Project Title:
HUMAN RESOURCE MANAGEMENT SYSTEM

Task 3 : System Design Phase

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EMPLOYEE   **ADMIN**   **CANDIDATE**

HUMAN RESOURCE MANAGEMENT SYSYTEM

HTML5,CSS3,BOOTSTRAP,JAVASCRIPT

MODULES

Employee	Administration	Project Details
Department	Training	Candidate

Human Resource

Tables

Employee Details	Admin	Assign Projects
Payroll details	Training details	Resignation
Department Details		Candidate Details
Recruited Candidates		Rejected Candidates

HR Details

WINDOWS DESIGN STANDARD

PORT SPECIFICATIONS

VARIOUS API INTEGRATION

WEB PORTAL DETAILS

Database

1.1. Architectural diagram[3-tier] of HRM

HRMS which is an online intranet system will be used by four types of employees. These types who have different roles can be stated as; admin, manager, hr, employee. Every user enters the main authentication page and after that, system will grant them authorization. After being authorized according to their permissions (role type) users will basically query and edit the database via HRMS.

1.2. SUBSYSTEMS OF THE SYSTEM

(1) Performance Appraisal

Performance appraisal is a process of rating or ensuring the performance of an employee of his job. The performance of an employee is measured against the factors such as knowledge of job, quality and quantity of output, initiative, supervision, leadership qualities etc.The purpose of appraisal is to assess the present position of efficiency of employee in order to determine the need for training. The performance appraisal process consist of:

(a) Job analysis. (b) Establishing standards of performance .(c) Communicating performance standards to employees. (d) Measuring actual performance.

(2) Training

Training is an attempt to improve current or future employee performance by increasing an employee's ability to perform through learning usually by changing the employee's attitude or increasing his or her knowledge. The need for training is determined by the deficiency of employee's performance, Training process include; acquiring skills, concepts, attitudes for increasing effectiveness in doing a specific job or jobs. Employees working as supervisors and executives need interpersonal skills or people skills. Interpersonal skills include persuading listening and respecting others feeling. Some organization appoint a senior person as training manager.

(3) Rewards

Reward system encourages employees to seek self development through their own ability. Rewards system is considered as the quickest way to increase productivity. Rewarding is motivational factor. One should remember that there is always a room for achievement. Many of the rewards like salary increases, employee benefits, and preferred job assignments are controlled by the organisations. The rewards that organisation can allocate is direct compensation and indirect compensation. These can be distributed on the basis of an individual, group or organization-wide.

(4) Role Analysis

Role is a set of expected behaviour patterns attributed to a person occupying a given position in a unit. Every employee has a role to play. Everyone does not have to be consistent and regular in one role. Employees have to play diverse roles both on and off the jobs. To understand the behaviour of a person, it is essential to know what role he is currently playing. The attitude and behaviour of a person vary with the role identity. Roles change according to the circumstances.

(5) Human Resource Planning

Human Resource Planning is an integral part of business and organisation planning. It concerns with detailed planning to establish the future human resource requirements at every level by skill and category. The quality of human requirements plan depends on the quality of the analysis and data on which it is based. The objective of HR planning is to have sufficient number of persons having adequate qualifications and skills to perform jobs and available as per needs of the organisation.

(6) Procurement and Placement

It is one of the important sub systems of HRD. Procurement of human resources is done through recruitment and selection. Vacancies are filled through these two methods. Placement is the process of assigning the procured candidates with suitable jobs. It is placing right persons at right jobs to obtain the best results.

(7) Job Rotation

Jobs are rotated among the employees to increase their knowledge and skill required for performance of various jobs. This is essential because during absence or leave of employees work should not suffer.

(8) Quality of Working Life

Employees are the assets of an organisation. To extract the best from employees adequate, healthy and hygienic working conditions should be provided. This increases the productivity. Unhygienic and inadequate working conditions will adversely affect the physical and mental health of the employees affecting their efficiency. The enterprises should be very careful about quality of working life.

1.3. DATA FLOW DIAGRAM

A data flow diagram should be the first tool used by system analyst to model system components. These components are the system processes; the data used by this processes and external entities that interact with the system and the information flows in the system.There are four kinds of system components:

1.3.1. Process

Process show what system does. Each process has one or more data inputs and produce one or more data output, Circles in a data flow diagram represent process. Each process has unique name and number. This name and number

appear inside the circle that represents the processes in a data flow diagram.This process is represented as circle:
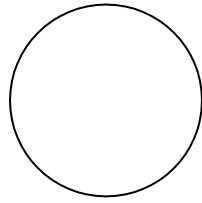
1.3.2. Data Stores

File or data store is depositary of data. They contain data that is retained in the system. Processes can enter the data into a data store or retrieve data from the data store. Each data store is represented by thin line in the data flow diagram and each data store has a unique name.The data store is represented in form of a line,

1.3.3. External Entities

External entities are outside the system but they either supply input data into the system or use the system output, they are entities which the designer has no control. Square or rectangle may represent external entities that supply data into a system or some times called sources. External entities that use the system data are sometimes called sinks.
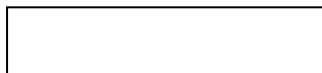
1.3.4. Data Flows

Dataflow model the passage of data in the system and are represented lines joining system components. An arrow indicates the direction of the flow and the line labeled by the name of the data flow.
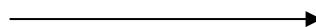
Context diagram

This diagram shows that human resources system consists of two actors are human resources manager and employees.Each actor requests login action to enter the system and does their tasks as shown.

