IN

The Name Of

Allah

The Most Gracious

The Most Merciful

JOB STATUS INFORMATION SYSTEM

FOR

CENTRAL ENGINEERING DIVISION, FFC.

By

SOHAIL AHMED

A Report submitted to

Quaid-i-Azam University, Islamabad.

In partial fulfillment of the

requirements for M.Sc. degree in

Computer Science.

Feb, 1994.

DEDICATED TO

Loving Abbajee & Ameejee

My Brother Saeed Ahmed & Sisters

&

Dearest Javed

DEPARTMENT OF COMPUTER SCIENCE

QUAID-I-AZAM UNIVERSITY

ISLAMABAD

Date: April 10, 1994

FINAL APPROVAL

This is to certify that we have read the report submitted by Mr. Sohail Ahmad and our judgement that this report is of sufficient standard to warrant its acceptance by Quaid-i-Azam University, Islamabad for the degree of M.Sc. in Computer Science.

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PROJECT BRIEF

Project Title	:	Job Status Information System
Organization	:	Fauji Fertilizer Company, Limited.
Undertaken By	:	SOHAIL AHMED
Supervised By	:	Mr. Naeem Akhtar Bhatti Department of Computer Science Q.A.U. Islamabad.
Starting Date	:	September, 1993.
Completion Date	:	Feb, 1994.
Software Used	:	VAX C, VAX Rdb/VMS, DECforms.
System Used	:	Micro VAX 3400, Micro VAX 4000-200.
Operating System Used	:	VMS A5.5.

ABSTRACT

To keep track of status of jobs assigned to employees is an important activity of Central Engineering Division, FFC. Since keeping and accessing information about status of jobs, job assignment etc are all time consuming tasks, a computerized information system has been developed for this purpose.

This system provides an on-line retrieval of information through queries and reports required by users. The system provides insertion, deletion, modification and retrieval of data in a very user friendly environment. With the implementation of this system, most of the problems faced by the organization regarding up-to-date provision of information will be solved.

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Islamabad.

PREFACE

This project is concerned with the development of Job Status Information System. The purpose of developing system is to keep track of status of jobs, jobs history, assignment of jobs and provide on-line information to management.

Chapter 1:- This chapter briefly describes the introduction of the organization, problem definition, existing system and its drawbacks.

Chapter 2:- Describes the proposed system and project objectives.

Chapter 3:- Deals with input, output, file designing and software selection.

Chapter 4:- Describes the software development and system components.

Chapter 5:- Discuss the system implementation, testing and evaluation.

Chapter 6:- is a User's Guide.

Appendices contain several input, output screens, reports and structure charts.

Bibliography is given at the end.

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APPENDICES

Appendix A, contains input,output screen and reports

Appendix B, contains flow charts and logical structure of database etc

BIBLIOGRAPHY

CHAPTER No.1

INTRODUCTION

1.1 INTRODUCTION TO FFC

Fauji Fertilizer Company is a world fame private sector organization producing urea fertilizers. Its two main plants are completely working & producing fertilizers. FFC started commercial production of urea in 1982. In May 1990, FFC undertook an expansion project which started its commercial production in march 1993. The first plant is called PROJECT_I and second plant as PROJECT_II. The Head Office of FFC is situated in Rawalpindi & the factory is located in Goth Machhi, Sadiqabad, District Rahim Yar Khan. It has many divisions like Central Engineering Division, Finance Division, Manufacturing Division and Marketing Division etc. Each division is further divided into sections. One of the major division situated in the head office Rawalpindi is Central Engineering Division (CED).

1.1.1 CENTRAL ENGINEERING DIVISION (CED)

Central Engineering Division consist of three sections are given below:

(i) Process Engineering Section
(ii) Project Engineering Section
(iii) CAD/CAM Section

The first two sections are located at factory site as well at head

office. Whereas, CAD/CAM section is situated at head office only. Since project concern with only CED, therefore CED will only be considered for discussion. The detailed information about section CED are given below:

1.1.1.1 PROCESS ENGINEERING SECTION

The Process Engineering Section provides assistance at factory site in all matters within the range of Chemical Engineering. Personnel in this Section are engaged to analyze chemical data, collected at plant, and solve any problem faced by chemical engineers at plant. For analyzing purposes, mostly different packages are used.

1.1.1.2 PROJECT ENGINEERING SECTION

The Project Engineering Section provides assistance at factory site in all matters related to Mechanical Engineering. Mostly engineers in this section do design work for plant's equipment. For drafting/designing they use graphical packages. Many database systems are also being used for keeping information about inventory etc.

1.1.1.3 THE CAD/CAM SECTION

The Computer Aided Design and Computer Aided Manufacturing Section

develops software for the engineering in Process as well as Project Engineering Sections to perform analysis and design. This section also develops engineering software which can be sold to other organizations. Normally packages available in market are not suitable for use in the local factory environment. So one of the major activities in this section is to develop such software packages which meet the factory requirements. However some existing software available in the market are adopted to fulfil the factory requirements. This section also develops Management Information System (MIS) for different divisions and sections which helps the management in decision making.

1.1.2 EXPANSION IN THE FIRM

The factory has setup third plant named PROJECT_III for production in Karachi, with the share of JORDAN. The third plant will increase their annual production of fertilizers, which fulfills the need for fertilizers in Pakistan.

1.1.3 Management

The head of the Fauji Fertilizer Company & Fauji Foundation is Managing Director (MD), who runs both under his supervision. The Each of them has an Assistant Managing Director (AMD) as head. Then head of the each Division is General Manager (GM), and each section

has a section incharge, who is called Unit Manager. Each section has different employees under section incharge, for example CAD/CAM section has four system analysts, two programmers, and three to four operators and also some clerical staff too. The FFC has a large no. of employees working in a factory, as well as in the head office.

1.2 PROBLEM DEFINITION

Central Engineering Division has many employees and each employee can perform different types of jobs. The jobs are assigned to different employees, but there is no appropriate way for keeping track of the status of the assigned jobs. So it is required that a system should be developed to keep the record of all the information about the assigned or unassigned jobs.

DEFINITION:- Design, develop and implement an information database which keep track of assigned jobs & their status. It also keeps the records of the information about the employees, finished jobs, pending jobs, running jobs etc and provides proper information to the management which help them in decision making. The developed system will also keep track of :-

(a) All steps taken to complete an activity.

(b) Duration for completion of an activity or job.

(c) Reason for delay, if any.

1.3 EXISTING SYSTEM

Presently almost all record keeping about jobs of the CED is done manually. The employees fill a form called "WEEKLY LOG SHEET", shown in appendix A. This form consists of information about jobs assigned to an employee. The employee has to put all information of his job, like current status, total manhours, weekly manhour,type of jobs etc, weekly. These forms are collected at their weekly meeting with their section head. The section head checks the status of the jobs, and give his remarks on the log sheet. This form is kept in a record file for further references. The form filled by an employee contains the following information.

- Name of employee
- Designation
- Job type
- Job code
- Job description
- Start date of Job
- End date of Job
- Start of week
- End of week
- Total manhours

There is no special way of keeping record safe and sound. The forms are kept in a file. Whenever any information is required, this file

has to be searched out, and the searching of the required form is a tedious job.

1.4 DRAWBACKS OF EXISTING SYSTEM

Since the existing system is completely manual, so it has many drawbacks. Since there are a lot of employees in CED, so searching a particular file becomes a tiring job. To get specific information one has to search through all the files. The major drawbacks are given as:

- Slow manual handling, the searching process is slow and retrieval of information is a difficult work.
- It is more time consuming as things are being done manually.
- Preparation of various reports is tough, Since we have to go through huge amount of material.
- Protection of the record may become serious problem.
- It is difficult to handle a large amount of data.
- The data is Less consistent.
- There is no data integrity.
- There is no check on employee, whether they are doing work or not, what is the status of the different jobs.
- The data is not complete, because the employees normally do not care to fill the log sheet weekly.

CHAPTER No.2

THE PROPOSED SYSTEM

2.1 INTRODUCTION

This chapter proposes a computerized system and discusses the suitable strategy to achieve this purpose. The proposed system indicates desired system precisely, in data processing terms.

The function plans and requirements of the organization were taken into consideration while proposing the new system.

2.2 PROJECT OBJECTIVES

For a successful database, it is most important that it satisfies the user's requirements. Mostly projects fail because of the unreasonable expectations attached to them. User's expectations should clearly be defined. The main goal of this project is to design and implement a system that would provide information to the management which would help them in decision making.The proposed database would have following capabilities.

- The computerized management information system would have capability to maintain information.
- It would be able to generate output reports pertaining to the various jobs assigned to an employee.
- Reports on job description, start & end date, estimated and actual time spent.
- It would give short description of the current status of each job.

- The goal of proposed system is to keep every thing nice and simple for all users.
- The proposed system would be a comprehensive database consisting insertion, modifications, retrieval for any data and facilities of various queries and reports.
- It would provide online information about any job.
- The proposed system should be user friendly.
- The proposed system should minimize redundancy of data which frequently occurs in non-computerized system.
- System should be acceptable to the organization in designed standard, such standards to ensure the previous objective are likely to meet.

2.3 PROPOSED SYSTEM

Considering the above objectives, the main feature of the proposed system are discussed below:

2.3.1 CODES

Codes would be designed to reduce the storage and the number of typing strokes used to input a record. To eliminate any error, codes would be small and easy.

2.3.2 USER INTERFACE

For better user interaction, the interactive input screen would be well designed with moving bar options. Input screen would be designed in a manner that the fields of the record are assigned in the same order in on the screen as they are on the input form. Input screens are designed to keep data entry simple and easy for the users and data will be accepted in the same manner as it is done manually. Some input screens will also be used for data updations and queries.

2.3.3 ONLINE HELP

The system would be designed, so that it provides full online help to users, so a user can use this system very easily. A system should be completely user friendly with appropriate messages will be given by the system on wrong input or on some other error.

2.3.4 UPDATION

Facilities would be provided to update the fields of the system. User may change any field of any file or table, having special privileges for updation. A record which does not exist in the database, then system should give an error message that the record does not exist. An employee would update only his own and his

colleagues and he would not be able to update record of a person higher to him in designation.

2.3.5 DELETION

Deletion facilities would be provided, only to the authorized persons. Every one is not allowed to delete record on its own. Only those record would be deleted, by the responsible person, which would be unnecessary.

2.3.6 CHECKS

Various checks would be provided in the database in the data entry, updation and deletion modules to ensure appropriate actions. Checks would be provided to make sure that no duplicate key would enter in database. If any user will enters duplicate record, system will give an error message of duplicate key. Checks on dates would also be provided, that shows starting date of the job should not be greater than ending date of the job. Similarly valid date would be accepted by the system, for example the month of February would have 28 or 29 days according to the year. Referential checks would also be provided. This means if a user enter an employee number in the assignment job file , the employee should also exist in the employee file, otherwise system will give an error message. These checks would increase the consistency of the data in the database.

2.3.7 REPORTS GENERATION

The one major purpose of establishing a database is to retrieve information quickly and efficiently. The user is not bothered with the internal working of the system. He is mainly concerned with the output produced by the system. The proposed system will generate different report according to the user's requirements. These reports will also be more helpful for the management of the organization.

2.4 CONSIDERATIONS TO ACHIEVE THE PROPOSED SYSTEM

To achieve the proposed system's objectives, following outline would be appropriate for the proposed database.

- Have a capability to store information in optimally organized way.
- Have a capability to retrieve information efficiently and without loss of information.
- Have a capability to process the resulting reports in an desired way.
- Have a capability to provide absolute data management control to the users like updation, retrieval, deletion etc.
- Have a capability to secure data in such a way that losses and information losses and dissipation could successfully be eliminated.

- Have restricted access to the database as it has very high significance with reference to the present context.

In this course, the following aspects are to be taken care of:

- Authorized access to the database.
- Synchronized data sharing.
- Optimized compromise between security and efficiency.
- Entity integrity and referential integrity.
- No redundancy.
- Have all tables in a normalized form.

CHAPTER No.3

SYSTEM DESIGN

3.1 INTRODUCTION

The system being designed keeps all necessary data and covers all the operation and objectives as defined in the previous chapter. The first thing involves in system designing is to see which Hardware machine is available? The second thing is the selection of an appropriate Software and reasons of its selection. After selection of the software the system is being designed according to the requirements defined.

3.2 EXISTING HARDWARE SYSTEM

3.2.1 VAX

The machine used by FFC is micro VAX-3400. VAX is a multiprogramming virtual storage system offered by Digital Equipment Corporation (DEC). VAX represents a virtual address extension of the PDP-11 family.

3.2.2 OPERATING SYSTEM USED BY VAX

Virtual Memory System (VMS) is the operating system used on VAX. Virtual Storage is the ability to address a storage space much larger than that available in the primary storage of a particular computer system. In virtual storage systems, the addresses

referenced by the running program are not necessarily those addresses which are available in primary storage, instead they may be virtual addresses.

3.3 EXISTING SOFTWARE

VAX supports many high level programming languages including Ada, Basic, C, COBOL, DIBOL, FORTRAN, Pascal, PL/1. C,FORTRAN and COBOL have been purchased by FFC. FFC also has VAX Rdb/VMS, DECforms and PHIGS packages.

3.4 SOFTWARE SELECTION

Software selection to implement the proposed system is an important decision that should be made carefully. This decision should be taken while considering the future trends & requirements. The following software has been selected for the proposed system.

3.4.1 VAX Rdb/VMS

VAX Rdb/VMS software is a multiuser relational database management system designed by DEC to make optimal use of VAX architecture. As a database management system, VAX Rdb/VMS allows many users simultaneous read/write access to highly volatile database. Since it uses the relational data model, a VAX Rdb/VMS database is composed of easy to understand tables, which allows maximum

flexibility in accessing data.

It include the following interfaces,

- SQL (Structured Query Language)
- Relational Database Operator (RDO)

Accessing a VAX Rdb/VMS database can also be done with following interfaces,

- Application program written in a VAX high level programming languages, Such as VAX COBOL, VAX FORTRAN and VAX C etc.

Why Rdb/VMS

The following features of Rdb are not contained in any conventional database.

(i) DATA SECURITY

Rdb/VMS protects database files in a complete manner. It also controls access to data from within the database through access control list (ACL). Access to the database is protected by applying authorization rules.

(ii) DATA INTEGRITY

Integrity means the absence of inconsistent data, i,e all rows stored are up-to-date. As a relational database management system,

Rdb/VMS manages much of the integrity of the database. This is accomplished as follows,

- Transaction commits and roll backs prevent partial update of rows closing a transaction. This helps ensure data consistency that transaction especially in the case of system failure or incomplete transaction.
- Locking manages the concurrent access/update of rows. This prevents inconsistent data during concurrent but unrelated transactions.

3.4.2 STRUCTURED QUERY LANGUAGE (SQL)

In Rdb/VMS SQL is an easy & good way to develop a database. One benefit of using SQL is that it should be easy for reader to obtain access to a working system. Following steps involve in creating a database in SQL.

(i) Create schema.
(ii) Create domains.
(iii) Create tables.
(iv) create indices.
(v) create views.
(vi) Create constraints etc.

For retrieving from database following steps are involved.

(i) Define a cursor.

(ii) Fetch rows from a cursor.

(iii) Select from a table.

SQL is of different types

(i) Interactive SQL.

(ii) Pre-compiled SQL (Embedded SQL).

(iii) SQL Module.

SQL Module would be used for proposed system.

