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**Employee's Information System
of
Islamabad College for Boys
G- 6/3,
Islamabad.**



**Designed and Computerized
By
Azra Sagheer.**



A report Submitted to
Quaid -i-Azam University, Islamabad.
as
A Partial fulfillment of the requirement of the
Post Graduate Diploma in Computer Science.

July,2003.



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



Acknowledgements

‘ALLAH’ created the seven heavens in harmony. You donot see any incongruity in the creation of “RAHMAN”. Then look again, can you see any flaw? And then look again and yet again, your sight will come back to you confused and fatigued. **(AL_ QURAN)**

My profound gratitude to the most Gracious and Compassionate ALLAH, whose blessing and guidance made it possible for me to complete this task.

Words seem to lose their significance when I try to express my feelings of gratitude towards my parents and inlaws whose prayers, affection and encouragement helped me to complete my project.

My special thanks to Muhammad Rafiq Malik, the Principal of Islamabad College for Boys, for his patience and cooperation in providing the relevant information whenever needed.

I sincerely acknowledge the painstaking efforts and guidance of Dr. Ghulam Muhammad. I highly appreciate his sense of responsibility, dedication and his sincerity in contributing new ideas and improving upon my work.

I am grateful to my beloved husband for his sincere wishes and encouragement. I will always relish the memories of the sweet company provided by my friends Saleha, Shehnila and Rehana.

AZRA





Abstract

The Staff information System has been developed for Islamabad College for Boys G-6/3, Islamabad . The System has efficient means of storage and retrieval of informatin related to employees of the College . The information Stored in the database is manipulated with the help of different layouts designed for the System. The data is retrieved in the form of queries and reports.





DECLARATION

I declare that this software, neither as a whole nor as a part has been copied from any other source. It is further declared that I have completed my final project of Post Graduate Diploma in Computer Sciences successfully as a result of my own struggle and research. No portion of this whole work represented in this report has been submitted in support of any application for any other degree or qualification of this or any other University or institute of learning. If any part of the project and write up is proved to be copied out or there is any duplication of the code, then I will be responsible for the consequences.


Mrs Azra Sagheer
29/9/03





Quaid-i-Azam University

Department of Computer Centre

Final Approval.

This is to certify that we have read the project report Submitted By Mrs. Azra Sagheer and it is our Judgement that this report is of sufficient standard to warrant its acceptance by the Quaid-i-Azam University, Islamabad for the Post Graduate Diploma in Computer Sciences.

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Project Brief

Project Title: Employee's information System

Organization: Islamabad College For Boys G-6/3, Islamabad

Under Taken by: Mrs Azra Sagheer

Supervisor: Dr. Ghulam Muhammad

Starting Month: July, 2003

Completion Month: September, 2003

Development Tool: Oracle Developer 2000 (7.3)

Operating System: Window 98





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CHAPTER NO 1

1.1 Introduction to the project

Computerized Employees Information System (EIS) provides facilities for users to keep personal record of college's employees. All the employee's designation , qualification , dependent's record , promotion , transfer , retirement,termination,leaves allowed are also maintained through this system.

Expert forms,ontime reports,queries and all kinds of help are the basic features of this software.It covers all features of existing (EIS) and Provide more functionality,higher level of security,reliability,better interface,sound management system and speedy output.

1.2 Introduction to Islamabad College for Boys G-6/3, Islamabad

The Concept of a model educational institution was transformed into a reality in the Shape of first Islamabad Model School for Boys established in 1966 by the Federal Government incepted as a non-residential English Medium Secondary School, essentially on the pattern of a Public School together with the formulation of an innovative model set-up. This institution was graded as a Centre of Excellence amongst its contemporaries.

Encouraged by its Superb overall Performance, this School was first Upgraded to intermediate level in the year 1975 and then elevated to a Prestigious Status of a Degree College in the year 1985. Out of all the Boys, institutions of the Federal Capital the ICB is a Unique institution offering educational Programmes from Class 1 to B.A./B.Sc level in Various disciplines.

Since its inception in 1966, this College has relentlessly Struggled not only to scale the peaks in the domains of Curricular, and extra-curricular activities but has also Successfully managed to maintain its tally of achievements todate. The College has a long list of distinctions earned totally through its imagination, team spirit, diligence and commitment to ensure the most dynamic academic process to a gainful consummation.

1.3 Need for computerization:

Every organization whether large or small uses an information system to maintain the important subjects of information which are vital for its existence. So such a system should exist in every organization which maintains the update information about its employees.

These days the head of the organization needs a lot of information to successfully run his organization and for decision making. He needs all that is happening in different departments and the factors outside the organization which will effect it. Unfortunately the handling of information is a big problem in large organizations. The head of an organization has to do a lot of paper work which leaves him with less time for planning, evaluation and decision making which are his main tasks.

To circumvent this problem a new type of information system is needed. This information system should be able to collect, store, update ,process and distribute the information easily. The ready solution that springs to ones mind is the use of computer. Computers are playing important role in almost every sphere of life. They are being used by the engineers, doctors, physicians and teachers etc. They have merged in certain fields where their existence seemed impossible.

The college is increasing every year. Such growth in number and size causes many problems like inaccuracy of information etc. At present all procedures are manual, time consuming and uneconomical. So keeping the above aspects in mind a computerized system is suggested which will not only lessen the laborious operations but it will be more accurate, efficient and effective.

1.4 Objectives of the proposed system

The employee's Information System (EIS) is a combination of record keeping and data processing system. Through this system we will get following results

- 1) It will increase the performance of the existing manual system.
- 2) It will provide an efficient system which would give efficient results.
- 3) It will overcome the redundancy factor of the existing system.
- 4) It will provide maximum data security.
- 5) It will overcome the non-centralized data control concept.
- 6) It will give quick results and will enhance time saving factor.
- 7) It will provide maximum data security.
- 8) It would be a flexible system.
- 9) It would be a user friendly system.
- 10) It would increase the productivity.
- 11) It would give reliable results.
- 12) It would provide maximum file movement.

CHAPTER NO 2

2.1 Introduction

Islamabad College for Boys, G-6/3 Islamabad has the rare distinction of being the pioneer of the Islamabad Model Institutions. A trend setter of model set up. As this College can Justifiably boast of ,this institution is Committed to the pristine objective of grooming the nation builders of tommorrow by employing the best of talents and potentials. The aim is to facilitate provision of conducive environment in the College so as to catalyze development of their enviable Personalities, injecting in them the nationalistic Spirit, love and respect for cherished human values and inculcating in them lofty Islamic Precepts. All these values coupled with dissemination of quality education constitute the hallmark of this college . The college motto (“ **He dieth not who giveth life to learning** “) is true reflection of its unstinted struggle for the cause of real education.

