

Chapter 6

Database Design

6.1 Introduction

Databases are used for storing, maintaining and accessing any sort of data. They collect information on people, places or things. That information is gathered in one place so that it can be observed and analyzed. Databases can be thought of as an organized collection of information.

The purpose of database design for the Family Planning Office is to create efficient way of handling large amounts and multiple types of data, easy access of information, categorizing data and to create an organized working environment.

6.2 Database for human resource

To gather all information related to human resources, several types of data is needed. These are categorized into several tables in our proposed database for human resource. This makes collecting, accessing and querying very easy. Name of the tables are given in *figure 6.1*.

Table	Action	R
<input type="checkbox"/> additional roles	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> educational qualification	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> employee job status	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> family_info	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> job_status	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> permanent address	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> person's_information	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> person_info2	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> person_trained	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> posting_info	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> present address	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> professional information	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> questionnaire	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> reward	★ Browse Structure Search Insert Empty Drop	
<input type="checkbox"/> training	★ Browse Structure Search Insert Empty Drop	

Figure 6.1 Tables of Human Resource Database

6.2.1 Entity relationship diagram for human resource

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how entities relate to each other within a system.

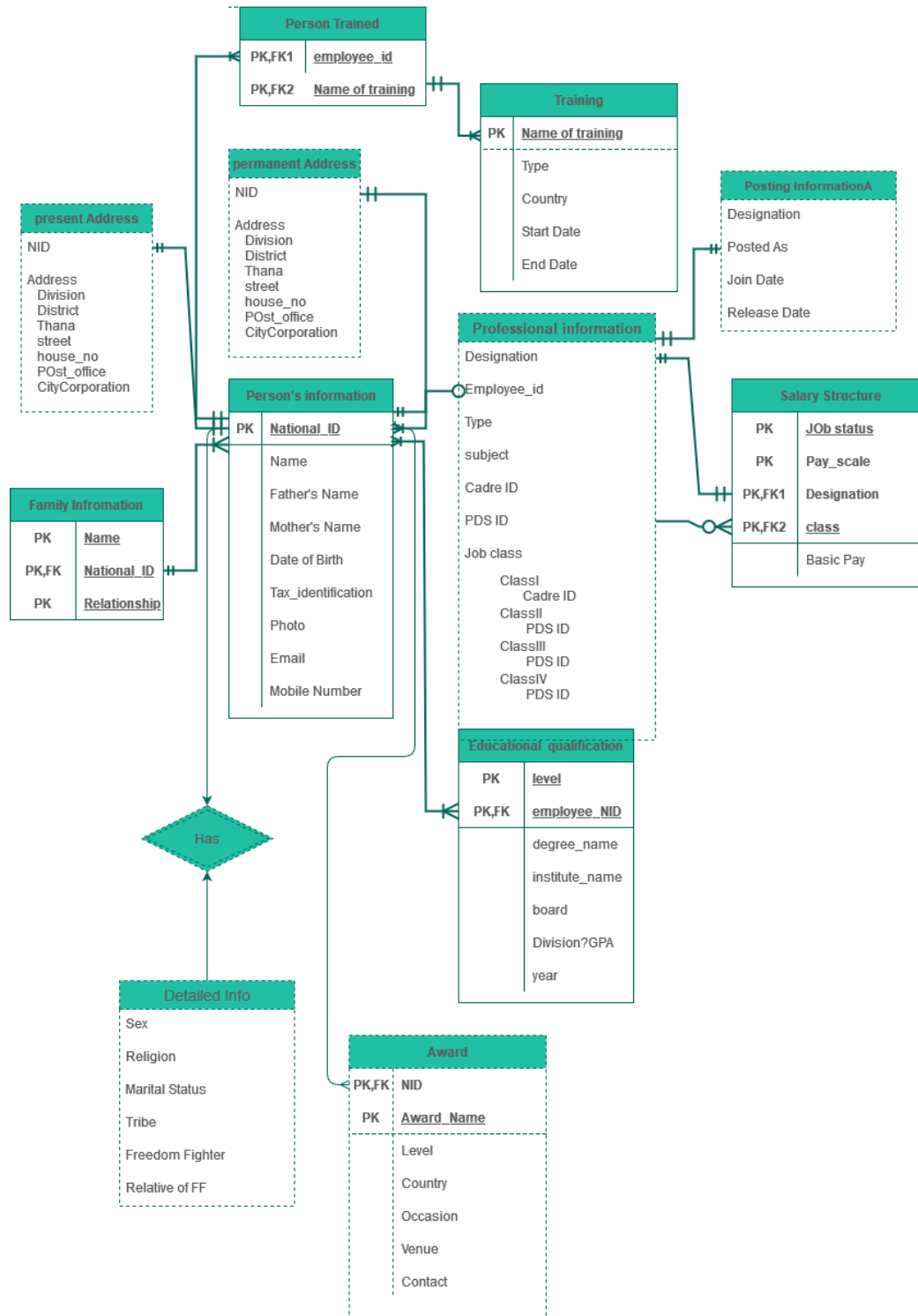


Figure 6.2 Entity Relationship diagram of Human Resource Database

6.2.2 Structure of tables in human resource

The structure of each table of the human resource database are shown in the figures below.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	National_ID	int(10)			No	None			Change Drop More
<input type="checkbox"/> 2	Name	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 3	Father's Name	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 4	Mother's Name	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 5	Date_of_Birth	date			No	None			Change Drop More
<input type="checkbox"/> 6	Tax_identification	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 7	Photo	longtext	utf8mb4_bin		No	None			Change Drop More
<input type="checkbox"/> 8	Email	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 9	Mobile Number	int(13)			No	None			Change Drop More

Figure 6.3 Person's information Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	NID	int(20)			No	None			Change Drop More
<input type="checkbox"/> 2	sex	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 3	religion	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 4	marital status	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 5	Tribe	binary(2)			No				Change Drop More
<input type="checkbox"/> 6	Freedom Fighter	binary(2)			No				Change Drop More
<input type="checkbox"/> 7	Relative of FF	binary(2)			No				Change Drop More

Figure 6.4 person_info2 Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	NID	int(20)			No	None			Change Drop More
<input type="checkbox"/> 2	Division	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 3	district	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 4	Thana	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 5	street	int(20)			No	None			Change Drop More