Level 0 DFD of Human Resource Management System
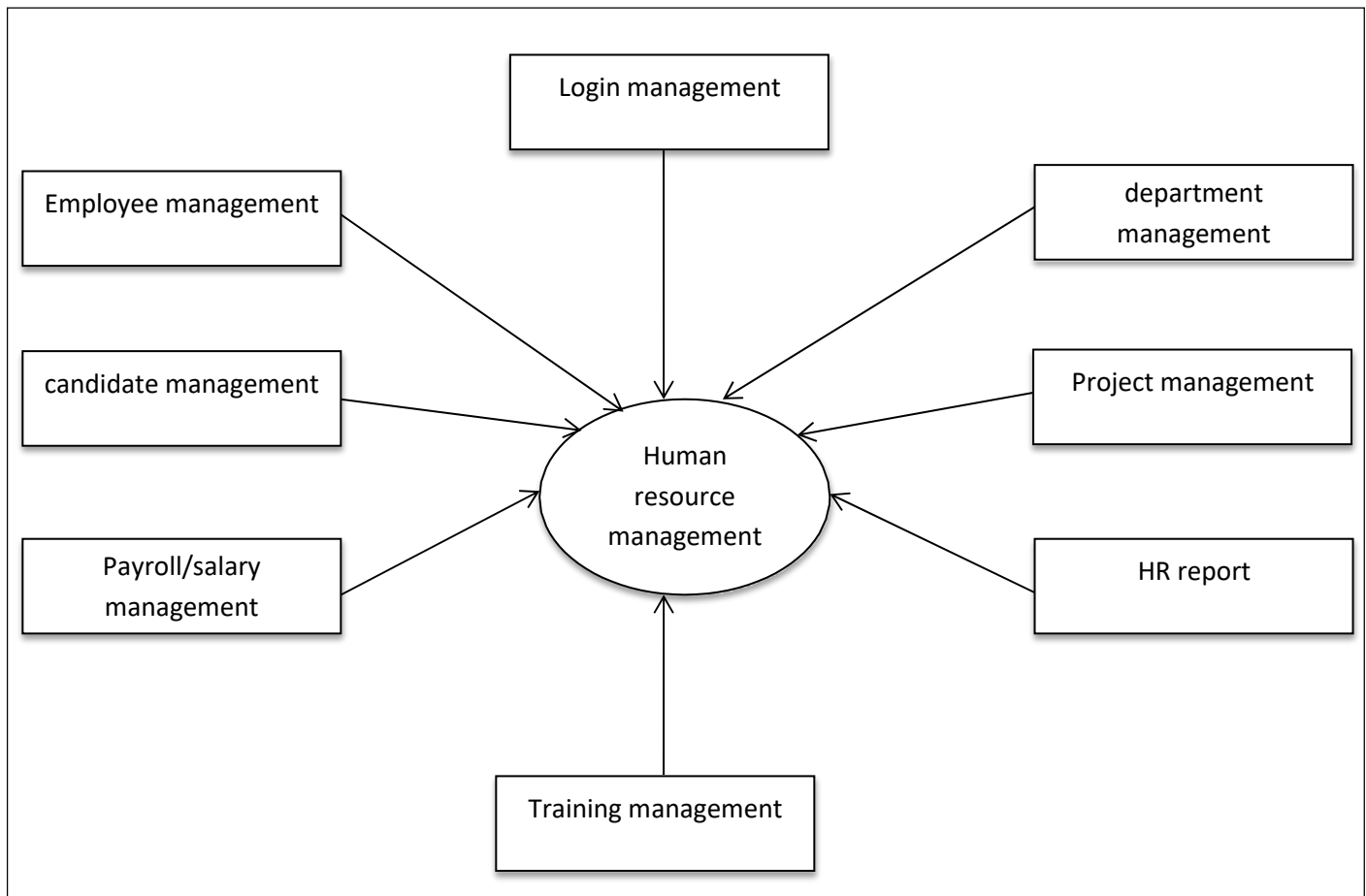
LEVEL 1 DFD
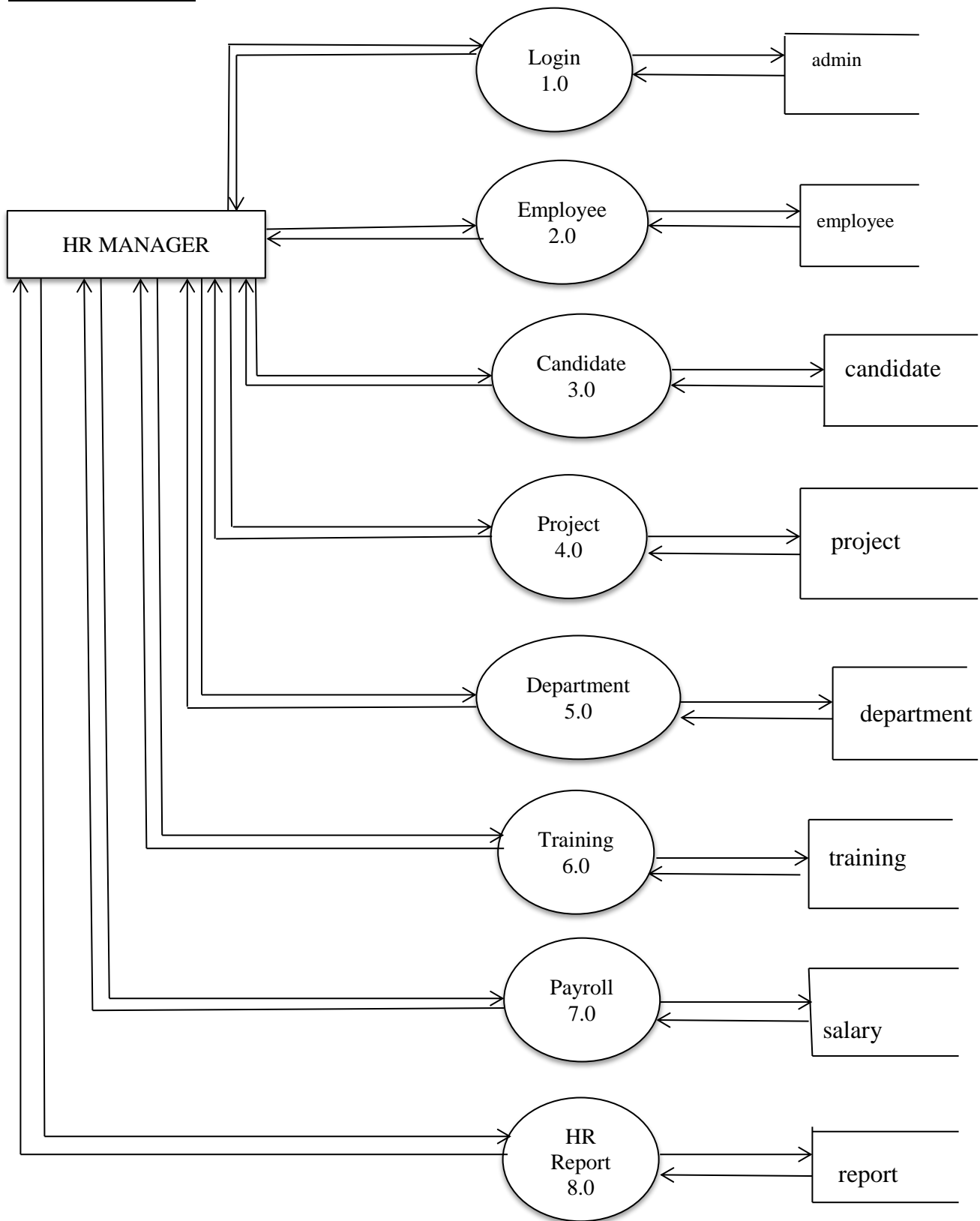
Level 1 dfd for Employee
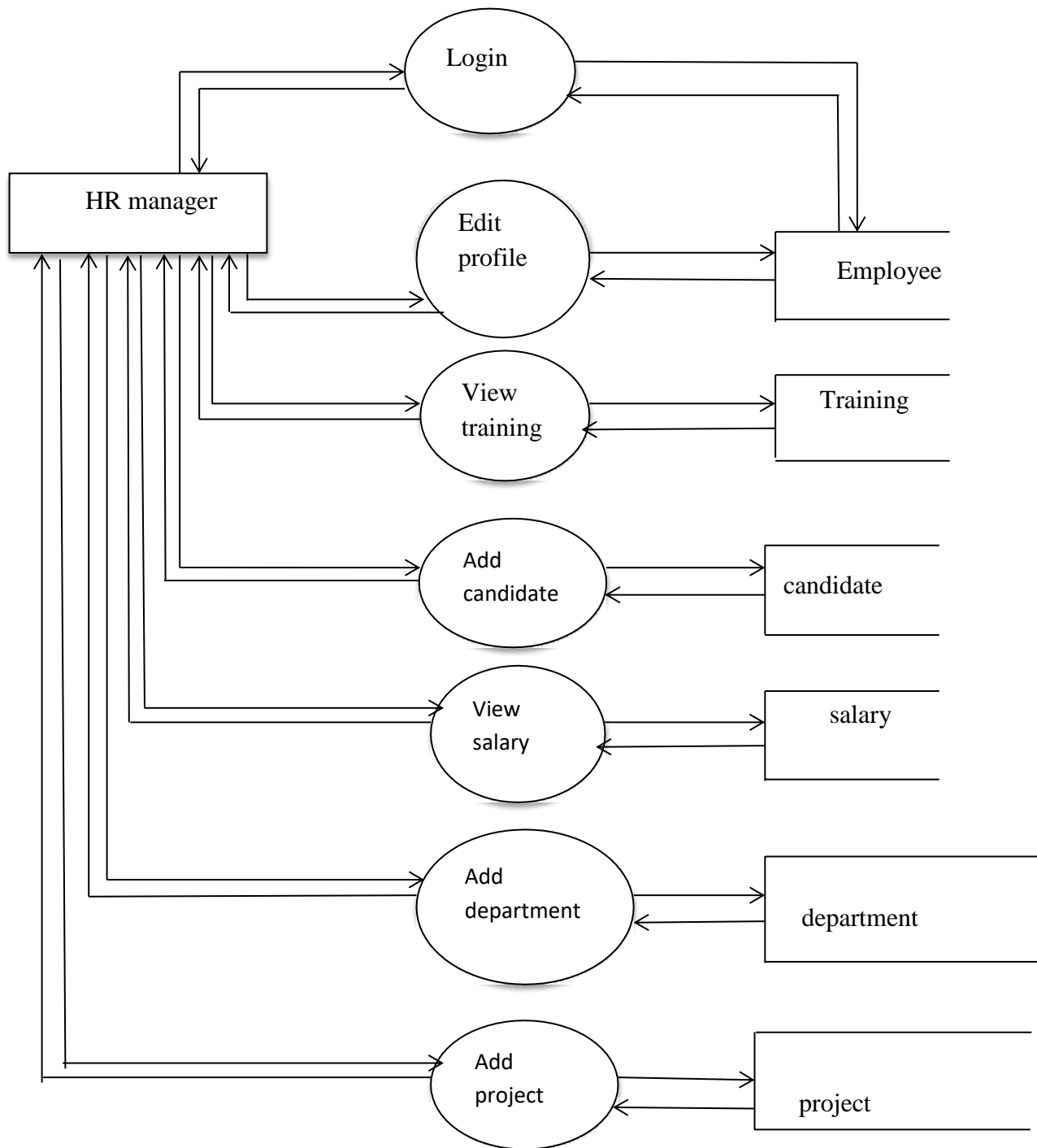
Level 1 dfd for Candidate
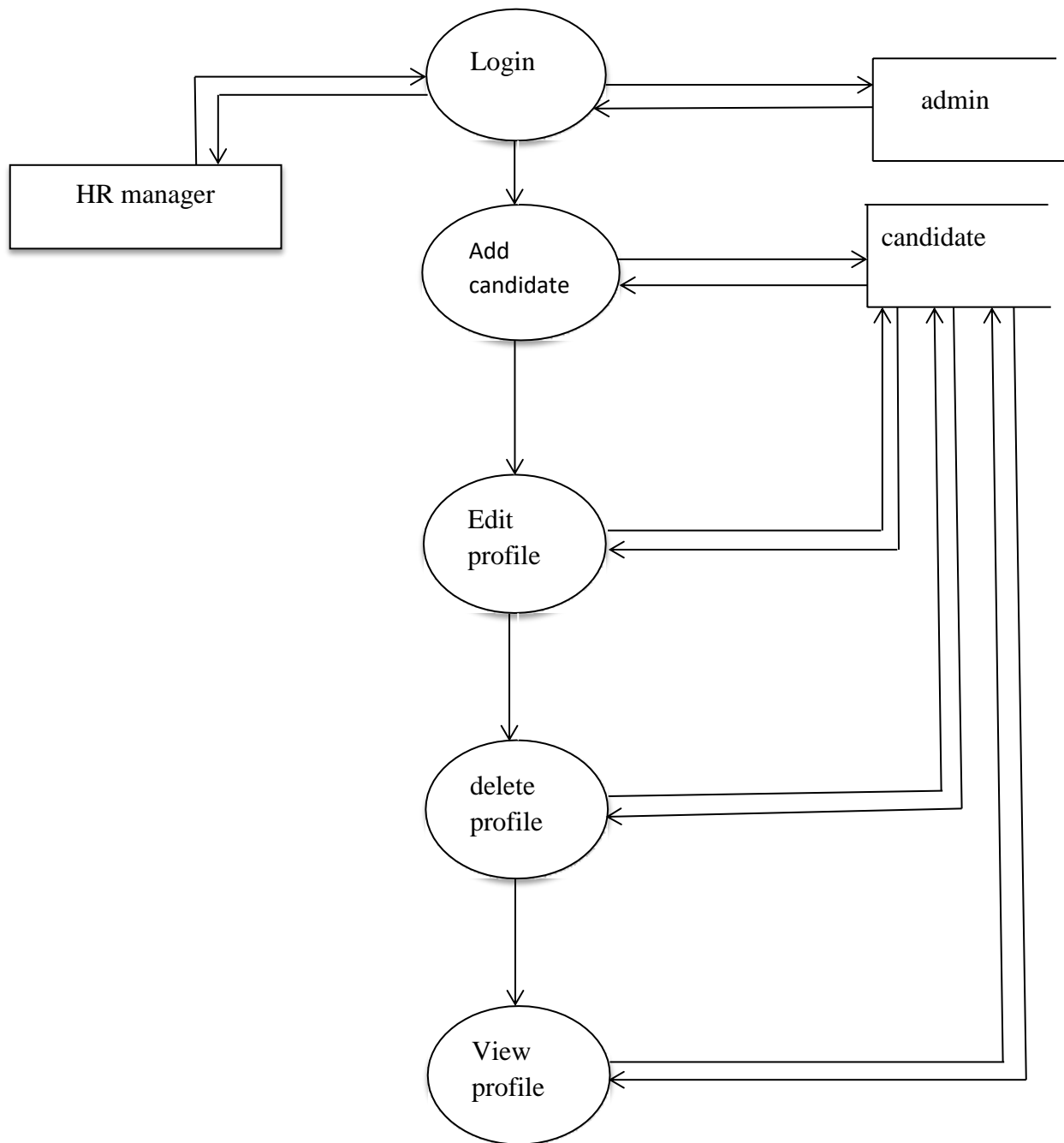
Level 1 dfd for project
