Project Design Report

Payroll Management System

PAYDAY

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Introduction

This database will serve as a payroll system for a company and its employees. The database that we are creating oversees all that has to do with the way a business is paying workers and documenting business charges. This payroll system generally caters towards the employers of general organizations that look for a productive method to pay and monitor worker money related records. The customer base may comprise businesses of all sizes that need an advantageous payroll system of their own. The design of this framework allows it to be seamlessly carried out whichever sort of business our customers may require.

Our motivation for creating this product is that our team is composed of young adults eager to begin our careers in the professional workforce. Whether we are working for a business or beginning our own, we wanted to create a tool that could be valuable to all persons involved.

This database is intended for businesses that might want to monitor their money related records without the dissatisfaction of having to interminably look for one specific snippet of data. It will keep their information composed and can be utilized for discovering records on an employee easily and expeditiously. One of the significant parts of our product incorporates the portion of hours for explicit projects, teams, and departments. This element permits businesses to effortlessly track and determine which department and project budgets to pay employees out of, allowing for proper budgeting and allocation of funds. This element will likewise be favorable for employees of all levels, by monitoring their hours for each pay period, and their hourly compensations.

<u>System Features</u>

- ❑ Employee pay tracking
- ❑ Tax deductions
- ❑ Employee Base Salary
- ❑ Pay & Benefits
- ❑ Employee Personal information
- ❑ Performance Reviews

Requirement Analysis

User Requirements - features our users want in this payroll management system

- User Requirement 1: The system will allow the user to find the department an employee is under.
- User Requirement 2: The system will allow the user to view the performance of an employee.
- User Requirement 3: The system will allow the user to view if an employee manages a department.
- User Requirement 4: The system will allow the user to check which projects the employee has worked on.
- User Requirement 5: The system will allow the user to check which projects the employee is currently working on.
- User Requirement 6: The system will allow the user to view how many hours the department has worked on a project.
- User Requirement 7: The system will allow the user to see how many teams a department has.
- User Requirement 8: The system will allow the user to view an employee's pay stub.
- User Requirement 9: The system will allow the user to view an employee's federal and state tax.
- User Requirement 10: The system will allow the user to view an employee's if an employee accepted the benefits that were proposed to them by the company.
- User Requirement 11: The system will allow the user to view an employee's base salary.

Constraints

- An employee has to work on at least one project and a project can have many employees working on it.
- An employee has to authenticate themselves with their SSN to view their performance.
- An employee can manage up to one department and a department only has one manager.
- A department can have many many task managers and a task manager will only approve one project.
- An employee can only be proposed at most one benefit package and can also only accept one benefit package.
- An employee can only receive one payout.
- A payout can have at most one W2 form and have at most one tax deduction from the tax system. The tax system consists of federal and state tax.

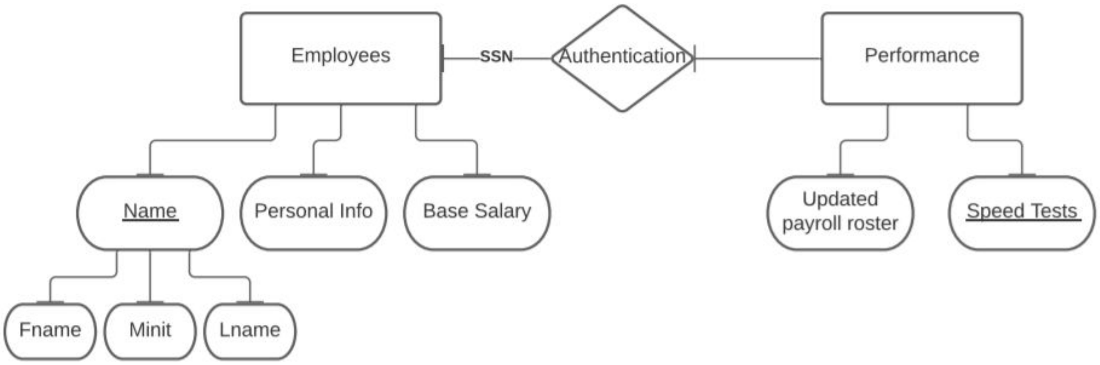
Data Requirements

- Data Requirement 1: Employees data - SSN, name, personal information, base salary; Employees have a relationship with Payout, Department, Projects, and Performance.
- Data Requirement 2: Department data - name, location, teams; Department has a relationship with Employees and Projects.
- Data Requirement 3: Projects data - number or workers, name, and hours; Project has a relationship with Employees and Department.