<input type="checkbox"/> 6	house	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 7	Post office	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 8	ward	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 9	union/city corporation	varchar(55)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 10	Address	varchar(200)	utf8mb4_general_ci		Yes	NULL		VIRTUAL GENERATED	Change Drop More

Figure 6.5 present address Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	NID 🔑	int(20)			No	None			Change
<input type="checkbox"/> 2	Division	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 3	district	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 4	Thana	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 5	street	int(20)			No	None			Change
<input type="checkbox"/> 6	house	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 7	Post office	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 8	ward	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 9	union/city corporation	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 10	Address	varchar(200)	utf8mb4_general_ci		Yes	NULL		VIRTUAL GENERATED	Change

Figure 6.6 permanent address Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	Name 🔑	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 2	Relationship 🔑	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 3	NID 🔑	int(10)			No	None			Change

Figure 6.7 family_info Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	employee_NID 🔑	int(20)			No	None			Change
<input type="checkbox"/> 2	level 🔑	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 3	degree_name	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 4	institute_name	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 5	board/University	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 6	division/class/GPA	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 7	year	year(4)			No	None			Change

Figure 6.8 educational qualification Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 NID	int(20)			No	None			Change
<input type="checkbox"/>	2 Joining Designation	text	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/>	3 General	binary(2)			Yes	NULL			Change
<input type="checkbox"/>	4 technical	binary(2)			Yes	NULL			Change
<input type="checkbox"/>	5 subject	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/>	6 cader_id	int(20)			No	None			Change
<input type="checkbox"/>	7 pds_id	int(20)			No	None			Change
<input type="checkbox"/>	8 cadre	int(20)			Yes	NULL		VIRTUAL GENERATED	Change
<input type="checkbox"/>	9 non cadre	int(20)			Yes	NULL		VIRTUAL GENERATED	Change
<input type="checkbox"/>	10 classI	int(20)			Yes	NULL		VIRTUAL GENERATED	Change
<input type="checkbox"/>	11 classII	int(20)			Yes	NULL		VIRTUAL GENERATED	Change
<input type="checkbox"/>	12 classIII	int(20)			Yes	NULL		VIRTUAL GENERATED	Change
<input type="checkbox"/>	13 classIV	int(20)			Yes	NULL		VIRTUAL GENERATED	Change
<input type="checkbox"/>	14 Job Class	int(20)			Yes	NULL		VIRTUAL GENERATED	Change

Figure 6.9 professional information Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 NID	int(10)			No	None			Change
<input type="checkbox"/>	2 Designation	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/>	3 Posted As	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/>	4 Organization	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/>	5 Join Date	date			No	None			Change
<input type="checkbox"/>	6 Release Date	date			No	None			Change

Figure 6.10 posting info Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 job_status	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/>	2 pay_scale	int(10)			No	None			Change
<input type="checkbox"/>	3 designation	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/>	4 class	int(10)			No	None			Change
<input type="checkbox"/>	5 basic pay	decimal(20,0)			No	None			Change

Figure 6.11 salary structure Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	employee_ID	int(11)			No	None			Change
<input type="checkbox"/> 2	status	varchar(55)	utf8mb4_general_ci		No	None			Change

