User Requirements

The user requires that the human resources system provide the following business processes.

1.0 Employee Maintenance

    1.1 Add an employee by entering
        Employee information
        Salary or hourly rate information
        Dependent's information

        The location must be a valid location in the Fixed Asset System.

        The hourly rate is converted to U.S. dollars. The currency data is accessed from the Currency System (CS) in order to convert a standard hourly rate in U.S. dollars based upon the currency location of the employee. CS maintains the currency data together with other attributes.

    1.2 Update employee information
        Update any employee information except the social security number (SSN). The location must be a valid location in the Fixed Asset System.

        The hourly rate is converted to U.S. dollars. The currency data is assessed from the Currency System in order to convert a standard hourly rate in U.S. dollars based upon the currency location of the employee.

    1.3 Delete employee information
        Delete all information about an individual employee. When deleting an employee currently assigned to a job, update the job assignment to set the status to inactive.

    1.4 Inquire on individual employee
        Using an employee SSN, view all information about that specific employee.

    1.5 View a list of employees
        Retrieve a list of employees to view. This view totals the number of employees.

2.0 Job Maintenance

2.1 Add job information by entering
  Name
  Number
  Pay grade
  Description information

  The user considers job description to be free from text that is not maintained independently from the job.

2.2 Update job information
  Update any job information except the job number.

2.3 Delete job information
  Delete all information about a job. When deleting a job currently assigned to an employee, update the job   assignment to set the status to inactive.

2.4 Inquire on an individual job
  Using the job number, view all information about a specific job.

2.5 View a list of jobs
   Retrieve a list of jobs to view. This view totals the number of jobs.

3.0 Job Assignment Maintenance

    3.1 Assign an employee to a job
        Add job assignment information by entering the following information for each
        job and employee.
        Effective date
        Salary
        Performance rating

    3.2 Transfer employee
        An employee can be transferred to different job assignments.

    3.3 Delete job assignment information
        Delete a job assignment for an employee.

    3.4 Inquire on an individual job assignment
        Using the job number and employee social security number, view all information
        about a specific job assignment.

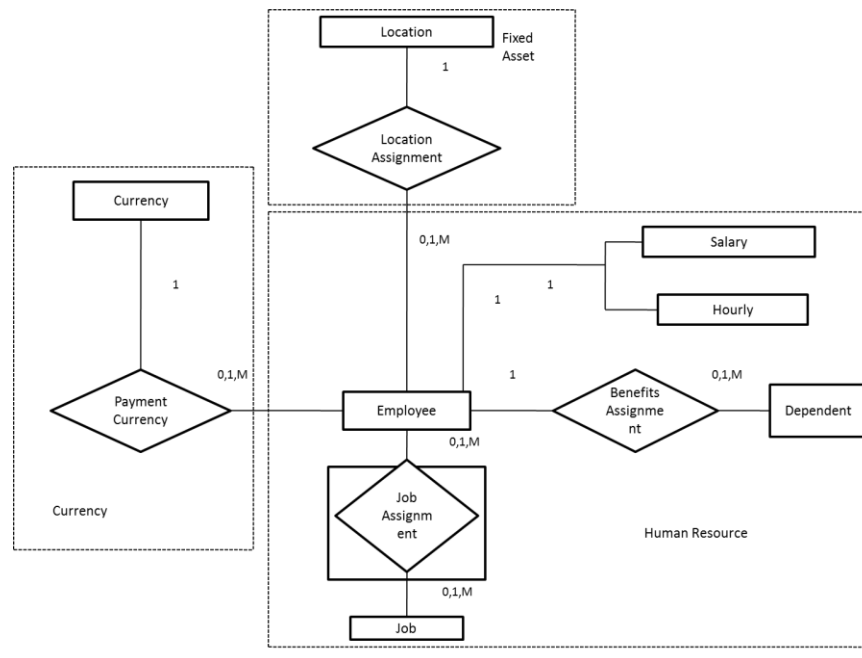   3.5 View a list of job assignments
        Retrieve a list of active job assignments. This view totals the number of
        employees assigned to each job.
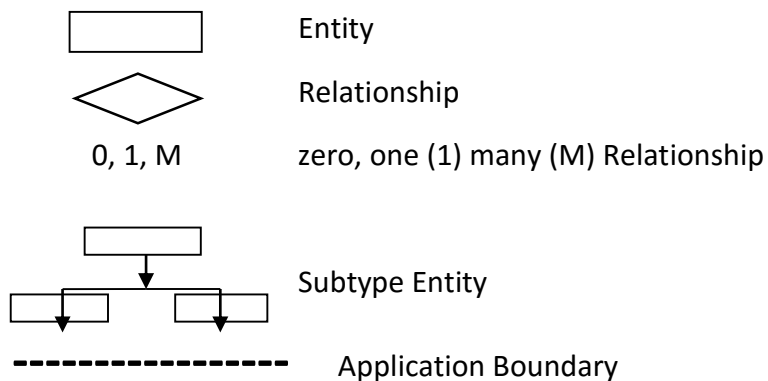
4.0 Inquire on location information