3.4.3 DECforms

DECforms integrate text and simple graphics into forms and menus. Application programs use these forms and menus as user interfaces. DECforms also provide extensive facilities for specifying full control of the user interface within the form rather than in the application program. The program implements the processing of the data and the interface to the operator is provided entirely by the forms. DECforms integrate text, simple graphics and menus for application programs to use as a user interface.

The Independent Form Description Language (IFDL) is the language used by DECforms to create a form and to define the different aspects of a form. IFDL statements are used to define the appearance of a form and how it is processed by the form manager.

3.4.4 VAX C

The VAX C programming language incorporates the features that are fundamental to C language and that exist in most C compilers. However, VAX C also has features that directly and efficiently use the VMS operating system environment. One must decide which feature of VAX C are most important to programming need. Portability across systems or efficient use of VMS operating system features.

VAX C also provides the facility of integration, to program written in other languages. VAX C can use forms designed in DECforms & SQL modules, one can embed SQL statement in a C program.

The VAX C would be used for integration of DECforms program and SQL module program in the development of the proposed system.

3.5 PROPOSED SYSTEM DESIGN

The system design process includes the following

(i) Input design

(ii) Table design

(iii) Output design

3.5.1 INPUT DESIGN

Inputs to the system are important because accuracy of the whole data processing and outputs depends upon accurate and efficient data entry. Also the data which is to be input must be minimum and should be what is essential. Codes have been used to save disk space and remove typing errors. The various codes designed for data entry, which are discussed below

3.5.1.1 CODES DESIGNING

The use of the codes plays an important role in the design of system where some fields have a fixed number of known values. The significance of codes just cannot be ignored in the design of a good system. Codes are decoded later in the program and that decoded information is displayed on the output device for the convenience of the user.

The codes used for this system are as follows.

i) Employee Code : 9999
This is four digits numeric code assigned to each employee, for example 3241, 5671 etc.

ii) Job Code : X(6)

This code is six characters in length & assigned to every job, for example code for "development of the software" is "Develp" etc.

iii) Section Code : X(3)

This code is three character long code, assigned to each section for example code for "Computer Aided Design Section" is "CAD" etc.

iv) Job Status Code : X

This is one character code, assigned to status of the job, for example the status of a job which has been completed would be "F" for finished etc.

3.5.1.2 INPUT TABLE DESIGNING

Input table designing is one of the most important tasks that must be taken seriously to ensure accurate and fast data entry. This has been achieved by assigning codes to different entities thus reducing the possible typing errors and numbers of key strokes required to enter a record, The fields are also arranged in the same order as they are on the actual input form. The table used in this system are as follows,

- Employee Information Table
- Job Information Table
- Weekly Job Status Table

- Section Code Table
- Job Status Description Table

3.5.2 TABLE SPECIFICATION

The description of the table specification is given as:

(i) Employee Information Table

Table Name :- Emp

Primary Key :- Emp_cod

Purpose :- This table stores the employee information of each department of FFC.

Structure Of Table

Column Name	Type	Default Value	Attribute
Emp_cod	Smallint	Not Null	Primary Key
Emp_nam	Char(30)	Null	None
Emp_desg	Char(20)	Null	None
Sect_cod	Char(3)	Null	None
B_cod	Smallint	Null	None

(ii) Job Information Table

Table Name :- Jobs

Primary Key :- J_cod

Purpose :- This table stores job information.

Structure Of Table

Column Name	Type	Default Value	Attribute
J_cod	Char(6)	Not Null	Primary Key
J_nam	Char(30)	Null	None
J_desc	Char(30)	Null	None
J_status	Char(30)	Null	None
Start_date	Integer	Null	None
End_date	Integer	Null	None

(iii) Assignment Of Job Table

Table Name :- Emp_job

Primary Key :- Emp_cod,j_cod

Purpose :- This table stores the information about assignment of jobs to employees, this table creates a relationship between employees and jobs.

Structure Of Table

Column Name	Type	Default Value	Attribute
Emp_cod	Smallint	Not Null	Primary Key
J_cod	Char(6)	Not Null	Primary Key
J_resp	Smallint	Null	None
Start_date	Integer	Null	None
Target_date	Integer	Null	None
End_dat	Integer	Null	None
Tot_mh	Smallint	Null	None
J_Status	Char(1)	Null	None

(iv) Weekly Status Of Job

Table Name :- Weekly_js

Primary Key :- Emp_cod, j_cod, St_week

Purpose :- This table stores the information about weekly status of any assigned job of an employee.

Structure Of Table

Column Name	Type	Default Value	Attribute
Emp_cod	Smallint	Not Null	Primary Key
J_cod	Char(6)	Not Null	Primary Key
St_week	Integer	Not Null	Primary Key
C_stat	Char(60)	Null	None
End_week	Integer	Null	None
Week_mh	Smallint	Null	None
J_status	Char(1)	Null	None

(v) Section Code Table

Table Name :- Sect

Primary Key :- Sect_cod

Purpose :- This table stores the codes and names of the different sections.

Structure Of Table

Column Name	Type	Default Value	Attribute
Sect_cod	Char(3)	Not Null	Primary Key
Sect_nam	Char(30)	Null	None

(vi) Job Status Code table

Table Name :- Jstat_cod

Primary Key :- J_status

Purpose :- This table keeps job status codes and their description.

Structure Of Table

Column Name	Type	Default Value	Attribute
J_status	Char(1)	Not Null	Primary Key
J_status_desc	Char(15)	Null	None

The input forms layout is shown in the appendix A, and the logical structure of the database is shown in appendix B.

3.5.3 OUTPUT DESIGNING

The end-user of an information system is more concerned with the result and their formats in which the output is produced, rather than the design and working of the system. Also the main objectives of any information system are always efficient, fast and reliable retrieval of information. The output may be screen oriented or in the form of printed reports. After careful study of the existing system and the requirements of CED, it has been decided that the system should display or print the following information:

ON SCREEN

- Employeewise summary of jobs
- Jobwise summary of jobs
- Sectionwise summary of jobs
- Statuswise Summary of jobs
- History of assigned jobs
- Jobs information
- Employee information
- Weekly status of any job
- Statuswise detail of all jobs

TO PRINTER

- Employeewise report of jobs
- Jobwise report of jobs

- Sectionwise report of jobs
- Statuswise report of jobs
- Report of assigned jobs
- Jobs information
- Employee information
- Weekly status of any job
- Statuswise detail of all jobs

These reports will help the management in a better way.

CHAPTER No.4

SOFTWARE DEVELOPMENT

4.1 INTRODUCTION

After the system study and designing phase of the new system, the next important phase is the software development. At this stage the system is developed according to the design, using the software selected and the designer is bound to remain within the constraints of the software.

Good system are those which are simple, modular, structured and satisfy the user requirements. An important point about the system components is that they should be developed as separate modules. Each module should have specific objective and it should be constructed in such a way that it can easily be interacted with other modules.

Development of the software modules is the most complicated & time consuming phase of the system development. Each module should do its job properly according to the requirements of the system.

4.2 SYSTEM COMPONENTS

The system is developed using three software packages. The main program (application program) has been written in VAX C language, which control the whole program. The screen designing and user input forms has been developed in Independent Form Development Language (IFDL) and database is created in SQL, while SQL Module

language has been used for insertion, deletion, updation procedures.

The system has the following main programs and procedures.

(i) Main Program (Main.c)

(ii) SQL Module Program (Job.mod)

(iii) Main Menu Program (Proj_main.ifdl)

(iv) Sub_modules Program (Proj_sub.ifdl)

4.2.1 MAIN PROGRAM (MAIN.C)

Main Program or Controlling Program is written in VAX C. The purpose of this program is that it controls the flow of the system. It calls many procedures and subprograms written in SQL Module and IFDL. It also consist of different subroutines which are called by the IFDL program to apply different checks on the various inputs received from users. The main program enables the Proj_Main.IFDL first and receives user's choice from that program. On the basis of this choice different IFDL program are enabled. Basically this program integrate the program written in IFDL and SQL module procedure with each other. This gets data from IFDL program which is accepted from users and then sends it to SQL module, which further transfers data to the database. It also receives data from SQL module and sends this data to the IFDL program to show to users. Since DECforms or program written in IFDL have no

interaction with SQL, so this main program use for this interaction.

To receive and to send data from host program to IFDL or vice versa the some requests are used like form_send and form_receive requests. The main program consist of following main routines.

(i) GET_OPERATOR CHOICE

The purpose is to get operator choice from IFDL program.

(ii) ENABLE_SUBMODULE PROGRAM

The purpose is to enable an appropriate form.

(iii) INSERTION PROCEDURES

Their purpose is to insert data in the database which is accepted from users. These subroutines gets information from forms and send it to SQL module procedures to store information in the database. Following routines are used.

- Ins_emp(),
- Ins_jobs(),
- Ins_emp_job(),

- Ins_weekly_js(),
- Ins_sect(),
- Ins_jstat() etc.

(iv) UPDATION PROCEDURES

Their purpose is to update existing data. These subroutines get some information from the database through SQL modules and send these information to IFDL program to display these on the screen for users, When updation is being done, so the changed information is again received from IFDL program and send to SQL modules to update the database record. These subroutines consist of following;

- Up_emp(),
- Up_jobs(),
- Up_emp_job(),
- Up_weekly_js(),
- Up_sect(),
- Up_jstat() etc.

(v) DELETION PROCEDURES

These procedures are used to get appropriate information from IFDL forms and send this information to database to delete appropriate record. These routines also consist of following subroutines.

- Del_emp(),

- Del_jobs(),
- Del_emp_job(),
- Del_weekly_js(),
- Del_sect(),
- Del_jstat() etc.

(vi) QUERIES PROCEDURES

These procedures are used to get required information from database through SQL modules and send to IFDL program to display on screen with appropriate format. These procedures consist of different subroutines which perform different tasks.

(vii) REPORTS PROCEDURE

These procedure are used to get information from database and send these on printer in an appropriate format for printing. These procedures also consist of different subroutines which performs different tasks.

(viii) GET_DATE_PROCEDURE

These procedures get the system's current date in year, month and day which used to compare date entered by users.

(ix) CHECK_DATE()

This routine checks the start date and completed date, so that start date should be greater than the completing date. It returns a flag to IFDL to display suitable message.

(x) CHECK_DAY()

This subroutine checks the days in month, Whether the year is a leap year or not, it return a flag to IFDL program for appropriate messages.

(xi) CHECK_WEEK()

This routine checks the duration of week, as job status entered by user weekly. This routine checks that if the week should not be greater than 7 days and similarly start of week should be greater than the previous end of week. It also return a flag to IFDL program.

Similarly some more routines are written for date, which convert date to integer for storing it to database and again convert integer to month, day and year to display for user.

(xii) PRIMARY KEYS AND REFERENCES CHECKING ROUTINES

Since SQL provides all the checks like primary keys and reference constraint on database, but when it is integrated with C or DECforms then these checks do not remain very appropriate for users.

So to display suitable messages of duplicate keys and reference constraint violation warnings, these routines are written. Some routines which apply these checks to data entered by the users, these routines return a status flag to IFDL program.

4.2.2 SQL MODULE PROGRAM (JOB.MOD)

This program consist of procedures written in SQL modules. These procedures are independent procedures which can be called by any language like C, FORTRAN, COBOL etc. These procedures are compiled independently to get its object file, this object file is linked with the source program in which these procedures are called. This program consists of different procedures, some of them are given as:

1:- DECLARE SCHEMA PROCEDURE

This procedure is used to declare schema or database.

2:- DECLARE CURSOR PROCEDURE

These procedures are used to declare cursor for select statement to retrieve data into host variables. Different cursor statement are present in these procedures.

3:- OPEN AND CLOSE CURSOR PROCEDURES

The open cursor procedure opens the declared cursor, so that a result table for select statement is created in memory and close cursor procedure close the already opened cursor, so that the existing table in memory is deleted.

(i) FETCH PROCEDURES

These procedures fetch the declared cursor into host variables, one row at a time. there are many fetch procedures in SQL module program.

(ii) INSERTION PROCEDURES

These procedures insert data to database, which is received from main program.

(iii) UPDATION PROCEDURES

These procedures update the tables to reflect the changes received from main program to update the database.

(iv) DELETION PROCEDURES

To delete different records from database on the choice of the user, the required choice is obtained from main program.

(v) SET TRANSACTION PROCEDURE

This Procedure set transaction to read write with constraints shared write and locking tables etc.

(vi) COMMIT TRANSACTION PROCEDURE

This procedure commits running transaction.

(vii) ROLLBACK TRANSACTION PROCEDURE

This procedure rollback any running transaction.

(viii) FINISH DATABASE PROCEDURE

To finish the database which is already declared, after finishing the database there will not be any reference to the database.

4.2.3 MAIN_MENU PROGRAM (PROJ_MAIN.IFDL)

This program is for main menu written in Independent Form Description Language (IFDL), which is the language of DECforms utility, used for screen interaction.

Structure of IFDL program is

1:- FORM DATA

Form data consists of the set of the variables associated with the form. An individual variable is called form data item.

2:- FORM RECORD

Form record controls data exchange between the program and the form. There are many form records to send data from the form to the main program and send data from the main program to the form.

3:- LAYOUT

A layout is an appearance of the form defined for one or more classes of display devices. The layout contains all the information pertaining to the mapping of the form to the display device.

4:- VIEWPORT

Viewports are areas on the screen in which panels are displayed. In the systems there are many viewports for different panels. For example VP_1 viewport is for displaying heading panels, VP_2 is viewport for displaying panels for data entry, data updation and data deletion etc. Message_VP is for displaying different messages, similarly some other viewports like VP_3, middle_VP etc are used for different purposes.

5:- PANELS

Panels consists of information that is displayed in the viewport. In main_menu program there are the following panels.

(i) WELCOME_PANEL

This panel is for welcome screen, which is displayed when the system starts. This panel displays the user name who uses the

system, and also displays version of VMS operating system.

(ii) HEADING_PANEL

This panel is for main menu heading, it is shown in appendix A.

(iii) MAIN PANEL

This panel consists of main options of the main menu like data entry, updation, deletion, queries and exit as shown in appendix A.

(iv) INSERTION_PANEL

This panel displays the insertion options on main menu. It has different options like employee information, job information, weekly status of job etc as shown in appendix A.

(v) UPDATION_PANEL

This panel also displays the updation options on main menu. It also consist same option as given above in insertion, shown in appendix A.

(vi) DELETION_PANEL

This panel has options for deletion of a record from different files. It also consist of the same options for deletion as described in insertion panel.

(vii) QUERIES_PANEL

This panel displays following choices.

On Screen :- Queries on the screen

TO File :- Queries stored in a file

TO Printer:- Reports on the printer

(viii) QUIT_PANEL

This panel is for quitting from system, to end the processing. This panel prints message for quit.

(ix) FAREWELL_PANEL

This panel displays the farewell screen at exit from processing of running system, as shown in appendix A.

4.2.4 SUBMODULE PROGRAM (PROJ_SUB.IFDL)

This program consist of form data, form records, form groups, different viewports and different panels to be displayed.

The panel is activated on the basis of user's choice received from main program. In this program different function keys are defined like for quit function F10, to select different options Select Key etc. and different function response steps are written. Send and receive response for sending data and receiving data are written in this program. This program has many panel in it, Which are used for different purposes, only a few of them are discussed here, for the sake of simplicity.

(i) EMP_PANEL

To display, accept, update and delete employee information. This panel also calls some escape routines for different purposes like check_emp_key, check_sect_key, get_emp_rec etc.

