS

3.1 INTRODUCTION

A proper system analysis is absolutely to the development of any system, which has acceptable levels of user satisfaction. It is at this stage of the project that all planning takes place. In this phase one tries to put down on paper the requirements of the user, the information and the resources and the salient features of the existing system.

This section is divided into five sub-sections. In the first section, problem definition, the problem is clearly defined. In second subsection, the requirement analysis, various requirements like functional, performance, availability and security are analyzed. In the third phase, we propose the system and in the fifth phase we define the objectives of the system.

3.2. EXISTING SYSTEM.

The Existing system was managing all the resources manually.

- Resume collection and storage was done by keeping the resumes in the folders and files in an unorganized way. This method created chaos while retrieving data.

- Interview ratings were stored in physical media such as files and books.

- Employee details were not maintained by their original attributes like educational details, contact no's, address, e-mail etc.

- There was no system to keep track of Client requirements.

- There was no proper database to store resume details or client details.

- There was no reporting system to monitor the company's operational performance in these fields .
- There was no security to some important details.

3.3PROBLEM DEFINITION

This document introduces the policies and the application of the HUMAN RESOURCES MANAGEMENT SYSTEM of EAST BAY TECHNOLOGIES P. .LTD., This system serves the needs of HR dept.

The main purpose of the automated process is to ease out the tasks of manual labor. Hard copies of important reports and form are reduced to a greater level of extent and thus making the user comfortable in entering or details regarding any needy information of HR dept of EAST BAY Tech P Ltd. Thus errors are minimized to an appreciable extent.

3.4. PROPOSED SYSTEM

After the launch of the new system the company is able to access these facilities given below.

- Resume collection and storage is made in a computer system.
- No manual work is needed in this part.
- Interview ratings are stored in the system with password security.
- Employee details are maintained with lot of attributes.
- The system consists of master tables for each candidate whose resume is obtained.
- There is a well– planned reporting system available to monitor the company's performance and day to day progress in these fields.
- The service provided to each Client can be monitored.

3.5 REQUIREMENT ANALYSIS

3.5.1 FUNCTIONAL REQUIREMENT

3.5.1.1 MANAGING PROFILE OF A CANDIDATE MODULE

The beginning phase of the HRMS is the Managing profile of a candidate module and is described below.

- Acquire candidates resume

  Extract the following details

  -Resume code

  -Name of the candidate

  -Address (Both Permanent and temporary)

  -Passport details

  -Details of projects accomplished

  -Years of experience (if applicable)

  -Previous job details (if any)

  -Previous job title

  -Organization last worked

  (if necessary add more attributes)

After acquiring all the above details from the resume move the details are stored in a database maintained separately for fresher and experienced candidates.

RECEIVING EMPLOYEE REQUEST MODULE

- In the Client master entry form the necessary details of the clients are collected and maintained in a separate database.
- The following details are to be maintained in the database

  -Client Id

  -Client name

  -Address

  -phone

  -Email Id

- Every month the employee request details are to be got from the clients

  The request details must include

  -Request no

  -Job title

  -Date, month

  -Job description

  -Nos.required (number of personnel)

  -Min qualification

  -Years of experienced

  -Special skills required

  -Recruitment type (Permanent or Associate)

  -Duration (if applicable)

- These requirement details are then stored in a database.

TRACKING SOFTWARE SKILLS OF A CANDIDATE

- With the employee request form the database is searched for the appropriate match with required skill set.
- The available skill set which matches with the requirement details are then displayed
- The candidate whose skill set matches with the employee requirement of the Client are selected for an Interview.

INTERVIEW STATUS MODULE

- Based on how the profile of a candidate matches with the employee request the HR selects the candidates.
- For all the candidates selected, an Interview is conducted, on a specific date and time.
- The Interview details are then recorded.
- The Interview details contains

  -Candidate no.

-Interview date and time.

-Assessments

-Interview rating

(If necessary add more details)

- Based on the interview ratings (*selected,*rejected,*with held), further actions are taken

MODE OF PLACEMENT MODULE

.

- If candidates are selected, Offer letter is dispatched.
- Dispatching offer letter depends on the mode of placement.
- Mode of placement is of four types:

  -Direct employee to company (EastBay Technologies P Ltd)

  -Contract to company (EastBay Technologies P Ltd)

  -Direct to Client

  -Contract to Client

All the placement types are decided by the Client and for the company it is decided by the work schedule which may vary from time to time.

EMPLOYEE DETAILS

- Once a candidate is selected, his/her details are recorded into the employee details:

  -Employee no.

  -Employee name

  -Employee type (Direct or Associate)

  -Martial status

  -Sex

  -Address (Both permanent and temporary)

  -Date of birth

  -Contact no(if applicable)

  -Previous experience(if applicable)

  -Name of the organization previously worked in

  -Existing Email Id

-Date of joining of the employee

-Designation

-Qualification degree

-Skill set

-Passport no

SALARY DETAILS

The salary details are calculated for all the employees based on their designation and attendance. The salary details should include

-Employee code

-Employee name

-Designation

-Month of salary

-Basic

-HRA

-DA

-LIC

-PF

-Deductions

-Net pay

CLIENT BILLING

For the Associates working for clients salary is also calculated based on their designation and attendance. It contains

-Employee Id

-Employee name

-Month of salary

-Total working days

-Leave granted

-Leave taken

-Days present

-Earned leave

-Net pay.

3.5.2 PERFORMANCE AND AVAILABILITY REQUIREMENT

The new functionality of the system should help the system in ease of handling the HR activities. The performance and availability of the system are determined from the following criteria.

Alert messages:

System will automatically notify the users with various error messages at the time of use of system.

Report generation:

The system should be capable of generating the reports on various criteria

List of available Resumes ordered based on skill set.

Client's Employee request for each month (For all Clients)

Percentage satisfaction for clients for every month (Graphical)

(if necessary add more reports in future)

More generalization of the usage:

The system is so user friendly in such a way that the person who uses this software for the first time can easily work with it. More flexibility of handling the system is more beneficial of the output.

3.5.3 SECURITY REQUIREMENT

Access restrictions are provided to the users of the HRMS to certain parts of the system such as Interview rating, attendance etc.

Multilevel password protection is given to important screens of the system.

SYSTEM DESIGN

4. SYSTEM DESIGN

SOFTWARE DEVELOMENT LIFE CYCLE

The execution of any project follows a certain methodology, i.e., a sequence of steps that are applicable for any project. There are several methodologies that one can adopt , depending on the type of the project.

System development cycle consists of three main types:

1: Definition:

This step answers the question "what". The problem definition stated in the system study serves as the input for the system, which is to be developed. Analyzing the customer's requirements is the essence in this phase. The actual implementation for satisfying the requirements comes later. The functional and performance requirements of the system, constraints for the system to develop, interfaces, etc., are analyzed and documented during this phase.

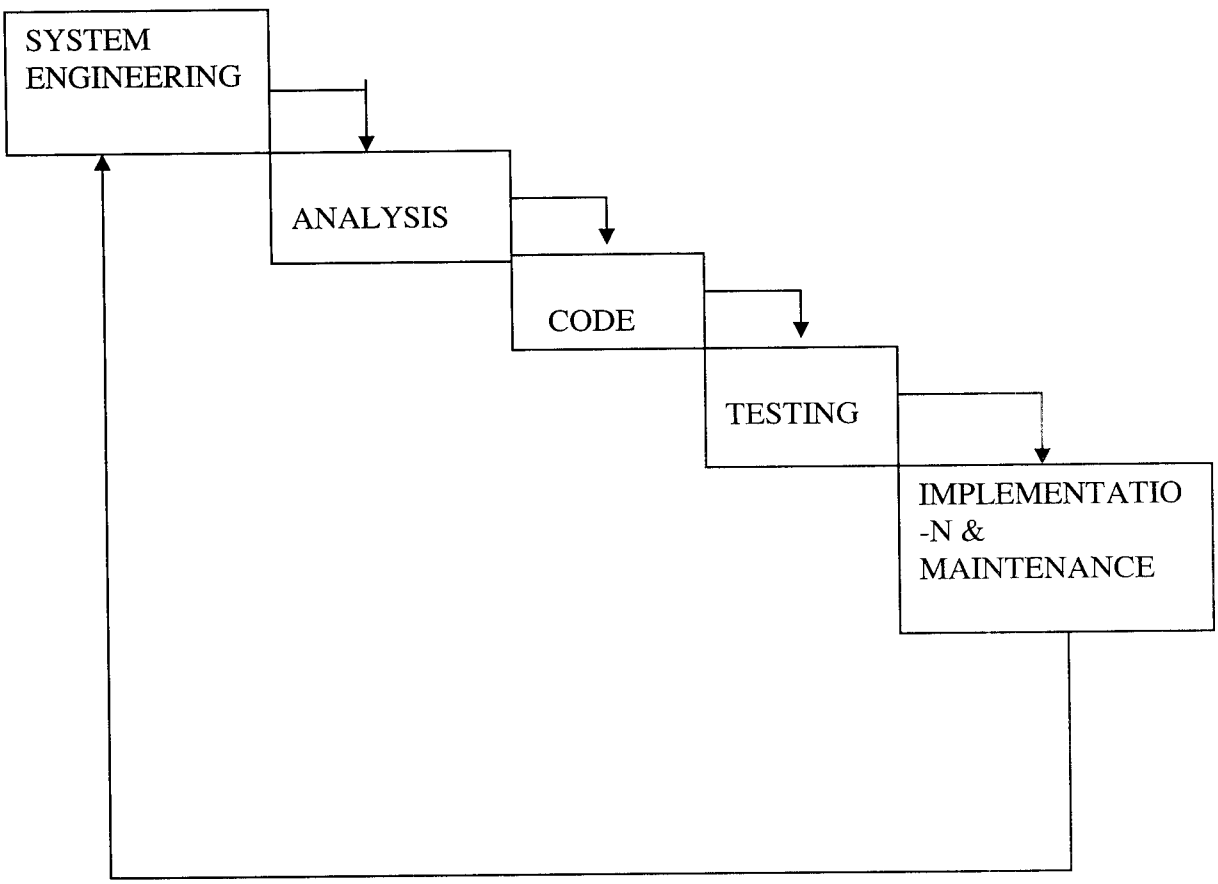
2.Development :

Simply put, it is in this question "how" is answered. For instance, program specifications are designed. Of course, high level design precedes development of the program specifications. The data dictionary for database screens and report formats are defined during this phase, test planning, coding and actual testing form party of this phase.