4.1 The user requires the ability to inquire on employees and their location. The location data is for   reference only. It is maintained by the Fixed Asset System together with other data attributes.

Entity- Relationship Diagram

The following shows an entity-relationship (E-R) model (Chen based with variations) of the HR system's data requirements. Descriptions and attributes for each entity are included on the following pages.
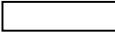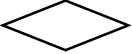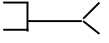

Legend

▭	Entity
◇	Relationship
0, 1, M	zero, one (1) many (M) Relationship
(subtype diagram)	Subtype Entity
- - - - - - - - - - - - - - -	Application Boundary

Note: This case study entity-relationship (E-R) diagram is intended to illustrate one type of data model. Many types of data models are in use today, each using specific diagramming conventions to depict entities and their relationships to each other. We are not endorsing a particular data modeling technique, but have included an example E-R technique, but have included an example E-R diagram E-R diagram to illustrate the analysis of the user requirements.
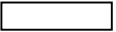
Diagram Description

The following points describe some of the components of the Chen diagram.

- All entities are enclosed within ⬚ . An entity is a thing which can be distinctly identified. The Chen diagramming technique classifies entities as regular and weak. A weak entity that is existence-dependent on some other entity. This means it cannot exist if that other entity does not also exist. For example, DEPENDENT in the diagram is a weak entity. Weak entities may have attributes.
- Relationship ⬦ , indicates an association among entities. These entities or relationship may also be regular or weak. A relationship may also have attributes.
- Each relationship box is connected by lines to the entity box participating in the relationship in question ⊐—⟨ Each line is labeled "0" , "1" and/or "M" to indicate whether the relationship is mandatory or optional, and one-to-one, many-to-one, or many-to-many.
- Subtype entity ⬚ represents a given entity type and its subtypes.

  Note: The notation for subtype entity extends the Chen relationship model.

The following points describes the relationships in the diagram.

- All entities are enclosed within ⬚.
- <u>Currency - Employee Relationship</u>: one currency can be used to make payments to different employees, but one employee can be paid in only one currency.
- <u>Employee – Salaried/hourly Relationship</u>: An employee is either a salaried or an hourly employee.
- <u>Employee - Location Relationship</u>: An employee can only work in one location, but one location can zero, one or more employees.
- <u>Employee – Dependent Relationship</u>: An employee can have zero, one or more dependents for whom he/she is responsible for benefits, but a dependent can be related to only one employee for benefits assignment.
- <u>Employee – Job Relationship</u>: The association (link-up) of employee(S) and one or more jobs is made through job assignments. One job assignment associates one job to one employee, however, one employee can have many job assignment, and one job may be assigned to many employees.

Entity Attributes

The attributes for each entity are listed below. The entities are listed in alphabetical order from left to right.

CURRENCY entity type
Currency_ Location
Base_ Currency
Conversion Rate_ To_ Base_ Currency
Date_ Of_ Rate

DEPENDENT entity type
Dependent_ Social_ Security Number
Dependent_ Name
Dependent_ Birth_ Date

EMPLOYEE entity type
Employee_ Name
Social_ Security_ Number
Nbr_ Dependents
Type_ Code
SALARIED EMPLOYEE entity subtype
   Supervisory_ Level
HOURLY_EMPLOYEE entity subtype
   Standard_ Hourly_ Rate
   Us_ Hourly_ Rate
   Collective_ Bargaining_ Unit_ Number

JOB entity type
Name
Number
Pay_ Grade
Description

JOB_ASSIGNMENT entity type
Effective_ Date
Salary
Performance_ Rating
Status_ Inactive
System_ Date

LOCATION entity type
Location_ Name
Address
City
State
Zip
Country

Attribute Relationships

The following data is required to establish relationships between the entities.