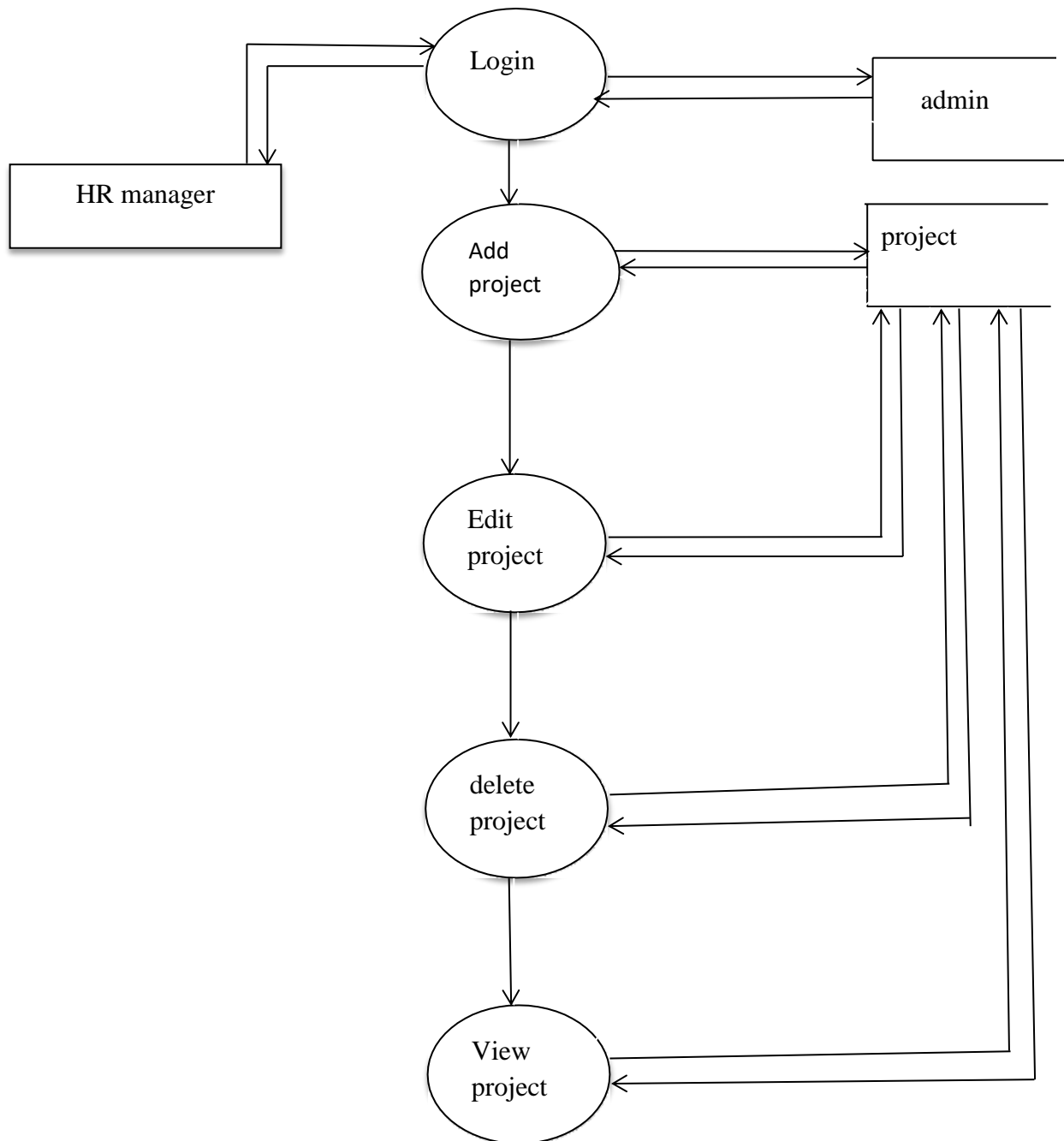
Level 1 dfd for department
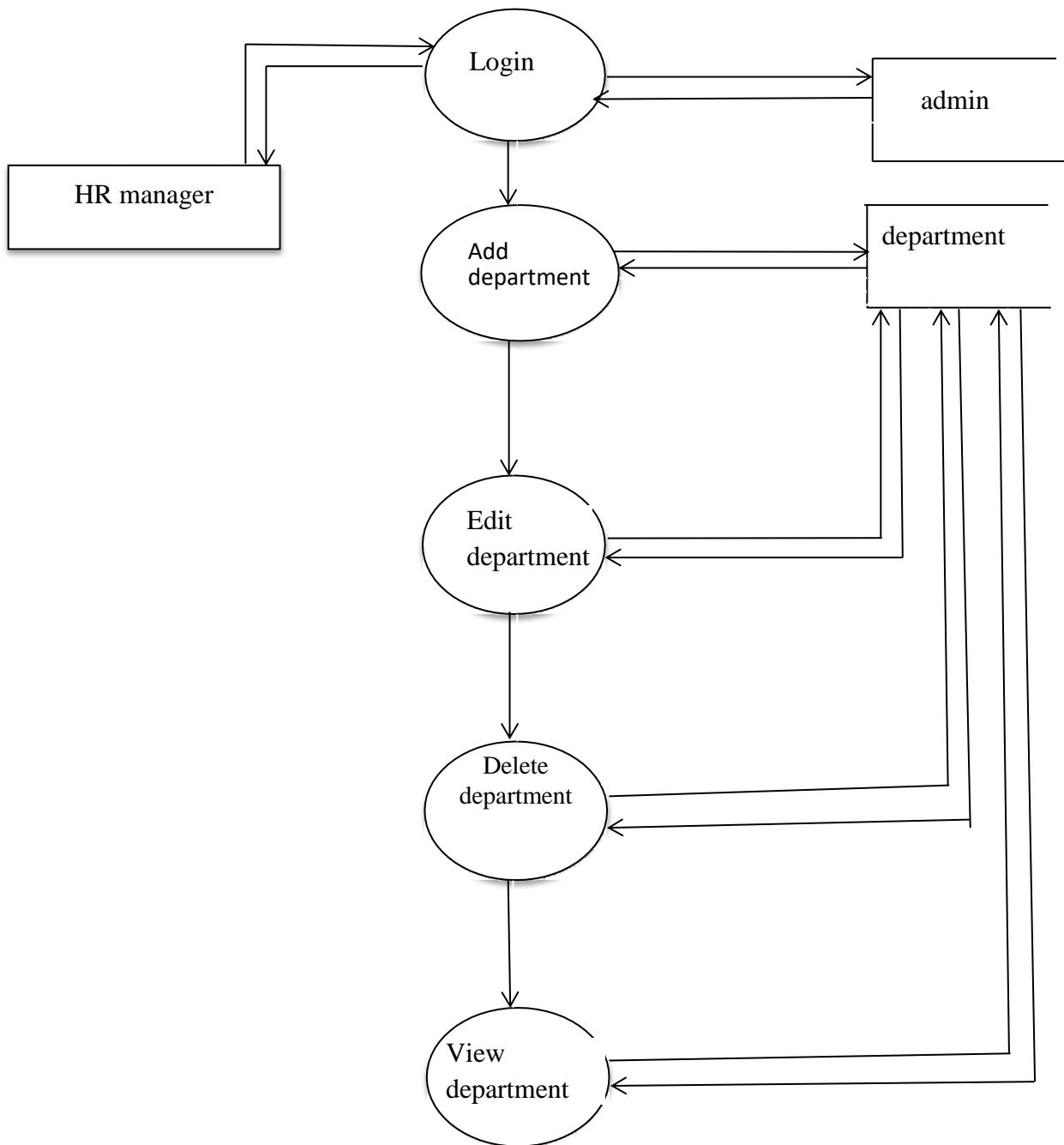
LEVEL 1 DFD FOR TRAINING
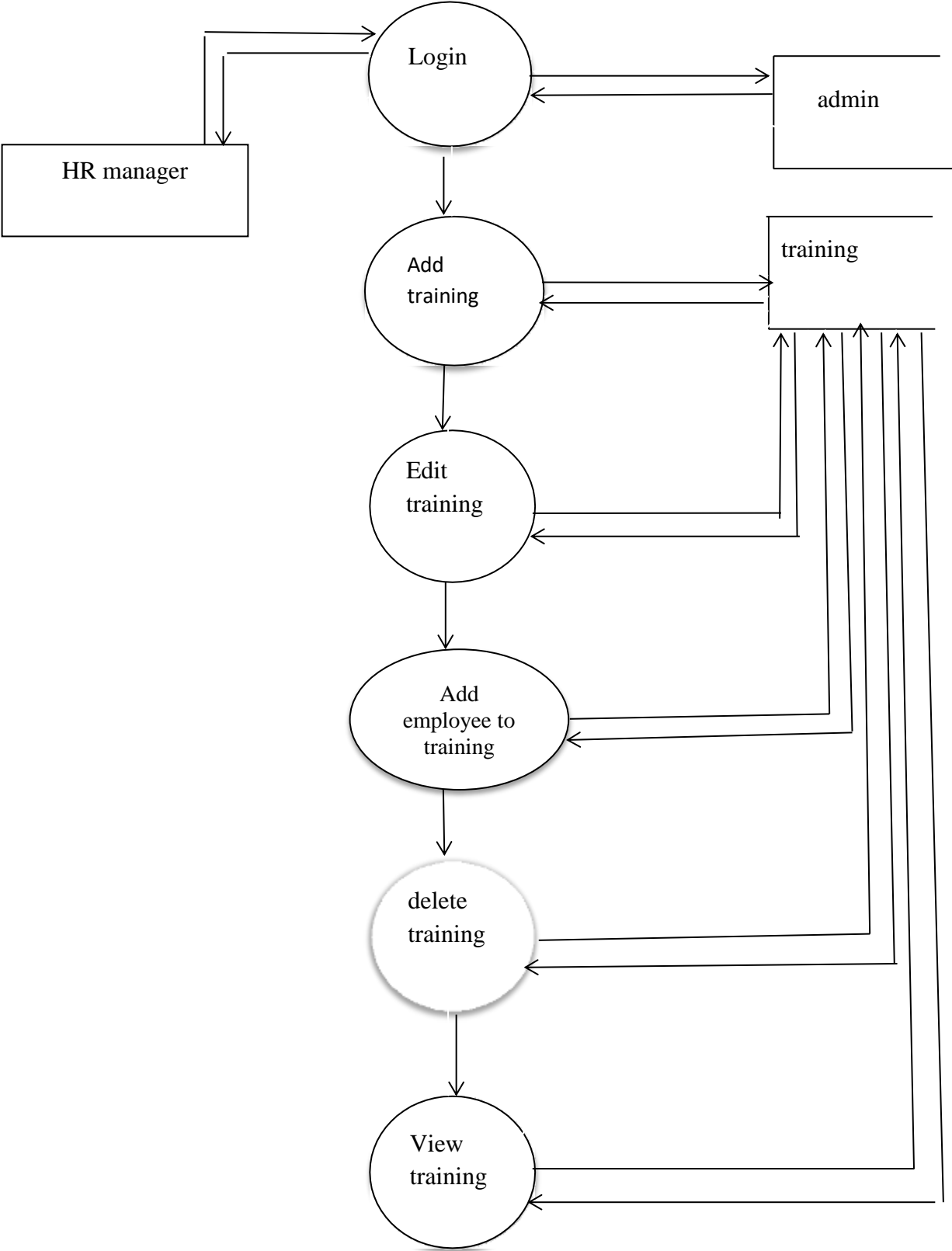
Level 1 dfd for HR Report
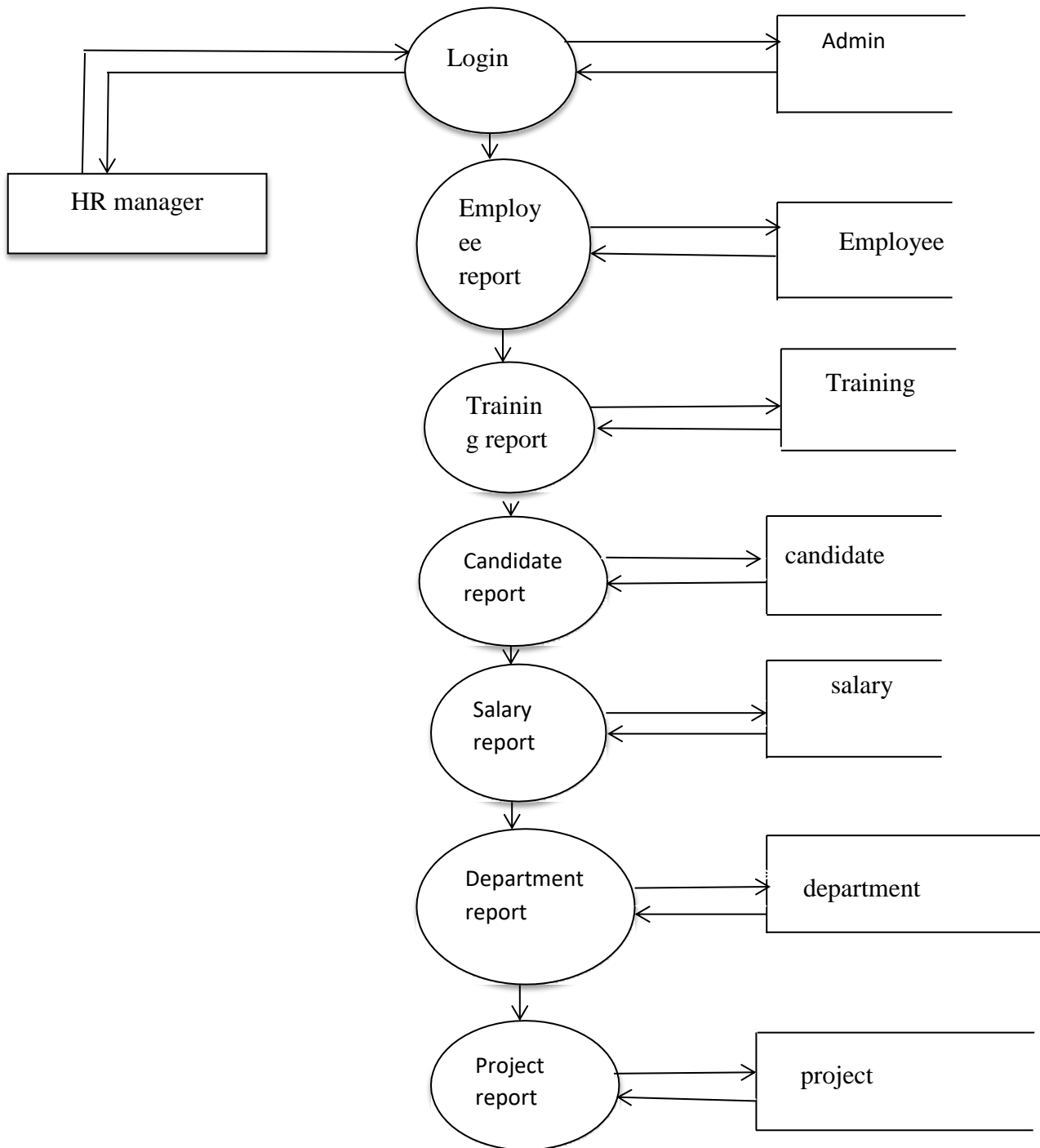
Level 1 dfd for payroll
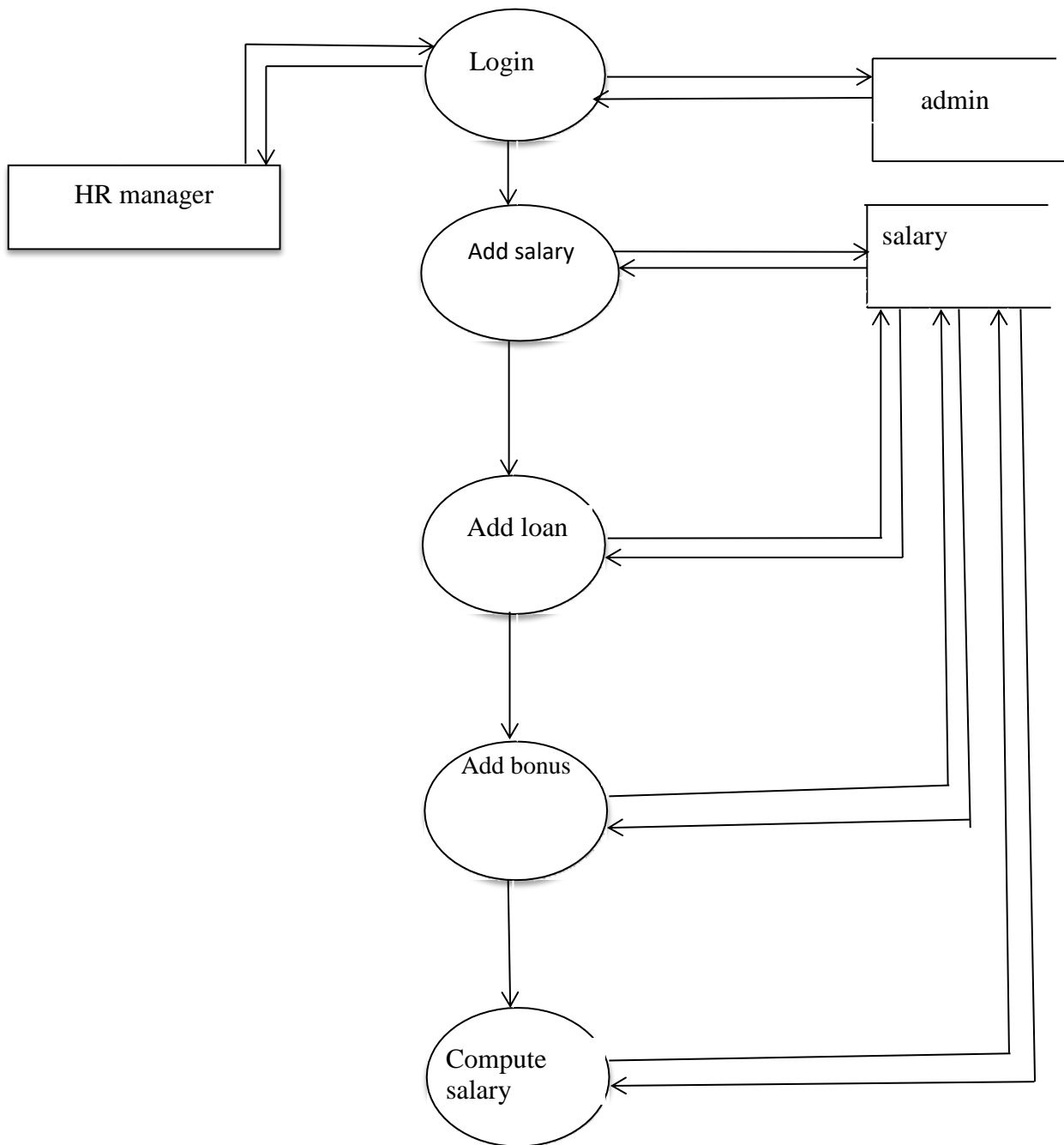