(ii) JOB_PANEL

To display, accept, update and delete jobs information. This panel also called some escape routines for different purposes like check_job_key, check_jst_key, get_job_rec, check_date, dat_to_int,

int_to_dat etc.

(iii) EMP_JOB_PANEL

To display, accept, update and delete information about assignment of jobs to different employees. This panel also calls some escape routines for different purposes like check_job_key, check_emp_key, get_job_rec, check_date, dat_to_int, int_to_date etc.

(iv) WEEKLY_JS_PANEL

To display, accept, update and delete information about status of jobs assigned to different employees. This panel also calls some escape routines for different purposes like check_job_key, check_emp_key, get_job_rec, check_date, dat_to_int, int_to_dat,check_wjst_key etc.

(v) JSTAT_COD_PANEL

To display, accept, update and delete codes of status of jobs and their description. This panel also calls some escape routines for different purposes like get_jst_rec, check_jst_key etc.

(vi) SECT_COD_PANEL

To display, accept, update and delete codes for sections and their names. This panel also calls some escape routines for different purposes like get_sect_rec, check_sect_key etc.

(vii) QUERIES_PANEL

These panel are used to display different queries as required by the user. This panel also calls some escape routines to get data for displaying purposes.

(viii) COMMIT_ROLLBACK_PANEL

This panel is used, to display the option for saving information to database or to rollback these changes. This panel also calls some escapes routines which are used for inserting data, updating and deletion data like ins_emp_rec etc.

Besides these panels many other panels are written in this program, only their names are given below

- Help_panel
- Message_panel
- Emp_cod_panel
- Job_cod_panel
- section_cod_panel

- jst_cod_panel

_ more_panel etc.

These panels are activated on the choice of the users or as a response of pressing some function key.

The escape routines called by different panels are written in C language. Different checks are implemented by these routines. The form manger keeps addresses of these routines in the object file of the IFDL program, this object file is linked with the main program in which these routines are included.

CHAPTER No.5

SYSTEM IMPLEMENTATION AND SYSTEM EVALUATION

5.1 INTRODUCTION

This chapter describes the implementation plan for proposed system. It is the phase where manual system is replaced by computerized system. The goal of the system implementation is to transfer the plan and schedule into integration functioning operation.

5.2 SYSTEM IMPLEMENTATION

Implementation is the activity of getting the designed system in operation. The new system may be totally new, replacement of the existing system or it may be a major modification to the existing one. In either case proper implementation is essential to provide a reliable system to meet requirements. It is a planned work and requires more attention of the system designer. We discuss two major aspects of system implementation.

- System Testing
- System Conversion

5.2.1 SYSTEM TESTING

Testing is the basis for the system acceptance. So before getting the new system in operation, it of vital importance to check that the new system is comprehensive within its limits and is fully correct. This can be achieved by testing its programming logic and accuracy of the generated output. The job information system is checked with the sample data and queries and reports generated by

the new system are checked for validation.

5.2.2 SYSTEM CONVERSION

System conversion is stage where the system designer gets the reward of all the hardwork. Several conversion plans are there to put the new system in operation but the four best conversion plans are as follows

(a) Direct Conversion

(b) Parallel Conversion

(c) Pilot Conversion

(d) Phase in Conversion

5.3 PROPOSED CONVERSION PLAN

After thorough analysis of the different approaches used for the system conversion, parallel conversion is recommended for the implementation of job status information system of CED of FFC. The arguments against parallel conversion are cost and extra work load factors, from this point of view direct conversion is the best strategy for the system conversion. But in the event of the new systems failure the whole process will have to be repeated duel disruption of going back to the old system. In case of parallel conversion the old system will be available as the back up and results obtained through the new system can be compared to the output of the old system. This will permit changes and adjustment

if required in the new system with out disturbing information flow order.

5.4 SYSTEM EVALUATION

An evaluation of the computerized system is necessary to judge whether the goals and objectives of the proposed system have been met or not. The new system has number of advantages over the manual system as described below.

5.4.1 EFFICIENCY

The new system is very time effective. Data entry task is easier and faster because instead of entering lengthy names and words respective codes are used, which makes the new system much faster for insertion and retrieval of data. This reduces the chance of error by data entry operators, moreover the space needed to store the data is also reduced.

5.4.2 ACCURACY

The new system gives a high degree of correctness and produces reliable results. The outputs are sufficiently precise for the desired purpose and there is no chance of entering wrong data because many consistency checks are provided especially for entry

codes for the data items.

5.4.3 EDIT CHECKS

Various edit checks are provided in developed system, so that correct data entry would be possible. These checks assure the correctness of the data,for example reference check is applied that foreign key constraints are fulfilled. Similarly various checks are provided like date checks, primary key checks, week checks and authorization checks etc.

5.4.4 SECURITY AND INTEGRITY

By security we mean the protection of data against unauthorized disclosure, alteration are distraction where as integrity involves insuring that the things they are trying to do are correct.

In SQL there are two features of system, that are involved in the provision of security.

(i) THE VIEW MECHANISM

It is used to hide sensitive data from unauthorized users.

(ii) AUTHORIZATION SUBSYSTEM

It allows users having specific rights to selectively and dynamically grant those rights to other users and subsequently to revoke those rights. This is possible by means of grant and revoke statement. In developed system most integrity checking is done by user written procedural codes. If the user attempts to execute an operation that would violate the constraint then system either rejects the operation or would give the instruction about the proper way of entering the data.

5.4.5 MODULARITY

The system is divided into number of modules integrated together to fulfill user requirements. These modules are independent of each other. An other advantage of modularity is the case of modification and extension and enhancement of the developed system.

5.4.6 EASE OF USE

The developed system is menu driven and very easy to use for a user having even little knowledge of data processing, online help, proper error messages and respective information messages are provided to make the system user friendly.

5.4.7 RECOVERY AND CONCURRENCY

The problem of recovery and concurrency in a database system are heavily bound up with the notion of transaction processing. For example it may be possible that one of the two updates to be executed and other not or the system crash might occurs between two updates or the program itself might abnormally terminate between the two with an overflow error. The developed system support transaction processing and guarantees that if transaction execute some updates and then a failure occurs before the transaction reaches its normal termination, then those updates will be undone. The commit and rollback operation are the key to providing this automatically. The commit operation signals Successful end of transaction. The rollback operation by contrast signals unsuccessful end of transaction.

5.5 CONCLUSION

"Job Status Information System" is helpful, easy to use and menu driven. By utilizing the power of computer following results have emerged,

- Since the system is very easy to use so common user can conduct his job easily.
- Due to accuracy and high degree of precision the computer

based system is reliable and helpful.

- Time factor, data collection, retrieval system is very tedious if done manually. These are done at proper time without error with computer based system.
- Error free results with high degree of precision.
- All possible queries and reports have been generated as needed by the organization.
- Any number of queries and reports can be added to this system.
- Hence all the objectives mentioned in beginning of this project have been achieved successfully.

CHAPTER No.6

USER'S GUIDE

6.1 INTRODUCTION

This chapter has been designed for the user to become familiar with the system developed for CED. All the menus and reports are discussed in this chapter.

6.2 GETTING STARTED

To start the Job Status Information System, simply type "JOB" and Press <Return>, The system will display the welcome Screen as shown in fig 6.1.

After a few seconds the second screen displays, it is the main menu screen as shown in fig 6.2.

The Main Menu has three parts.

(i) HEADING

This is the main heading for the system as shown in main menu screen, this part also has a small viewport for date. It always shows the current date of the system.

(ii) MAIN OPTIONS

This part consists of main options of the system provided to the

user. These option are

Data entry, updation, Deletion, Queries, Exit.

The user can move by either **Up/Down arrow Keys** or **Right/Left Arrow Keys** from one option to another option. A reverse bar moves

WELCOME SCREEN

WELCOME : USER NAME

TO

JOB STATUS INFORMATION SYSTEM

DEVELOPED BY

SOHAIL AHMED

DEPTT.COMPUTER SCIENCE,Q.A.U.

ISLAMABAD

VMS VERSION : A5.5

WAIT PLEASE.....

fig 6.1.

MAIN MENU SCREEN

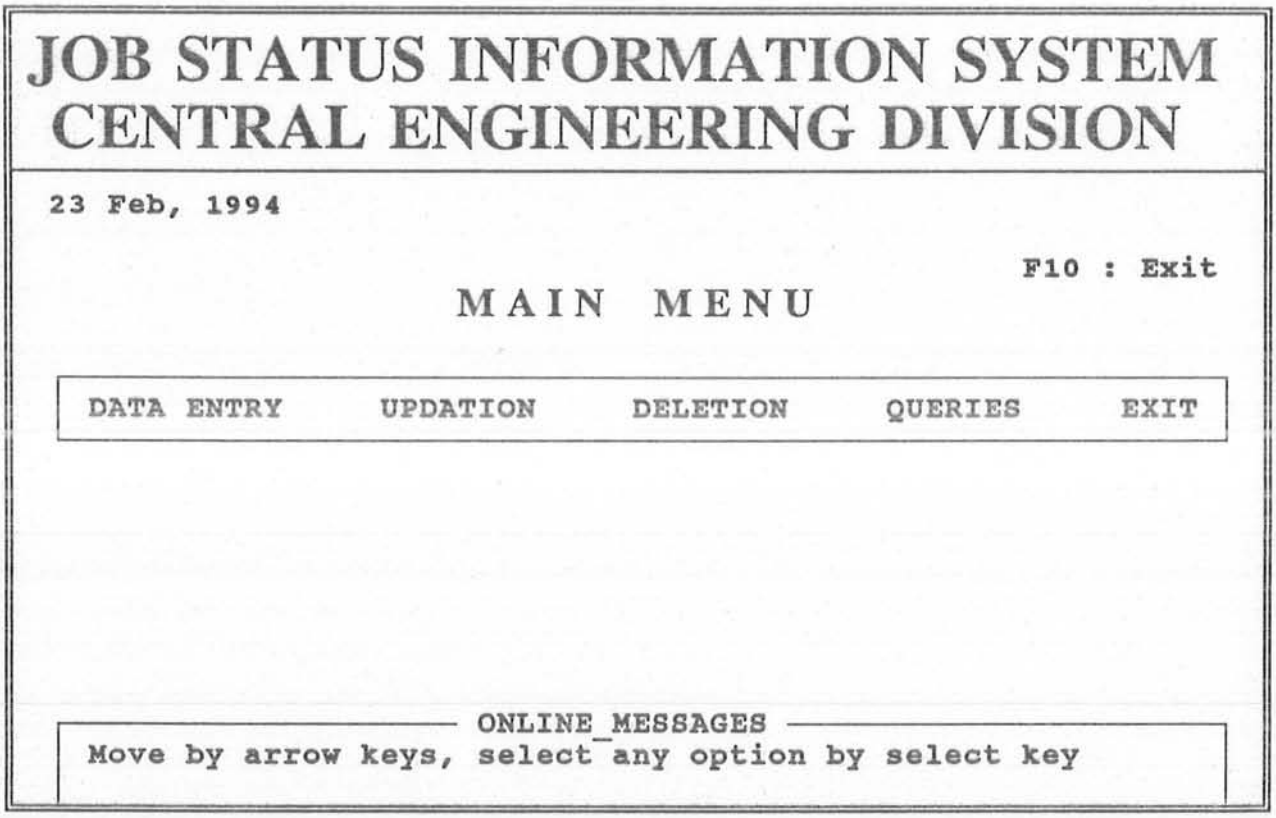


fig 6.2.

with the cursor Keys on the options. To select any option, user has to press **Select Key.**

If the user tries to press any key other than **select key** and **arrow keys**, system will simply display a massage

"Undefined Function Key"

(iii) SUBMENU OPTIONS

This menu provides options for each main choice, which is discussed above. For example for Data Entry, it will display option menu, which is shown in fig 6.3.

These susbmenus will be displayed, as user moves the cursor bar on the main options of the system. As the cursor bar moves from one option to the next, the previous pulldown submenu will be disappeared and next will be displayed.

Similarly Submenu for Updation, deletion & Queries are shown in fig 6.4, fig 6.5, fig 6.6 respectively.

When main option **Data Entry** is selected, the cursor bar is placed at first option of the related submenu. Now at the submenu, the user can move with **Up/Down arrow Keys** on different options provided by the submenu. To select a particular option, user has to press

Select key, to go back to the main menu, he has to press **F10 Key**.

(iv) **ONLINE MESSAGE PART**

This part of main menu displays online messages, this part is shown in fig 6.1,fig 6.2. etc.

DATA ENTRY SUBMENU ON MAIN MENU

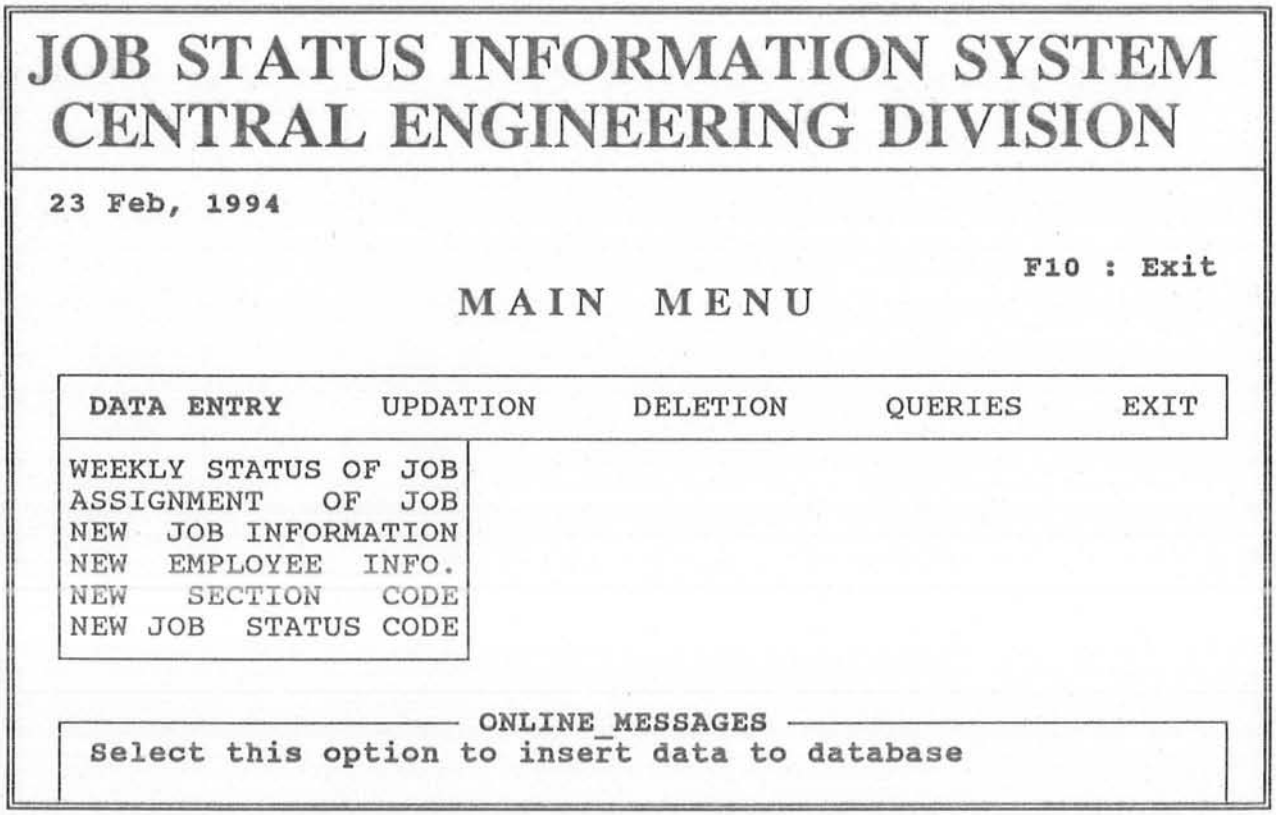


fig 6.3.