Attribute	Established Relationship For
Currency_ Location	CURRENCY and EMPLOYEE
Location_ Name	EMPLOYEE and LOCATION
Social_ Security_ Number	EMPLOYEE and DEPENDENT
Social_ Security_ Number	EMPLOYEE and JOB ASSIGNMENT
Job Number	JOB and JOB ASSIGNMENT

The data model diagramming standards used in these illustrations are based upon the following assumption.

- Key-to-key relationships are links without other maintained data.

The same information could have been described using a different technique.

KEY: Different diagramming techniques should not affect the function point count.
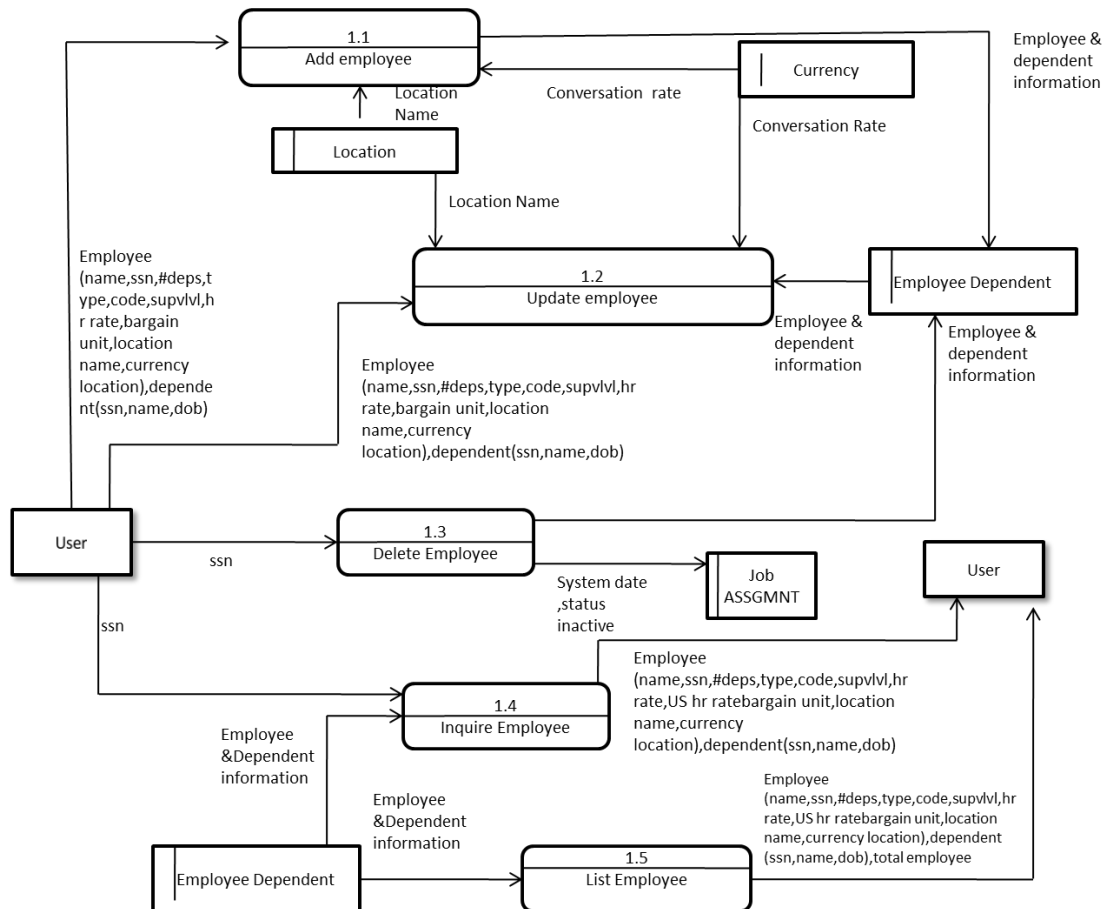
Data Flow Diagrams

This section includes the data flow diagrams for the following processes.