Level 2 DFD of Employee details
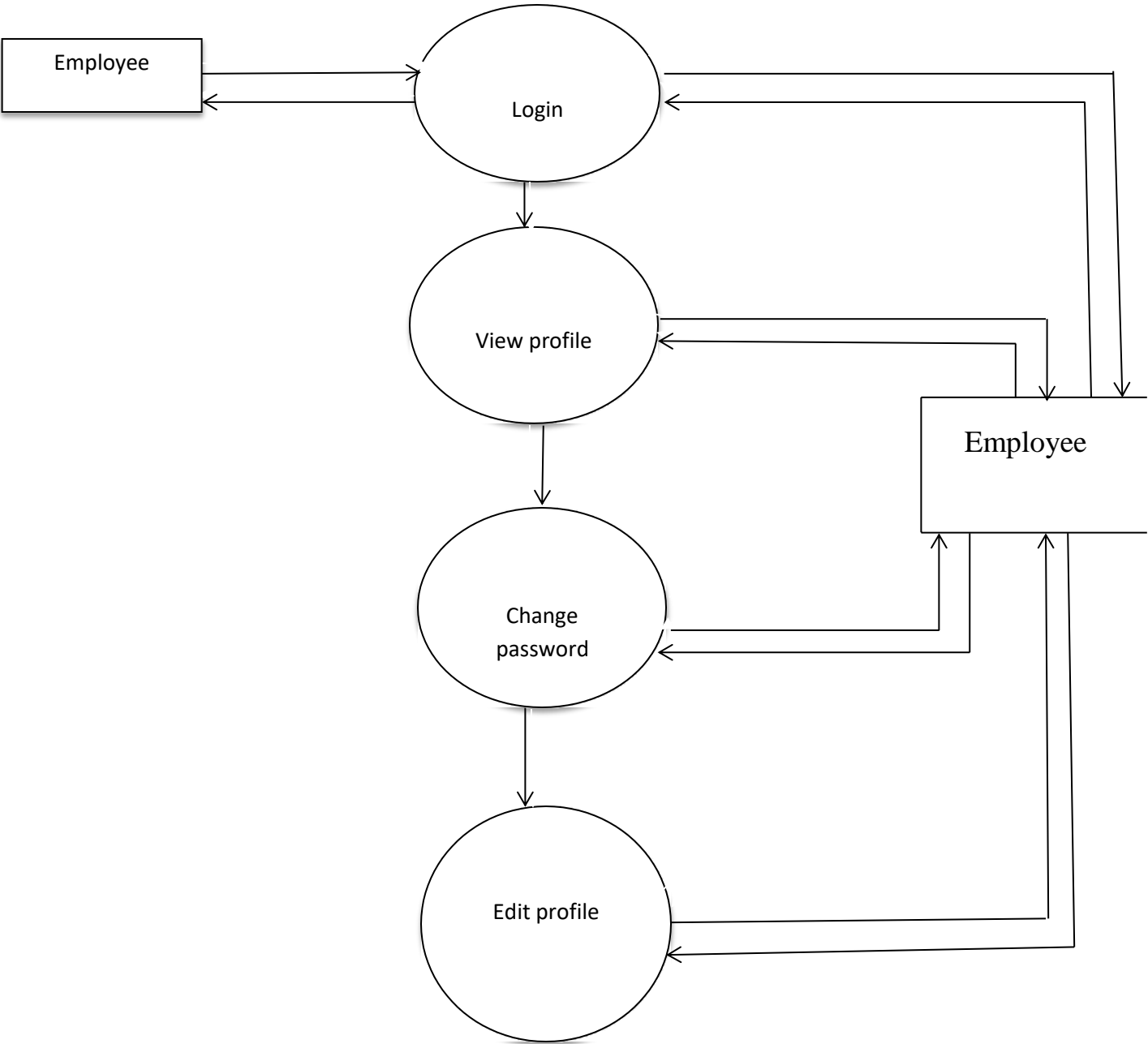
Level 2 DFD for training
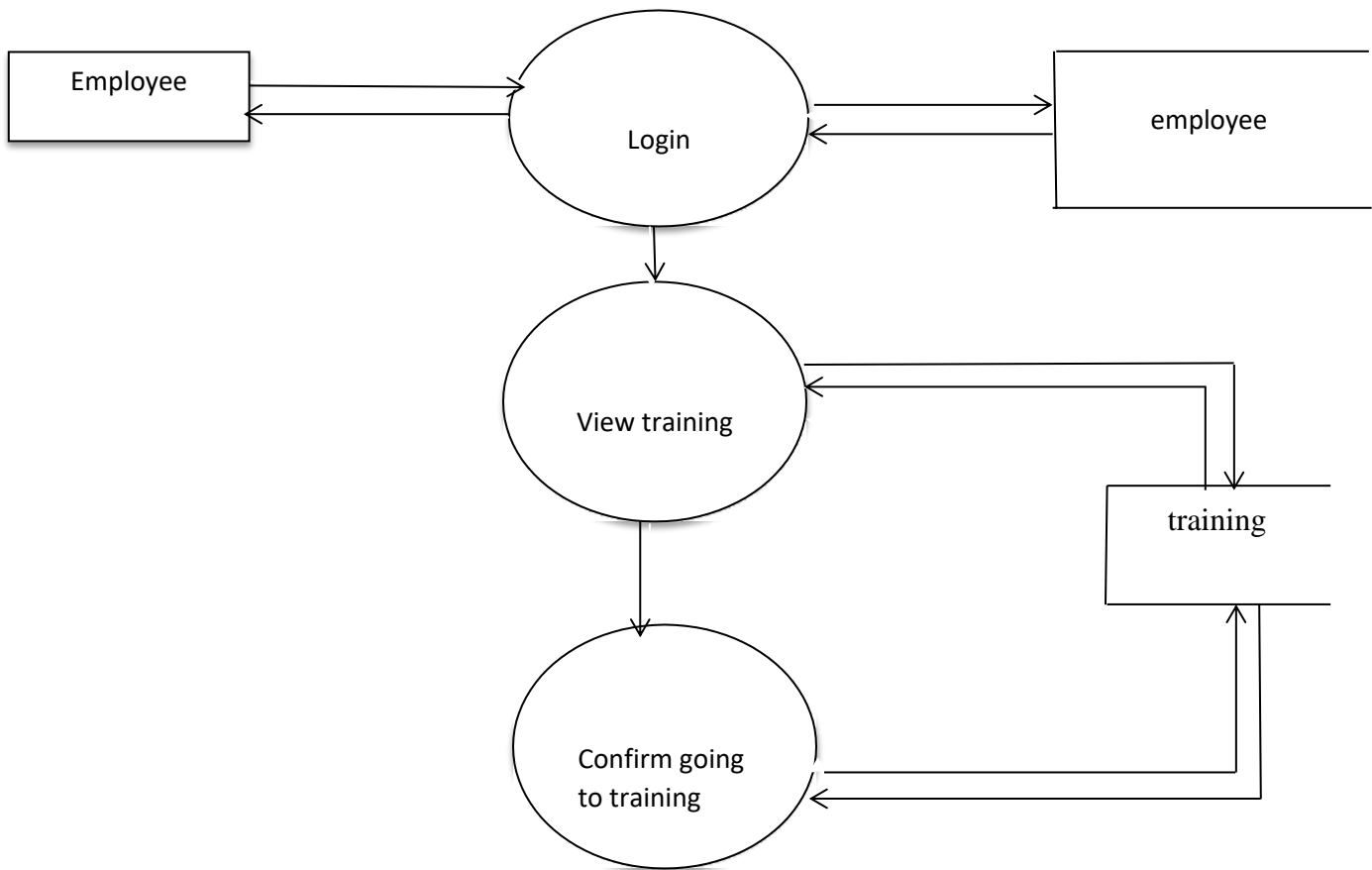
Level 2 DFD for department

```
Employee  →  ( Login )  ⇄  employee
          ←
              │
              ▼
          ( Viewdepartment )  ⇄  department
```