3 Maintenance:

The implementation of the project and any subsequent maintenance forms the last of the three basic steps. The change in control procedures have to be finalized beforehand. The most commonly used software development model is "WATER FALL MODEL"

WATER FALL MODEL



4.1 DESIGN METHODOLOGY AND DEVELOPMENT

System design is the step that comes right after system analysis in the software development lifecycle. The design is a solution – the translation of requirement innate ways of meeting them. The design will determine the success of the system. The system design phase of HRMS itself , the user of the system are called for the meeting to express heir views on the system and in every steps of system development was made after getting suggestions from the users and project manager. Since this is the new application the whole development was done beginning from scratch.

4.2 OUTPUT DESIGN

Reports

The output design is nothing but reports according to the user inputs. As previously said, system is capable of delivering the output according to inputs.

4.3 SCREEN DESIGN

Now a day IT is becoming more flexible and user friendly because of GUI tools. The main factor contributing these facilities is windows and Microsoft front end tools like Power Builder, Visual Basic, VC++ etc., In this project , all screens are designed by visual basic 6.0. People are interested in using mouse rather then keyboard in command passing. Visual basic and its features are detailed in the appendix.

TESTING AND IMPLEMENTATION

5.TESTING AND IMPLEMENTATION

The Implementation is the final and important phase. It involves user training, System testing and successful running of the developed system. Users propose the developed system and changes be made according to their needs. The testing phase involves the testing of developed system using various kinds of data.

An elaborate testing data is prepared and system is tested using that data. While testing errors are noted and the corrections are made. The corrections are also noted for future use. The users are to be trained to use the new system. Hardware and software securities are to be checked to run the system in the future.

5.1 TESTING

System testing is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently before live operation commences. Testing is vital to the success of the system. System testing makes logical assumption that if all parts of the system is subjected to a variety of tests. Serious of tests are performed for the proposed system before the system is taken to the user.

The testing steps involved in software process

- Unit testing
- Integration testing
- Validation testing
- Output testing
- User acceptance testing

5.1.1 UNIT TESTING

Unit testing is performed for each of the smallest units of the code produced by programmer. This is also termed as "Module testing". This testing for toolkit programs for HRMS was carried out during the programming stage itself.

5.1.2 INTEGRATION TESTING

Data can be lost across an interface. One module can have an adverse effect on another sub functions when combined may not produce the desired major functions. Integration testing verifies the logic and processing for suits of modules that perform some activity, verifying communication between them. The objective is to take unit tested modules and build a program structure. All the modules have combined and tested as single program. Thus during the integration testing step, the errors uncovered are corrected for the next testing steps.

5.1.3 VALIDATION

After the software has been integrated a set of high –order tests are conducted. Validation criteria must be tested. Validation testing provides the final assurances that the software meets all the functional, behavioral and performance requirements. Validation testing can be defined in many ways, but a simple definition succeeds when the software functions in a manner that can be reasonably expected by the customer. After validation test has been conducted one of two possible conditions exists.

1. The function or performance characteristics conform to specifications and are accepted.
2. A deviation from specification is uncovered and a deficiency list is created.

5.1.4 OUTPUT TESTING

After performing the validation testing the output generated or displayed by system under considerations are tested by asking the users about the format required by them. Here the output format is considered in two ways. One is on screen and another is in printed format. These were checked during the pilot migration done at different centers.

5.1.5 USER ACCEPTANCE TESTING

User acceptance of the system to key factor in the success of any system. The system under consideration is tested for user acceptance by constantly keeping in touch with the users at the time of developing and making changes to their needs.

This is done in regard with the following points:

- Input screen design
- Output Format
- On-line message to guide the user.

5.1.6 TEST DATA

The above testing is done by various kinds of tested data. Test data should verify all major paths, protection mechanisms and audit trials. This may include all subjects of previous test cases. While testing the system using test data errors may be uncovered which are corrected as they occur.

5.2 IMPLEMENTATION

Implementation is that period of time during which a software products is integrated into its operational environment and is phased into production use. Implementation includes the completion of data conversion, installation and user training. At this point the software development cycle ends and the maintenance phase begins. Maintenance and operation continue until the project is retired. Training has to be given to the staff at the user site for the support and maintenance work. The implementer is to stay at user's site until the user is completely at home with the new system.

In the implementation phase the following things are taken into considerations

- Data transfer
- User manual preparation
- Direct entry of the data which are in the form of hard copy
- Corrections in the existing data
- Verify the unwanted data from existing databases

5.2.1 USER TRAININIG

After the system (HRMS) is implemented successfully, training of the user is the most important sub task of the developer. User manuals are prepared for the and are handed over to the user to operate the developed system.

FURTHER ENHANCEMENT

6.FURTHER ENHANCEMENT

The following enhancements can be made to the developed system

1. Auto downloading of resume sent through E-mail which is now performed through manual work.
2. The project now developed in VB 6.0 can also be extended to VB.NET

CONCLUSION

7.CONCLUSION

The project HUMAN RESOURCE MANAGEMENT SYSTEM is new application project that serves the HR department of EAST BAY TECHNOLOGIES. This project was done exclusively for EASTBAY Technologies (P) LTD to fulfill their requirements.

This project after launch is to provide these facilities given below.

- Resume collection and managing profile of a candidate .
- Auto extract the necessary details from the resume and maintain in a proper database.
- Employee requests from the Clients are maintained properly in a secure database.
- Tracking the software skill set of a candidate is done with respect to the employee request of the Client.
- This system gives an Overview of the availability of the candidates both Skill set wise and experience wise.
- Interview schedule and Interview ratings are stored in the system with password security.
- Mode of placement of a candidate is made as per the need of the Client
- Employee details are maintained with lot of attributes.
- The salary details are calculated for each employees as per their attendance and their designation.
- There is a Graphical way to monitor the company's progress and performance against their obligations.

APPENDICES

HUMAN RESOURCE MANAGEMENT SYSTEM

DATABASE NAME : HRMS

Fresher profile

Res_code	String	8	Resume number-primary key
Cand_name	String	20	Candidate name
Email	String	20	Email Id
Academic	String	10	Academic Qualification
Skill set	String	30	skill set of the candidate
Passport_no	String	8	Passport no of the candidate
Phone	Numeric	8	Phone no of the candidate

Experienced candidate profile

Res_code	String	6	Resume number-primary key
Cand_name	String	20	Candidate name
Email	String	20	Email Id
Academic	String	10	Academic qualification
Skill set	String	30	Skill set of the candidate
Passport_no	String	8	Passport no of the candidate
Phone	Numeric	8	Phone no of the candidate
Prev_comp	String	15	Company previously worked
Duration	Numeric	2	Years of Previous Experience
Designation	String	10	Designation held

Client Master table structure :

Client_Id	String	5	Client number-primary key
Name	String	15	Name of the client
Address	String	40	Address of the client
Phone	Numeric	8	Phone no of Client
E-mail	String	15	E mail Id of the Client

Client requirements

Client_Id	String	5	Client number which refers client Master-Foreign key
Req_Id	String	6	Requirement number-Primary key
No_req	Numeric	3	No of requirements
Month	String	10	Month of requirement
Re_satisfied	Numeric	3	Requirements met
Percent	Numeric	2	Percent satisfied
Req_type	String	15	Type of recruitment
Duration	Numeric	2	Duration of job
Skill set	String	10	Skill set wanted

Interview schedule

Cand_Id	String	8	Candidate Id which refers fresher Or experienced profile-foreign key
Client_Id	String	5	Client for which candidate attends The interview-foreign key
Date	Date/time		Date of Interview
Time	Date/time		Time of Interview
Venue	String	15	Venue of Interview
Status	String	10	About the candidate's presence
Result	String	10	Result of the Interview

Mode of placement

Cand_Id	String	8	Candidate Id which refers to Candidate database-foreign key
Client_Id	String	5	Client for which candidate got Selected-foreign key
Mode	String	10	mode of placement
Duration	Numeric	2	Duration of the job
Date of join	Date/time		Date of joining the job

Employee databases:

Salary details :
Direct employee to company table structure

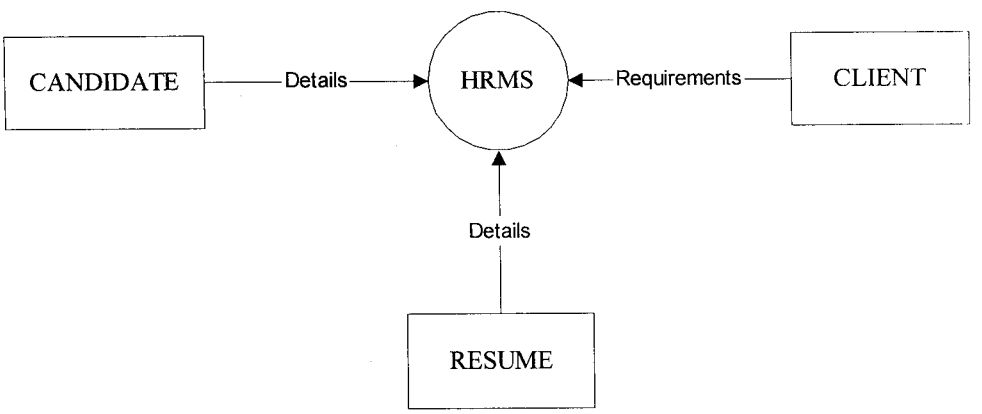
Emp_id	String	8	Employee Id referring to Employee Database-foreign key
Designation	String	15	Designation held currently
Basic	Numeric	5	Basic pay
HRA	Numeric	4	House rent allowance
ESI	Numeric	4	Insurance
PF	String	4	provident fund

Client billing :