UPDATION SUBMENU ON MAIN MENU

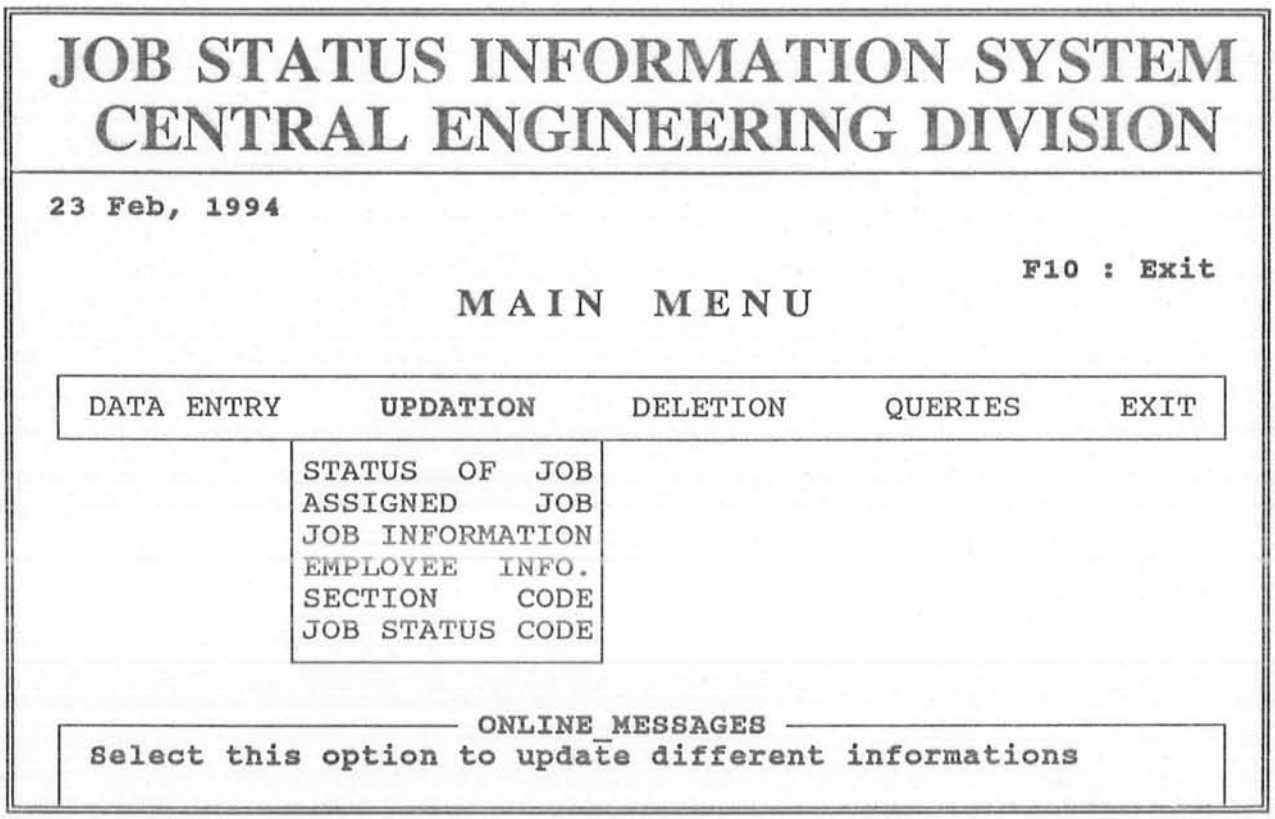


fig 6.4.

DELETION SUBMENU ON MAIN MENU

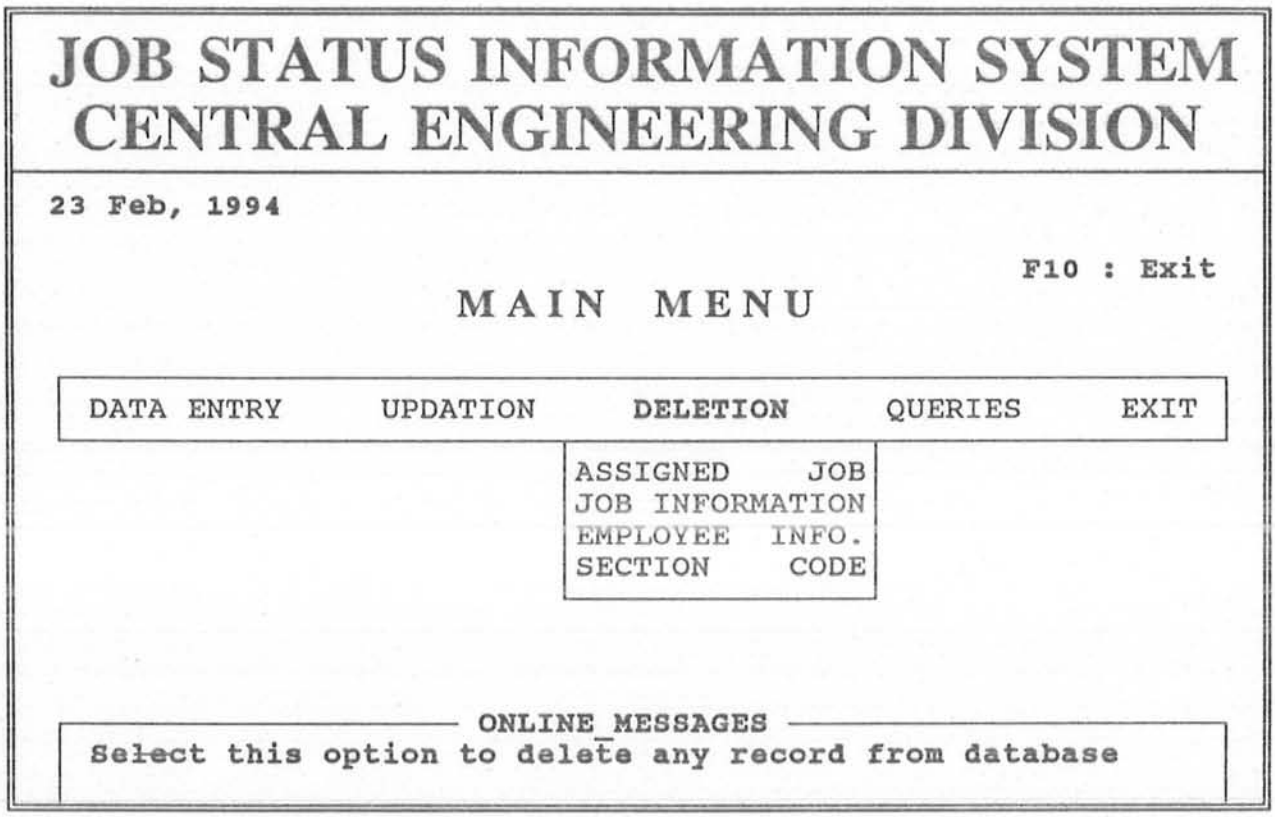


fig 6.5.

QUERIES SUBMENU ON MAIN MENU

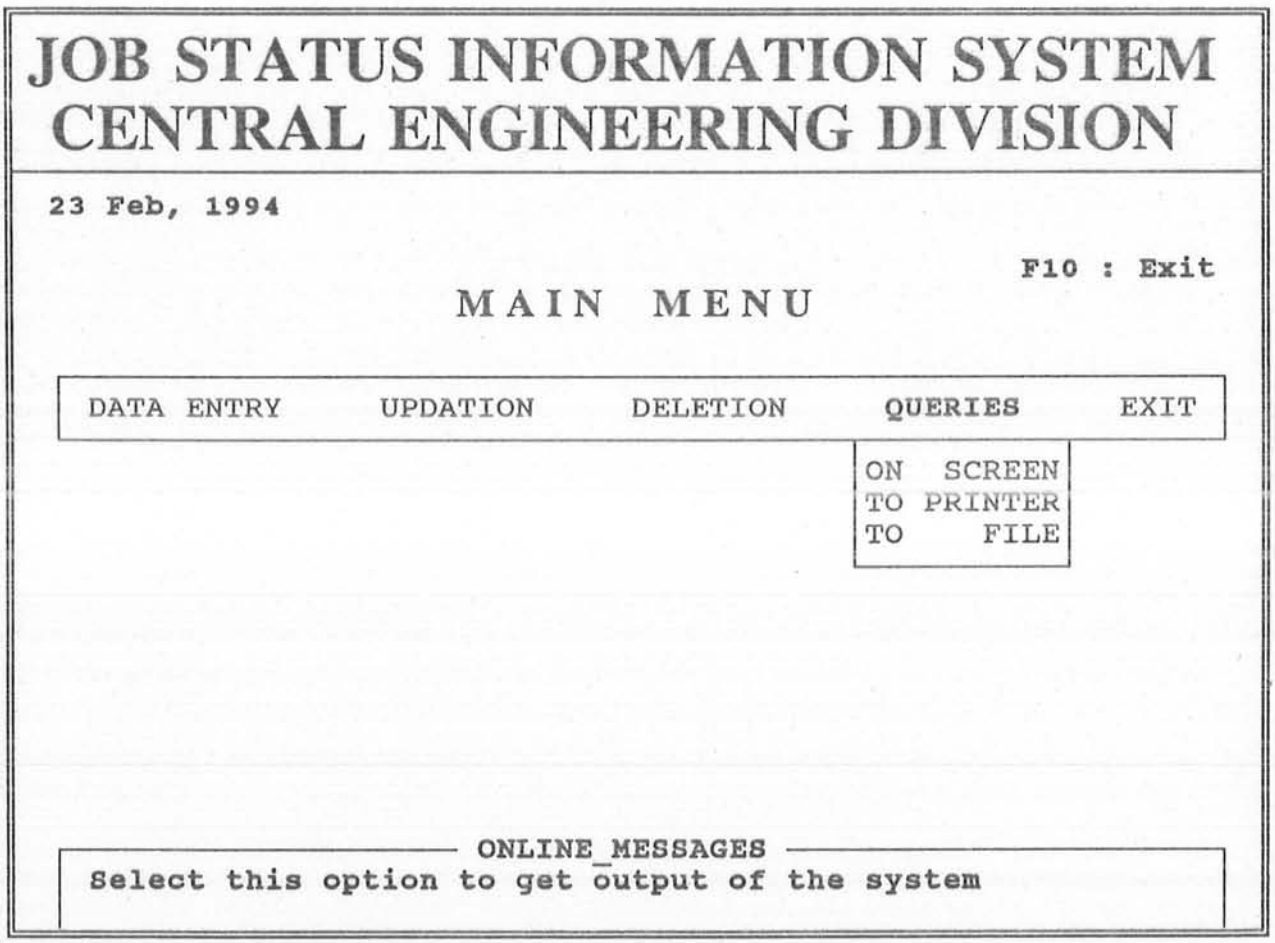


fig 6.6.

As the cursor bar moves from one option to the next, the messages are changed from option to option automatically. For example if the cursor bar is at Data Entry option, the message will be displayed as

" Select this option to enter data to database"

Each option of main menu and submenu has relevant messages, which will be displayed in message viewport.

6.3 HOT KEY (F10)

As displayed, on the main menu screen the F10 key is a hot key, if a user presses this key at any option of the main menu, it will exit from the running system with the message,

" Aborting from running processing"

with bell signal.

6.4 HELP (HELP KEY)

At main menu if user wants to see some help about function keys, or help to choose an option or some other type of help, he can press **Help Key.** The system will display a help panel on the screen, Which contains help of all defined function keys and their related functions etc.

6.5 SUBMENU OPTIONS

The description of the submenu options is given as:

6.5.1 DATA ENTRY SUBMENU

This menu is displayed when the cursor bar is on Data Entry option, when user selects Data Entry option, the bar is placed on first option of the submenu. i,e

DATA ENTRY SUBMENU OPTIONS

WEEKLY STATUS OF JOB
ASSIGNMENT OF JOB
NEW JOB INFORMATION
NEW EMPLOYEE INFO.
NEW SECTION CODE
NEW JOB STATUS CODE

fig 6.7.

Now user can move on these options by **Up/Down arrow keys.** If user presses **Select Key**, when bar is at first option as described above, the main menu screen will be disappeared and a message is displayed,

" Processing, Wait Please.....",

After a few seconds the next screen will be displayed, which will

be the input screen to enter data of weekly status of job, the input screen is shown in fig 6.8.

INPUT SCREEN FOR EMPLOYEE INFORMATION

EMPLOYEE INFORMATION

Employee Code	:	1234
Employee Name	:	MOHAMMAD SADDIQUE
Employee Desgnation	:	SYSTEMS ANALYST
Section code	:	CAD
Immediate Boss code	:	1000

Next Item :- Return
Previous Item :- F12

Messages
Press help key to see existing code.

fig 6.8.

The cursor is at the first field of this table. The message is displayed at the bottom of screen,

" Press Select Key to select existing codes, you may enter direct"

Now user may enter employee code direct, if one remember or one can press **Select key**, to select existing codes. If user press **Select Key**, the system will display the existing employee codes and their names in another viewport, which will overlap the previous Data Entry table as shown in fig 6.9.

EXISTING CODES PANEL

FOLLOWING CODES EXIST

CODE	NAME
1000	NAVEED A. MALIK
1234	MOHAMMAD SADIQ
1817	KHALID NAWAZ KIYANI
1367	AMBREEN HASAN
1567	MOHAMMD ASIF
1789	ABID ALI
1098	SOHAIL AHMED
1457	ZAHID SAEED
1543	FAREEHA HASHMI
1290	MOHAMMAD RIAZ

THIS IS THE FIRST PAGE OF CODES

UP/DOWN KEYS :- Move up and down
NEXT/PREVIOUS SCREEN :- Move by page
SELECT KEY :- Select F10 :- Exit

fig 6.9.

Now cursor is on first code of the new table, now user can move on existing code by arrows keys, 10 codes are displayed at first time. When user reaches the 10th code, then next page of code will be displayed on pressing **Down arrow key**. If user is at the last code the message will be displayed,

" You are at last code",

and if user is at first code, the message will be displayed,

" You are at first code ".

User can also scroll codes by page with the help of **Next/Previous screen keys**,if one scrolls codes by page and if it is last page, the message will be displayed,

" End of codes",

and if it is first page code the message will be displayed,

" Beginning of codes".

Now user can select codes by pressing **Select Key**, the current value of the cursor bar will be moved to the field, or press **F10 Key** to exit from this help table, without select code. If user presses select key, the code will be displayed at the employee code field position and the table of codes will disappear. Once again the whole Data Entry screen will appear, and the cursor will be at the next field of the table. If user presses **F10 key** at code table, then the code table will disappear and cursor will be at same

field, now user can enter a value through the keyboard.

Similarly all fields are entered by the user directly or by selection of the existing codes. Different checks are implemented for data entry, so if user tries to violate any one check, the system will display appropriate message at once in message panel. For example if user enters duplicate key, system will give error message ,

"duplicate key enter again valid key".

User can move from one field to another, for this purpose two keys are defined,

- **F12 key** for previous item .
- **<Return>** for next item.