Level 2 DFD for payroll

```
Employee  →  ( Login )  ⇄  employee
          ←
              │
              ▼
          ( View bonus/loan )  ⇄  salary
              │
              ▼
          ( View net salary )
```

Level 2 DFD for project
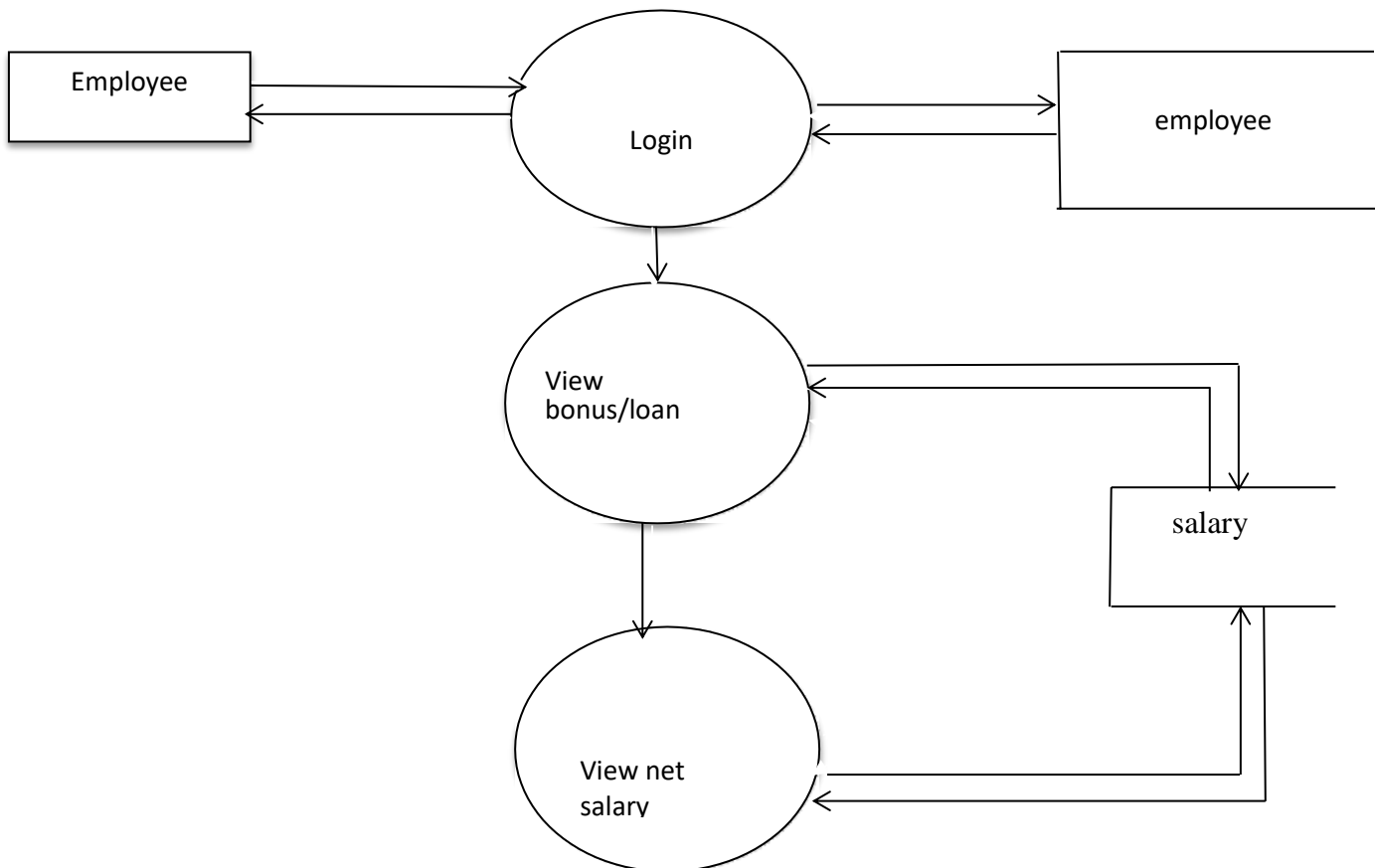
```
┌──────────────┐                    ╭────────────╮                    ┌──────────────┐
│  Employee    │ ─────────────────► │            │ ─────────────────► │              │
│              │ ◄───────────────── │   Login    │ ◄───────────────── │   employee   │
└──────────────┘                    ╰────────────╯                    └──────────────┘
                                          │
                                          ▼
                                    ╭────────────╮
                                    │            │ ◄──────────────────┐
                                    │View project│                    │
                                    │            │ ◄───────────┐      │
                                    ╰────────────╯             │   ┌──────────────┐
                                          │                    │   │              │
                                          ▼                    │   │   project    │
                                    ╭────────────╮             │   │              │
                                    │            │ ────────────┘   └──────────────┘
                                    │  Confirm   │                        ▲
                                    │  project   │ ◄──────────────────────┘
                                    ╰────────────╯
```
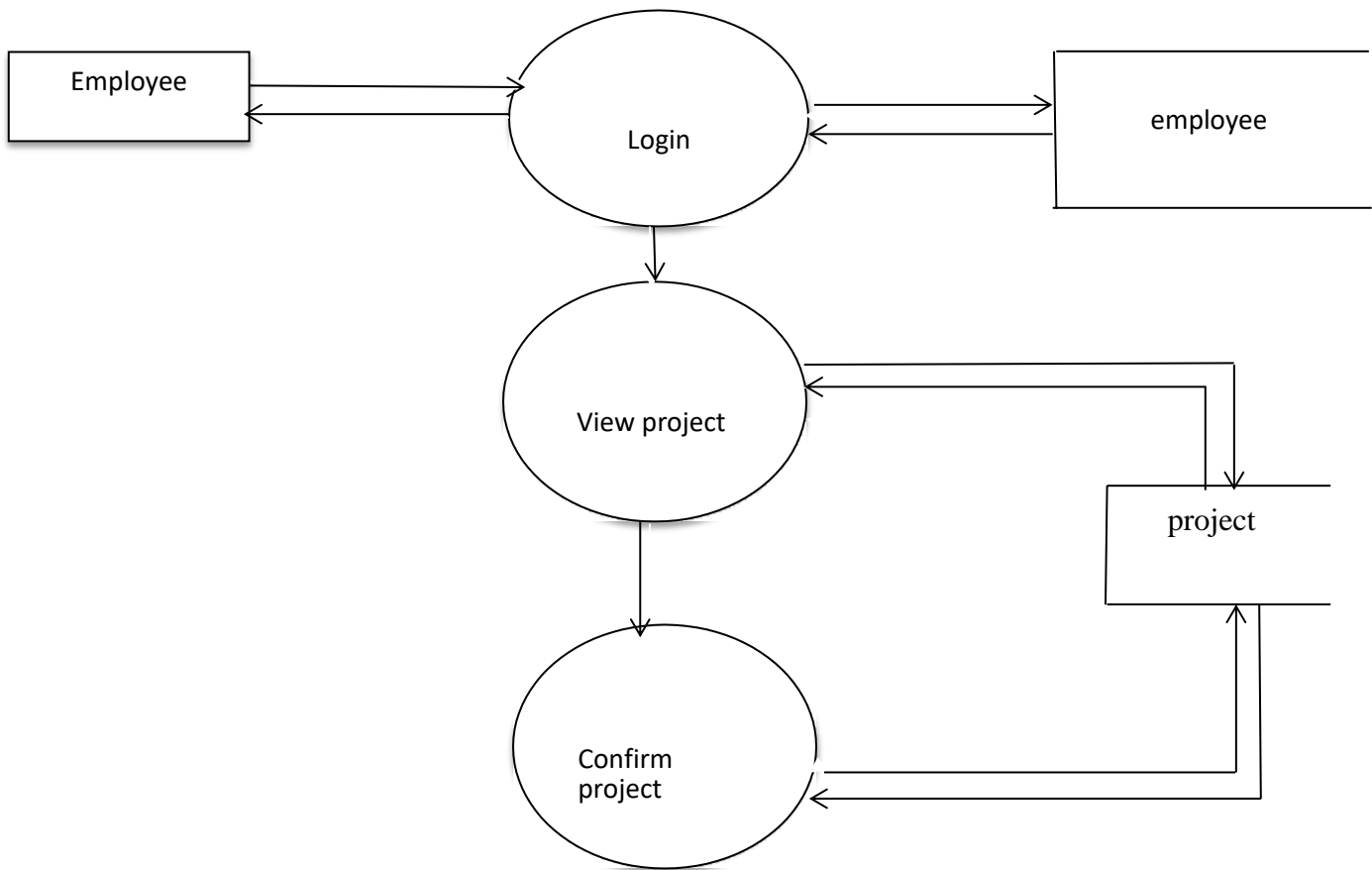
Level 2 DFD for candidate
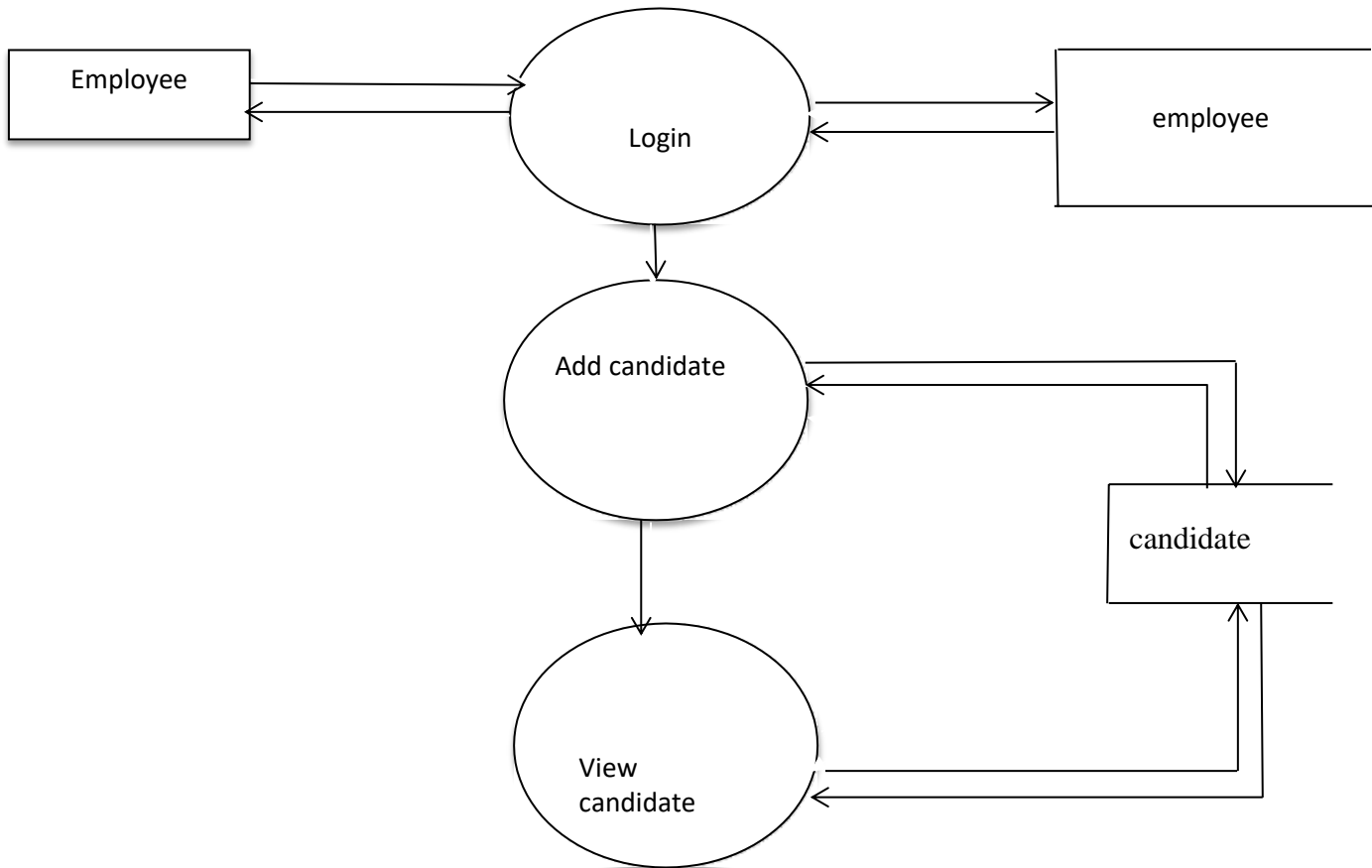
Entity Relationship Diagram (ERD)