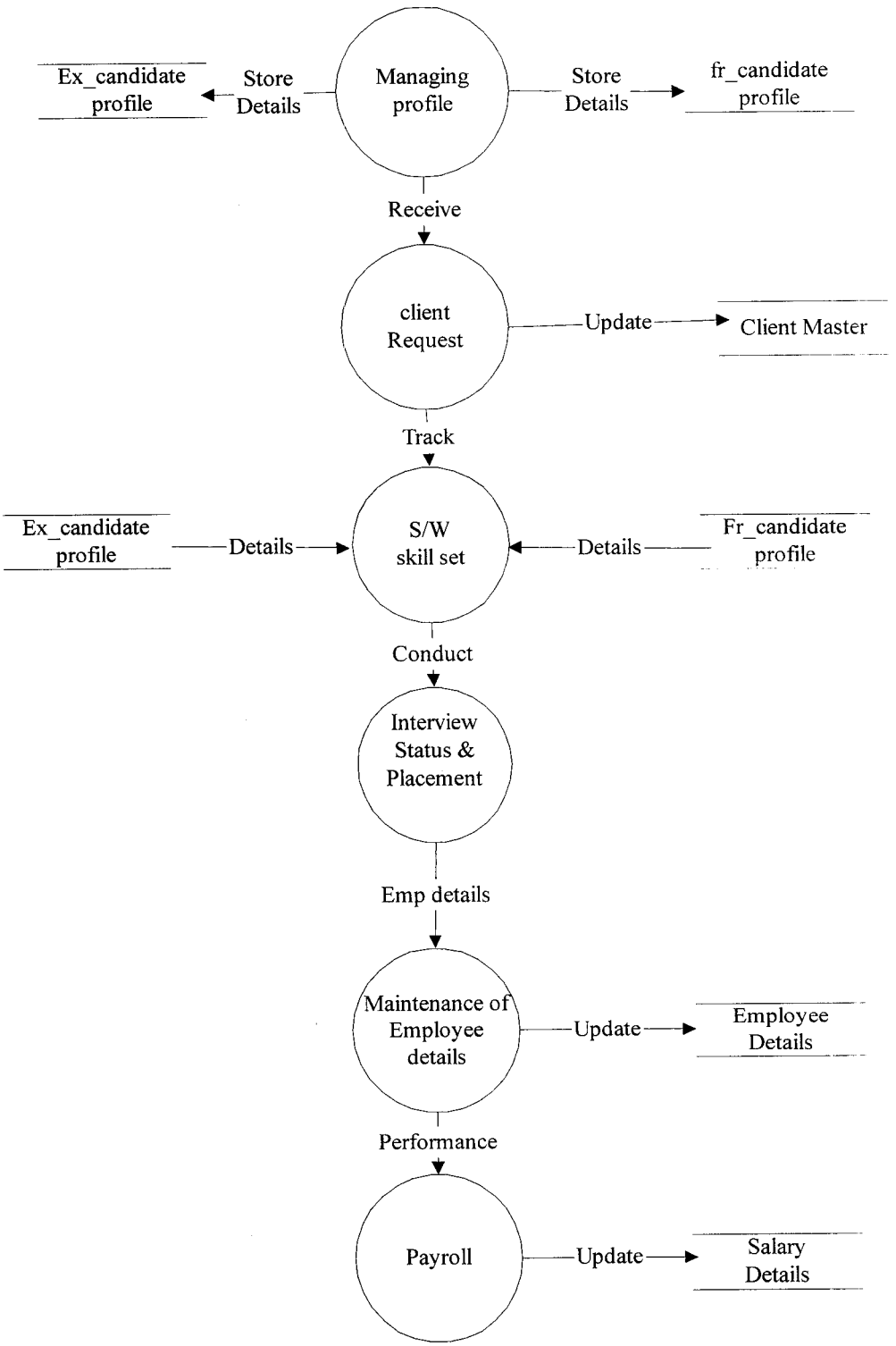
Emp_Id	String	8	Employee Id – foreign key
Month	String	10	Month of billing
Work_days	Numeric	2	Working days
Leave_gr	Numeric	2	Leave granted
Leave_tk	Numeric	2	Leave taken
Earned_lv	Numeric	2	Leave earned by not taking leave
Days_present	Numeric	2	Total days present in a month
Pay	Numeric	5	Monthly basic pay

DATA FLOW DIAGRAM

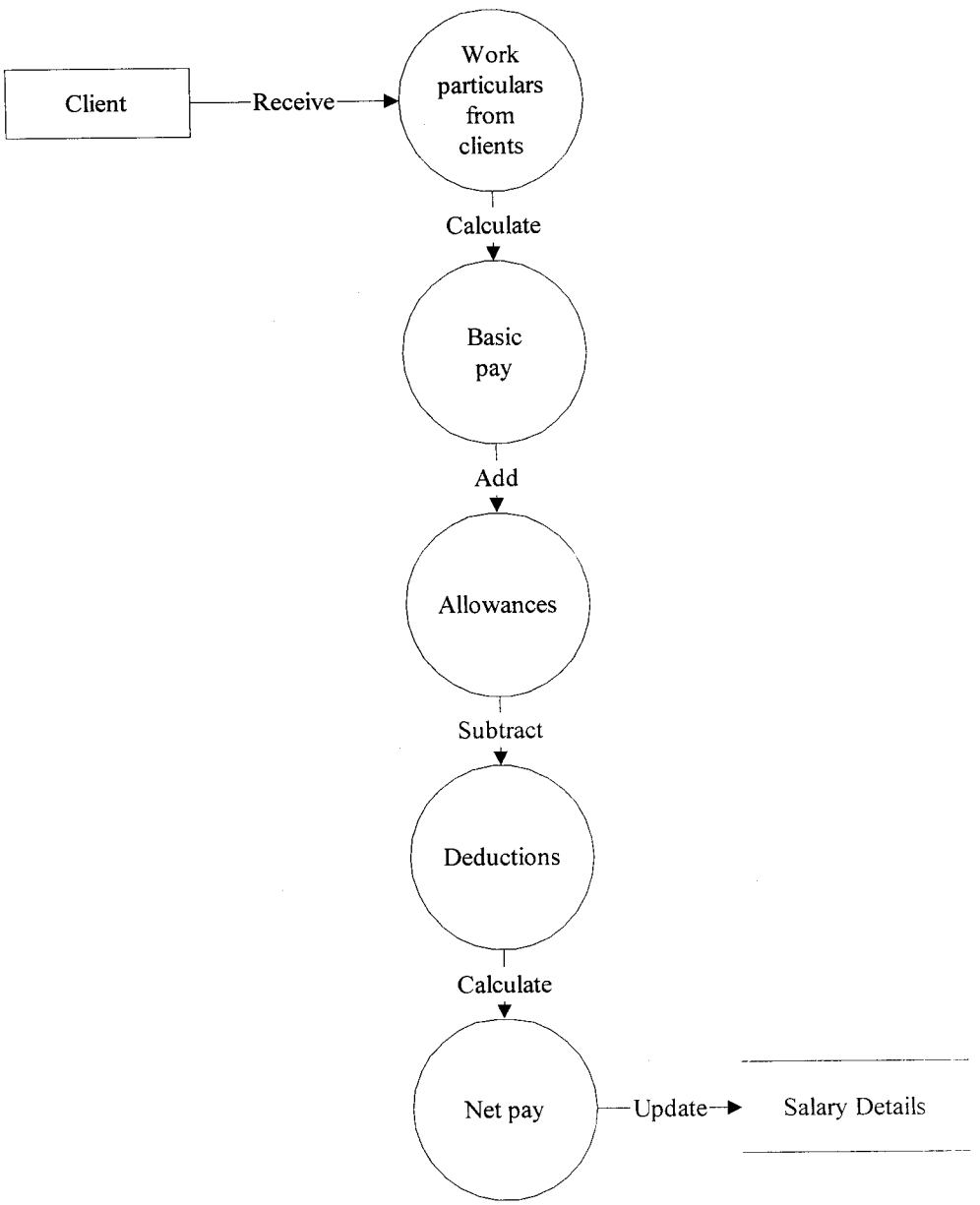
LEVEL -0


CANDIDATE
Details
HRMS
Requirements
CLIENT
Details
RESUME

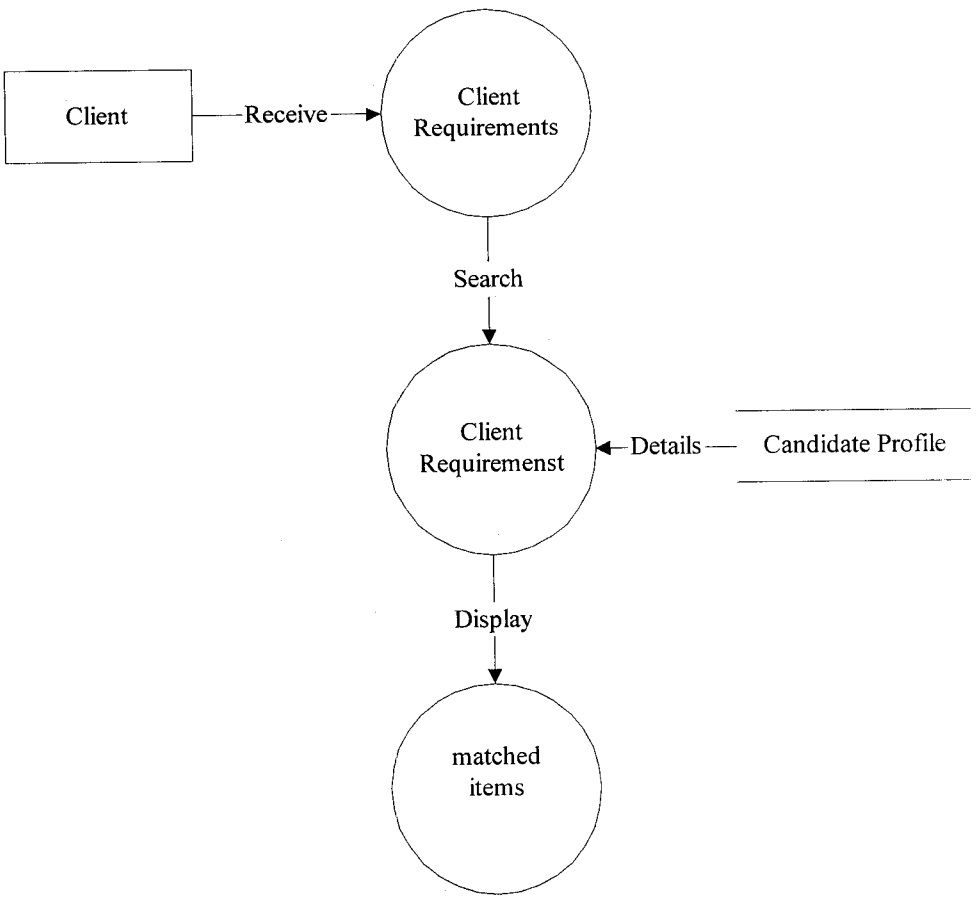
LEVEL-1


Ex_candidate profile
Store Details
Managing profile
Store Details
fr_candidate profile
Receive
client Request
Update
Client Master
Track
Ex_candidate profile
Details
S/W skill set
Details
Fr_candidate profile
Conduct
Interview Status & Placement
Emp details
Maintenance of Employee details
Update
Employee Details
Performance
Payroll
Update
Salary Details