When user reaches the last field of the table, and presses **next item key**, the system will display another screen, Which is a **commit, rollback** screen. If user selects **commit** option, the data will be written to the database in that particular Table, and message will be displayed,

"Data is successfully saved to database".

If user selects **Rollback** Option all the data entered by user will be deleted. After both actions another screen will be displayed, which is called add_more screen. The commit, rollback screen and

COMMIT ROLLBACK SCREEN

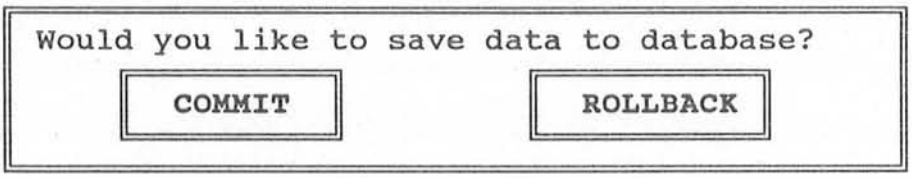


fig 6.10.

ADD MORE SCREEN

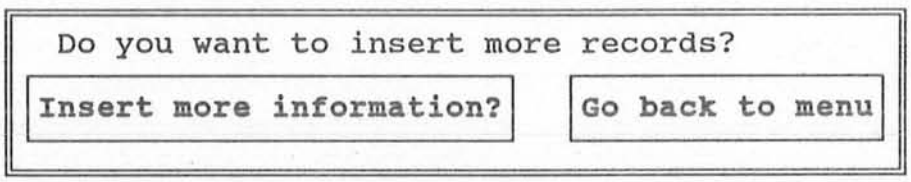


fig 6.11.

add_more screen are shown in fig 6.10, fig 6.11.

This screen has two options, **add more**, **go back**, one can move by **Left/Right arrow keys** on the options of this screen. If one selects **add more**, then this screen will disappear and again cursor will be at the first field of the entry table. If user selects **go to main** menu option , the main menu will be displayed again. Similarly all data entry options can be handled. The input screen for these are shown in appendix A.

6.5.2 UPDATION SUBMENU

This menu will be displayed when cursor bar is at updation option, on main menu, If user selects this option by **select key**, Then, cursor bar moves to the first option of the submenu, the options are shown in fig 6.12.

UPDATION OPTIONS

STATUS OF JOB
ASSIGNED JOB
JOB INFORMATION
EMPLOYEE INFO.
SECTION CODE
JOB STATUS CODE

fig 6.12.

This submenu has different options in it, which are shown above. If a user selects first option of this menu, than the data updation table is displayed. This table consists of primary key field of this particular table whose record is to be updated. User may enter data to fields directly are by selecting existing codes , following the procedure described in data entry options. A user enters employee code , Job code & start of week, as shown in fig 6.13.

UPDATION INPUT SCREEN

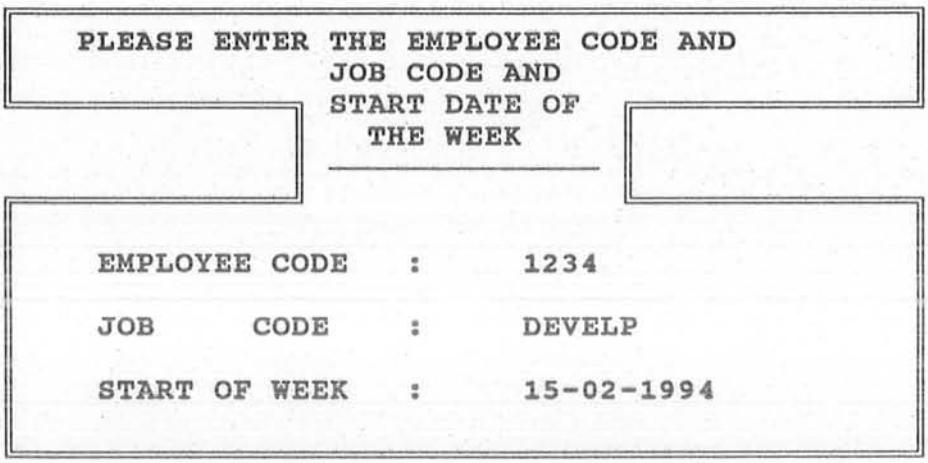


fig 6.13.

If the record of this specification does not exist, then an error message is displayed i.e

"This record does not exist",

and cursor again moves to first field of this table for accepting

data once again. If the record is found , then next screen will be displayed, which contains all the data of that particular specification. Now user can change any field of the record. When user has changed the last field of this table and presses **Next Item key**, another panel is displayed over this table, which has two options, **commit and rollback**. If a user select **commit**, these changes are saved to database, otherwise system will again display main menu for further selection of choices.

Similarly all options of this menu are handled. The input screens for updation options are shown in appendix A.

6.5.3 DELETION SUBMENU

This menu is displayed, when cursor bar is at the deletion Option of the main menu. When user selects deletion option, the cursor bar is placed to first option of submenu . This submenu has different options shown in fig 6.14.

DELETION OPTIONS

ASSIGNED JOB
JOB INFORMATION
EMPLOYEE INFO.
SECTION CODE

fig 6.14.

The user can move with the help of arrow keys on options. If user selects the first option of this menu, another deletion table is displayed as shown in fig 6.15.

DELETION INPUT SCREEN

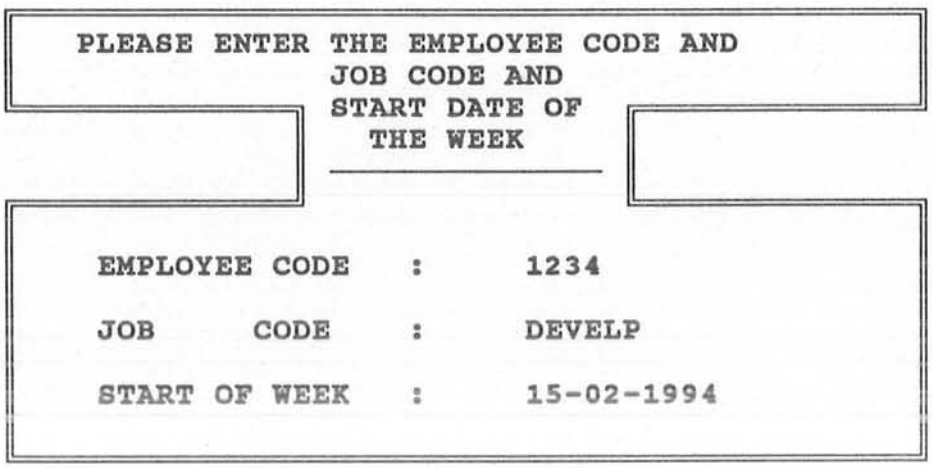


fig 6.15.

Now user can enter required employee code and job code directly or by selecting existing codes with the help of **Select key**. If the

record is found, then a warning message is displayed, which is shown in fig 6.16.

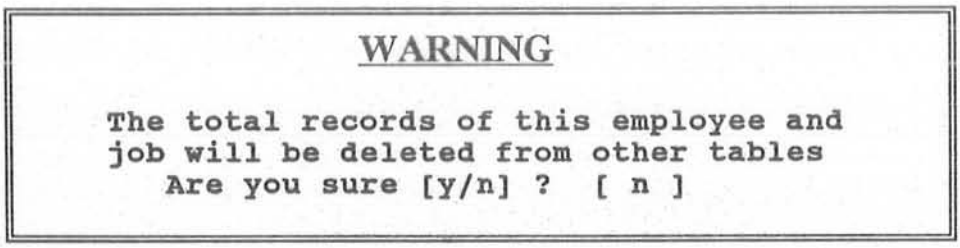


fig 6.16

If the user confirms the operation, then the record is deleted and message is displayed,

"the record is deleted".

After this del_more_panel is displayed. User may delete more record from this table or may go back to main menu. Similarly all options works in the same way. The deletion screen are shown in Appendix A.

6.5.4 QUERIES SUBMENU

This submenu is displayed, when cursor bar is at **Queries** at main menu. When user selects **queries** option, the cursor bar move to first option of queries submenu, which is **On Screen.** The options provided by this menu are given in fig 6.17.

QUERIES OPTIONS

fig 6.17.

On Screen means, to get some output from the system on display screen.

To File means, to get output reports and queries stored in a file.

To Printer means, to get output reports from the system in printed form.

Each option in the submenu has its own further options provided to user. For example, if a user selects the option **On Screen**, then another bar moving menu will be displayed which is shown in fig 6.18.

QUERIES ON THE SCREEN

```
FOLLOWING QUERIES ARE AVAILABLE ON SCREEN

 1:- EMPLOYEEWISE SUMMARY OF JOBS
 2:- JOBWISE SUMMARY OF JOBS
 3:- SECTIONWISE SUMMARY OF JOBS
 4:- STATUSWISE SUMMARY OF JOBS
 5:- HISTORY OF ASSIGNED OF JOBS
 6:- WEEKLY STATUS OF ANY JOB
 7:- JOBS INFORMATION
 8:- EMPLOYEE INFORMATIONS
 9:- STATUS WISE DETAIL OF ALL JOBS
```

fig 6.18.

The user can select any one of the option. The output of the required option will be displayed in an appropriate format on the screen.The user can move up & down the records on screen with the help of next and previous screen option, if records are greater than total number of lines on a screen, The output layout is shown in appendix A.

6.5.5 EXIT THE SYSTEM

This option is to quit from the system. when user selects this option, the system gives a message,

"Aborting from running system",

with bell and displays farewell screen. The farewell screen is shown in fig 6.19.

FAREWELL SCREEN

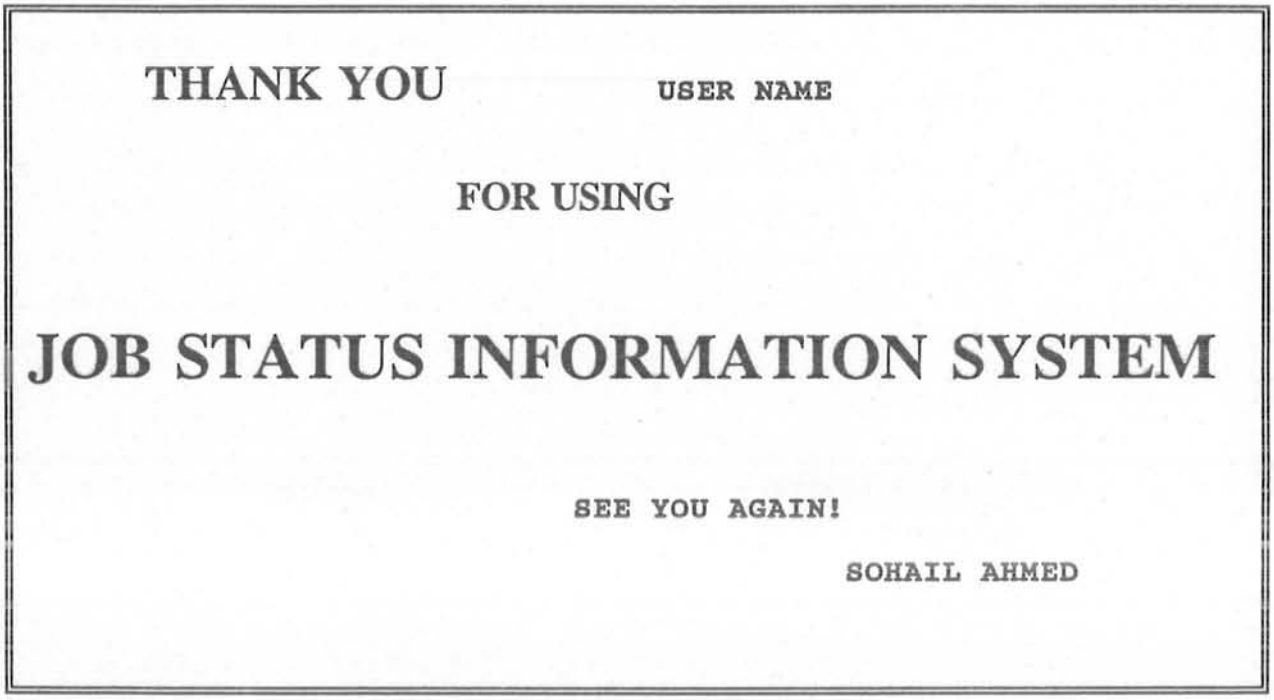


fig 6.19.

F10 key is a hot key in this system, a user can exit from any running process by pressing this key, if user is at main menu he will quit the system.

APPENDIX A

INPUT, OUTPUT SCREENS

D A T A E N T R Y T A B L E

EMPLOYEE INFORMATION

Employee Code	:	1234
Employee Name	:	MOHAMMAD SADDIQUE
Employee Desgnation	:	SYSTEMS ANALYST
Section code	:	CAD
Immediate Boss code	:	1000

Next Item :- Return
Previous Item :- F12

Messages

Press help key to see existing code.

D A T A E N T R Y T A B L E

JOB INFORMATION

Job Code	:	DEVELP
Job Name	:	S/W DEVELOPMENT
Job Description	:	DEVELOPMENT SYSTEM S/W
Job Status	:	A
Starting date	:	12-02-94

Next Item :- Return
Previous Item :- F12

Messages

Press help key to see existing codes.

D A T A E N T R Y T A B L E

JOB ASSIGNMENT INFORMATION

Employee Code :	1234	Job Code :	DEVELP
Assignment date:	15-02-1994	Job Status :	R
Target date :	20-05-1994	Job Responsbility:	1000

Next Item :- Return
Previous Item :- F12

Messages

Press help key to see existing codes.

D A T A E N T R Y T A B L E

WEEKLY STATUS OF JOB

Employee Code	: 1234
Job Code	: DEVELP
Start of Week	: 16-02-1994
Current status	: R
End of Week	: 22-02-1994
Status Description	: THE JOB IS JUST START.
Weekly Manhour	: 75

Next Item :- Return
Previous Item :- F12

Messages

Press help key to see existing codes.

D A T A E N T R Y T A B L E

JOB STATUS CODES DESCRIPTION

JOB STATUS CODE :- F

JOB STATUS CODE DESCRIPTION :- FINISHED

Next Item :- Return
Previous Item :- F12

Messages

Press help key to see existing codes.

D A T A E N T R Y T A B L E

SECTION CODES DESCRIPTION

SECTION CODE:- CAM

SECTION NAME :- COMPUTER AIDED MANUFACTURING

Next Item :- Return
Previous Item :- F12

Messages

Press help key to see existing codes.