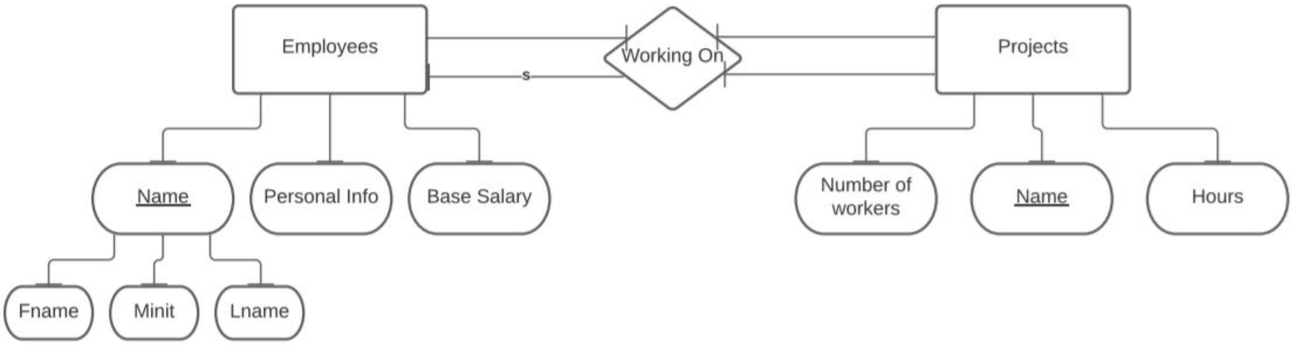
- Data Requirement 4: Performance data - updated payroll roster, speed tests; Performance has a relationship with Employees.
- Data Requirement 5: Payout data - paystub, roster; Payout has a relationship with Employees and Department.
- Data Requirement 6: Tax System - state tax, federal tax; Tax System has a relationship with Payout.

Functional Requirements

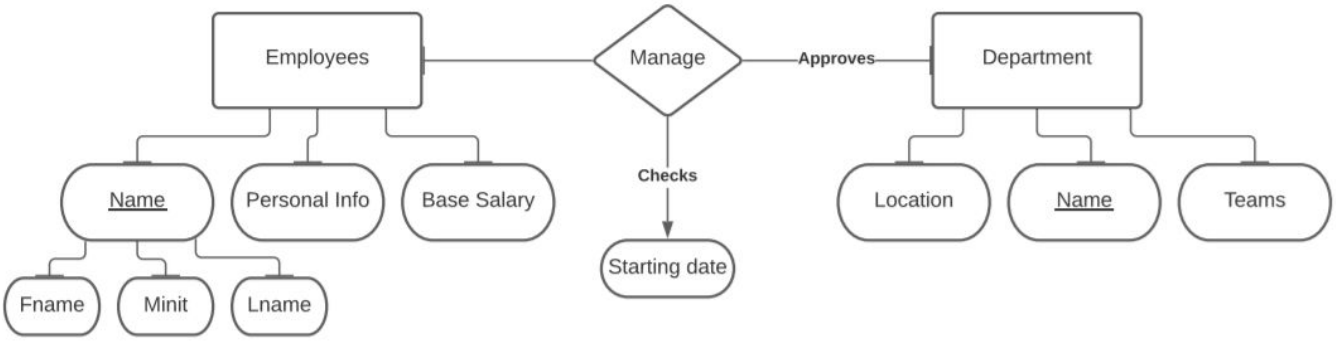
- Functional Requirement 1: Find the performance review of an employee with an employee's social security number.



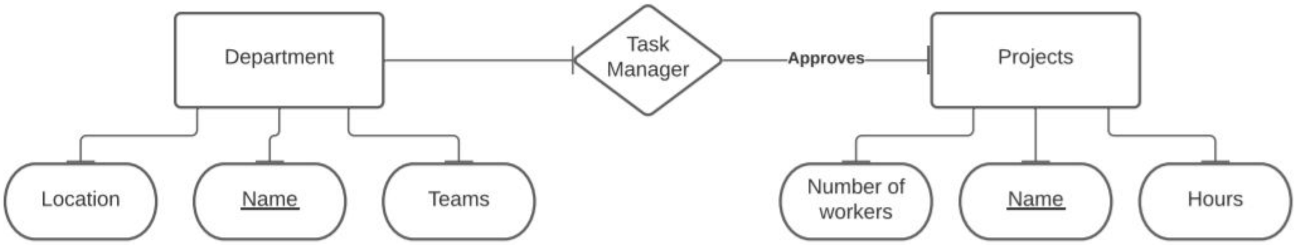
- Functional Requirement 2: Find which projects an employee is working on with input Employees name and Projects name.