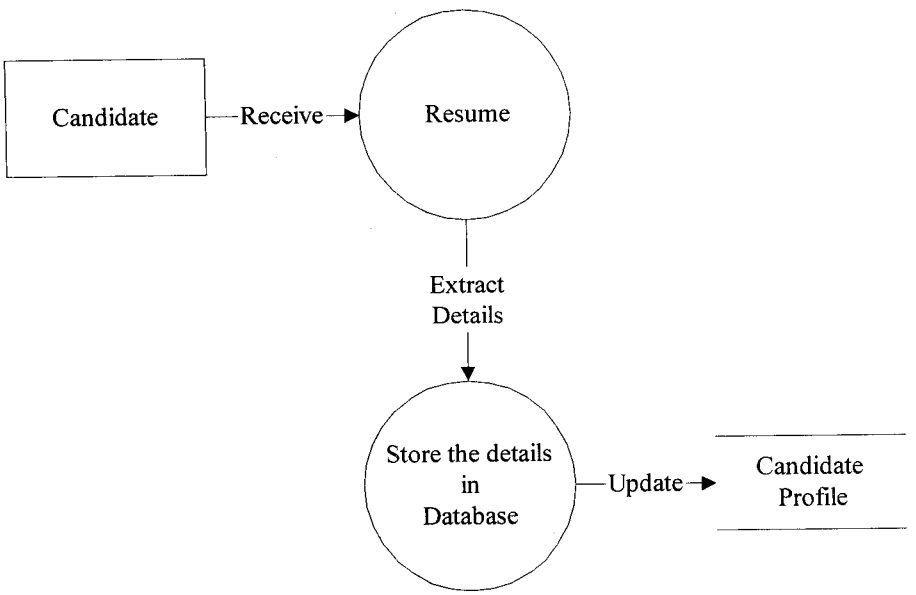
Level-2 Payroll



Level-2 Tracking Software Skill Set

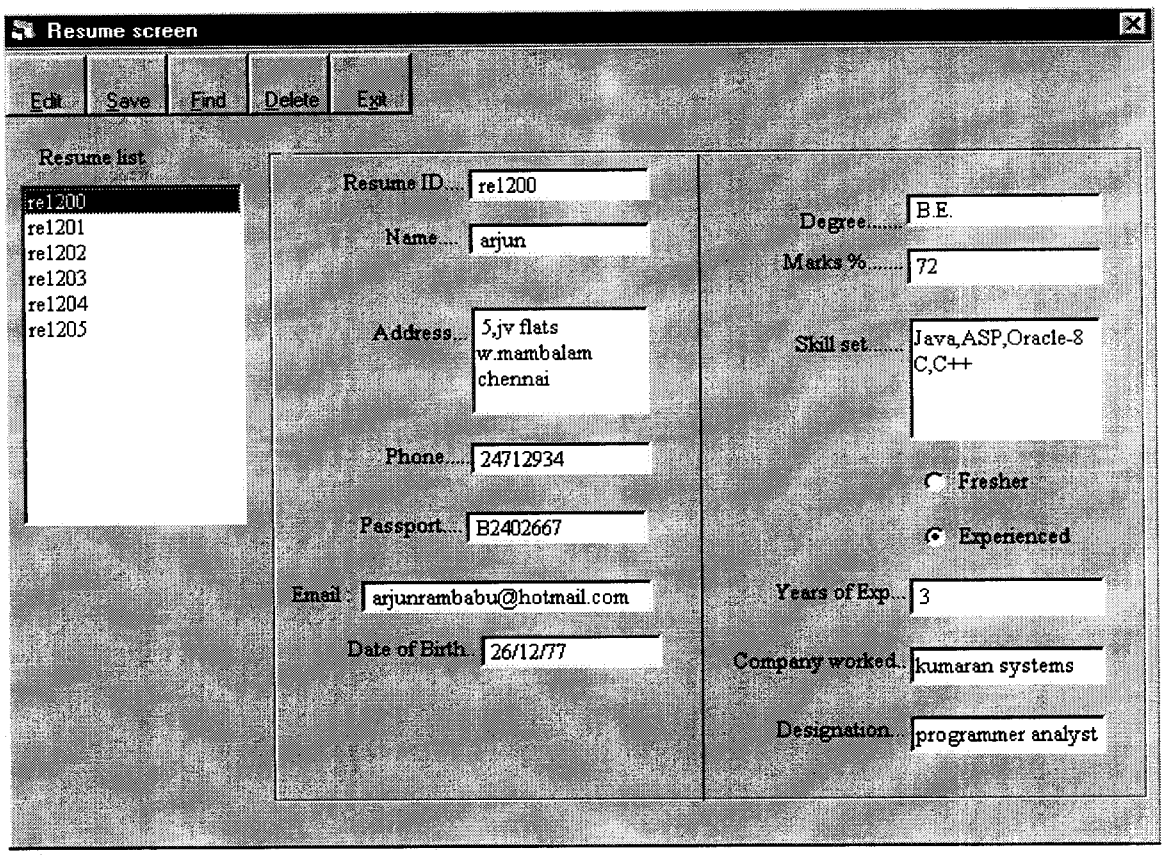


Level-2 Managing Profile of a candidate



HUMAN RESOURCE MANAGEMENT SYSTEM
SCREEN LAYOUTS

1.RESUME SCREEN



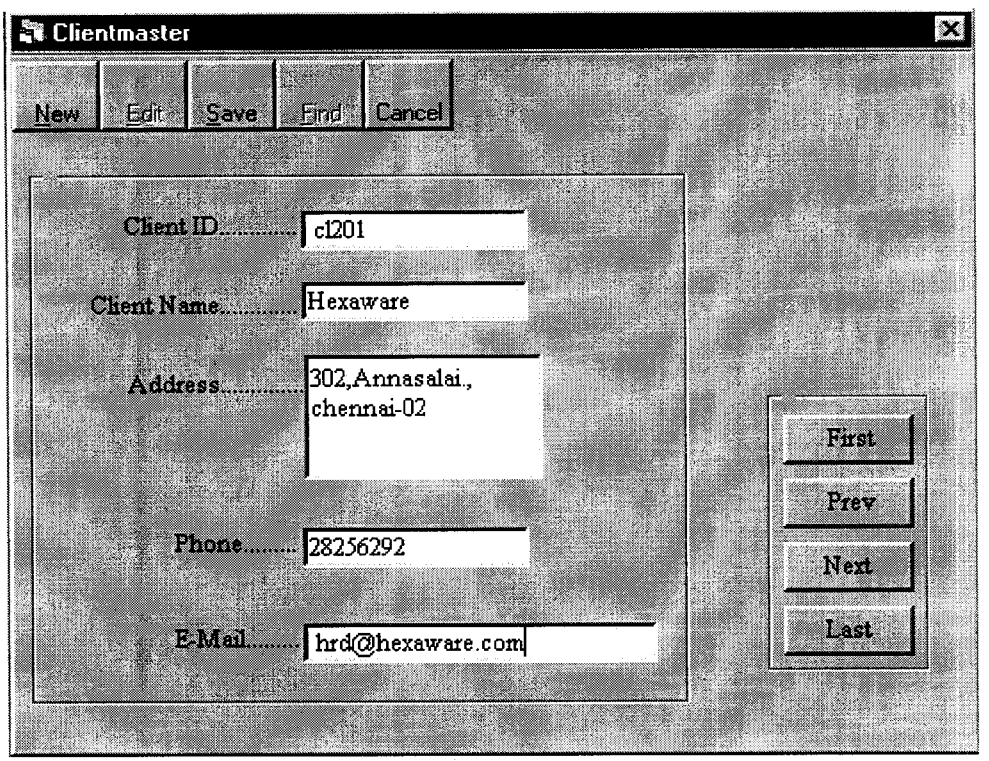
Screen description:

Screen name : resumeform

Table name :candidateprofile

The above screen layout shows the resume screen developed in Visual Basic 6.0

2.CLIENT MASTER SCREEN

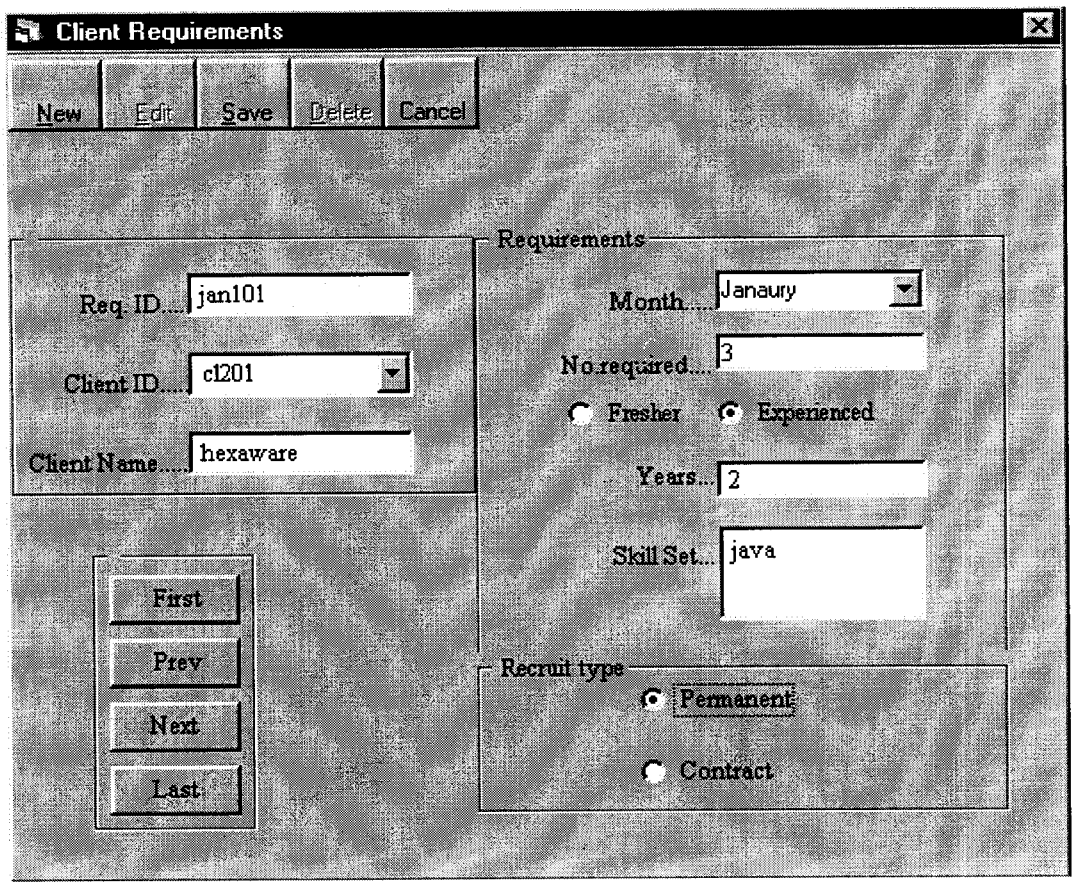


Screen description :