EMPLOYEEWISE SUMMARY OF JOBS

3 Mar, 1994

EMPLOYEE CODE :- 1234 EMPLOYEE NAME :- MOHAMMAD SADDIQUE
DESIGNATION :- SYSTEM ANALYST
BOSS CODE :- 1000 SECTION :- COMPUTER AIDED DESIGN

JOB CODE/ JOB NAME	STATUS	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESP
DEVELP DEVELOPMENT OF SOFTWARE	RUNNING	12-10-1993 31-03-1994	510 00-00-0000	1234
SYSRVW SYSTEM DESIGN & REVIEW	FINISHED	23-04-1993 30-10-1993	670 14-10-1993	1000
PCSOFT PC S/W LEARINING & MAINTANCE	PENDING	17-02-1994 30-04-1994	108 00-00-0000	1234
TRAIN TRAINING, COURSE & SEMINAR	RUNNING	10-12-1993 30-06-1994	390 00-00-0000	1234

=ARROW KEYS :- MOVE ONE BY ONE=====NEXT/PREVIOUS SCREEN :- MOVE BY PAGE=

This is the first page of records F10 :- Exit

JOBWISE SUMMARY OF JOBS

3 Mar, 199

JOB CODE :- PCSOFT JOB NAME :- PC S/W LEARNING & MAINTAINANCE
START DATE :- 12-10-1993 COMPLETION DATE :- 00-00-0000
STATUS :- RUNNING

EMPLOYEE CODE/ EMPLOYEE NAME	SECT CODE	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESP/ STATUS
1234 MOHAMMAD SADDIQUE	CAD	12-10-1993 31-03-1994	510 00-00-0000	1234 RUNNING
1000 M.KHALID NAWAZ KIYANI	CAD	23-04-1993 28-02-1994	320 14-10-1993	1000 FINISHED
1530 AMBREEN HASAN	CAM	17-02-1994 30-04-1994	108 00-00-0000	1234 RUNNING

ARROW KEYS :- MOVE ONE BY ONE NEXT/PREVIOUS SCREEN :- MOVE BY PAGE

This is the first page of records F10 :- Exit

EMPLOYEE INFORMATION

3 Mar, 199

EMPLOYEE CODE/ EMPLOYEE NAME	DESIGNATION	SECTION CODE	BOSS CODE
1234 MOHAMMAD SADDIQUE	SYSTEM ANALYST	CAD	1000
1000 M.KHALID NAWAZ KIYANI	SYSTEM ANALYST	CAM	890
1530 AMBREEN HASAN	SYSTEM ANALYST	CED	1000

ARROW KEYS :- MOVE ONE BY ONE NEXT/PREVIOUS SCREEN :- MOVE BY PAGE

This is the first page of records F10 :- Exit

STATUSWISE SUMMARY OF JOBS

3 Mar, 199

STATUS CODE :- F **STATUS CODE DESCRIPTION :- FINISHED**

EMPLOYEE CODE/ EMPLOYEE NAME	JOB CODE	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESP\ SECT CODE
1234 MOHAMMAD SADDIQUE	PCSOFT	12-10-1993 31-03-1994	510 28-02-1994	1234 CAD
1000 M.KHALID NAWAZ KIYANI	DEVELP	23-04-1993 28-02-1994	320 14-10-1993	1000 CAM
1530 AMBREEN HASAN	MAINT	17-02-1994 20-02-1994	208 18-02-1994	1234 CED

ARROW KEYS :- MOVE ONE BY ONE NEXT/PREVIOUS SCREEN :- MOVE BY PAGE

This is the first page of records F10 :- Exit

SECTIONWISE SUMMARY OF JOBS

3 Mar, 19

SECTION CODE :- CAD SECTION NAME :- COMPUTER AIDED DESIGN SECTION

EMPLOYEE CODE/ EMPLOYEE NAME	JOB CODE	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESP/ STATUS
1234 MOHAMMAD SADDIQUE	PCSOFT	12-10-1993 31-03-1994	510 00-00-0000	1234 RUNNING
1000 M.KHALID NAWAZ KIYANI	DEVELP	23-04-1993 28-02-1994	320 14-10-1993	1000 FINISHED
1530 AMBREEN HASAN	MAINT	17-02-1994 30-04-1994	208 00-00-0000	1234 RUNNING

ARROW KEYS :- MOVE ONE BY ONE NEXT/PREVIOUS SCREEN :- MOVE BY PAGE

This is the first page of records F10 :- Exit

WEEKLY JOB SCHEDULE

NAME _____

DESIGNATION _____

WEEK :
START :
END :

JOB TYPE	JOB CODE	JOB DESCRIPTION & STATUS	MAN HOURS	
			THIS WEEK	YEAR TO DATE
R & D				
DEVELOP				
SYSRVW				
MAINT				
SYSMGT				
PCSOFT				
SUPERV				
SERVICE				
STUDY				
TRAIN				
ADMIN				
LEAVE				

R & D	Research & Development Of Engineering & Scientific Softwares
DEVELOP	Development of other software packages
MAINT	Software Maintenance
SYSRVW	System Design & Review of New Systems
SYSMGT	Computer System Adminstration & Management
PCSOFT	PC Software Learning & Maintenance
SUPERV	Supervision & Training to Others
SERVICE	Routine Services To Management & Other Sections
STUDY	Self Study of new ideas & concepts
TRAIN	Training, Courses & Seminars
ADMIN	General Administration
LEAVE	Leave & Holidays

CADJB_01/B05

JOB STATUS :- R JOB STATUS DESCRIPTION :- RUNNING

EMP CODE/ SECTION NAME	JOB CODE	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESPOSIBILITY
123 COMPUTER AIDED MANUFACTURING	DEVLOP	11-11-1993 12-11-1994	0 0- 0- 0	1000
1891 ACCOUNT SECTION	ADMIN SECTION	12-10-1992 12-10-1993	0 0- 0- 0	1000
1891 ACCOUNT SECTION	DEVLOP SECTION	11-11-1992 13-11-1993	0 0- 0- 0	1000
1891 ACCOUNT SECTION	R&D SECTION	11-11-1993 11-11-1994	0 0- 0- 0	1891
2456 COMPUTER AIDED MANUFACTURING	DEVLOP	19- 9-1992 11-11-1993	2 0- 0- 0	1000
2627 COMPUTER AIDED MANUFACTURING	TRAIN	19-11-1993 19- 9-1994	0 0- 0- 0	2627
2879 COMPUTER AIDED DESIGN	TRAIN	17-10-1993 19-11-1993	0 0- 0- 0	1000
2879 COMPUTER AIDED DESIGN	SUPERV	11-11-1993 18-10-1994	0 0- 0- 0	1000
2879 COMPUTER AIDED DESIGN	MAINT	11-11-1993 17-12-1994	0 0- 0- 0	1000
2879 COMPUTER AIDED DESIGN	PCSOFT	8- 9-1992 4- 3-1993	4 0- 0- 0	1000

SECTIONWISE SUMMARY OF JOBS

6-4-1994

SECTION CODE :- CAD SECTION NAME :- COMPUTER AIDED DESIGN

EMP CODE	JOB CODE	JOB STATUS	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESPOSIBILI
2879	R&D	ASSIGNED	26-11-1990 11-12-1993	800 0- 0- 0	1000
1000	PCSOFT	FINISHED	11-11-1991 11-11-1992	210 10-10-1993	2627
2879	DEVLOP	FINISHED	11-11-1992 24-12-1993	205 23-12-1992	2879
3209	STUDY	PENDING	9- 9-1993 10-10-1994	0 0- 0- 0	1000
3290	SUPERV	PENDING	18-11-1991 11-11-1992	0 0- 0- 0	3290
2879	TRAIN	RUNNING	17-10-1993 19-11-1993	0 0- 0- 0	1000
2879	PCSOFT	RUNNING	8- 9-1992 4- 3-1993	4 0- 0- 0	1000
2879	SUPERV	RUNNING	11-11-1993 18-10-1994	0 0- 0- 0	1000
2879	MAINT	RUNNING	11-11-1993 17-12-1994	0 0- 0- 0	1000
2879	STUDY	RUNNING	18-12-1992 15-11-1994	0 0- 0- 0	2879

EMPLOYEE CODE :- 2879 EMPLOYEE NAME :- SOHAIL AHMED
DESIGNATION :- SYSTEMS ANALYST
BOSS CODE :- 1000 SECTION NAME :- COMPUTER AIDED DESIGN

JOB CODE/ JOB NAME	STATUS	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESPOSIBILIT
DEVLOP DEVELOPMENT	FINISHED	11-11-1992 24-12-1993	205 23-12-1992	2879
R&D RESEARCH AND	ASSIGNED DEVELOPMENT	26-11-1990 11-12-1993	800 0- 0- 0	1000
PCSOFT PC SOFTWARE	RUNNING	8- 9-1992 4- 3-1993	4 0- 0- 0	1000
MAINT MAINTANANCE	RUNNING	11-11-1993 17-12-1994	0 0- 0- 0	1000
SUPERV SUPERVISION	RUNNING	11-11-1993 18-10-1994	0 0- 0- 0	1000
STUDY STUDY OF NEW	RUNNING IDEAS	18-12-1992 15-11-1994	0 0- 0- 0	2879
SYSMGT SYSTEM MANAGE	RUNNING MENT	15- 1-1994 6- 7-1994	0 0- 0- 0	2879
TRAIN TRAINING	RUNNING	17-10-1993 19-11-1993	0 0- 0- 0	1000

JOB CODE / JOB NAME	START DATE	COMPLETED DATE / DESCRIPTION	JOB STATUS
R&D RESEARCH AND DEVELOPMENT	10- 3-1990	10-10-1992 R&D OF ENGG. AND SCIENTIFIC S	FINISHED
DEVLOP DEVELOPMENT	11-11-1991	10-10-1992 DEVELOPMENT OF S/W	FINISHED
PCSOFT PC SOFTWARE	11-11-1990	5-10-1992 SYSTEM DEVELOPMENT	FINISHED
SYSRVW SYSTEM REVIEW	2- 3-1990	0- 0- 0 SYSTEM REVIEW AND DESIGN OF S	RUNNIN
MAINT MAINTANANCE	11- 7-1991	0- 0- 0 SOFTWARE MAINTAINANCE	ASSIGNED
SUPERV SUPERVISION	11- 4-1991	0- 0- 0 SUPERVISION & TRAINING OF DEV	ASSIGNED
STUDY STUDY OF NEW IDEAS	20- 9-1992	0- 0- 0 STUDY ABOUT NEW CONCEPTS	RUNNING
TRAIN TRAINING	12-10-1993	0- 0- 0 COURSE AND SEMINARS	ASSIGNED
SYSMGT SYSTEM MANAGEMENT	23- 2-1993	0- 0- 0 SYSTEM MANAGEMENT & ADMIN	UNASSUGNED
ADMIN ADMINISTRATION	8- 3-1992	0- 0- 0 GENERAL ADMINISTRATION	ASSIGNED

EMP CODE/ EMP NAME	EMPLOYEE DESGNATION/ SECTION NAME	BOSS CODE
3838 TOQUEER AHMED	CHEMICAL ENGINEER PROCESS ENGINEERING SECTION	1000
2202 MOHAMMAD ABID	COMPUTER OPERATOR PROCESS ENGINEERING SECTION	10(
2627 KHALID NAWAZ KIANI	SYSTEM ANALSYT COMPUTER AIDED MANUFACTURING	1000
2456 MOHAMMAD RIAZ	SYSTEM ANALYST COMPUTER AIDED MANUFACTURING	1000
6788 MOHAMMAD SADDIQUE	SYSTEM ANALYST COMPUTER AIDED MANUFACTURING	1000
8398 UMER SADIQ	SYSTEM ANALYSTS COMPUTER AIDED MANUFACTURING	1891
123 MOHAMMAD SHAHAB	PROGRAMMER COMPUTER AIDED MANUFACTURING	2879
2879 SOHAIL AHMED	SYSTEMS ANALYST COMPUTER AIDED DESIGN	1000
1000 NAVEED A. MALIK	UNIT MANAGER COMPUTER AIDED DESIGN	1000
3290 MOHAMMAD KHALID	COMPUTER ASSISTANT COMPUTER AIDED DESIGN	2879

JOB CODE :- DEVLOP JOB NAME :- DEVELOPMENT
START DATE :- 11-11-1991 COMPLETED DATE :- 0-0-0
JOB STATUS :- FINISHED

EMP CODE/ EMP NAME	SECTION CODE	JOB STATUS	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESPOSIBILIT
2879 SOHAIL AHMED	CAD	FINISHED	11-11-1992 24-12-1993	205 23-12-1992	2879
2456 MOHAMMAD RIAZ	CAM	RUNNING	19- 9-1992 11-11-1993	2 0- 0- 0	1000
2627 KHALID NAWAZ KIANI	CAM	FINISHED	11-11-1992 19-11-1992	109 0- 0- 0	1000
1891 MOHAMMAD ASIF	ACT	RUNNING	11-11-1992 13-11-1993	0 0- 0- 0	1000
123 MOHAMMAD SHAHAB	CAM	RUNNING	11-11-1993 12-11-1994	0 0- 0- 0	1000

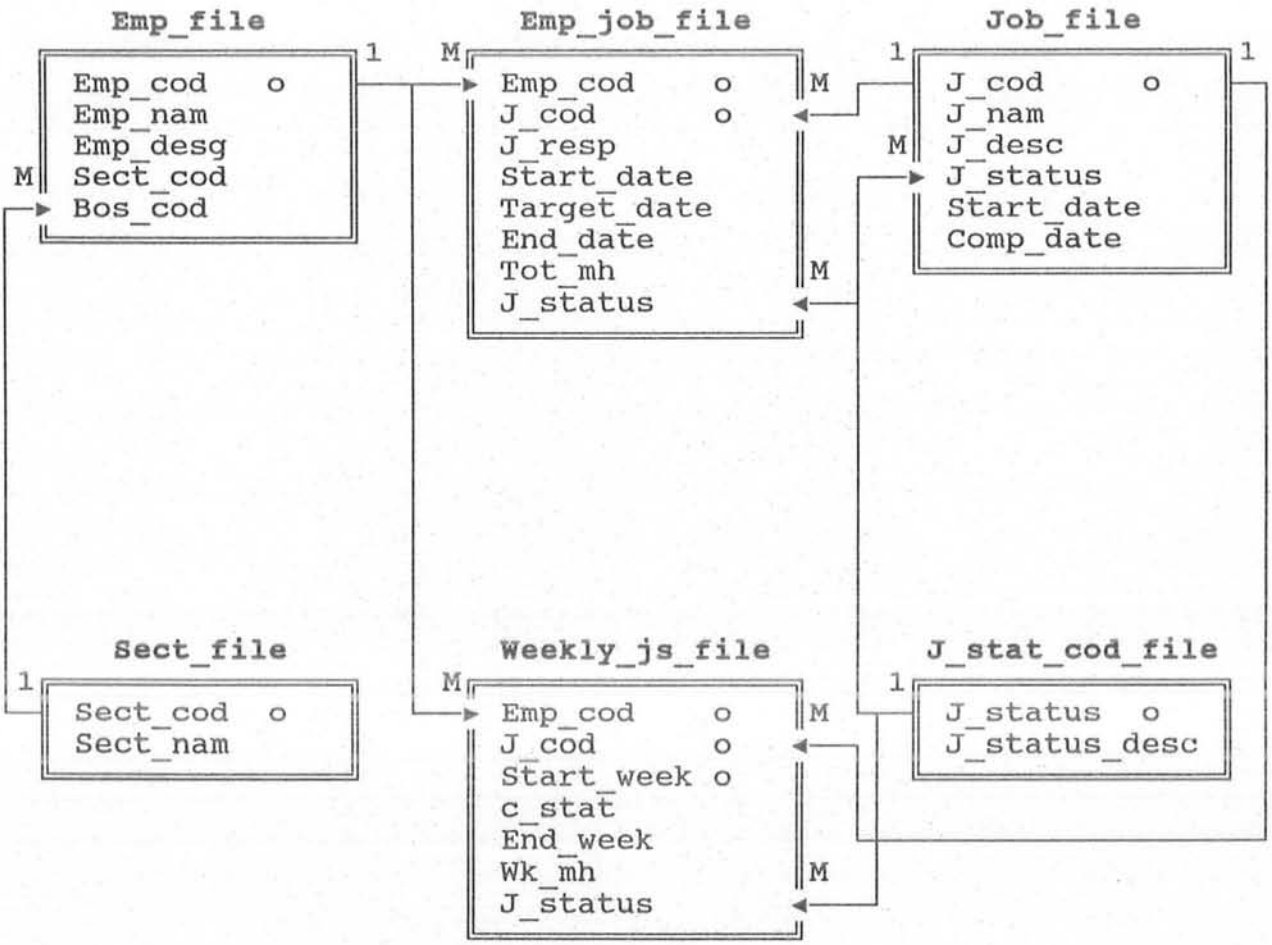
JOB CODE :- R&D JOB NAME :- RESEARCH AND DEVELOPMENT
START DATE :- 10-3-1990 COMPLETED DATE :- 0-0-0
JOB STATUS :- FINISHED