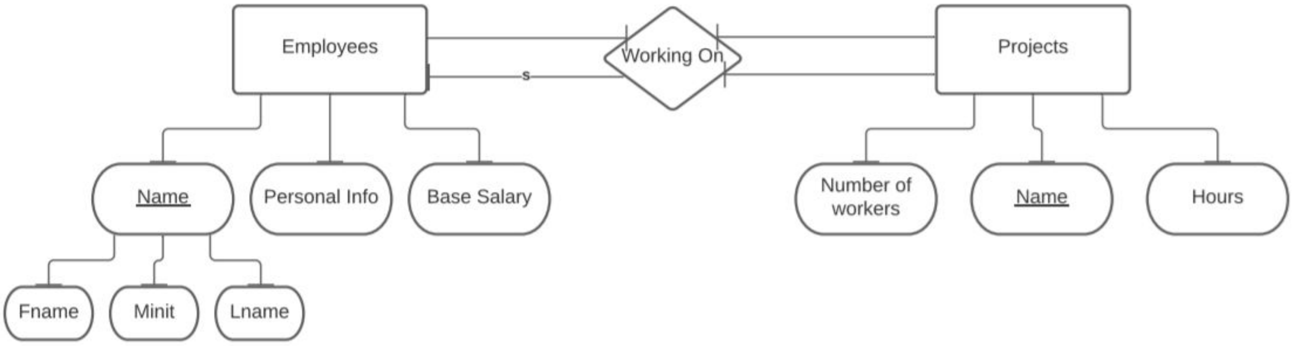
- Functional Requirement 3: Find which teams, if any, an employee is a part of with input Employees name and Department teams.



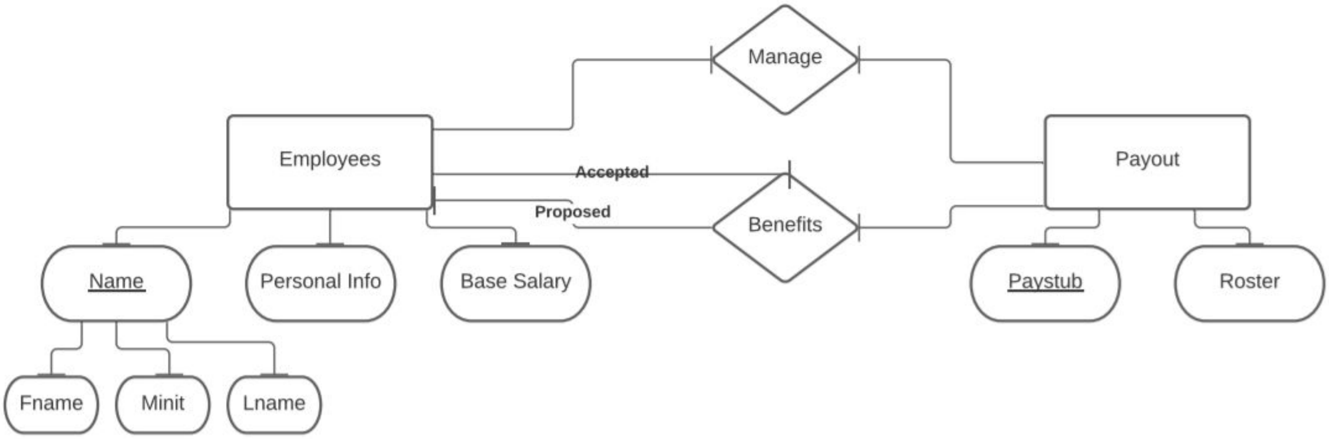
- Functional Requirement 4: Find which project a department is working on with input Department name and Project name.



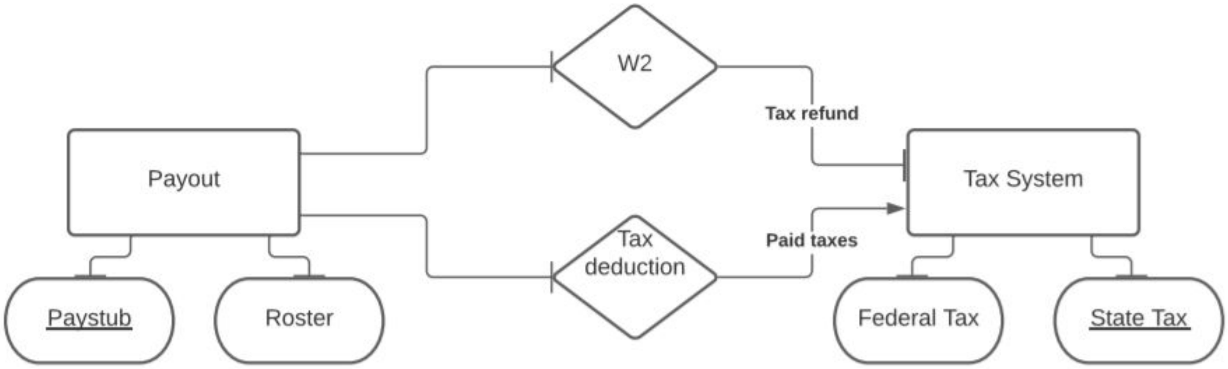
- Functional Requirement 5: Find how many hours an employee worked on a project with input Employee name and Project name.