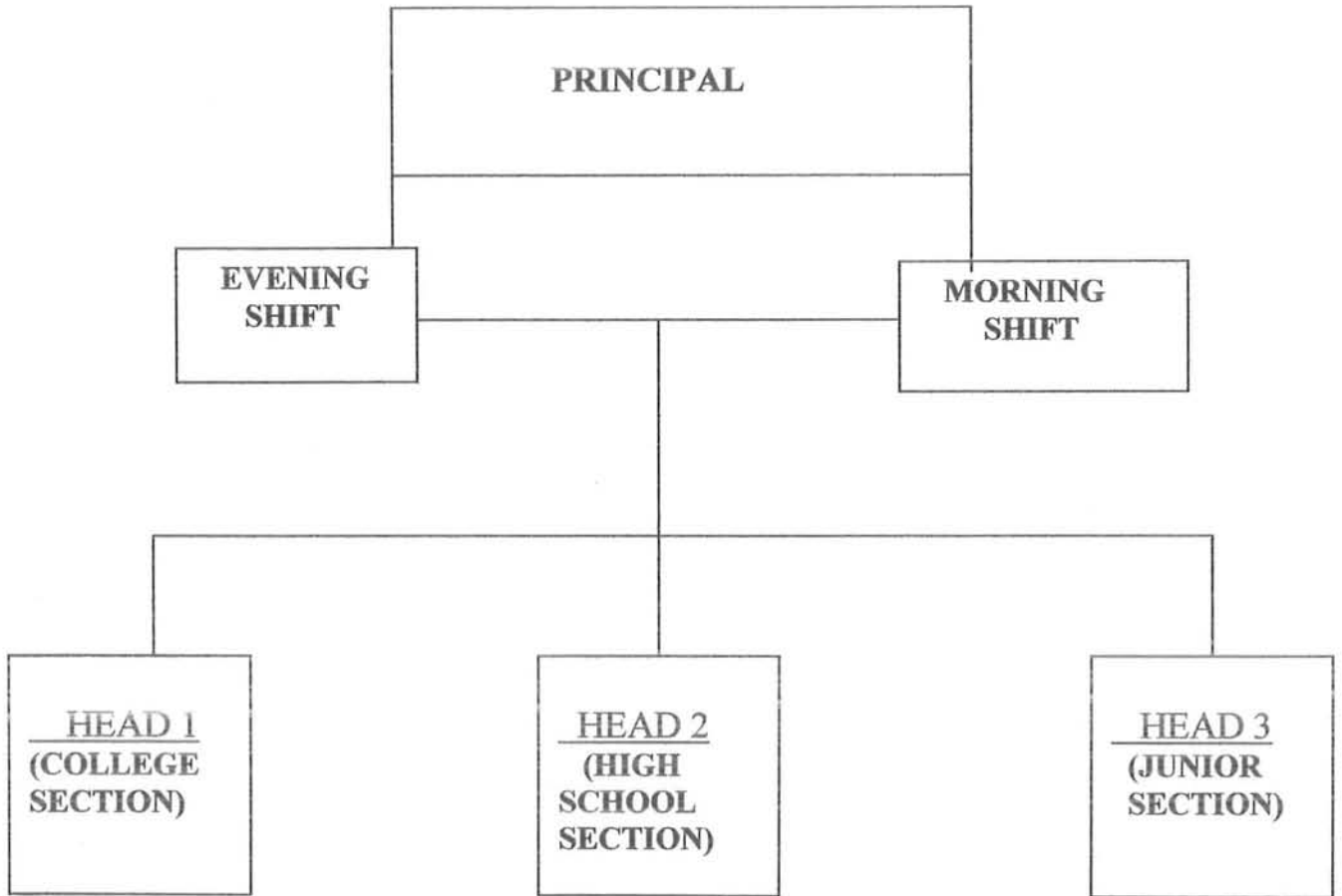
2.2 Administrative and academic structure

Although the college has a multi_dimensional outlook in its academic pursuits,it comprises of following main sections:

- 1) **JUNIOR SECTION** classes 1 to class 5
- 2) **SENIOR SECTION** classes 6 to class 12
- 3) **DEGREE SECTION** classes 13 & 14

In view of vast expanded establishment , the senior section is jointly supervised by Head (School) and Head(College).Headmistress coordinates both the administrative and academic programes of the Junior Section.The respective incharge assists the principal in running the affairs of the college and implimentation of policies.

Organizational setup



2.3 Shift System

Faced by an onslaught of admissions and the resulting distorted proportions in the available resources, exclusively because of the demonstrated popularity, the Federal Government was constrained to introduce the scheme of second shift in the college section and then recently in the school section. Here again we have registered a substantial strength. The scheme of second shift has been instrumental in alleviating the problems of those parents who wanted quality education of their children but were deprived because of non-availability of this facility. The scope of this shift has undergone radical expansion and now the second shift caters to following levels.

JUNIOR SECTION	Classes I to V
SECONDARY SCHOOL SECTION	Classes VI to X
COLLEGE SECTION_HSSC_B.A /B.Sc	Ist Yr & IInd Year
	Classes IIIrd & Ivth year

2.4 Employees registration

The College receives the information about each employee from FDE. The employees have to produce detailed information such as name, father's name, date of birth, date of joining, gender, marital status, permanent address, telephonic contact etc. Every employee is assigned a unique employee number through which all future correspondence is made.

2.5 EMPLOYEE CATAGORIES.

2.5.1 PERMANENT/REGULAR.

The employees which are appointed through Federal Public Service Commission selection are said to be permanent or regular employees. The Federal Public Service Comomission announces the seats in newspapers for the requiered subjects and then takes exams.After interviewing the selected candidates appoints them as regular employees in all Federal Educational Institutions.The regular employees have scales ranging from 1 to 20.The employees of scale 1 to 15 are called Non_Guzetted and the employees of scale 16 and above are called Guzетted employees.

2.5.2 Daily Wages

These are also the employees which are appointed by Federal Directorate of Education.Whenever an institution demands for extra teachers to overcome the burden,the FDE provides the personnel.These personnel are also being paied by FDE.They are given fix pays excluding allowances and deductions.

2.5.3 Adhoc

These are also empolyed by FDE and are given fix pays without allowances on contract basis.

2.6 LEAVES

The admissisble leaves to all the permanent employees are many types .For example casual leave,earn leave,study leave ,leave without pay etc.All other employees can get unpaid leaves.

LEAVES	DAYS PER YEAR
Casual leaves	24 days
Earn leaves	12 days
X_Pakistan leaves	365 days

2.7 Dependents

The department needs information about spouse .For this purpose related dependent's record is gathered by each employee.

2.8 Retirement of Employees

RETIREMENT AFTER 30 YEARS SERVICE.

If age of employee is 60 years or his service duration is 30 years then employee is retired from service and there is no extension to its job.

RETIREMENT AFTER 25 YEARS SERVICE.

If age of employee is less than 60 years or his service duration is 25 years then employee can take retirement from service , but he can apply for extension to its job.

RETIREMENT AFTER 15 YEARS SERVICE IN CASE OF DISABILITY.

If employee become disable due to any reason & its sevice length is 15 years then he is retired from the service.

2.9 PROMOTION

For promotion employee has to improve its qualification or show efficiency.

2.10 TRANSFER

The FDE sends transfer letter of an employee to the institution. All details are then recorded on hand written files. The data is accessed with the help of notification number and date.

2.11 TERMINATION

Whenever an employee is terminated the institution provides all informations relating to the reason of termination. These informations are gathered by the employee alongwith the institution and are received by FDE. The institution has to provide sound reason for termination to FDE.

2.12 Drawbacks of existing system

- Efficiency of the system is minimum.
- Information is available to many users at the same time.
- Retrieval of information is very slow.
- It requires the creation of many files with large number of duplicate data resulting in a highly redundant data.
- Too much stationary is used to store data.
- Data is being stored on paper files which are opened to different users. Any authorized person who wishes to give false image to his loss, may replace record files with fictitious data.
- If any personal file gets lost then all the informations regarding that employee is lost.

- File maintaining system is difficult and space consuming.
- Extra staff is required for maintaining files.
- Too much paper work is involved.
- The insertion,deletion and updation are time consuming and cumbersome jobs.
- Due to non_centralized data different users cannot use it at the same time.

CHAPTER NO 3

3. PROPOSED SYSTEM

The new computer system is developed as a general purpose system but the main target of the system where to implement the system is Islamabad College for Boys.

The college has a well equipped computer department but there is no software to maintain the data in an organized way. They are willing to develop a system, which helps them to solve the entire problem to maintain data they are facing. The proposed system is a database system developed in ORACLE DEVELOPER 2000(7.3), therefore we should know about what is a database.