Screen name : clientmaster

Table name :clientmaster

3.CLIENT REQUIREMENTS SCREEN

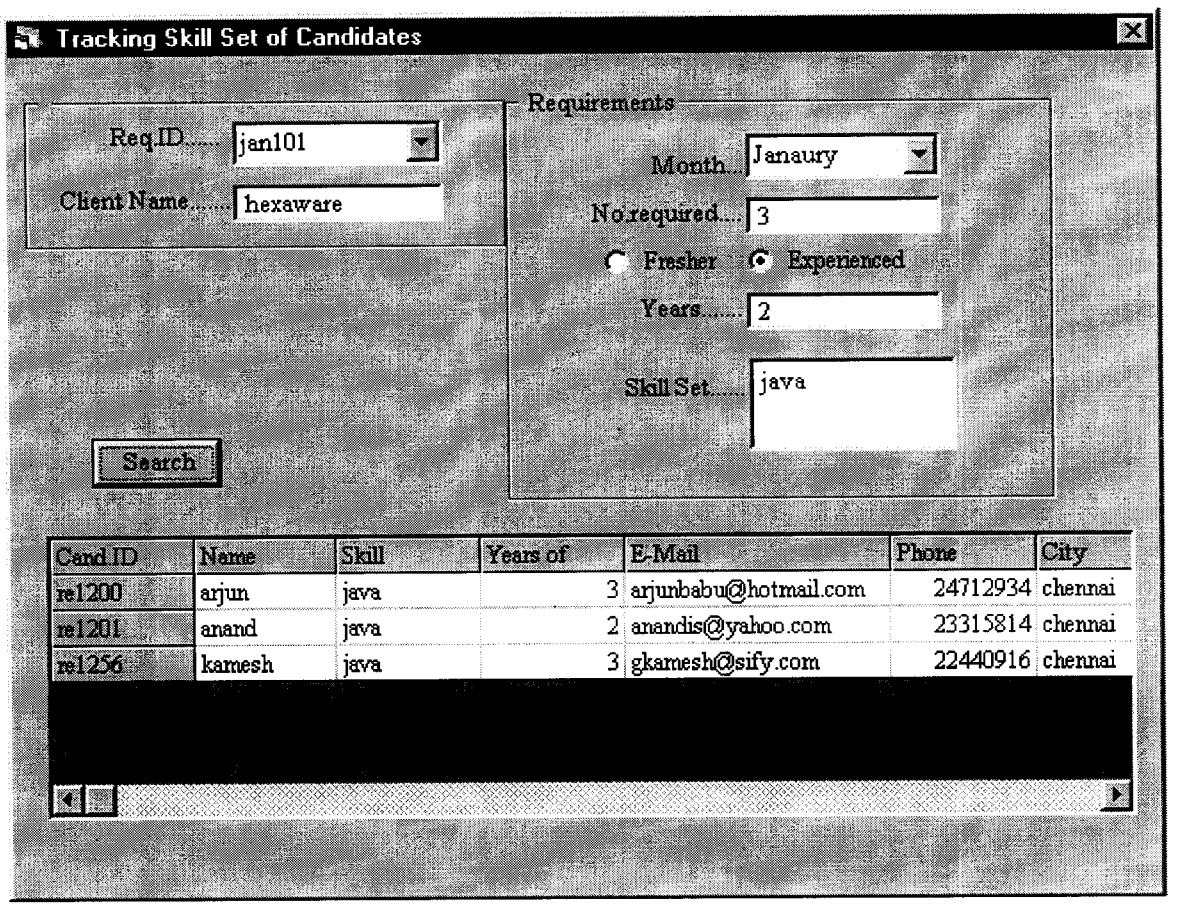


Screen description :

Screen name :clientrequirements

Table name :clientrequirements, clientmaster

4.TRACKING SKILL SET OF CANDIDATES SCREEN

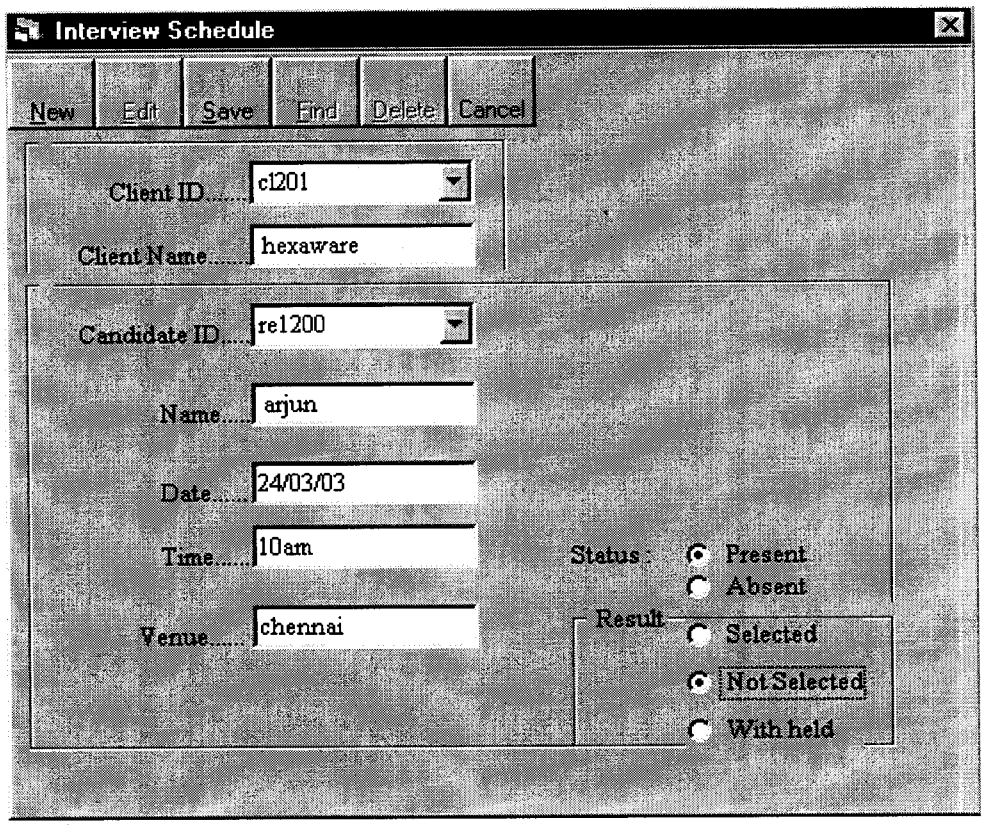


Screen description :

Screen name :Trackingskill

Table name :candidate_profile, clientmaster

5.INTERVIEW STATUS SCREEN

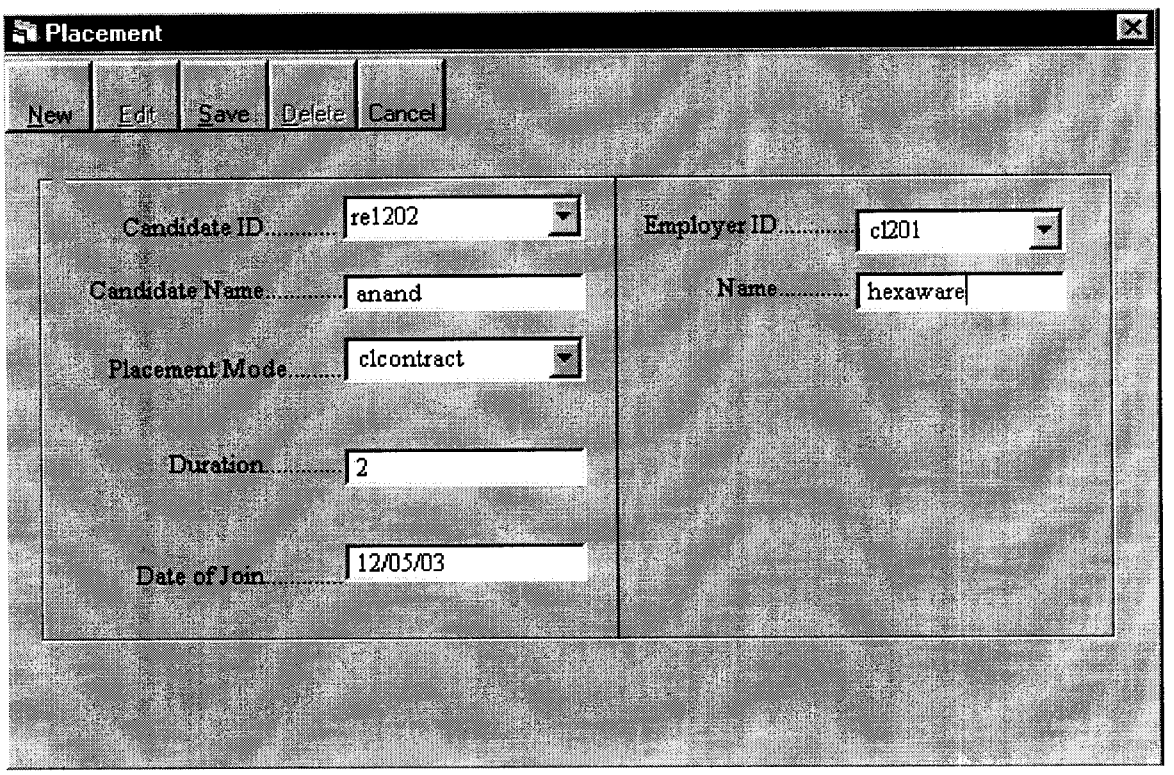


Screen description :