Figure 6.12 employee job status Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	Name_of_training	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 2	Type_of_training	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 3	Country	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 4	Start_date	timestamp(6)			No	current_timestamp(6)	ON UPDATE CURRENT_TIMESTAMP(6)		Change
<input type="checkbox"/> 5	End_date	timestamp(6)			No	current_timestamp(6)			Change

Figure 6.13 training Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	employee_NID	int(20)			No	None			Change
<input type="checkbox"/> 2	Name_of_training	varchar(55)	utf8mb4_general_ci		No	None			Change

Figure 6.14 person_trained Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	employee_NID	int(20)			No	None			Change
<input type="checkbox"/> 2	Name_of_award	text	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 3	Level_of_award	varchar(255)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 4	Country	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 5	Occasion	text	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 6	Venue	varchar(55)	utf8mb4_general_ci		No	None			Change
<input type="checkbox"/> 7	contact&details	text	utf8mb4_general_ci		No	None			Change

Figure 6.15 reward Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	NID	int(20)			No	None			Change Drop More
<input type="checkbox"/> 2	qus_id	int(5)			No	None			Change Drop More
<input type="checkbox"/> 3	yes	binary(2)			No				Change Drop More
<input type="checkbox"/> 4	no	binary(2)			No				Change Drop More
<input type="checkbox"/> 5	expected	binary(2)			No				Change Drop More
<input type="checkbox"/> 6	not_applicable	binary(2)			No				Change Drop More

Figure 6.16 questionnaire Table

6.3 Database for recruitment management system

To successfully execute recruitment process, monitor them and store information efficiently, several types of data is needed. For collecting, accessing and querying efficiently, there are several tables in this database. Name of the tables are given in *figure 6.17*.

Table	Action
<input type="checkbox"/> applicant	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> application	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> criteria	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> document	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> exam&interviewresult	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> hiring manager	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> interview	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> job	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> jobcategory	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> jobposition	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> process	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> recruiment	Browse Structure Search Insert Empty Drop
<input type="checkbox"/> steps	Browse Structure Search Insert Empty Drop

Figure 6.17 Tables of Recruitment Management Database

6.3.1 Entity relationship diagram for recruitment management system

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how entities relate to each other within a system.