- Employee Maintenance
- Job Maintenance
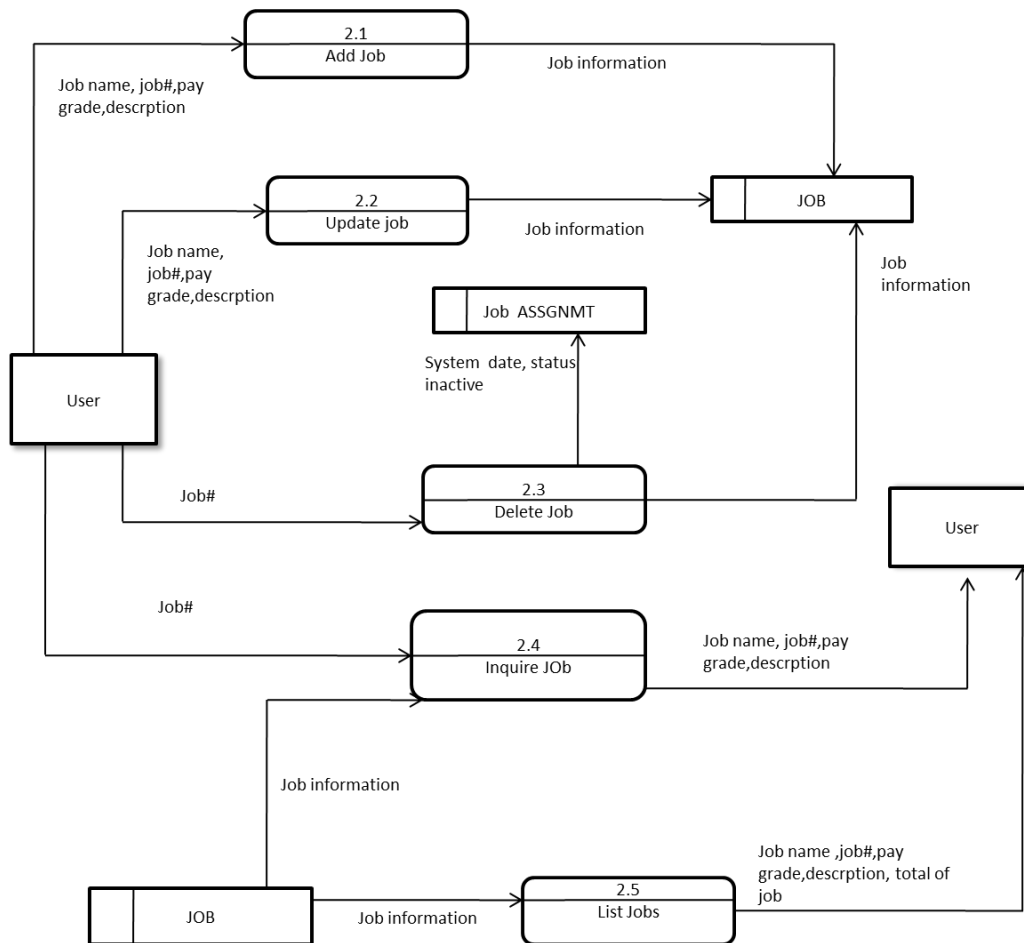- Job Assignment Maintenance
- Location Reporting