3.1 DATABASE

A database consists of some collection of persistent data that is used by application system of some given enterprise. The term enterprise is here simply a convenient generic term for any reasonable self-contained commercial, scientific, technical, or other organization. An enterprise might be a single individual or complete corporation of similar large bodies or any thing in between, here are some examples.

- A manufacturing company
- A bank
- A hospital
- A university
- A government department

3.1.1 Theory of RDBMS

In recent years, database management system (RDBMS) have established themselves as the primary means of data storage for information ranging from large commercial transaction applications to PC-based desktop applications. At the heart of most of today's information system is a relational database management system (RDBMS). RDBMS have been the workhorse data management operations for over a decade and continue to evolve and mature, providing sophisticated storage, retrieval and distribution functions to enterprise-wide data processing and information management systems. Compared to the file systems, relational database management systems provide organizations with the capacity to easily integrate and leverage the massive amounts of operational data into meaningful information systems. The evolution of high-powered database such as ORACLE 7 has fastened the development of advanced "enabling" technologies including client/server, data warehousing, and online analytical processing, all of which comprise the core of today's state of the art information management systems.

Examine the components of the term RELATIONAL DATABASE MANAGEMENT SYSTEM. First, a database is an integrated collection of related data. Given a specific data item, the structure of a database facilitates the access to data related to it, such as a student and all of his registered courses or an employee and his dependents. Next, a relational database is a type of database based in a relational model; non-relational database commonly use a hierarchical, network or object-oriented model as their basis. Finally, a relational database management system is the software that manages a relational database. These systems come in

several varieties,ranging from single_user desktop systems to full_featured,global,enterprise_wide systems,such as ORACLE 7.

3.2 (EIS) MODULES

The Employees Information System (EIS) is a record keeping and data processing system.Successful use of electronic data processing provides not only the previous information but also the current updated information.Following are the modules used in EIS.

- Employees personal record.
- Leaves management
- Dependent's record
- Employees transfer record
- Employees promotion record
- Employees retirement record
- Employees termination record

3.2.1 Employees Personal Record

The module will be used for maintaing the Employees personal Record like employees catagories, academic information, department,Designation etc.Any change in post ,Department, Designation will also be maintained.

3.2.2 Leave Management

This module will store the informations about the leaves availed by the employees. It will also show that how many he has availed from allowed

leaves and will show the balance. In case of misuse it will show warning as misuse of facility.

3.2.3 Dependent's Record

This module will be used to store the Record of employees dependents, their biodata and relationship etc.Each relation to the employee is assigned a unique number .This number would be used as a code for dependent's biodata.

3.2.4 Employees Transfer Record

This module will store the information about the transfer of employees.It will also keep their notification numbers,place of transfer,date of transfer etc.

3.2.5 Employees Promotion Record

This module will keep the record of promotion of the employees.It will maintain the information of promotion grade ,place of promotion notification number,date etc.

3.2.6 Employees Retirement Record

This module will store the information about retirement of the employees.It will keep the information about the type of retirement and date of retirement.

3.2.7 Employees Termination Record

This module will save the record of termination of employees.It will show the reason for termination and will keep all necessary data.

3.3 REPORTS

Following are the suggested reports:

- Employee's personal record
- Academic and professional Qualification of Employees
- Department wise Detail of Employees.
- Designation wise Record of Employees
- Employees leave Record
- Employees Dependents Detail
- Shift wise Detail
- Post wise Detail
- Record of Transfer and promotion
- Record of Retirement
- Record of Termination

3.4 Improvements Expected by the Proposed System

Keeping in mind the shortages and drawbacks of the existing system,our proposed system will strive for achieving the following objectives:

- **Efficiency**

Efficiency is defined as the economic utalization of available resources for achieving a predetermined objectives.The proposed system is more efficient than the existing one.For it uses minimum human and financial resources, and still its output is far better in terms of time and appearance and error free.

- **Data security**

Data required for decision making is highly valuable. Therefore, reliability of the proposed system is secured by giving a regular and guaranteed service to the user.

- **Time factor**

Queries and reports can be produced quickly.

- **Accuracy**

The system will provide the accurate information, needed for decision making. It will also ensure efficient and accurate record keeping.

- **Flexibility**

The (EIS) will be capable making changes and enhancement in accordance with future needs of the management.

- **User friendly**

The user will communicate with the system through simple onscreen dialogues. Its menu will be self explanatory and supplemented by on_line help.

- **Productivity**

Significant reduction of clerical task will lead improved system productivity.

- **Performance**

The proposed system will reduce time and efforts required to retrieve information. It would have the capacity to answer various queries instantly and efficiently.

- **Data redundancy**

It would help in reducing the problem of data redundancy.

- **Time saving**

The proposed system would help to save time.

- **Reliability**

The new system will be more reliable than the manual system, due to its accurate, secure and timely decision making.

- **Minimum file movement**

The proposed system will minimize the movement of files from one department to another. As all the departments would have access to centralized database and it would also help in maintaining security.

CHAPTER NO 4

4 System Design

System design is based upon the information gathered during the system analysis phase to produce an economical, reliable, simple, acceptable and flexible system. System design is mainly concerned with the coordination of various components of a system in order to achieve the organizational objectives. Different users have different views to a database. The key task of design is to integrate these views and to create a physical database capable of supporting different logical views with adequate performance.

4.1 Different approaches to system design

There are different approaches to system design and are discussed as under:

4.1.1 System development life cycle approach

This is the most traditional approach. In this approach the whole system is analysed and designed in increasing detail. Then each of the designed part is tied in the overall system framework. In system development life cycle, phases are managed as they perform. In turn they are reviewed before the project work proceeds. Quite often, that triggers cycling back to the earlier phase. This system development life cycle uses the bottom up approach; that is, all the modules are tested at lower level and then finally testing takes place at top level.

4.1.2 Structure design approach(Top down approach)

This approach is viewed as top down program design technique which ensures that the entire program is logically concerned by the limited set of control structures. These structures included sequencing process(continuous flow of coding)alteration or conditional decisions(if_then_else, etc) and repetition or iterative loops(do_until etc).

Various structured methodologies are as under:

1. top down
2. data flow
3. data structures
4. output oriented

As discussed earlier the structured methodologies are top down . Remaining three methodologies are:

- **Data flow**

This methodology centers on analyzing the logical flow of data through a system that as the basis for developing a hierarchical set of logical system. This methodology involves drawing data flow diagrams which are similar to the traditional system flow charts.

Data structures

This starts by analyzing and defining the data structure, which determines the program structure. The program task is then expressed in executable operations, with each operation allocated to one program component.

- **Output oriented**

This approach centers around designing the outputs initially and developing the data structures for those outputs. That proceed in a step by step manner to a logical data base design, and analyze real world events to design the input, methods, and procedures.

More than any other structured approach, output oriented design has the advantage of producing minimal system in which the data will be maintained correctly. In addition, allows a precise definition of the scope of the system. If output is used as the key of design, then the designer has good way of knowing when a system activity has been completed. Output methodology reduces the total time due to its structured approach.

4.2 Selected approach

As discussed earlier there are two major approaches to design; that is, system development life cycle approach and structured approach. We are going to adopt structured approach, further we are going to adopt output oriented. It is observed that there are a number of problems with system development life cycle. These problems are related directly to both system analyst and programmers.

4.3 DATA BASE DESIGN

In this section we define the possible approaches of database design.