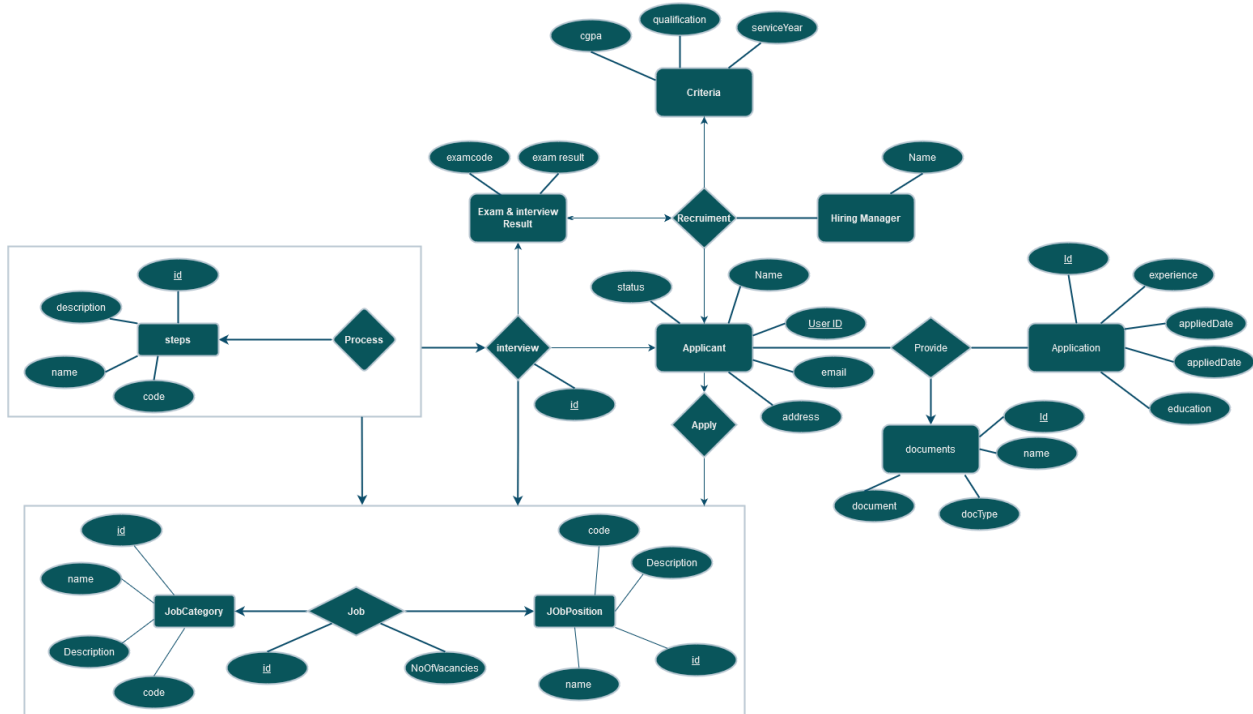


Figure 6.18 Entity Relationship diagram of Recruitment Management Database

6.3.2 Structure of tables in recruitment management system

The structure of each table of the recruitment management system database are shown in the figures below.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	appliedDate	date			No	None			Change Drop
<input type="checkbox"/> 3	education	char(255)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 4	experience	char(255)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 5	applicantId	int(20)			No	None			Change Drop
<input type="checkbox"/> 6	jobid	int(20)			No	None			Change Drop
<input type="checkbox"/> 7	documentid	int(20)			No	None			Change Drop

Figure 6.19 application Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	first_name	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 3	last_name	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 4	email	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 5	phone	int(15)			No	None			Change Drop
<input type="checkbox"/> 6	summery	text	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 7	status	binary(2)			No	None			Change Drop

Figure 6.20 applicant Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	name	varchar(255)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 3	document	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 4	docType	varchar(55)	utf8mb4_general_ci		No	None			Change Drop

Figure 6.21 document Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	qualification	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 2	service Year	year(4)			No	None			Change Drop
<input type="checkbox"/> 3	cgpa	float			No	None			Change Drop

Figure 6.22 criteria Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	code	int(20)			No	None			Change Drop
<input type="checkbox"/> 3	name	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 4	description	text	utf8mb4_general_ci		No	None			Change Drop

Figure 6.23 jobcategory Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	code	int(20)			No	None			Change Drop
<input type="checkbox"/> 3	name	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 4	description	text	utf8mb4_general_ci		No	None			Change Drop

Figure 6.24 jobposition Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop ▾
<input type="checkbox"/> 2	code	int(20)			No	None			Change Drop ▾
<input type="checkbox"/> 3	name	varchar(55)	utf8mb4_general_ci		No	None			Change Drop ▾
<input type="checkbox"/> 4	description	text	utf8mb4_general_ci		No	None			Change Drop ▾
<input type="checkbox"/> 5	noOfVacancies	int(20)			No	None			Change Drop ▾
<input type="checkbox"/> 6	jobCategoryId	int(20)			No	None			Change Drop ▾
<input type="checkbox"/> 7	processId	int(20)			No	None			Change Drop ▾
<input type="checkbox"/> 8	jobPositionnid	int(20)			No	None			Change Drop ▾

Figure 6.25 job Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop ▾
<input type="checkbox"/> 2	code	int(20)			No	None			Change Drop ▾
<input type="checkbox"/> 3	name	char(55)	utf8mb4_general_ci		No	None			Change Drop ▾
<input type="checkbox"/> 4	description	text	utf8mb4_general_ci		No	None			Change Drop ▾

Figure 6.26 steps Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	code	int(20)			No	None			Change Drop
<input type="checkbox"/> 3	description	text	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 4	step_id	int(20)			Yes	NULL			Change Drop
<input type="checkbox"/> 5	name	varchar(55)	utf8mb4_general_ci		No	None			Change Drop

Figure 6.27 process Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	applicantid	int(20)			No	None			Change Drop
<input type="checkbox"/> 3	processid	int(20)			No	None			Change Drop
<input type="checkbox"/> 4	jobid	int(20)			No	None			Change Drop

Figure 6.28 interview Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	examcode	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	exam_result	varchar(255)	utf8mb4_general_ci		No	None			Change Drop

Figure 6.29 exam&interviewresult Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	RecruitmentCode	int(20)			No	None			Change Drop
<input type="checkbox"/> 2	applicantid	int(20)			No	None			Change Drop
<input type="checkbox"/> 3	exam result	int(20)			No	None			Change Drop
<input type="checkbox"/> 4	qualification	varchar(55)	utf8mb4_general_ci		No	None			Change Drop
<input type="checkbox"/> 5	job_id	int(20)			No	None			Change Drop

Figure 6.30 recruitment Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	name	int(11)			No	None			Change Drop
<input type="checkbox"/> 2	recruitmentCode	int(11)			No	None			Change Drop

Figure 6.31 hiring manager Table

6.4 Conclusion

The proposed databases will improve data sharing and data security. This will minimize data inconsistency, faster data access. This will also reduce data entry, storage, and retrieval costs. It will make the Family Planning office more efficient, effective.