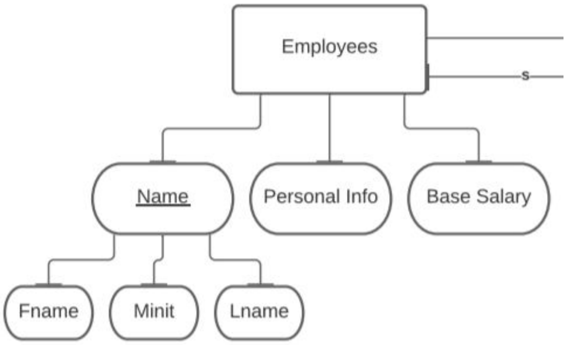
- Functional Requirement 6: Find if an employee receives benefits from the company with input Employee SSN and Pay benefits.



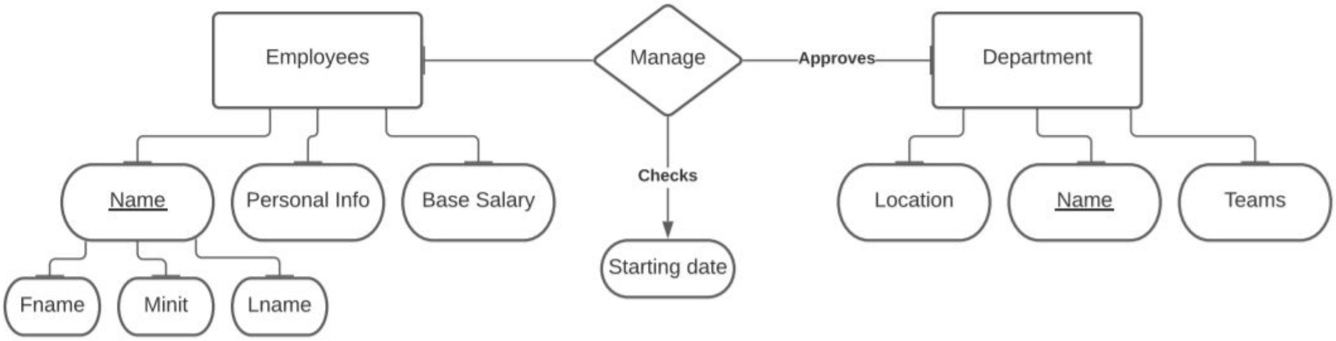
- Functional Requirement 7: Find how much an employee paid in federal tax with input Employee name and Tax System federal tax.



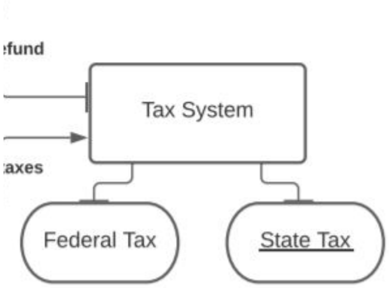
- Functional Requirement 8: Find the base salary of an employee with input Employee name and base salary.



- Functional Requirement 9: Find the starting date of a department’s manager with input Employees name and relationship Manage starting date.



- Functional Requirement 10: Find how much an employee paid in taxes, total, with input Employees name and Tax System federal tax and state tax.



Conceptual Design

Entities and Attributes

Entity 1: Department

Entity: The entity named department houses all the companies who are enrolled in using the payroll system. The department entity has three attributes, all of which are mandatory for each company to provide in order to use the service.

Attributes

- Name: This attribute refers to the specific name of the department that is using the payroll system.
- Teams: This attribute refers to the specific teams within the department.
- Location: This attribute refers to the location of the companies who are using the payroll system.

Relationships

- Relationship: The entity department has the relationship with the entity projects. This relationship represents the companies of the department assigning projects via task manager to the projects entity. Projects pulls the information from this relationship and distributes the data as needed.
- Relationship: The entity department has a mutual relationship with employees and payout via “manage”. These relationships are needed in order for the companies to have direct control over their employees and employee pay rates.