POSSIBLE APPROACHES TO DATA BASE DESIGN

Basically there exist two approaches namely:

- Traditional or conventional file approach
- Database approach

4.3.1 TRADITIONAL OR CONVENTIONAL FILE APPROACH

This approach focuses in the data processing that is required in individual department in the organization. This approach has the following disadvantages:

1. uncontrolled redundancy.
2. inconsistent data.
3. inflexibility.
4. limited data sharing.
5. poor enforcement of standards.
6. low programmer's productivity.
7. excessive progame maintenance.
8. problems of data storage.

Due to above disadvantages we reject this approach.

4.3.2 DATA BASE APPROACH

We have already discussed about the definition of a data base .The main purpose of data base technique is to speed up computer application development, to reduce application maintenance cost, and to avoid user with the data for doing their job as efficiently as possible.

These data bases are controlled through a software known as database Management System (DBMS) to integrate the data and provide different views of data for different users.

(A) HIERARCHICAL MODEL APPROACH

Hierarchies are often referred to as tree structures, especially in the context of databases. A hierarchy, or a tree, is a structure such that there is a single module at the top with one or more subordinate modules. The singular top module is superordinate or superior to its subordinate modules, and these subordinate modules may themselves have additional subordinate modules to which they are superior, any given module can be subordinate to only one superior, but may be superordinate to one or more subordinate modules. The designation of superordinates and subordinates constitutes the specification of the relationships. Two basic characteristics of any hierarchy structure are that there is a single superordinate module for the entire hierarchy and that there is only one superordinate module for each subordinate module. Any two nodes in tree are linked through arcs and these arcs are not labeled, hence different arcs used in hierarchy do not represent M:N relationship.

In hierarchical database, parent and children records can be identified naturally; generally in a hierarchical database there can be varying number of each record type at each level in database tree.

The properties of hierarchical model are as under:

- There is a root record type which has no parent.
- There are leaf record types having no son.
- Every son has only one parent node.

But this model has following problems:

- Limited number of queries are possible in this approach.
- Addition and deletions are only possible by keeping tracks.

Therefore, Hierarchical Approach is not feasible.

B) NETWORK MODEL APPROACH

As contrast to a hierarchy structure, in network structure there is no single module that is subordinate to all others, and relationships among modules are unrestricted. In other words, two modules may relate to each other in both directions, so that we cannot say that one is superordinate to the other. In this approach data model consists of record types and links. Record types are used to represent the relationships among the attributes of entity sets. Links represents the associations between entity sets.

A Record type is a collection of data items and data item is the smallest unit of logical data. A set of data item is called a **KEY**, if its value uniquely determines an occurrence of record.

Links are usually constructed manually by selection records and explicitly connecting them. As far as updating is concerned this model can easily be handled. Invalidation of links implies loss of information. In many network systems, links are essential, although an application designer may decide to maintain redundancy of links by keeping symbolic references within data records.

This approach is inflexible and may cause serious problems in system enhancement. In this approach the number of modules in a system is indicative of program complexity, the greatest source of complexity is the number of intermodule relationships.

(C) RELATIONAL DATABASE

Relational database approach is known as a system in which data is perceived by the user as tables.

The operators at user disposal are operators that generate new tables from

old.

This approach has its roots in traditional set theory (relational algebra), in which tables (rows & columns) form the sets. A relation is two dimensional table made up of rows and columns. A database in the relational model is made up of a collection of interrelated relations. In this approach data is divided into tables based on knowing what their contents mean and how they are related. We can implement it by isolating useful relationships in their own separate tables. The result is to reduce redundancy, simplify updating, and make data more readily accessible for a wide range of applications.

The term TABLE and RELATON are interchangeable having the following properties:

- The entries in the table are single valued; neither repeating groups nor arrays are allowed:
- The entries in any column are of the same kind.
- Each column has unique name.
- Ordering of Attribute (column) is immaterial.
- No two Tuples (rows) in a table are identical.
- Order of the tuple is insignificant. .-
- Each attribute (column) has a domain (pool of legal values).
- An attribute that uniquely identifies a record is known as Candidate Key.
- One of the Candidate keys selected to be used as the unique identifier to all record is called Primary Key.

4.4 SELECTED APPROACH

The relational database approach has the following advantages over other approaches:

1. Minimize data redundancy.
2. Consistency of data.
3. Integration of data.
4. Sharing of data.
5. Enforcement of standards.
6. Ease of application development.
7. Uniform security and privacy.



Due to the above advantages, most recent DBMS are based on relational data model. An important characteristic of relational model is that records stored in one table can be related to records stored in the other tables by matching common data values from different tables. Thus data in different relations can be tied together, or integrated. Access to data in database is accomplished in two ways. The first is by writing program in procedural language that add, modify, delete or retrieve data from database. The second is accomplished by issuing commands or queries. We shall use both. The data stored is interconnected. If we want to change, it will be very easy because it will be edited at single place.

The matching data of items for connecting different types of records require additional storage .When dealing with large number of records speed and storage efficiencies become important. Since mini computer supports relational database, as under mini system environment all tasks of the organization are centrally tackled.

4.5 SYSTEM DESIGN OF EIS

System design of EIS is divided into following three parts for convenience and easy understanding of system design.

- EIS Inputs
- EIS Outputs
- EIS Database

4.5.1 EIS INPUTS

Input is the information that is required from the user for producing required results. Input design is related to design of receiving valid information from the user in a good and proper manner that reduces the chance of error. The input design of EIS ensures proper and valid data input. The EIS input design includes following:

- Identification numbers and codes.
- Input Forms.
- Validation checks.

Because of above-mentioned things in input design, the EIS is capable of producing accurate results and outputs that are required from this system.

(A) IDENTIFICATION NUMBERS AND CODES

To ensure the proper data input that has no redundancy, the identification number and codes are used in EIS. The identification numbers are digital codes used for identification of different entities like employee identification number, notification number, serial number and relation number etc. These identification numbers are uniquely allotted to identify different fields e.g., we may have same name for two employees but their codes will be different.

Some codes are specific arrangements of characters used to identify some things like Post id 'P' is for permanent employee, C is for contract and DW for daily wages.

Identification numbers and codes used in EIS will reduce chance of errors, save the computer storage and make the data entry process quick and easy.

(B) INPUT FORMS

Typically, modernizing information systems-whether they be transaction processing, management information Systems, decision support systems, or executive information systems-collect and display data via customized screen displays. For data entry, often these displays resemble manual forms traditionally used for data capture. On-screen forms, in comparison to line-by-line data entry, are easier to use and follow, make people less prone to errors, and are more flexible.

Features such as multiple -screen forms, boxes and color, automatic fill-in of default values, and on-screen menus make all this possible.

The EIS is very dependent on proper data input. Input forms provide an easy interface for data input to the user. User can toggle between different

fields on the form and can correct wrong entries. Different explanatory messages, online help, and tooltip text entering the required data in the fields.

(C) VALIDATION CHECKS

In EIS, for ensuring the accuracy and efficiency during the data input process various checks are implemented. Some of the checks imposed are as following:

The checks for proper primary key input, avoiding duplication records and correct mandatory fields are implemented.

Data entry validation checks like range checks, numerical data numeric field and proper code entry etc; are imposed.

Restriction on updating, deletion of some protected field during query is imposed at many places.

Many numeric fields are generated by the system to reduce user work.

4.5.2 EIS's OUTPUTS

The output from an information system is often a report produced on a printer or displayed on a terminal screen. A report differs from a form in that a form is based on only one row from one table, whereas a report typically lists many rows with summary statistics at specified control breaks. The design of reports programs can, as with forms, take considerable programming. Fortunately, many DBMSs provide a report generator that, in a style similar to forms, allows us to lay out a report on the screen. The output design is very important in computer systems and constitutes an important part of system. EIS has the following outputs.