Screen name :Interviewschedule

Table name :Interviewschedule, candidateprofile, clientmaster

6.PLACEMENT SCREEN

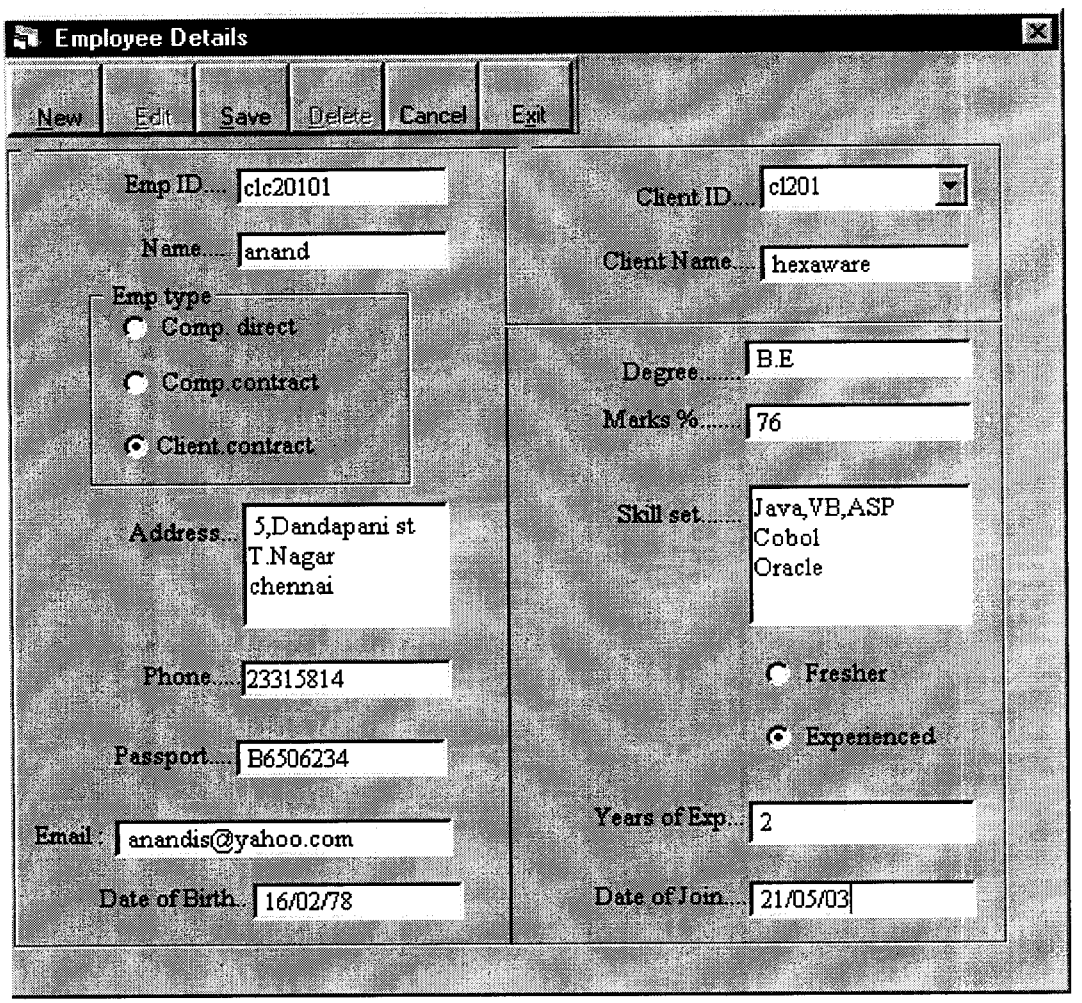


Screen description :

Screen name :placement

Table name :placement, clientmaster, candidateprofile

7.EMPLOYEE DETAILS SCREEN

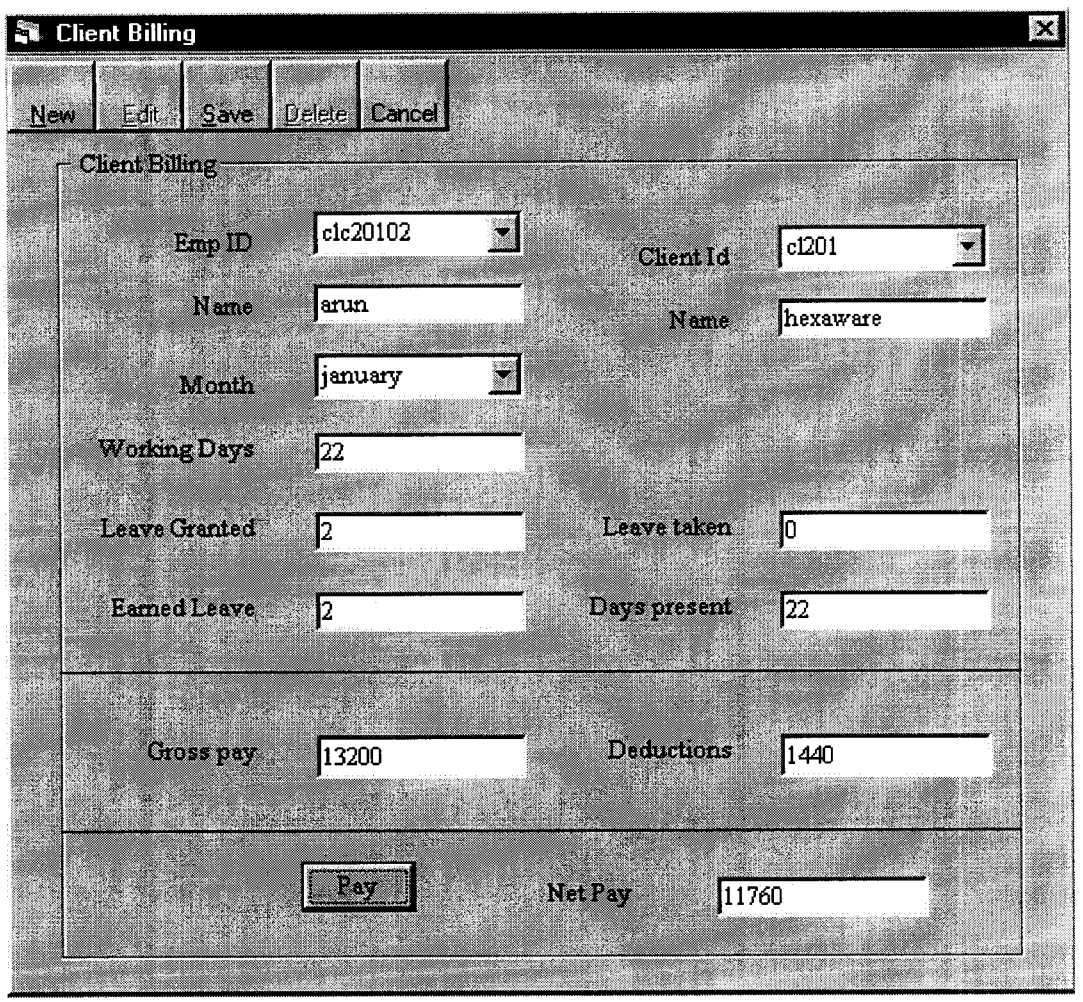


Screen description :

Screen name :employeedetails

Table name :emp_details, clientmaster

8.CLIENT BILLING SCREEN

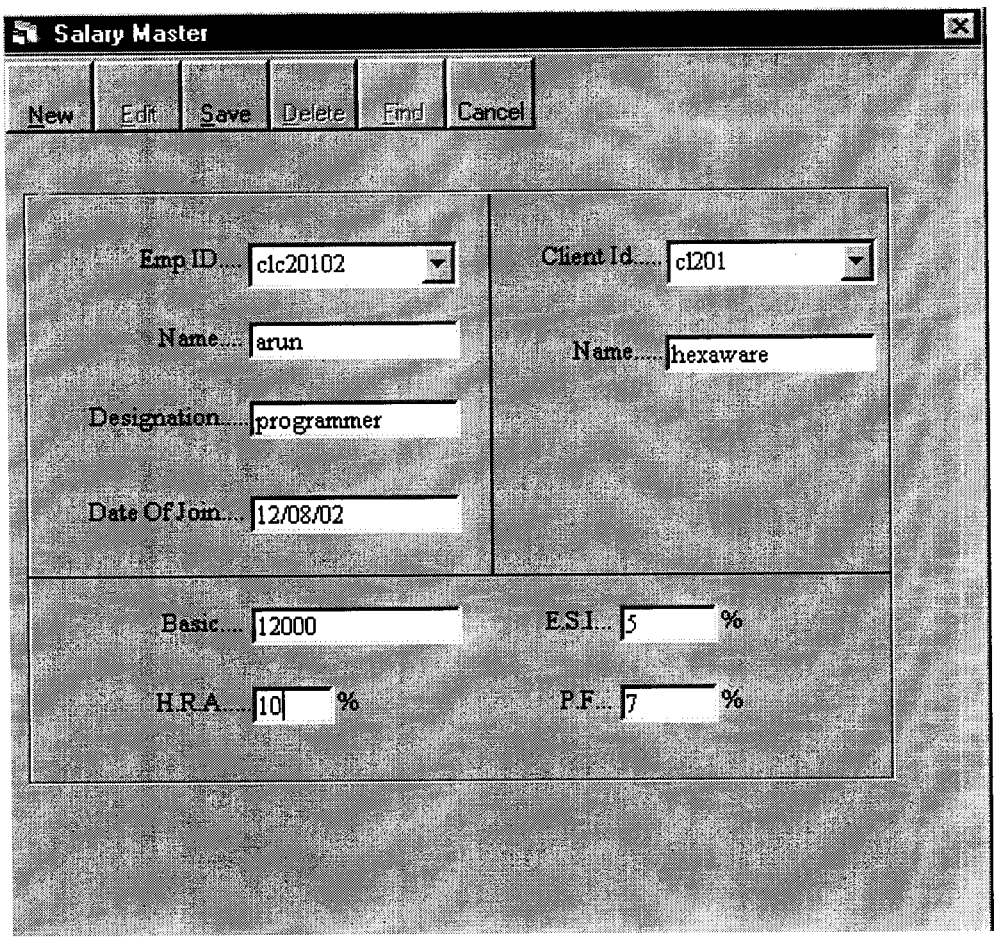


Screen description:

Screen name :clientbilling

Table name :clientbilling, emp_master

9.SALARY MASTER SCREEN



Screen description :

Screen name : Salarymaster

Table name :Salarymaster, emp_master

EastBay Technologies Pvt.Ltd **Test Report**
Chennai-40

PROJECT INFORMATION

Project/System Name: Human Resource and Management System

Test Phase: Unit testing

Module and Form name: Client master.frm

Test information:

Test design specification	Test case specification		Procedure	Remarks
	Input	Output		
1.check for Form completion	Click **Save** with incomplete form	ERROR message- "Form Incomplete"	Click "Client master form" from the Menu.	Pass
2.Check For Irrelevant Entries	Enter text for phone	ERROR message- Enter numbers alone	Click "Client master form " from the menu	Pass
3.Check if transaction roll back happens when cancel is clicked	Click **New**.make entries and click **Cancel**	The transaction is rolled back	Click "Client master form" from the menu	Pass
4.check for redundant Client Id	An already existing no.	ERROR message –This number exists already	Click "Client master form" form menu	Pass
5.Check on clicking Find, input box appears	Enter a client Id as cl201.	The existing record is displayed.	Click "Client master form" from menu.	Pass

Report :

Date of Test : 26/03/03 Tested by : Ohm prakash .J.

No.of errors /defects detected during test : 0

Comments : No errors encountered.

EastBay Technologies Pvt.Ltd **Test Report**
Chennai-40

PROJECT INFORMATION
Project/System Name: Human Resource and Management System Test Phase: Unit testing Module and Form name : Employeedetails.frm
Test information:

Test design specification	Test case specification		Procedure	Remarks
	Input	Output		
1.Check for Form completion	Click **Save** with Incomplete entries in form	ERROR message-"Form fields are Incomplete"	Click "Employee details" from the menu	Pass
2.Check for redundant Emp.Id	Enter an already existing no	ERROR message.-"This Id exists already".	Click "Employee details "from the menu	Pass
3.Check only if the selected record is deleted	Click on **Delete** button when the record is active.	Delete confirmation comes up. On clicking Ok the active record is deleted and the user is notified.	Click "Employee details " from the menu	Pass
4.Check if transaction rollback happens when cancel clicked	Click **New** make new entries. Click on cancel	The last transaction is rolled back.	Click "Employee details "from the menu	Pass
5.Check for Irrelevant entries.	Enter text for phone number	ERROR message – "Enter only numbers"	Click "Employee details "from the Menu	Pass
6.Check on clicking Find ,the input box appears	Enter any existing Emp. Id	The record exists in the database and is displayed in the form.	Click "Employee details "from the menu	Pass

Report :

Date of Test : 26/03/03 Tested by : Ohm Prakash.J.

No.of errors /defects detected during test : 0

Comments : No error encountered.

VISUAL BASIC –AN OVERVIEW

what is Visual Basic? The "Visual" part refers to the method used to create the graphical user interface (GUI). Rather than writing numerous lines of code to describe the appearance and location of interface elements, you simply add pre-built objects into place on screen. If you've ever used a drawing program such as Paint, you already have most of the skills necessary to create an effective user interface.

The "Basic" part refers to the BASIC (Beginners All-Purpose Symbolic Instruction Code) language, a language used by more programmers than any other language in the history of computing. 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. Beginners can create useful applications by learning just a few of the keywords, yet the power of the language allows professionals to accomplish anything that can be accomplished using any other Windows programming language.

The Visual Basic programming language is not unique to Visual Basic. The Visual Basic programming system, Applications Edition included in Microsoft Excel, Microsoft Access, and many other Windows applications uses the same language. The Visual Basic Scripting Edition (VBScript) is a widely used scripting language and a subset of the Visual Basic language. The investment you make in learning Visual Basic will carry over to these other areas.

Whether your goal is to create a small utility for yourself or your work group, a large enterprise-wide system, or even distributed applications spanning the globe via the Internet, Visual Basic has the tools you need.

- Data access features allow you to create databases, front-end applications, and scalable server-side components for most popular database formats, including Microsoft SQL Server and other enterprise-level databases.

- ActiveX™ technologies allow you to use the functionality provided by other applications, such as Microsoft Word word processor, Microsoft Excel spreadsheet, and other Windows applications. You can even automate applications and objects created using the Professional or Enterprise editions of Visual Basic.

- Internet capabilities make it easy to provide access to documents and applications across the Internet or intranet from within your application, or to create Internet server applications.

- Your finished application is a true .exe file that uses a Visual Basic Virtual Machine that you can freely distribute.

Visual Basic Editions

Visual Basic is available in three versions, each geared to meet a specific set of development requirements.

- The Visual Basic Learning edition allows programmers to easily create powerful applications for Microsoft Windows and Windows NT®. It includes all intrinsic controls, plus grid, tab, and data-bound controls. Documentation provided with this edition includes the Learn VB Now CD plus the Microsoft Developer Network (MSDN™) Library CDs containing full online documentation.

- The Professional edition provides computer professionals with a full-featured set of tools for developing solutions for others. It includes all the features of the Learning edition, plus additional ActiveX controls, the Internet Information Server Application Designer, integrated Visual Database Tools and Data Environment, Active Data Objects, and the Dynamic HTML Page Designer. Documentation provided with the Professional edition includes the Visual Studio Professional Features book plus Microsoft Developer Network CDs containing full online documentation.

- The Enterprise edition allows professionals to create robust distributed applications in a team setting. It includes all the features of the Professional edition, plus Back Office tools such as SQL Server, Microsoft Transaction Server, Internet Information Server, Visual SourceSafe, SNA Server, and more. Printed documentation provided with the Enterprise edition includes the Visual Studio Enterprise Features book plus Microsoft Developer Network CDs containing full online documentation.

Visual Basic Concepts

In order to understand the application development process, it is helpful to understand some of the key concepts upon which Visual Basic is built. Because Visual Basic is a Windows development language, some familiarity with the Windows environment is necessary. If you are new to Windows programming, you need to be aware of some fundamental differences between programming for Windows versus other environments.

How Windows Works: Windows, Events and Messages

A complete discussion of the inner workings of Windows would require an entire book. A deep understanding of all of the technical details isn't necessary. A simplified version of the workings of Windows involves three key concepts: windows, events and messages.

Think of a window as simply a rectangular region with its own boundaries. You are probably already aware of several different types of windows: an Explorer window in Windows, a document window within your word processing program, or a dialog box that pops up to remind you of an appointment. While these are the most common examples, there are actually many other types of windows. A command button is a window. Icons, text boxes, option buttons and menu bars are all windows.

The Microsoft Windows operating system manages all of these many windows by assigning each one a unique id number (window handle or hWnd). The system continually monitors each of these windows for signs of activity or events. Events can occur through user actions such as a

mouse click or a key press, through programmatic control, or even as a result of another window's actions.

Each time an event occurs, it causes a message to be sent to the operating system. The system processes the message and broadcasts it to the other windows. Each window can then take the appropriate action based on its own instructions for dealing with that particular message (for example, repainting itself when it has been uncovered by another window).

As you might imagine, dealing with all of the possible combinations of windows, events and messages could be mind-boggling. Fortunately, Visual Basic insulates you from having to deal with all of the low-level message handling. Many of the messages are handled automatically by Visual Basic; others are exposed as Event procedures for your convenience. This allows you to quickly create powerful applications without having to deal with unnecessary details.

Understanding the Event-Driven Model

In traditional or "procedural" applications, the application itself controls which portions of code execute and in what sequence. Execution starts with the first line of code and follows a predefined path through the application, calling procedures as needed.

In an event-driven application, the code doesn't follow a predetermined path — it executes different code sections in response to events. Events can be triggered by the user's actions, by messages from the system or other applications, or even from the application itself. The sequence of these events determines the sequence in which the code executes, thus the path through the application's code differs each time the program runs.

Because you can't predict the sequence of events, your code must make certain assumptions about the "state of the world" when it executes. When you make assumptions (for example, that an entry field must contain a value before running a procedure to process that value), you should structure your application in such a way as to make sure that the assumption will always be valid (for example, disabling the command button that starts the procedure until the entry field contains a value).

Your code can also trigger events during execution. For example, programmatically changing the text in a text box cause the text box's Change event to occur. This would cause the code (if any) contained in the Change event to execute. If you assumed that this event would only be triggered by user interaction, you might see unexpected results. It is for this reason that it is important to understand the event-driven model and keep it in mind when designing your application.

Interactive Development

The traditional application development process can be broken into three distinct steps: writing, compiling, and testing code. Unlike traditional languages, Visual Basic uses an interactive approach to development, blurring the distinction between the three steps.

With most languages, if you make a mistake in writing your code, the error is caught by the compiler when you start to compile your application. You must then find and fix the error and begin the compile cycle again, repeating the process for each error found. Visual Basic interprets

your code as you enter it, catching and highlighting most syntax or spelling errors on the fly. It's almost like having an expert watching over your shoulder as you enter your code.

In addition to catching errors on the fly, Visual Basic also partially compiles the code as it is entered. When you are ready to run and test your application, there is only a brief delay to finish compiling. If the compiler finds an error, it is highlighted in your code. You can fix the error and continue compiling without having to start over.

Because of the interactive nature of Visual Basic, you'll find yourself running your application frequently as you develop it. This way you can test the effects of your code as you work rather than waiting to compile later.

Forms, Controls, and Menus

The first step to creating an application with Visual Basic is to create the interface, the visual part of the application with which the user will interact. Forms and controls are the basic building blocks used to create the interface; they are the objects that you will work with to build your application.

Forms are objects that expose properties which define their appearance, methods which define their behavior, and events which define their interaction with the user. By setting the properties of the form and writing Visual Basic code to respond to its events, you customize the object to meet the requirements of your application.

Controls are objects that are contained within form objects. Each type of control has its own set of properties, methods and events that make it suitable for a particular purpose. Some of the controls you can use in your applications are best suited for entering or displaying text. Other controls let you access other applications and process data as if the remote application was part of your code.