Primary Key

- It is identified by the name attribute because it is the main mandatory specification of each company that uses the payroll system

Entity 2: Projects

Entity: The entity named projects houses the numerous and specific projects put out by the companies using the payroll system. The project's entity inputs the data from the department and outputs the data accordingly to employees.

Attributes

- Number of Workers: This attribute refers to the specific employee and number of employees
- Name: This attribute refers to the specified names of each project and the data to go along with it.
- Hours: This attribute refers to the amount of time each project logs to complete as well as the estimated time of completion.

Relationships

- Relationship: The projects entity has a relationship with the entity department via the task manager relationship. This relationship is mostly dependent on the department entity for data in order to function.

- Relationship: The project's entity has a direct one to none relationship with employees via the working on relationship. This relationship exists in order to distribute the project details to employees and also log the project hours of each individual project worked on.

Primary Key

- It is identified by the name attribute as it is the most distinct way to separate the project data.

Entity 3: Employees

Entity: The entity named employees takes on the role of the most intractable entity. This entity is determined solely by department and stores the data of each companies' specific employees.

Attributes

- Base salary: This attribute refers to the standard amount of pay determined by the company that the employee works for.
- Personal information: This attribute refers to the employee's personal information in regards to their social security number, ethnicity, resume, etc. etc.
- Name: This attribute refers to the name of specific employees who work for the companies using our payroll system along with the data in respect to that name.

Relationships

- Relationship: The employee entity has a relationship with the department via the "manage" relationship. This relationship is imperative as it is the department who determines which employees will go into the entity.
- Relationship: The employee entity has a relationship with projects via the working on relationship. This relationship exists to show employees specifically what projects they will be working on while also logging the hours of each project into the project entity.
- Relationship: This relationship between payout and employees exists via the benefits relationship. This relationship exists in order to pay the employees who work for their respective companies.
- Relationship: This relationship between performance and employees exists via the authentication relationship. in order to upkeep system maintenance. The employees must be currently employed and verified in the system to be accounted for in the system maintenance. This is purely for system performance in order to keep it outputting the most current and accurate results possible.

Primary Key

- It is identified by the name attribute as it is the most distinct way to identify that employee's data.

Entity 4: Payout

Entity: The entity named payout takes on the role of paying the employees based on the data managed by the department. This entity houses the paystub and roster for the employee and the companies who use the payroll system.

Attributes

- Paystub: This houses the employees' weekly pay stub and salary.
- Roster: This attribute stores the active roster of employees within a given department.

Relationship

- Relationship: The payout entity has a relationship with employees via the benefits relationship. This relationship exists in order to connect employees with information towards their pay in respect to the company's payroll.
- Relationship: The relationship between payout and department exists in order to manage the amount paid to employees via the payout entity.
- Relationship: The relationship between payout and tax system exists in two ways via the W2 relationship and the tax deduction relationship. The W2 relationship exists to serve as the taxes deducted out of the employees checks along with their tax refund. The tax deduction relationship exists to show how much tax is deducted via the tax system which is largely based on where the employee lives.

Primary Key

- It is identified by the roster attribute as this is the distinct way to identify which group of employees belong to a specific department.

Entity 5: Tax System

Entity: The entity named tax system serves to regulate taxes invoked by the state and federal rates. This entity will have direct relation with payouts as it is what collects tax money and stores the amount that should be refunded given that the employee files their taxes.

Attributes

- Federal tax: This attribute attests to the amount of taxes invoked by the federal government to be paid.
- State Tax: This attribute attests to the amount of taxes invoked by state governments to be paid.

Relationship

- Relationship: The relationship between payout and tax system exists in two ways via the W2 relationship and the tax deduction relationship. The W2 relationship exists to serve as the taxes deducted out of the employees checks along with their tax refund. The tax deduction relationship exists to show how much tax is deducted via the tax system which is largely based on where the employee lives.

Primary Key

- It is identified by the state tax attribute as the federal tax is more of a national standard rate and the state tax fluctuates from location to location.

Entity 6: Performance

Entity: The entity named Performance exists to exhibit system performance and upkeep maintenance via speed tests and cleaning. This entity will hold an updated payroll roster in order to keep up to date with who is and isn't currently active within the payroll system.

Attributes

- Updated Payroll Roster: This attribute accounts all of the participants within the payroll system.
- Speed Tests: This attribute takes care of upkeep and maintenance to keep the system working as new.