- Reports
- Queries

(A) REPORTS

The reports are of main interest of organization or end user. The user is concerned with the output and not its internal functionality. EIS contains some important and specific reports. These reports are mostly desired by the end-users or organization. EIS reports are helpful for taking decision. Sample of some reports are given in the end.

(B) QUERIES

In order to see the details of the stored data, we use queries. Queries are the statements that retrieve information from database and display it on the screen. EIS provides some important and commonly desired queries.

4.5.3 EIS DATABASE

The designing of tables and their internal relationship is called Database design. Database design is the most important part of system design. The entire system depends on good database design. Normalization is a technique, which is used to make an efficient database design. Normalized database avoids problems like inconsistency and redundancy of data. EIS also use database for keeping information because it is a database system. A brief description of all database tables of EIS is given in the “user guide”.

CHAPTER NO 5

5.0 SYSTEM DEVELOPMENT

The salient features in the development of an efficient computerized system is software development. The purpose of software development is to transfer the complete proposed system into the executable computer programs.

Programming is not simply a science but there is a touch of art involved in it. There are, however, a number of identifiable steps that are always involved in the programming phase and those provide a convenient framework.

These steps are:

1. Define the problem
2. Plan a solution
3. Maintain the program

Thus the purpose of the programming task is to code, debug and test each program before and after integrating them into the modules. The development of the modules is the most complicated and time consuming stage of the system development. The programs have to be developed in order to have consistency or compatibility with the proposed system. Each module has to do job properly according to the input and output requirements of the system.

5.1 EMPLOYEE'S INFORMATION SYSTEM (EIS) DEVELOPMENT

The EIS is developed by going through following steps and phases:

- Software Selection
- Creation of Database Tables And Their Relationships
- Form Designing
- Report Generation
- Menu Designing
- Context Sensitive Help

5.1.1 SOFTWARE SELECTION

Selection of suitable software for development is very difficult task during computerization of some system. Users requirements and project objectives are kept in mind while selecting software. After underlying the system and main objectives of proposed system, the *Oracle Developer 2000* is selected as the tool for development of EIS.

5.1.1.1 ORACLE'S COMPONENTS USED IN EIS DEVELOPMENT

Conceptually, Oracle is a kernel package that has a number of tools that can be integrated with the kernel. These tools allow the user to create database objects.

- SQL* Plus
- PL/SQL

- Oracle Forms (Form 5.0)
- Report Writer

5.1.1.2 WINDOWS ENVIRONMENT

The windows environment maintains the visual interface of a windows program. EIS is firstly developed on Windows 98 as a standalone application. It can run on Windows 95 to Windows 98 as a standalone. To make it a Client/Server application. Windows 2000 and NT can be used.

5.1.2 CREATION OF DATABASE TABLES AND THEIR RELATIONSHIP

The Oracle Developer 2000 is a powerful software with Oracle at back end, which has the following supported features that makes it an ideal RDBMS

- Portability
- Security and Control
- Integrity and Consistency
- Compatibility
- Single user as well as Multi-user.
- Ease of migration to latest version of Oracle

SQL * Plus is a very powerful Oracle component. For generating the tables in the table space of Oracle Database Engine, SQL * Plus is used. Every table has Primary key (some have composite keys) to uniquely identify each field in the particular table. Checks are also implemented through constraints used in the SQL code. Foreign keys are also declared where these are required.

Primary Key

A primary key is one or more columns in a table used to uniquely identify each row, in the table. Primary key values must not be null and must be uniquely across the column.

Composite Key

A multicolumn primary key is called a Composite key. Multiple columns i.e. (composite keys) are used only when the system designed requires a primary key that cannot be contained in a single column.

Foreign Key

Foreign keys represent relationships between tables. A foreign key is a column (or a group of columns) whose values are derived from the primary key of the same or some other table.

Column level Constraints

If the constraints are defined along with the column definition, it is called as a column level constraint. Column level constraint can be applied to any one column at a time i.e. they are local to a specific column. If the constraint spans across multiple columns, the user will have to use table level constraints. Tables of EIS have such type of constraints.

Table level Constraints

If the data constraint attached to a specific cell in a table references the contents of another cell in the table then the user will have to use table level constraints.

5.1.3 FORM DESIGNING

According to Mcfadden [MCF94], a form is a fill-in-the-blanks template on the computer screen that allows you to enter, delete, update and query the information in the database. EIS's forms consist of:

- Blocks
- Fields
- Canvas
- Alerts
- Triggers
- List of values (LOV's)

Chu [CHU94] describes the above terms in a very simple way.

Blocks

The basic building blocks of SQL * FORMS are Blocks. A form may contain one or more block. Each block may be associated with a Base table or may be Non-Base table. Each block is used to perform a specific task.

Base table : is a database table on which a block is based.

Non -Base-table: Manually built data block is called Non-Base table.

EIS's forms use both types of blocks.

Fields/ Items

Items are objects contained in blocks. At the most basic level, items serve as containers for data within the form. The values in an item can be manipulated by the user.

Creating Items in Data Blocks

When we create an item in a data block, Form Builder assumes the item is a data item, and sets its Database Item property to YES. Data items are automatically included in any SELECT, UPDATE, and INSERT statements issued to the database; If the item we are creating is a control item in a data block, we must explicitly set its Database Item property to NO.

Creating Items in Control Blocks

When we create an item in a control block, that item is always a control item, regardless of how the item*s Database Item property is set. (Because a control block is not associated with a database table, none of the items in a control block can be data items.)

Canvas

Form Builder provides four types of canvases, all of which can be displayed in the same window at runtime. A canvas type defines how Form Builder will display it in the window to which it is assigned. When we create a canvas, we Specify its type by setting the Canvas Type property. The four canvas types are:

- Content
- Stacked

- Tab
- Toolbar

Content Canvas:

The most common canvas type is the content canvas(the default type). A content canvas is the "base" view that occupies the entire content pane of the window in which it is displayed. You must define at least one content canvas for each window you create.

Stacked Canvas

A stacked canvas is displayed a top or stacked on content canvas assigned to the current window. Stacked canvases obscure some part of the underlying content canvas, and often are shown and hidden programmatically. We can display more than one stacked canvas in a window at the same time.

In personal application, both type of canvases are used. Stacked canvas is used in Employee's Input Form, where user have to enter necessary information related to employee's personal contract, department, section and designation as well as employee's qualification etc.

Alerts

Modal dialog windows often are used as interactive dialog boxes. When an application needs information from the end user before it can continue, we can display a modal dialog window to allow the end user to enter the required information. Most dialogs require the end user to either provide the necessary information or dismiss the dialog and cancel the operation.

In EIS, alerts are used where there is the chance of wrong entry from the user end. Especially on the fields, where users have to enter joining date, leave dates etc.

Triggers

A trigger is a program unit that is executed ("fired") due to an event. Triggers enable us to add or modify functionality in a procedural way, so that the detailed processes of our applications can be defined. Each trigger that we define is associated with a specific event. Oracle Forms defines a vast range of events that we can fire a trigger for. These include:

- Query-related events.
- Data entry and validation.
- Logical navigation or physical mouse movement.
- Operator interaction with items in the form.
- Internal events in the form.
- Errors and messages.

Trigger Scope

The scope of a trigger is determined by its position in the form's object hierarchy. That is, which kind of object we create it under.

Chu ken [CHU94] defines three possible levels:

Form Level

The triggers belongs to the form, and can fire due to events across the whole form.

Block Level

The trigger belongs to a block, and can only fire when this block is current.

Item Level

The trigger belongs to an individual item, and can only fire when this is the current item.

Some triggers cannot be defined below a certain level. For example, POST-QUERY triggers cannot be defined at item level because they fire due to a global or restricted query on a block.

In EIS, all above-mentioned types of triggers are used.