The entity relationship (ER) diagram represents the model of human resource management system entity. The entity-relationship diagram of human resource management system shows all the visual instrument of database tables and the relations between trainings, departments, employee, salary etc. it used structure data and to define the relationships between structured data groups of human resource management system functionalities. The main entities of the human resource management system are employee, trainings, departments, salary and salary.

ER Diagram of Human Resource Management System
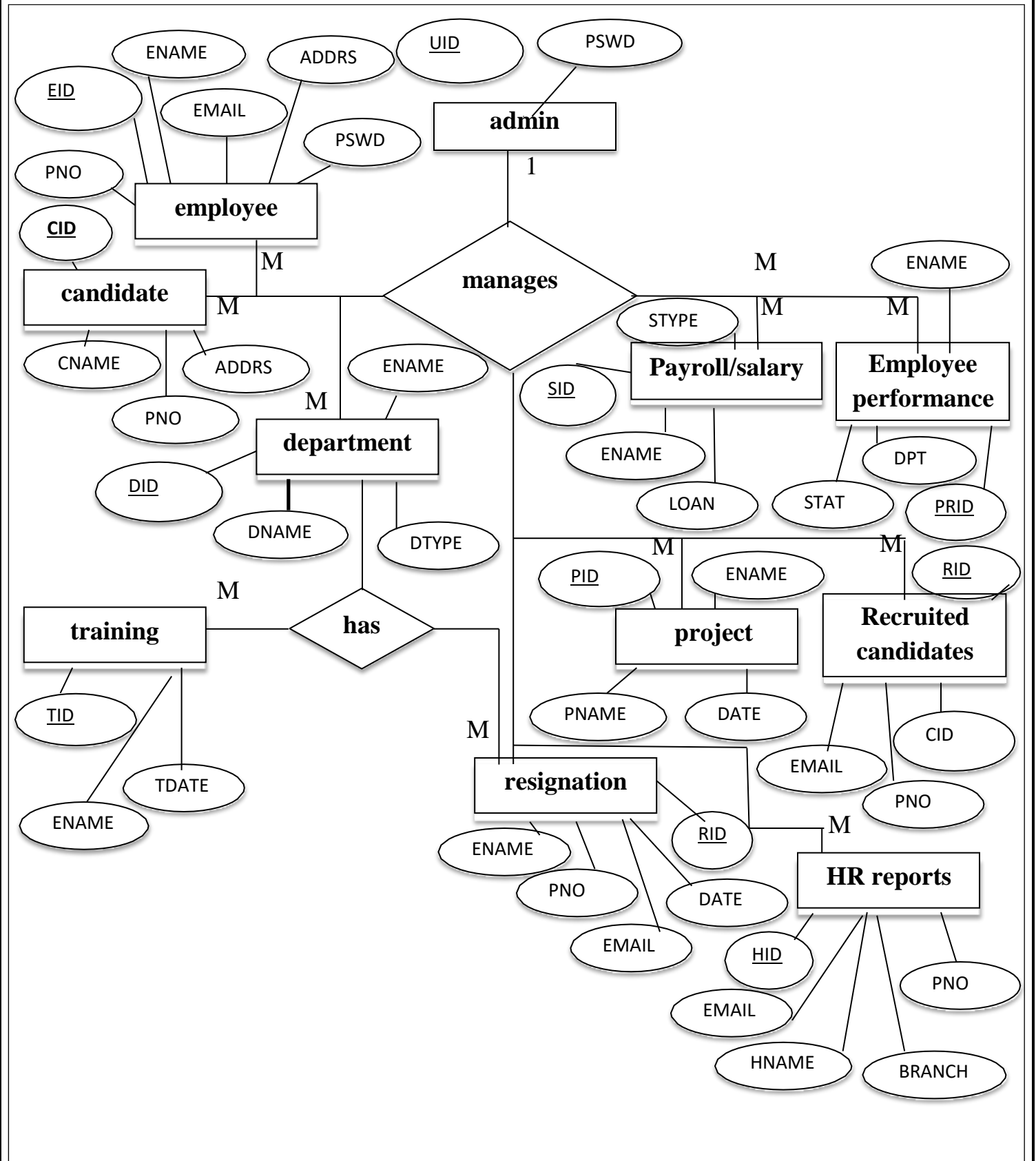
1.4. TABLE AND DATABASE DESIGN:

1.4.1. Normalization:

Normalization is the process of strutting relational database schema such that most ambiguity is removed. The stage of normalization are referred to as forms and progress from the least restrictive(first normal form)through the most restrictive(Fifth normal form), generally , most database designers do not attempt to implement anything higher then normal form of Boyce code Normal Form.

1.4.1.1. FIRST NORMAL FORM:

A relation is said to be in First normal form (INF) if and each attributed of the relation is atomic. More simply, to be INF, each column must contain only a single value and each now contain in the same column.

1.4.1.2 SECOND NORMAL FORM:

In the Second normal Form, a relation must first fulfill the requirement to be in first Normal Form. Additional, each donkey attribute in the relation must be functionality dependent upon the primary key.

1.4.1.3 THIRD NORMAL FORM:

A table is said to be in third normal form and every non key attribute is functionality dependent only on the primary key. This normalization process is applied to this system and the normalized tables are given in the above section.

➢ **Table Design**

- Admin .
- Employee details.
- Department details
- Training details
- Assigned Project details
- Payroll details
- Resignation details
- Candidate details
- Recruited candidate details
- Rejected Candidates details
- HR details

✓ **Table : Admin**

Description :

The admin table stores the information about human resources manager profile. All the human resources managers who will manage the system will be saved in this table.

Attributes	DataType	Constraints	Description
user_id	Varchar(30)	Primary key	User id
password	varchar(30)	Not Null	User password

✓ **Table : Employee details**

Description:
The table employee stores the information about employee profile. The entire employees who are added by the manager in the system will be saved in this table.

Attributes	DataType	Constraints	Description
Employee_id	varchar(30)	Primary key	Employee id
Employee_name	Varchar(30)	Foreign key	Employee name
Supervisor_id	Varchar(30)	Not Null	Supervisor id
Blood	Varchar(30)	Not Null	Blood group
Nationality	Varchar(30)	Not Null	Nationality
Address	Varchar(30)	Not Null	Employee address
Gender	Char(30)	Not Null	Gender
Mobile	Number(20)	Not Null	Contact number
Email	Varchar(30)	Not Null	Email address
Designation	Varchar(30)	Not Null	Designation
Hdate	Date	Not Null	Hire date
Department	Varchar(30)	Not Null	Employee_department
DOB	Date	Not Null	Date of birth
Djoin	Date	Not Null	Date of joining
Workgroup	varchar(30)	Not Null	Work group
Division	varchar(30)	Not Null	Division
Position	varchar(30)	Not Null	Position
Evaluate_date	Date	Not Null	Evaluation time

Evaluator	varchar(30)	Not Null	Evaluator
Performance_status	varchar(30)	Not Null	Performance status
Applying_date	Date	Not Null	Applying date for leave
Type_leave	varchar(30)	Not Null	Type of leave
No_days	number(30)	Not Null	Number of days
Total_leave	Number(30)	Not Null	Total_leave
Attendance %	Number(30)	Not Null	Attendance %

After normalisation

Employee_details

Attributes	DataType	Constraints	Description
Employee_id	Integer (30)	Primary key	Employee id
Employee_name	Varchar(30)	Not null	Employee name
Blood	Varchar(30)	Not Null	Blood group
Nationality	Varchar(30)	Not Null	Nationality
Address	Varchar(30)	Not Null	Employee address
Gender	Char(30)	Not Null	Gender
Mobile	Number(20)	Not Null	Contact number
Email	Varchar(30)	Not Null	Email address
Designation	Varchar(30)	Not Null	Designation
Supervisor	Varchar(30)	Not Null	Supervisor name
Hdate	Date	Not Null	Hire date
Department	Varchar(30)	Not Null	Employee_department
DOB	Date	Not Null	Date of birth

Djoin	Date	Not Null	Date of joining
Attendance %	Number(30)	Not Null	Attendance %

Employee_status

Attributes	DataType	Constraints	Description
Employee_id	Integer (30)	Foreign key	Employee id
Division	varchar(30)	Not Null	Division
Position	varchar(30)	Not Null	Position
Workgroup	varchar(30)	Not Null	Work group

An Employee can have multiple positions in the company

Emp_Performace

Attributes	DataType	Constraints	Description
Employee_id	Integer (30)	Foreign key	Employee id
Evaluator	varchar(30)	Not Null	Evaluator
Evaluate_date	Date	Not Null	Evaluation time
Performance_status	varchar(30)	Not Null	Performance status

Emp_leave_status

Attributes	DataType	Constraints	Description
Employee_id	Integer (30)	Foreign key	Employee id
Applying_date	Date	Not Null	Applying date for leave

Type_leave	varchar(30)	Not Null	Type of leave
No_days	number(30)	Not Null	Number of days
Total_leave	Number(30)	Not Null	Total_leave

✓ **Table : Department details**

Description:
This table contains the records of various departments under which the employees works.