This chapter introduces the basic concepts of working with forms and controls and their associated properties, methods, and events. Many of the standard controls are discussed, as well as form-specific items such as menus and dialog boxes.

ActiveX Data Objects (ADO)

The bridge between the data providers and data consumers is through data sources created using Microsoft ActiveX Data Objects (ADO), which is the primary method in Visual Basic to access data in any data source, both relational and non-relational. For backward compatibility and project maintenance, Remote Data Objects (RDO) and Data Access Objects (DAO) are still supported.

Data Sources and Data Controls

On the client side, several new data sources are available, including the Data Environment, a graphical designer that allows you to quickly create ADO Connections and Commands to access your data. The Data Environment designer provides a dynamic programmatic interface to the data access objects in your project. In addition, the Data

Environment provides advanced data shaping services — the ability to create hierarchies of related data, aggregates, and automatic groupings, all without code.

The new ADO Data control is similar to the intrinsic data control and Remote Data control, except that it uses ADO to access data. You can now use an ADO Recordset as a data source for your controls and objects in Visual Basic.

In Visual Basic you can now create your own data sources either as user controls or classes, to encapsulate business rules or proprietary data structures. The class module now features the DataSourceBehavior property and the GetDataMember event, which allow you to configure a class as a data source.

Dynamic Data Binding

The ability to dynamically bind a data source to a data consumer is now possible in Visual Basic. At run time, you can now set the DataSource property of a data consumer (such as the DataGrid control) to a data source (such as the ADO Data control). This capability, unavailable in previous versions of Visual Basic, allows you to create applications, which can access a multitude of data sources.

Presenting Data to the End User

Visual Basic offers a variety of rich ways to present data to your end users. ADO/OLE DB-based versions of all the data bound controls are included in Visual Basic:

- The DataList and DataCombo controls are the ADO/OLE DB equivalents of DBList and DBCombo controls.
- The DataGrid is the successor to DBGrid.
- The Chart control is now data bound.
- A new version of the FlexGrid control, called the Hierarchical FlexGrid, supports the hierarchical abilities of the Data Environment.
- The new DataRepeater control functions as a scrolling container of data bound user controls where each control views a single record.

The Data Report is a new ActiveX designer that creates reports from any data source, including the Data Environment. With the Data Report designer, formatted reports can be viewed online, printed, or exported to text or HTML pages.

Data Formatting and Data Validation

The new DataFormat object allows you to display data with custom formatting, but write it back to the database in the native format. For example, you can now display dates in the format appropriate to a country, while the actual data is stored in a date format. Data is formatted coming out of the source, and unformatted going back in. You can also do custom formatting and perform additional checks using the Format and Unformat events.

Data validation is also enhanced using the CausesValidation property with the Validate event. By setting the CausesValidation property to True, the Validate event for the previous control in the tab order will occur. Thus, by programming the Validate event, you can prevent a control from losing focus until the information it contains has been validated.

SQL SERVER AN OVERVIEW

Database Architecture

Microsoft SQL Server data is stored in databases. The data in a database is organized into the logical components visible to users. A database is also physically implemented as two or more files on disk.

When using a database, you work primarily with the logical components such as tables, views, procedures, and users. The physical implementation of files is largely transparent. Typically, only the database administrator needs to work with the physical implementation.

Each SQL Server installation has multiple databases. SQL Server has four system databases (master, model, tempdb, and msdb) and each SQL Server installation has one or more user databases. Some organizations have only one user database, containing all the data for their organization. Some organizations have different databases for each group in their organization, and sometimes a database used by a single application. For example, an organization could have one database for sales, one for payroll, one for a document management application, and so on. Sometimes an application uses only one database; other applications may access several databases.

It is not necessary to run multiple copies of SQL Server to allow multiple users to access the databases on a server. SQL Server is capable of handling thousands of users working in multiple databases on the same server at the same time. SQL Server makes all databases on the server available to all users that connect to the server, subject to the defined security permissions.

When connecting to SQL Server, your connection is associated with a particular database on the server. This database is called the current database. You are usually connected to a database defined as your default by the system administrator, although you can use connection options in the database APIs to specify another database. You can switch from one database to another with the Transact-SQL USE *database_name* statement, or you can use an API function that changes your current database context.

SQL Server version 7.0 allows you to detach databases from a server, then reattach them to another server, or even attach the database back to the same server. If you have a SQL Server

database file, you can tell SQL Server when you connect that you want that database file attached with a specific database name.

Database Design Considerations

Designing a database requires an understanding of both the business functions you want to model and the database concepts and features used to represent those business functions.

It is important to accurately design a database to model the business because it can be time consuming to change the design of a database significantly once implemented. A well-designed database will also perform better.

When designing a database, you should consider:

- The purpose of the database and how it affects the design. Create a database plan to fit your purpose.
- Database normalization rules that prevent mistakes in the database design.
- Protection of your data's integrity.
- Security requirements of the database and user permissions.
- Performance needs of the application. You must ensure that the database design takes advantage of Microsoft SQL Server features that improve performance. Achieving a balance between the size of the database and the hardware configuration is also important for performance.
- Maintenance.
- Estimating the size of a database.

Overview of Creating and Maintaining Databases

A client/server database system comprises two components: programs that provide an interface for client-based users to access data, and the database structure that manages and stores the data on the server. For example, if you use Microsoft SQL Server to create a checking account application, you must set up a database structure to manage the account transaction data and an application that acts as the user interface to the database, allowing users to access checking account information.

Creating a database to serve your business needs requires an understanding of how to design, create, and maintain each of these components to ensure that your database performs optimally.

Databases

A database in Microsoft SQL Server consists of a collection of tables that contain data, and other objects, such as views, indexes, stored procedures, and triggers, defined to support activities performed with the data. The data stored in a database is usually related to a particular subject or process, such as inventory information for a manufacturing warehouse.

SQL Server can support many databases, and each database can store either interrelated data or data unrelated to that in the other databases. For example, a server can have one database that stores personnel data and another that stores product-related data. Alternatively, one database can store current customer order data, and another, related database can store historical customer orders that are used for yearly reporting.

Before you create a database, it is important to understand the parts of a database and how to design these parts to ensure that the database performs well after it is implemented.

Tables

Tables are database objects that contain all the data in a database. A table definition is a collection of columns. In tables, data is organized in a row-and-column format similar to a spreadsheet. Each row represents a unique record, and each column represents a field within the record. For example, a table containing employee data for a company can contain a row for each employee and columns representing employee details such as employee number, name, address, job title, and home phone number.

Database Diagrams

You can create, edit, or delete database objects while you are directly connected to the database in which those database objects are stored.

You interact with the server database using database diagrams. Database diagrams can be accessed through SQL Server Enterprise Manager. Database diagrams graphically represent the tables in your database. The database diagrams display the columns contained within the tables, relationships between the tables, and indexes and constraints attached to the tables. After a connection to a database has been established, you can use database diagrams to:

- View the tables and their relationships in a database.
- Perform complex operations to alter the physical structure of a database.

  You can make changes in the database diagram without affecting the underlying database. When you use a database diagram to modify a database object, the modifications you make are not saved in the database until you save the table or database diagram. Thus, you can experiment with "what if" scenarios on a database's design without permanently affecting its existing design or data.

- Save the changes to selected tables or the database diagram and have the changes modify the server database.

If you don't want to save changes you've made to selected tables or the database diagram, you can discard the changes.

- Save a change script that contains the Transact-SQL code generated by your changes to the database diagram. Saving a change script rather than saving your changes to the database enables you to edit the change script in a text editor and then apply the modified script to the database.

  You can also choose to create a change script automatically each time you save your database diagram or any database object in your diagram. This provides you with a record of the changes you have made to the database.

  You control the timing, type, and extent of the changes to your database by choosing how changes to the database diagram affect the server database.

Stored Procedures

When you create an application with Microsoft SQL Server, the Transact-SQL programming language is the primary programming interface between your applications and the SQL Server database. When you use Transact-SQL programs, two methods are available for storing and executing the programs. You can store the programs locally and create applications that send the commands to SQL Server and process the results, or you can store the programs as stored procedures in SQL Server and create applications that execute the stored procedures and process the results.

Stored procedures in SQL Server are similar to procedures in other programming languages in that they can:

- Accept input parameters and return multiple values in the form of output parameters to the calling procedure or batch.
- Contain programming statements that perform operations in the database, including calling other procedures.
- Return a status value to a calling procedure or batch to indicate success or failure (and the reason for failure).

You can use the Transact-SQL EXECUTE statement to run a stored procedure. Stored procedures are different from functions in that they do not return values in place of their names and they cannot be used directly in an expression.

The benefits of using stored procedures in SQL Server rather than Transact-SQL programs stored locally on client computers are:

- They allow modular programming.

  You can create the procedure once, store it in the database, and call it any number of times in your program. Stored procedures can be created by a person who specializes in database programming, and they can be modified independently of the program source code.

- They allow faster execution.

  If the operation requires a large amount of Transact-SQL code or is performed repetitively, stored procedures can be faster than batches of Transact-SQL code. They are parsed and optimized when they are created, and an in-memory version of the procedure can be used after the procedure is executed the first time. Transact-SQL statements repeatedly sent from the client each time they run are compiled and optimized every time they are executed by SQL Server.

- They can reduce network traffic.

  An operation requiring hundreds of lines of Transact-SQL code can be performed through a single statement that executes the code in a procedure, rather than by sending hundreds of lines of code over the network.

- They can be used as a security mechanism.

  Users can be granted permission to execute a stored procedure even if they do not have permission to execute the procedure's statements directly.

A SQL Server stored procedure is created with the Transact-SQL CREATE PROCEDURE statement and can be modified with the ALTER PROCEDURE statement. The stored procedure definition contains two primary components: the specification of the procedure name and its parameters, and the body of the procedure, which contains Transact-SQL statements that perform the procedure's operations.

BIBLIOGRAPHY

9.BIBLIOGRAPHY

- DATABASE PROGRAMMING WITH VISUAL BASIC 6.0

  -MICHAEL AMUNDSEN & CURTISH SMITH

- SOFTWARE ENGINEERING

  -ROGER S.PRESSMAN

- VISUAL BASIC CONCEPTS

  -PETER NORTON

- MSDN COLLECTION JAN 2000