EMP CODE/ EMP NAME	SECTION CODE	JOB STATUS	START DATE/ TARGET DATE	HOUR/ END DATE	JOB RESPOSIBILIT
2627 KHALID NAWAZ KIANI	CAM	FINISHED	11- 1-1992 10-10-1993	102 0- 0- 0	1000
2879 SOHAIL AHMED	CAD	ASSIGNED	26-11-1990 11-12-1993	800 0- 0- 0	1000
1891 MOHAMMAD ASIF	ACT	RUNNING	11-11-1993 11-11-1994	0 0- 0- 0	1891

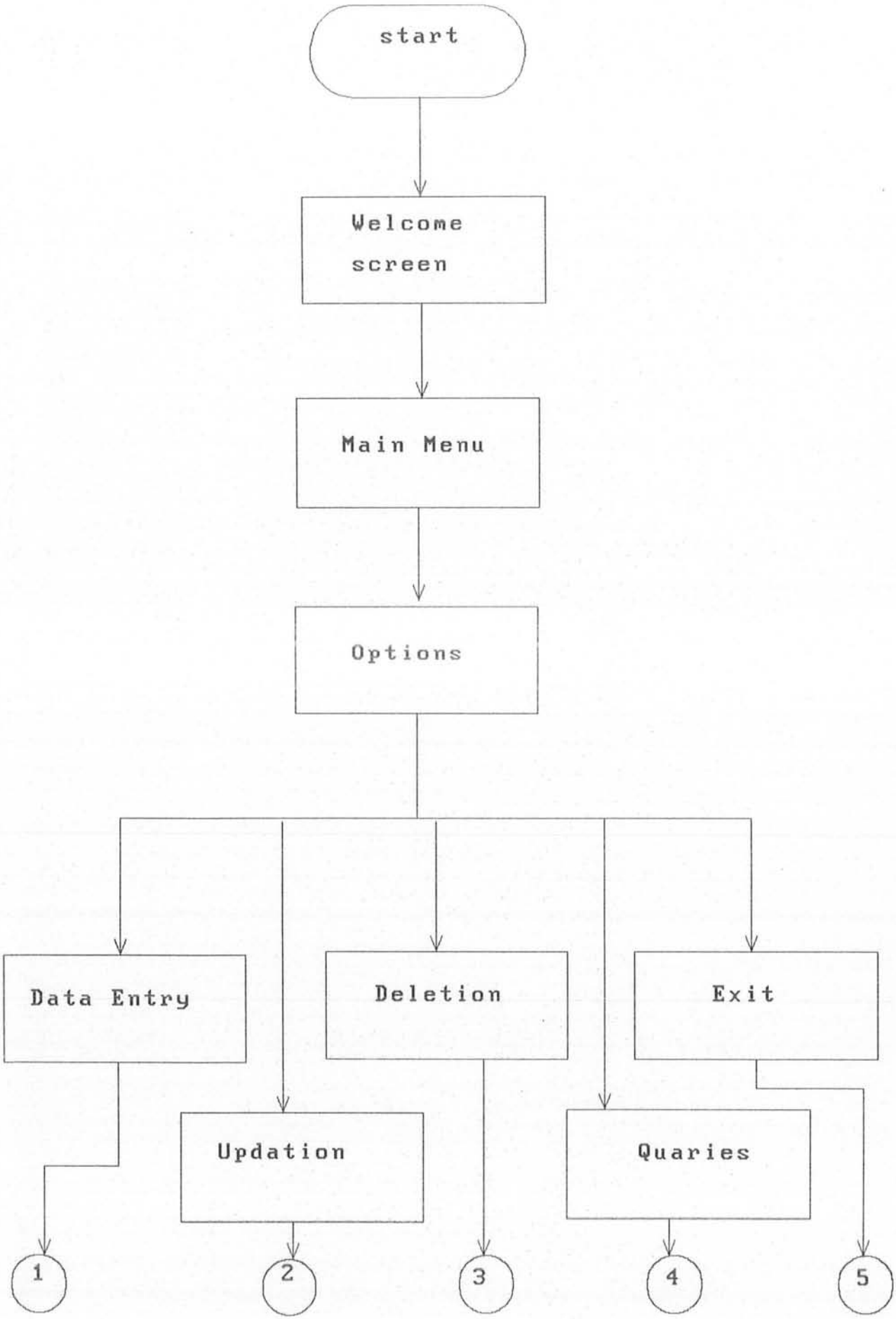
APPENDIX B

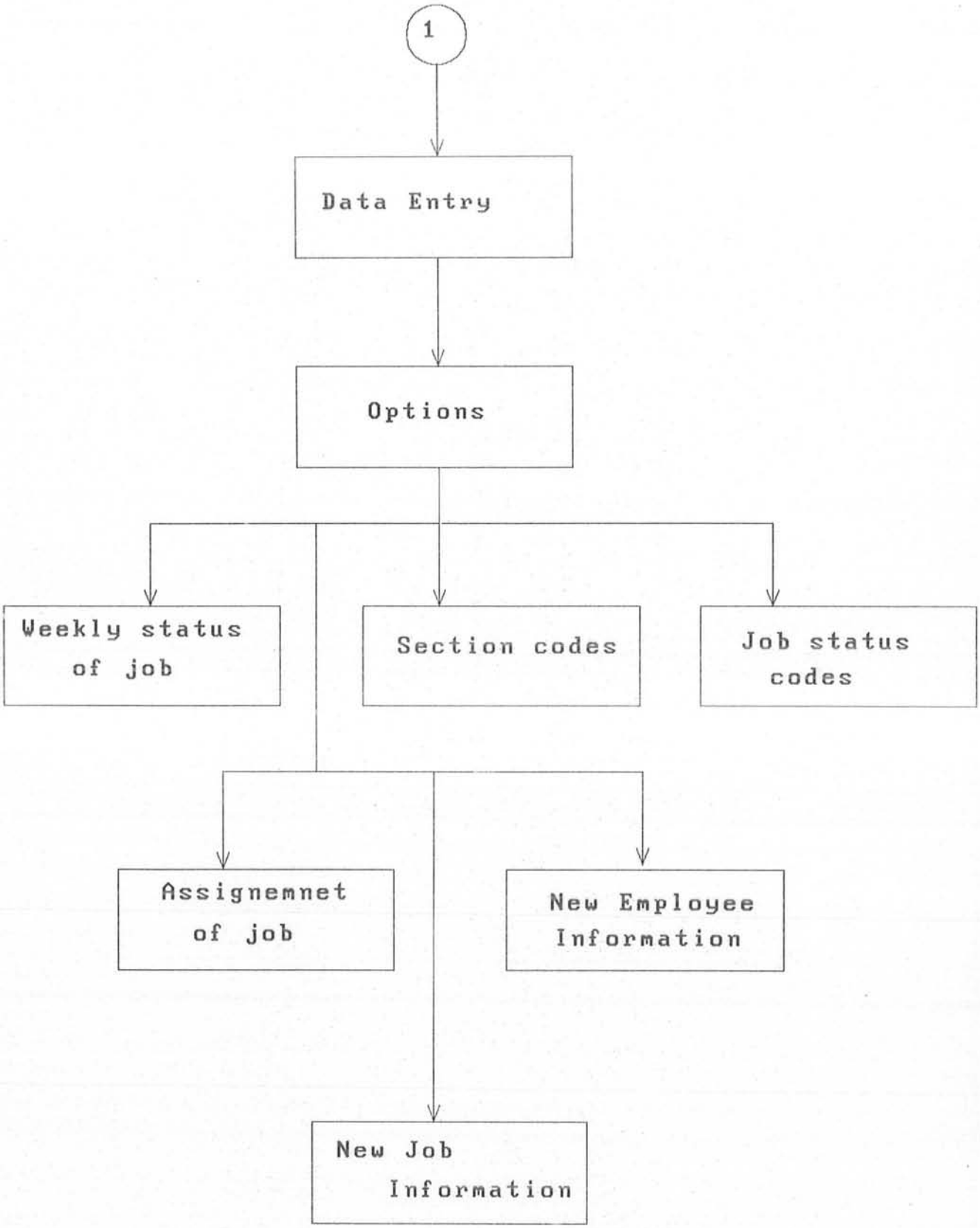
STRUCTURE CHARTS

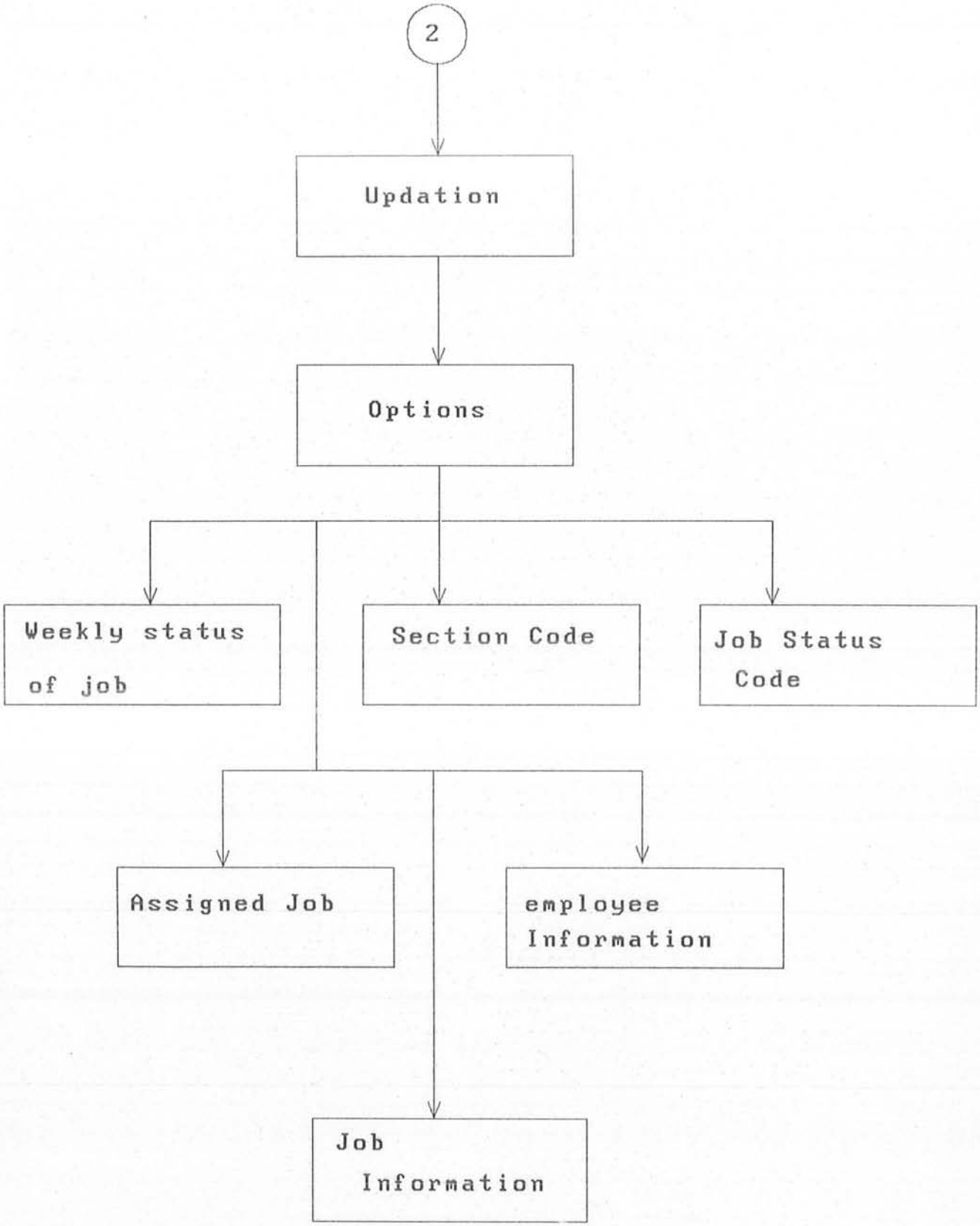
Logical Structure of Database

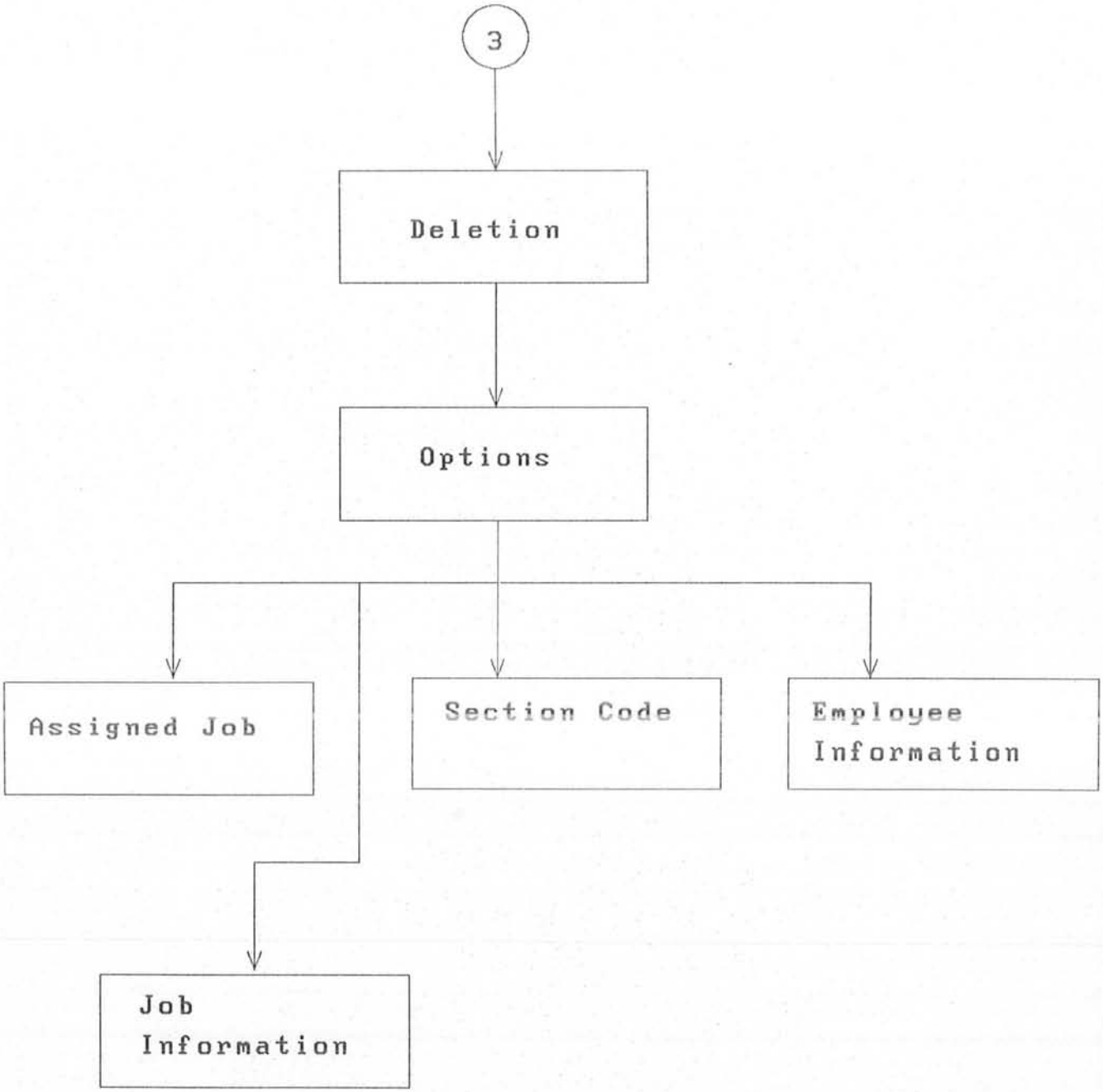


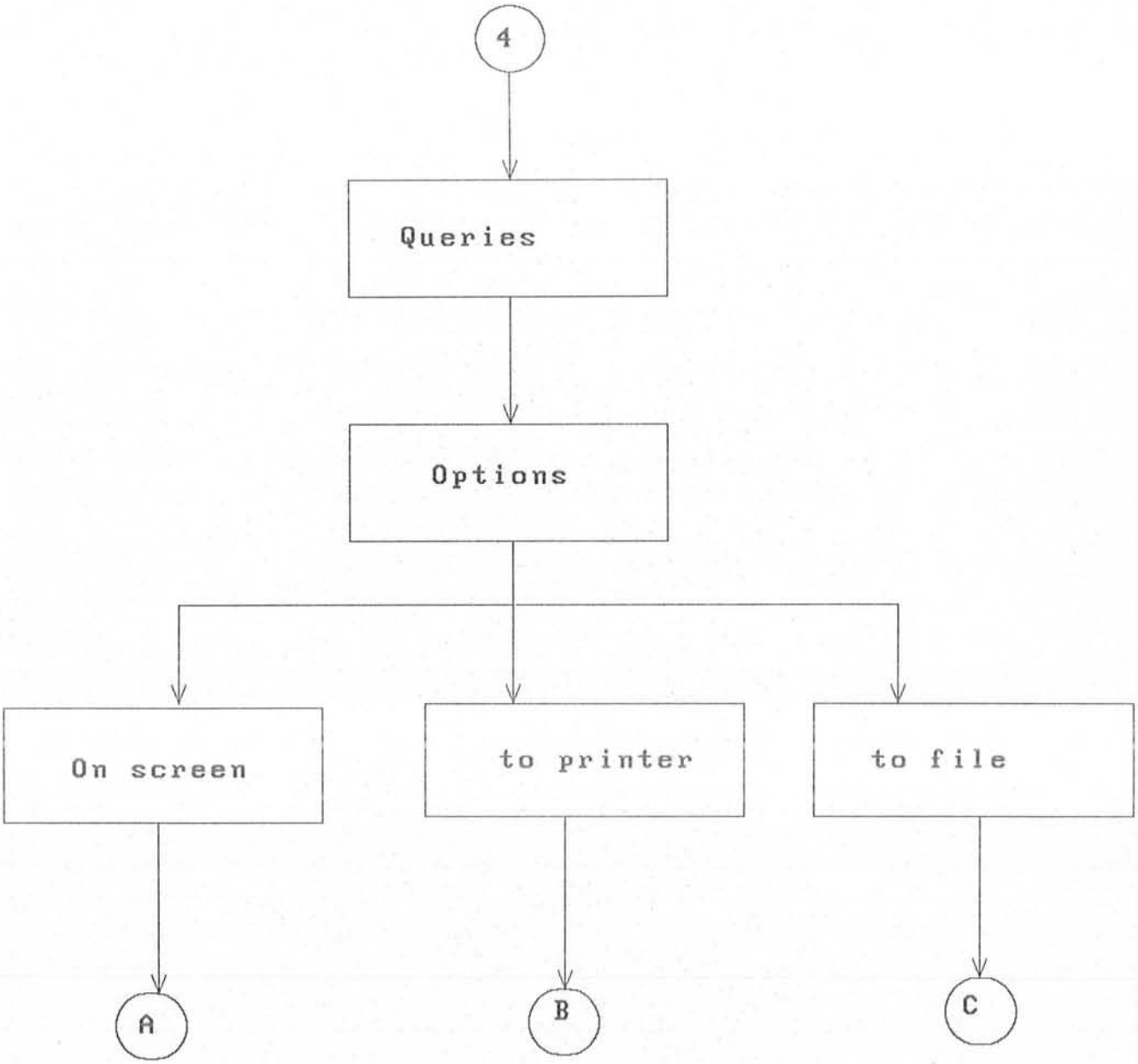
Where "o" means primary key

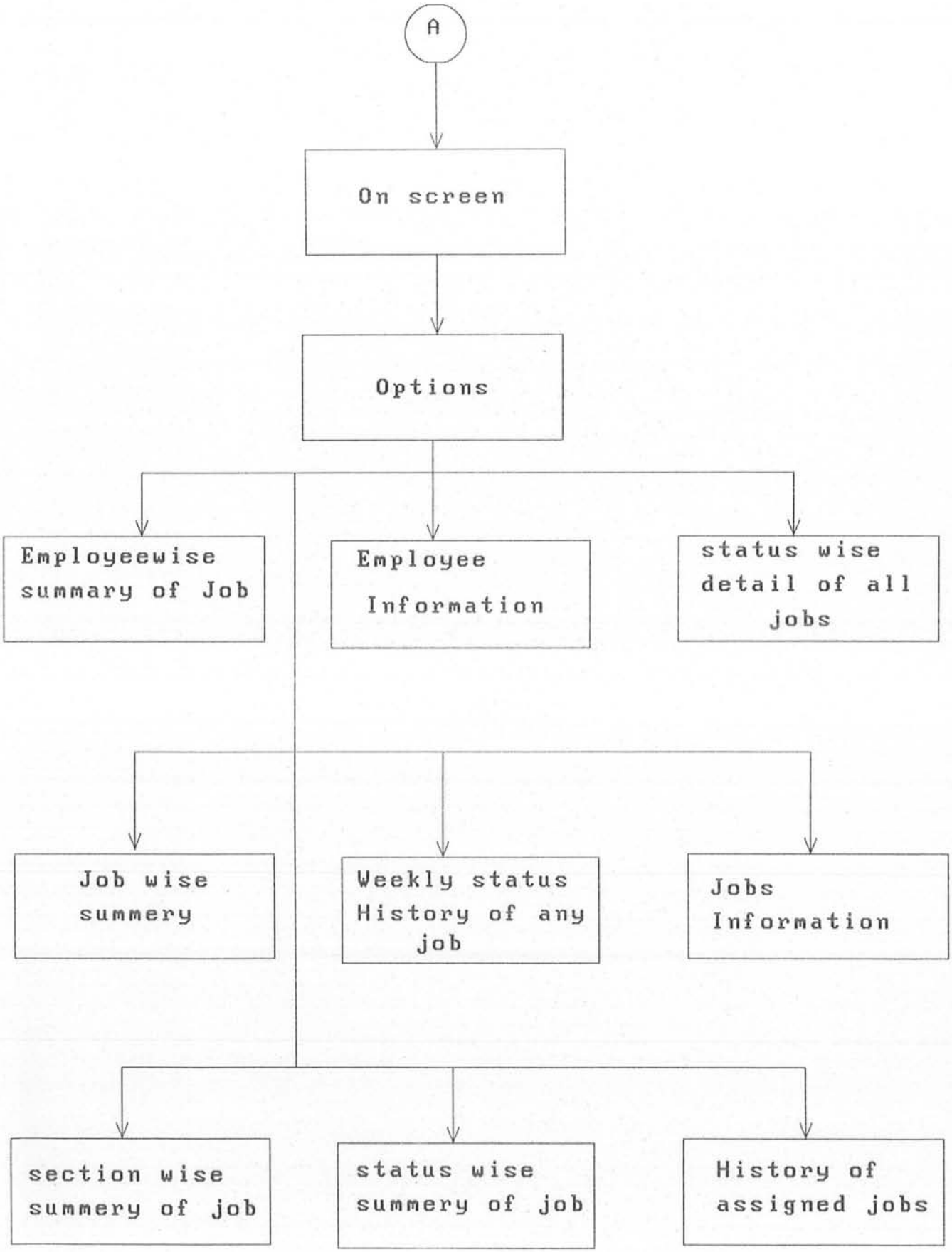

start
Welcome screen
Main Menu
Options
Data Entry
Deletion
Exit
Updation
Quaries
1
2
3
4
5

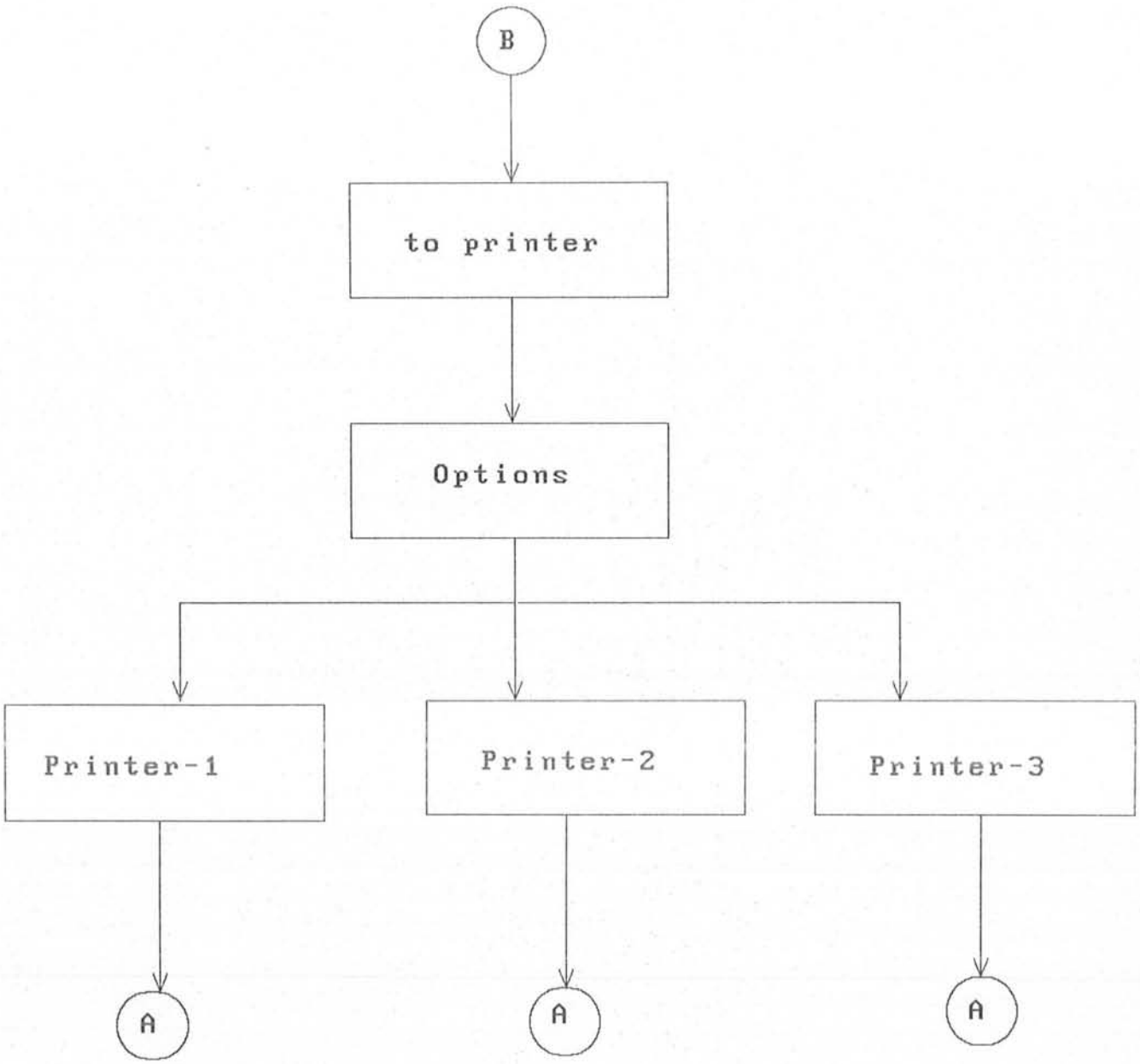

1
Data Entry
Options
Weekly status of job
Section codes
Job status codes
Assignemnet of job
New Employee Information
New Job Information

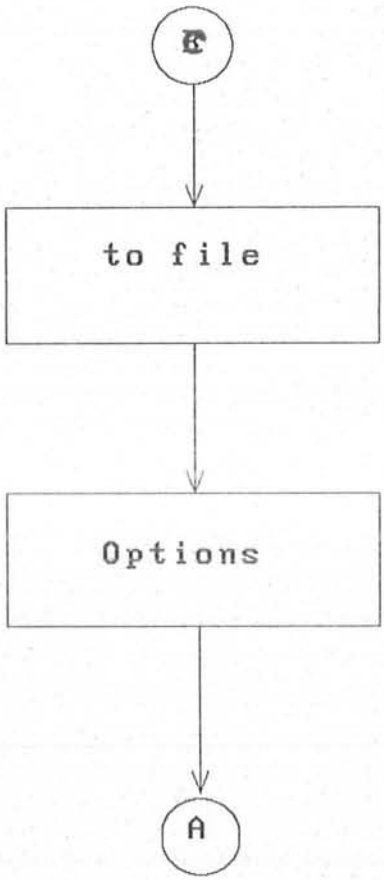

2
Updation
Options
Weekly status of job
Section Code
Job Status Code
Assigned Job
employee Information
Job Information


3
Deletion
Options
Assigned Job
Section Code
Employee Information
Job Information


4
Queries
Options
On screen
to printer
to file
A
B
C


A
On screen
Options
Employeewise summary of Job
Employee Information
status wise detail of all jobs
Job wise summery