Relationship

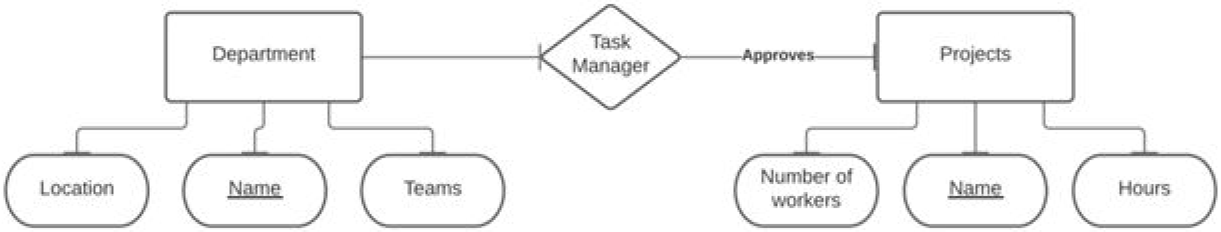
- Relationship: The relationship between performance and employee exists via the authentication relationship. This relationship exists in order to verify whether or not an employee is truly within the system whether they are new hires or terminated employees. This is all to upkeep the system by removing whoever is no longer eligible and making sure the employees who are authenticated fit into the system as advertised.

Primary Key

- It is identified by the updated payroll roster as the data stored here may fluctuate and needs to be represented accurately to achieve efficient system performance.

Relationships

Relationship 1*: Task Manager*



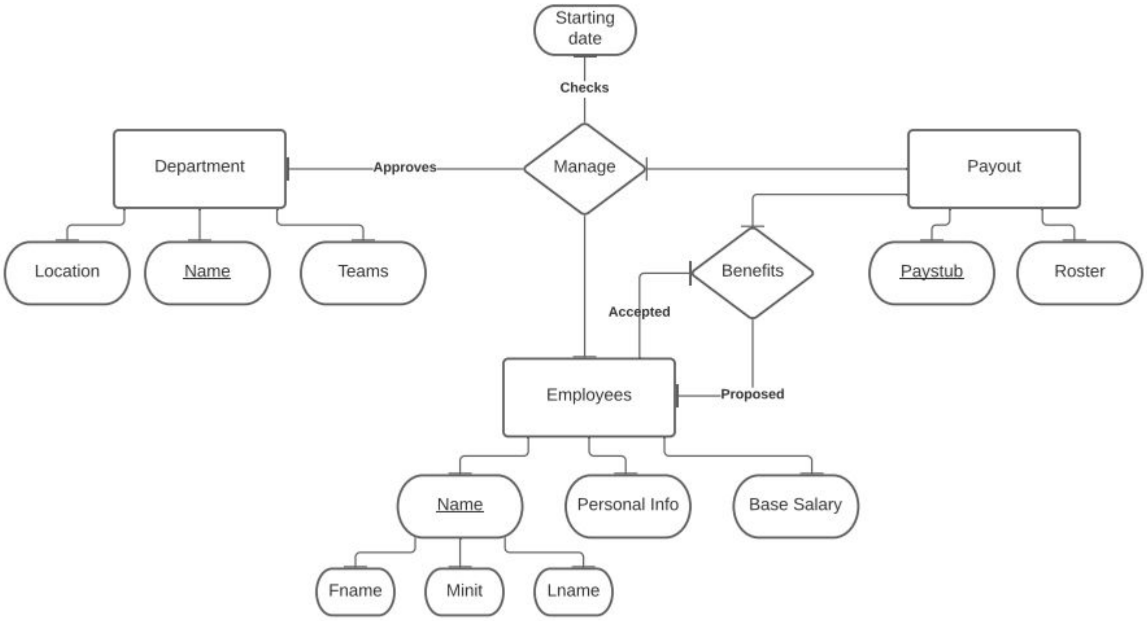
Relation: Shows the relation between Entity Department and Entity Projects …

Attributes

- Name (Foreign Key from Department): This key directly pushes specific information from a specific company onto the task manager.
- Name (Foreign Key from Projects): This key directly pulls from the specified project given by the company who proposes the data.

Cardinality: The cardinality of the Task Manager relationship Department and Projects is (1:N)