LOV's

An LOV is a scrollable popup window that provides the end user with either a single or multi-column selection list. At least in every form of EIS, LOVs are used. Each line in a LOV can present several field values, with column headings above. LOV is design to retrieve some or all of the field values from the line chosen by the operator, and place them into form items or variables.

EIS' Forms

EIS has different types of forms

- Input Forms.
- Code Forms.
- Search Forms.

Input Forms

In EIS, Input forms are for the input purpose.

Code Forms

Code Forms are to add the new required code at the form level instead of inserting from the SQL.

Search Forms

In order to search a specific record from the form Level, Oracle provides the facility of "EXECUTE QUERY" at the form level. So by using this facility, EIS has also such type of forms.

5.1.4 REPORT GENERATION

After validated data is stored in Oracle tables, it is necessary to extract this data and display it on VDU or printer. Business managers then can make business decisions based on how they interpret the displayed data. The process of data extraction and its display is called Report Generation / Report Creation.

In EIS , different reports are generated on which decisions can be taken. In these reports data is extracted from tables with the help of queries. EIS have different styles of reports e.g. tabular, Form Left, Group Above etc. Query Builder helps to select the required tables and create the relationship between them. It also provides the facility of choosing required columns and their sequence which user wants to see on the report layout. User can also get the calculation of some specific field. Column can be created at report level by adding "Formula Column", setting its properties and writing appropriate function on it.

Besides Static reports, EIS also have dynamic reports. In dynamic reports, parameter is passed. User can pass the employee CODE and get the required information against it.

The basic concepts used in reports are as following:

Data model Editor in which we define the data for the report(i.e.defining Query, groups, computation fields etc. for the report)

Layout Editor, in which we create the report layout (i.e. designing the looks of the reports)

Parameter Form Editor, is used to customize the appearance of the Runtime Parameter Form (a window that optionally appears at runtime and enables us to enter parameter values that effect report execution).

Queries, are the statements that fetch data from the database. In EIS, queries are used to select data from any number of tables.

5.1.5 MENU DESIGNING

The menu module is collection of objects such as menu items, sub menus items and PL/SQL code blocks.

CHAPTER NO 6



6 SYSTEM TESTING AND IMPLEMENTATION

The importance of software testing and its implementation with respect to software quality cannot be overemphasized. Software testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding.

6.1 EIS Testing

6.1.1 Testing During The Planning Phase

Under this stage all the collected data, requirements are analyzed, every possibility are considered. For EIS six issues are kept in mind while testing the planning phase.

1. Are these the "right" requirements?
2. Are they complete?
3. Are they compatible? (requirements can be logically incompatible, contradictory or psychologically incompatible)
4. Are they achievable?
5. Are they reasonable?
6. Are they testable?

Each requirement of EIS is tested under above-mentioned issues.

6.1.2 Testing During The Design Phase

All the related data, its type, length are tested by taking "Live data. Live test data is that which is from actual implementation of system in real life. In our case personal data of EIS will be used for such type of testing.

Easy To Use

This software is easy to use because it has Online help, readable forms having meaningful fields and simple interface.

Storage

Normalized database and tables are helpful for data storage

Efficient

The new system is efficient than the existing manual system because of incredible speed of computer.

Accuracy

The new system is accurate because during data entry several data validation checks are provided. Hence there is small probability of incorrect data because in many fields the user can mis_spell the values.

Periodic Reports

Periodic reports will be helpful for taking decision

Security

EIS provides security on different levels by password implementation. This makes the system protective from unauthorized users.

6.2 EIS IMPLEMENTATION

The existing manual Employee's Information System cannot be discarded at once, direct conversion was not suitable. Hence the EIS is not implemented using this conversion technique.

EIS is implemented using **Parallel Conversion** because it is a secure and convenient conversion technique. Also almost every organization accept it easily. Although this implementation approach is more expensive and

involves additional workload but the old system will be safe. The reasons of selecting this technique are as follows:

- It is normally the safest and suitable conversion strategy.
- It minimizes the problems that arise from system failure.
- If unfortunately the system fails, data would not be lost because old system would be working in parallel.
- It provides an opportunity to compare the results of the existing manual employee's record with those of the developed EIS.

Table Description

Table name: emp

Purpose of the table: For keeping the information of employees of ICB

Primary key: emp_code

Foreign key: non

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
EMP_CODE	NOT NULL	NUMBER(3)
EMP_NAME		CHAR(30)
F_NAME		CHAR(30)
D_O_BIRTH		DATE
D_O_JOINING		DATE
GENDER		CHAR(8)
RELIGION		CHAR(10)
NIC_NO		CHAR(15)
PH#_HOME		NUMBER(20)
PH#_OFFICE		NUMBER(20)
DOMICILE		CHAR(15)
QUALIFICATION		CHAR(30)
POSTAL_ADDRESS		CHAR(50)
PERMANENT_ADDRESS		CHAR(50)
PRO_QUALIFICATION		CHAR(30)
MARITAL_STATUS		CHAR(10)

Table name: department

Purpose of the table: For keeping the departments code and departments name of ICB

Primary key:dept_code

Foreign key: non

Table structure

<u>Name</u>	<u>Null?</u>	<u>Type</u>
S_NO		NUMBER
DEPT_ID	NOT NULL	NUMBER(2)
DEPT_NAME		CHAR(25)

Table name: designation

Purpose of the table: keeping the designation code and scale(bps) of the employees of ICB

Primary key:des_code

Foreign key: non

Table structure

<u>Name</u>	<u>Null?</u>	<u>Type</u>
DES_CODE	NOT NULL	NUMBER(2)
DESIGNATION		CHAR (35)
BPS		NUMBER(2)

Table name: post

Purpose of the table: keeping the post_id and its detail

Primary key:post_id

Foreign key: non

Table structure

<u>Name</u>	<u>Null?</u>	<u>Type</u>
S_NO		NUMBER(3)
POST_ID	NOT NULL	CHAR(3)
POST_DETAIL		CHAR(10)

Table name: shift

Purpose of the table: keeping the shift code and name of ICB

Primary key:shift_id

Foreign key: non

Table structure

<u>Name</u>	<u>Null?</u>	<u>Type</u>
S_NO		NUMBER
SHIFT_ID	NOT NULL	CHAR(8)
SHIFT_NAME		CHAR(15)

Table name: leave_head

Purpose of the table:keeping record of leave code and its types.

Primary key:leave_id

Foreign key: non

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
LEAVE_ID	NOT NULL	NUMBER(2)
LEAVE_TYPE		CHAR(30)
LEAVE_PER_Y		NUMBER(3)

Table name: leave_record

Purpose of the table:keeping record of leaves of employees.

Primary key:non

Foreign key: emp_code,leave_id.

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
EMP_CODE		NUMBER(3)
LEAVE_ID		NUMBER(2)
STARTING_FROM		DATE
ENDING_TO		DATE
LEAVE_BALANCE		NUMBER(3)

Table name: dependent

Purpose of the table:keeping record of types of relations

Primary key:dep_id

Foreign key:

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
DEP_ID	NOT NULL	NUMBER(2)
DEP_NAME		CHAR(25)

Table name: dep_detail

Purpose of table :keeping the spouse record of employees.

Primary key:dep_id

Foreign key: emp_code

Table structure

<u>Name</u>	<u>Null?</u>	<u>Type</u>
EMP_CODE		NUMBER(2)
DEP_ID		NUMBER(2)
NAME		CHAR(30)
AGE		NUMBER(2)
DATE_OF_BIRTH		DATE
GENDER		CHAR(10)
QUALIFICATION		CHAR(35)
JOB		CHAR(35)

Table name:pro

Purpose of the table:keeping record of promotion of employees.