Employee Maintenance

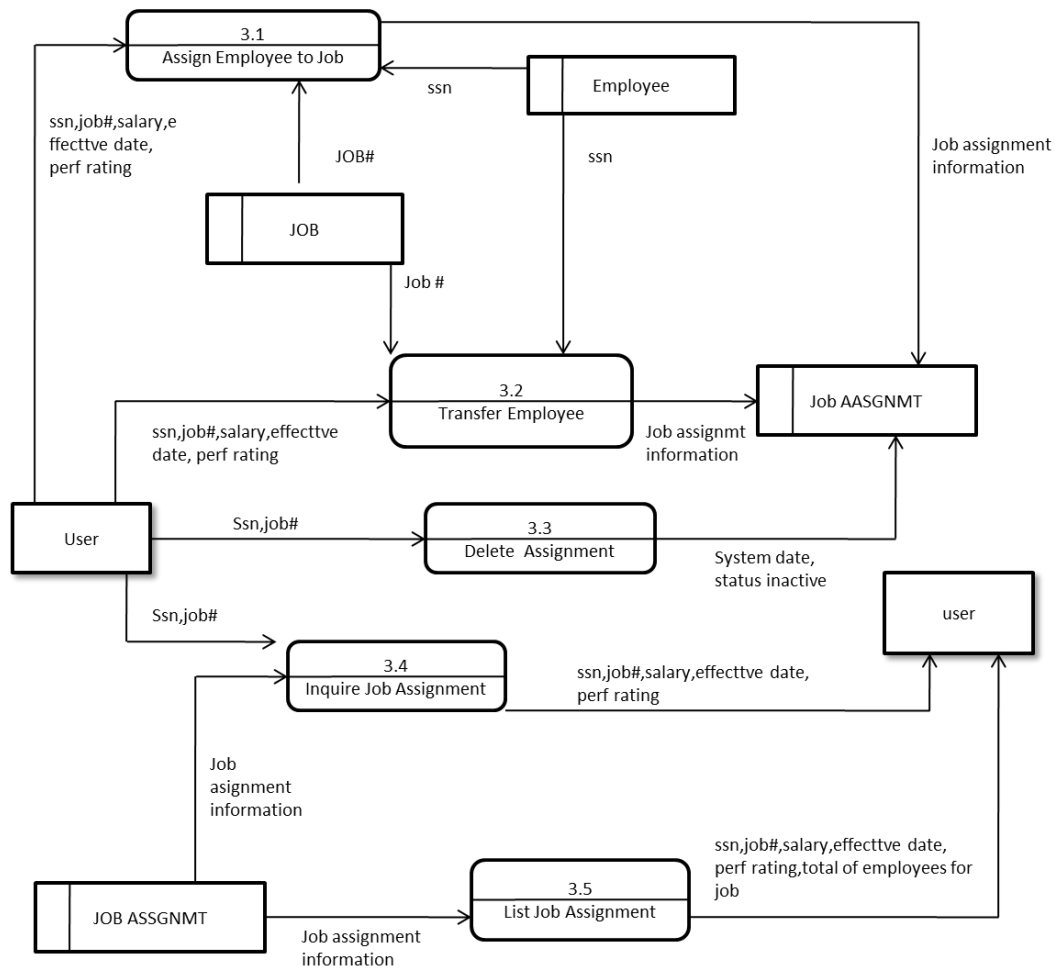Below is the data diagram for the process to maintain employee information.

Job Maintenance

Below is the data flow diagram for the process to maintain job information.

Job Assignment Maintenance

Below is the data flow diagram for the process to maintain job assignment information.

| 3.1 |
| Assign Employee to Job |

Employee

ssn

ssn,job#,salary,effecttve date, perf rating

JOB#

Job assignment information

JOB

Job #

ssn

| 3.2 |
| Transfer Employee |

Job AASGNMT

ssn,job#,salary,effecttve date, perf rating

Job assignmt information

User

Ssn,job#

| 3.3 |
| Delete Assignment |

System date, status inactive

user

Ssn,job#

| 3.4 |
| Inquire Job Assignment |

ssn,job#,salary,effecttve date, perf rating

Job asignment information

JOB ASSGNMT

Job assignment information

| 3.5 |
| List Job Assignment |

ssn,job#,salary,effecttve date, perf rating,total of employees for job

Location Reporting

Below is the data flow diagram for the process to report location information.
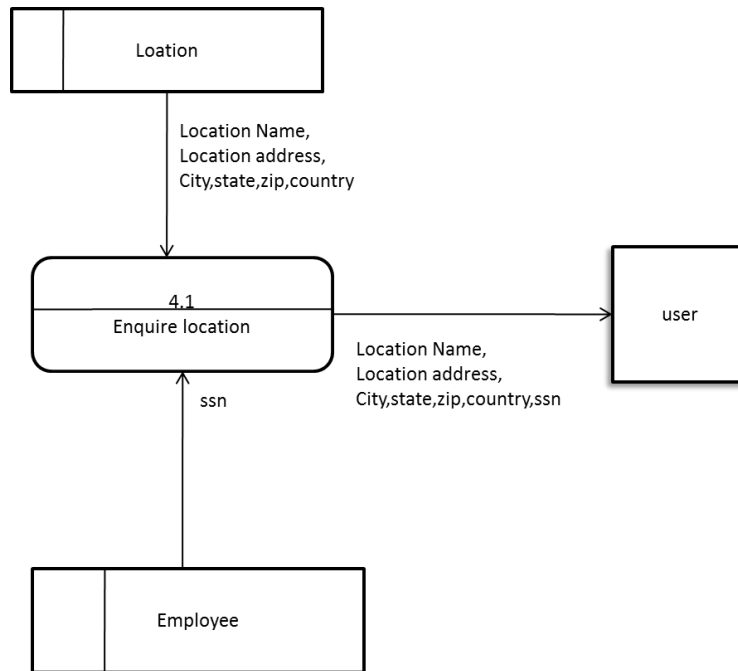
Key: This set of diagrams could have been expressed in equivalent forms, such as a process model, without affecting the function point count.