Relationship 2*: Manage*



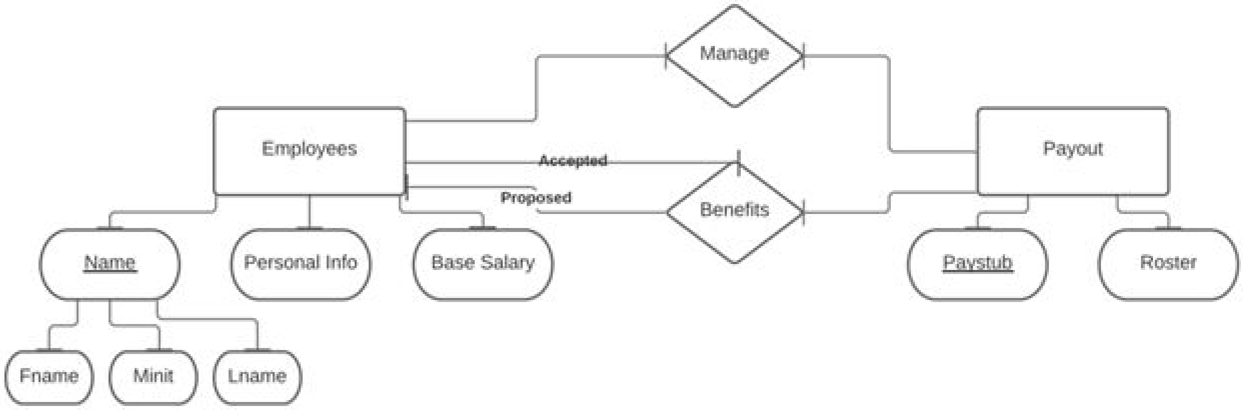
Relation: Shows the relation between Department, payout, and Employees …

Attributes

- Name (Foreign Key from Department): This key pushes data onto “manage” in order to be pulled onto the payout entity.
- Personal info (Foreign Key from Employees) This key makes sure the employee’s personal information is authentic then stored in the company database for employees via the “manage” relationship.
- Starting Date: This checks the employee’s hiring day to verify them before initializing their identity within the payroll system.

Cardinality: The cardinality of the Manage relationship between Department and Employee is (1:1)

***Relationship 3**: Benefits*



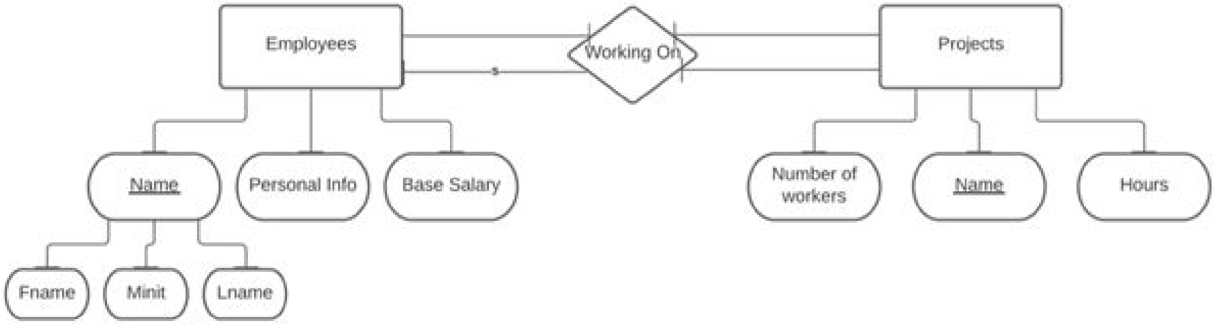
Relation: Shows the relation between Employees and Payout …

Attributes

- Paystub: This directly relates to employees as it is what determines the eligibility of benefits given out by the employee’s respective companies when earned.

Cardinality: Ther cardinality of the Benefits relationship between Employee and Payout is (1:1)

***Relationship 4**: Working On*



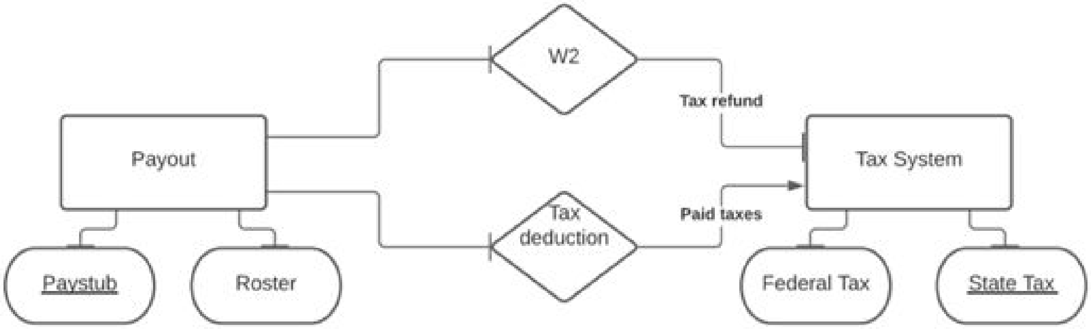
Relation: Shows the relation between Projects and Employees …

Attributes

- Number of workers (Foreign Key from Projects): This signifies the amount of employees will be assigned to a specific project to work on.
- Name (Foreign Key from Employee): This pulls the data from projects to specify who is working on a specific task.