Attributes	DataType	Constraints	Description
Department id	Integer(30)	Primary key	Department id
Employee id	Integer(30)	Foreign key	Employee name
Department name	Varchar(30)	Not Null	Department name
Department type	Varchar(30)	Not Null	Department type
Supervisor_number	Integer(30)	Foreign key	Supervisor number

After normalisation

Department_deatils

Attributes	DataType	Constraints	Description
Department id	Varchar(30)	Primary key	Department id

Department name	Varchar(30)	Not Null	Department name
Department type	Varchar(30)	Not Null	Department type

Employee_department_details

Attributes	DataType	Constraints	Description
Department id	Varchar(30)	Foreign key	Department id
Employee id	Integer(30)	Foreign key	Employee name
Supervisor_number	Integer(30)	Foreign key	Supervisor number

✓ **Table : Training details**

Description:
It consists of the employees' schedule about the training conducted in the organization for the particular employee. The employees' previous training experience will be maintained in the database.

Attributes	DataType	Constraints	Description
Training_id	Integer(30)	Primary key	Training_id
Training_name	Varchar(30)	Not nul	Training_name

Tcategory_name	Varchar(30)	Not Null	Training_category_name
Tcategory_code	Varchar(30)	Not Null	Training_category_code
Training_description	Varchar(30)	Not Null	Training_description
Start date	Date	Not Null	Training Start date
End date	Date	Not Null	Training End date
Training_company	Varchar(30)	Not Null	Training_company
Training_place	Varchar(30)	Not Null	Training_place
Training_time	Varchar(30)	Not Null	Training_time
No_of_participants	Number(30)	Not Null	No_of_participants
Training_status	varchar(30)	Not Null	Training_status
Previous_experience	varchar(30)	Not Null	Previous training experience

After normalization

Trainig_details

Attributes	DataType	Constraints	Description
Training_id	Integer(30)	Primary key	Training_id
Training_name	Varchar(30)	Not null	Training_name
Tcategory_name	Varchar(30)	Not Null	Training_category_name
Tcategory_code	Varchar(30)	Not Null	Training_category_code
Training_description	Varchar(30)	Not Null	Training_description
Start date	Date	Not Null	Training Start date

Attributes	DataType	Constraints	Description
End date	Date	Not Null	Training End date
Training_company	Varchar(30)	Not Null	Training_company
Training_place	Varchar(30)	Not Null	Training_place
Training_time	Varchar(30)	Not Null	Training_time

Employee_training_details

Attributes	DataType	Constraints	Description
Training_id	Integer(30)	Foreign key	Training_id
Employee id	Integer(30)	Foreign key	Employee name
Training_status	varchar(30)	Not Null	Training_status
Previous_experience	varchar(30)	Not Null	Previous training experience

✓ **Table : Assigned Project details**

Description:
This table deals with project details and project schedule of the employee by the HR administrator. Based on the project management specification and technical skills of the employee the modules generate the decisive information about the employee's strengths and weakness.

Attributes	DataType	Constraints	Description
Project id	Integer(30)	Primary key	Project id
projectMid	Integer(30)	Foreign key	projectManagerid
Employee id	Integer(30)	Foreign key	Employee id
Project name	varchar(30)	Not Null	Project name
Start date	Date	Not Null	Start date
Budget	Integer(30)	Not Null	Budget
Total_hours	Integer(30)	Not Null	Total_hours
Labor_cost	Integer(30)	Not Null	Labor_cost
Material_cost	Integer(30)	Not Null	Material_cost
Total_cost	Integer(30)	Not Null	Total_cost
Exp_End_date	Date	Not Null	Expected End_date
Final_End_date	Date	Null	Finished date
Project_status	Varchar(30	Not null	completed/pending/stopped

After normalization

Project_details

Attributes	DataType	Constraints	Description
Project id	Integer(30)	Primary key	Project id
projectMid	Integer(30)	Foreign key	projectManagerid
Project name	varchar(30)	Not Null	Project name

Start date	Date	Not Null	Start date
Budget	Integer(30)	Not Null	Budget
Total_hours	Integer(30)	Not Null	Total_hours
Labor_cost	Integer(30)	Not Null	Labor_cost
Material_cost	Integer(30)	Not Null	Material_cost
Total_cost	Integer(30)	Not Null	Total_cost
Exp_End_date	Date	Not Null	Expected End_date

Project_status

Attributes	DataType	Constraints	Description
Project id	Integer(30)	Foreign key	Project id
Final_End_date	Date	Null	Finished date
Project_status	Varchar(30	Not null	completed/pending/stopped

Employee_assigned_project

Attributes	DataType	Constraints	Description
Project id	Integer(30)	Foreign key	Project id
Employee id	Integer(30)	Foreign key	Employee id

✓ **Table : Payroll details**

Description:

In the payroll module, it consists of the information about the employee salary details such as basic pay, allowances, deductions and calculate the gross pay and net pay from the given allowances and deductions.

Attributes	DataType	Constraints	Description
Salary_id	Integer(30)	Primary key	Salary id
Employee_id	Integer(30)	Foreign key	Employee id
Basic pay	Integer(30)	Not Null	Basic pay
Allowances	Integer(30)	Not Null	Allowances
deductions	Integer(30)	Not Null	deductions
Gross pay	Integer(30)	Not Null	Gross pay
Net pay	Integer(30)	Not Null	Net pay
Salary_description	Varchar(30)	Not Null	Salary_description
Salary_issue_date	Date	Not Null	Salary_issue_date
Salary_account_number	number(30)	Not Null	Salary_account_number

Already in 3nf

✓ **Table : Resignation details**

Description:
This table contains the information about the ex-employees who have worked for the organization. These information are used to contact the ex-employees in case of emergency in which project they have already involved.

Attributes	DataType	Constraints	Description
Resignation_id	varchar(30)	Primary key	Resignation id
Employee_id	Integer(30)	Foreign key	Employee id

title	varchar(30)	Not Null	Title of resignation
Email id	varchar(30)	Not Null	Email id
gender	varchar(30)	Not Null	gender
Mobile number	number(30)	Not Null	Mobile number
Position	varchar(30)	Not Null	Position
Department	varchar(30)	Not Null	Department
Supervisor	varchar(30)	Not Null	Supervisor
Joining_date	Date	Not Null	Joining_date
Resign_date	Date	Not Null	Resign_date
achievements	varchar(30)	Not Null	achievements

Already in 3nf

✓ **Table : Candidate details**

Description:
All candidates who are applying for the job will be shown in this table.

Attributes	DataType	Constraints	Description
Candidate_id	Integer(30)	Primary key	Candidate_id

Candidate_name	varchar(30)	Not Null	Candidate_name
Gender	varchar(30)	Not Null	Gender
DOB	number(30)	Not Null	Date_of_Birth
Address	varchar(30)	Not Null	Address
Qualification	Varchar(30)	Not Null	Qualification
Year_experience	Number(30)	Not Null	Year_of_experience
Mobile_number	Number(30)	Not Null	Mobile_number
PostApplied	Varchar(30	Not	Post applied
CV	varchar(30)	Not Null	CV
Reference	varchar(30)	Not Null	Job references from previous consititution
Applying date	Date	Not Null	Applying date

Already in 3nf

✓ **Table : Recruited candidate details**

Description:
This table records all recruitment details along with candidate current status(chosen and rejected)will be shown.

Attributes	DataType	Constraints	Description	

Recruitment_id	varchar(30)	Primary key	Recruitment_id
employee_id	integer(30)	Foreign key(not part of candiadte key)	employee_id
Candidate_name	varchar(30)	Not Null	Candidate_name
Gender	varchar(30)	Not Null	Gender
DOB	number(30)	Not Null	Date_of_Birth
Address	varchar(30)	Not Null	Address
Qualification	Varchar(30)	Not Null	Qualification
Year_experienc	Number(30)	Not Null	Year_of_experience
Mobile_number	Number(30)	Not Null	Mobile_number
PostApplied	Varchar(30	Not	Post applied
CV	varchar(30)	Not Null	CV
Reference	varchar(30)	Not Null	Job references from previous consititution
Recruitement_date	Date	Not Null	Recruitement_date

✓ **Table : Rejected candidate details**

Description:

This table records all recruitment details along with candidate current status(chosen and rejected) will be shown.

Attributes	DataType	Constraints	Description
Rejected_id	Integer(30)	Primary_key	Rejected id
Candidate_name	varchar(30)	Not Null	Candidate_name
Gender	varchar(30)	Not Null	Gender
DOB	number(30)	Not Null	Date_of_Birth
Address	varchar(30)	Not Null	Address
Qualification	Varchar(30)	Not Null	Qualification
Year_experienc	Number(30)	Not Null	Year_of_experience
Mobile_number	Number(30)	Not Null	Mobile_number
PostApplied	Varchar(30	Not	Post applied
CV	varchar(30)	Not Null	CV
Reference	varchar(30)	Not Null	Job references from previous consititution
Rejected Date	Date	Not Null	Rejected date

✓ **Table:HR details**

Description:
In this table, we have the information about the human resource manager.

Attributes	DataType	Constraints	Description
HR id	varchar(30)	Primary key	HR id
Name	varchar(30)	Not Null	Name
Email	varchar(30)	Not Null	Email
Mobile number	Number(30)	Not Null	Mobile number
Hiring date	Date	Not Null	Hiring date
Branch name	varchar(30)	Not Null	Branch name
Joining date	Date	Not Null	Joining date

➢ **REFERENCES**

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✓ https://www.freeprojectz.com/entity-relationship/human-resource-management-system- er-diagram