Primary key:non

Foreign key: emp_code.

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
EMP_CODE		NUMBER(3)
EMP_NAME		CHAR(30)
PRESENT_GRADE		NUMBER(2)
DATE_OF_PROMOTION		DATE
PLACE_OF_PROMOTION		CHAR(50)
NOTIFICATION_NO		CHAR(10)
PROMOTION_GRADE		NUMBER(2)

Table name:rmt

Purpose of the table:keeping record of retirement of employees.

Primary key:non

Foreign key: emp_code.

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
NOTIFICATION_NO		CHAR(10)
EMP_CODE		NUMBER(3)
REASON_OF_RETIREMENT		CHAR(50)
DATE_OF_RETIREMENT		DATE

Table name:term

Purpose of the table:keeping record of termination of employees.

Primary key:notification _no.

Foreign key: emp_code.

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
NOTOFICATION_NO	NOT NULL	CHAR(10)
EMP_CODE		NUMBER(3)
REASON		CHAR(50)
DATE_OF_TERMINATION		DATE

Table name:transfer

Purpose of the table:keeping record of transfer of employees.

Primary key:non

Foreign key: emp_code.

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
NOTIFICATION_NO		CHAR(10)
EMP_CODE		NUMBER(3)
EMP_NAME		CHAR(30)
TRANSFER_FROM		CHAR(50)
TRANSFER_TO		CHAR(50)
DATE_OF_TRANSFER		DATE

Table name:emp2_record.

Purpose of the table:keeping multiple record of employees.

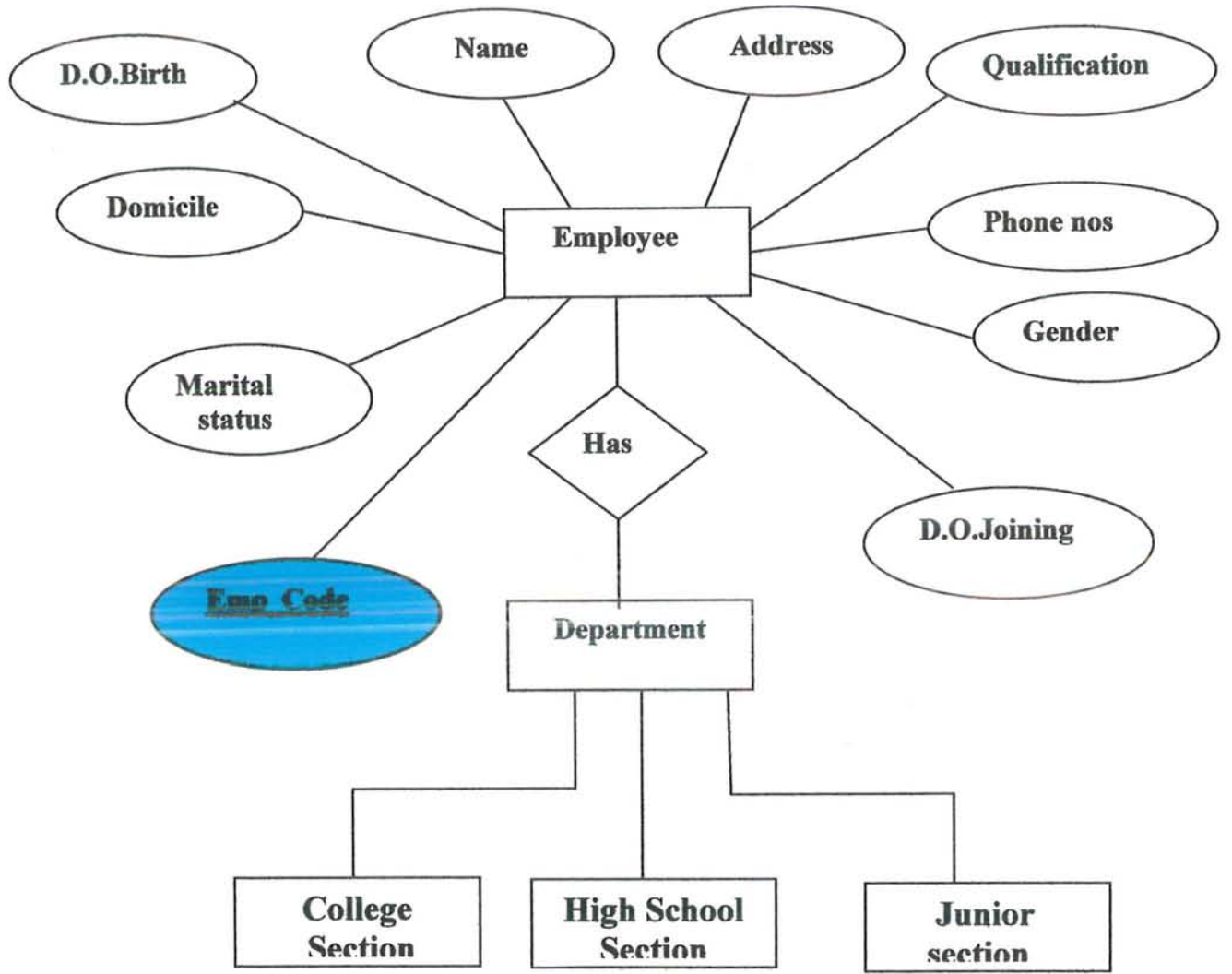
Primary key:non

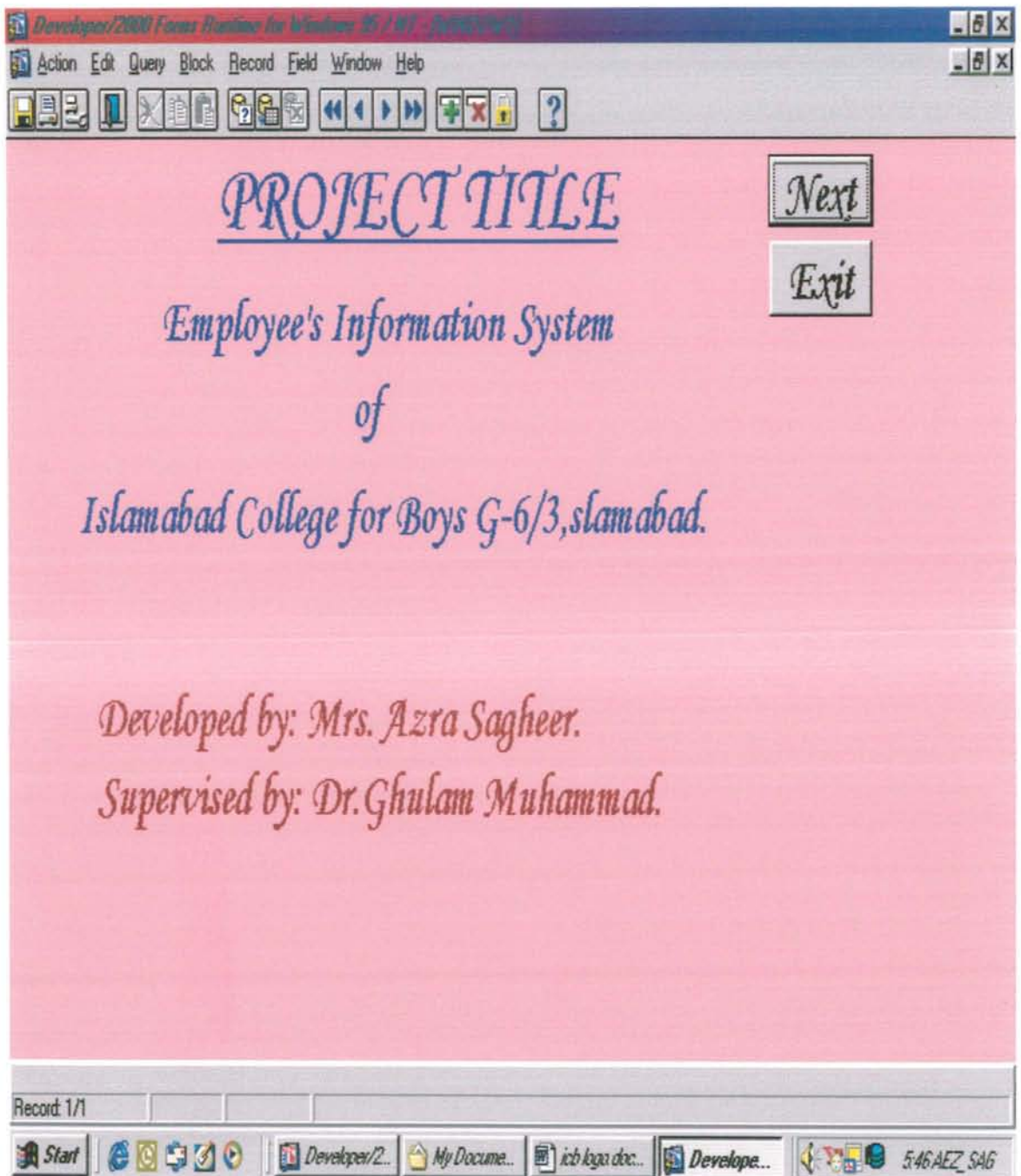
Foreign key: emp_code,dept_id,shift_id,post_id,des_code.