Weekly status History of any job
Jobs Information
section wise summery of job
status wise summery of job
History of assigned jobs


B
to printer
Options
Printer-1
Printer-2
Printer-3
A
A
A


E
to file
Options
A

BIBLIOGRAPHY

1. Bredley, James (1983),
   Introduction to Database Management in Business,
   by CBS College Publishing, Holt, Rinehart & Winston, The
   Dryden Press Saunders College Publishing, Japan.

2. Date, C.J. (1987), An Introduction To Database System,
   Volume I, 4th Edition by Addison-Wesley Publishing Co., USA.

3. Gordon B.Davis, Margrete H. Olson. (1987),
   Management Information Systems,
   Second Edition, McGRAW-HILL International Edition.

4. DECforms Guide To Programming,
   Digital Equipment Corporation, USA.

5. DECforms Programming Manual,
   Digital Equipment Corporation, USA.

6. Guide To Using SQL,
   Digital Equipment Corporation, USA.

7. Guide To VAX C, VAX C Student Guide,
   Digital Equipment Corporation, USA.

8. VAX C Run Time Library Reference Manual,
Digital Equipment Corporation, USA.

9. VAX Rdb/VMS Application Program,
Digital Equipment Corporation, USA.

10. VAX Rdb/VMS Guide to Database design and definition, Part I,
Digital Equipment Corporation, USA.

11. VAX Rdb/VMS SQL Reference Manual,
Digital Equipment Corporation, USA.

12. VMS General User, Volume 6A,
Digital Equipment Corporation, USA.