Table structure

<u>Name</u>	<u>Null</u>	<u>Type</u>
EMP_CODE		NUMBER(3)
DEPT_ID		NUMBER(2)
SHIFT_ID		CHAR(8)
POST_ID		CHAR(3)
DES_CODE		NUMBER(2)
EMPLOYEE_NAME		CHAR(30)
DEPARTMENT		CHAR(25)
POST		CHAR(10)
SHIFT		CHAR(15)
DESIGNATION		CHAR(35)
GRADE		NUMBER(2)

User Guide





PROJECT TITLE

Next

Exit

Employee's Information System
of

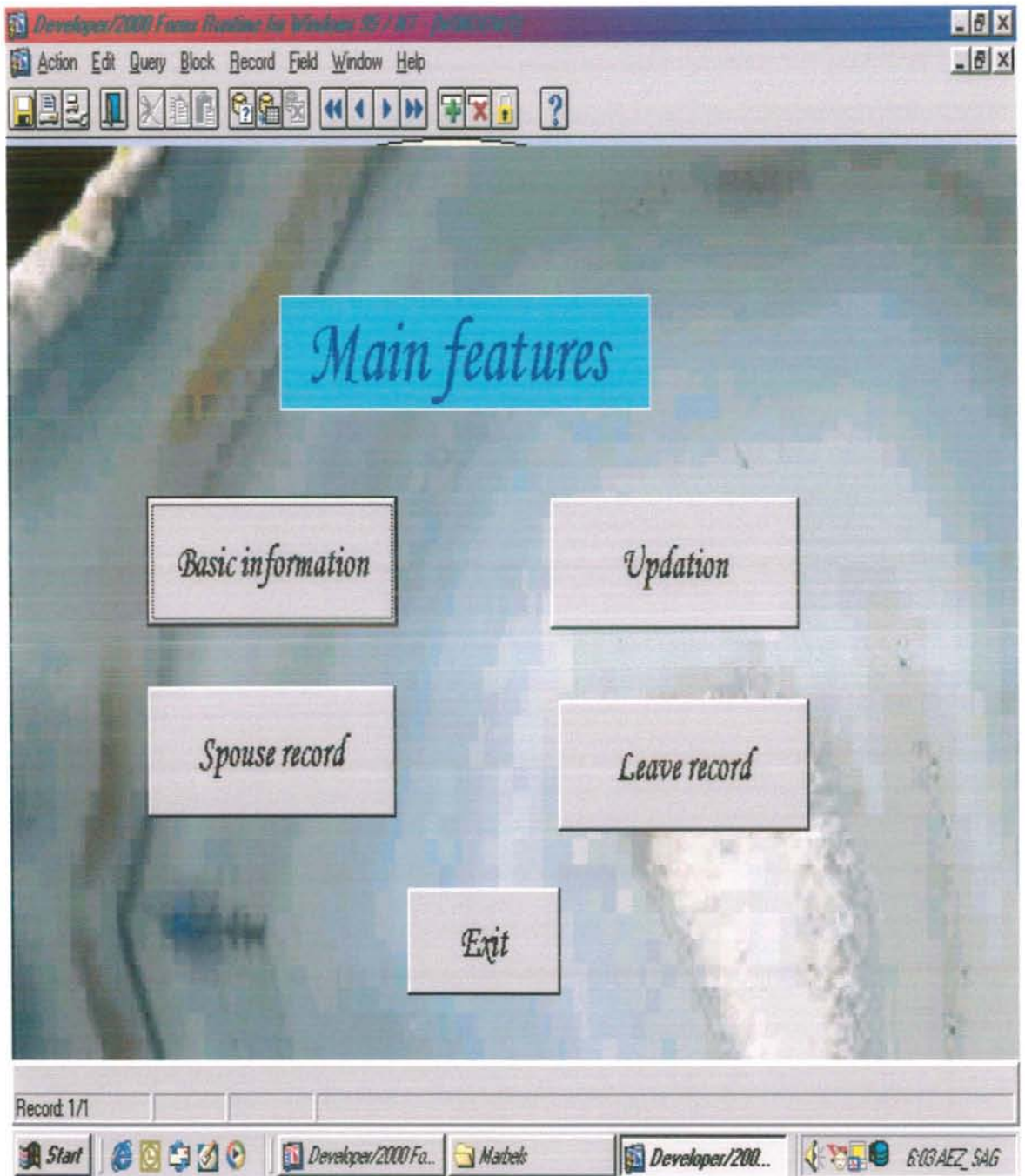
Islamabad College for Boys G-6/3, Islamabad.

Developed by: Mrs. Azra Sagheer.

Supervised by: Dr. Ghulam Muhammad.

Record: 1/1







BASIC INFORMATION

BIODATA

DEPARTMENT

DESIGNATION

SHIFT

Type of job

EXIT





Updation forms

Promotion

Termination

Transfer

Retirement

Exit





Record of dependents

Dependents

Dependent's Biodata

Exit





Leave information

Type of leaves

Leave record

Exit





EMPLOYEE DATA SHEET

EXIT

Emp Code

Note: (all columns must be filled in block letters)

Emp Name

F Name

D O Birth

D O Joining

Postal Address

Permanent Address

Ph# Office

Ph# Home

Nic No

Domicile

Qualification

Professional Qualification

Record: 1/1



CONCLUSIONS

After a careful study of the system development and design it is concluded that the developed system is capable of achieving the maximum objectives of the project. It is capable of handling all problems relating to the existing system.

Further more it is come to known that its implimentation is also possible in the existing environment. Though it needs skilled personnel to run this system; but when it will be installed, it will work efficiently. It will be very useful for the institution.





RECOMMENDATION

Employee's Information System (EIS) is a general-purpose system. Because of generalization of the software it can be implemented in any organization. Due to time constraint, it circles around some specific features of the employee. But it has large tendency of updation. It may be updated for many other requirements relating to employees.

Moreover better use of tools can make it more reliable and efficient. Higher version of Oracle can be used to get more facilities in the said system. Only a computer literate can handle this software, therefore it should be installed and run by the skilled personnel.





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