Cardinality: The cardinality of the Working On relationship between Employees and Projects is (1:N)

***Relationship 5**: W2 and Tax Deduction*



Relation: Shows the relation between the Tax system and Payout

Attributes

- Federal tax (Foreign Key from Tax system): This returns the tax refund eligible via the employee's W2
- Roster: Depending on the location of the employees on the roster the tax deduction can determine what state tax to deduct from that employee's paychecks.

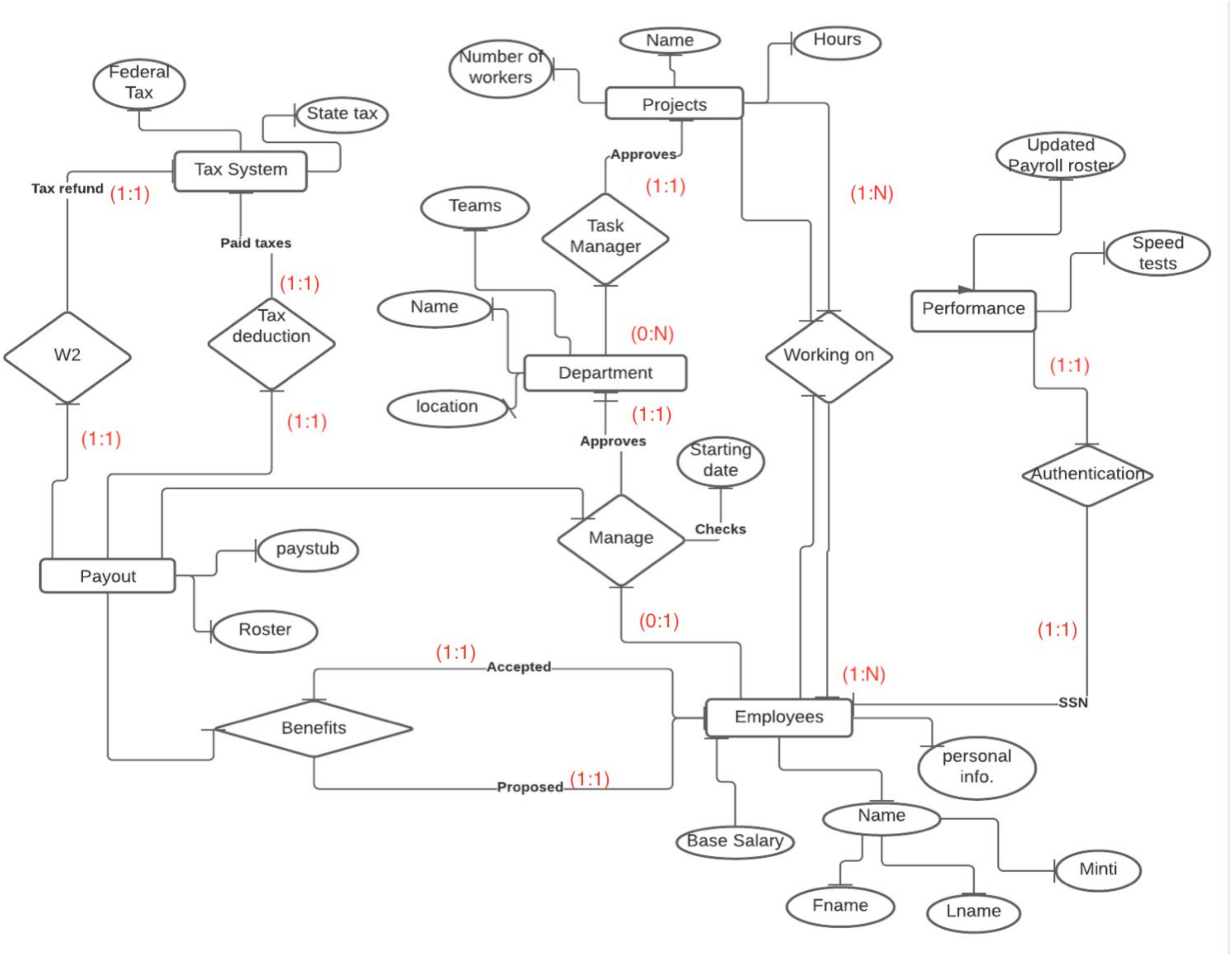
Cardinality: The cardinality of the Tax deduction relationship between Payout and Tax System is (1:1) and the cardinality of the W2 relationship between Payout and Tax System is (1:1).

Teamwork

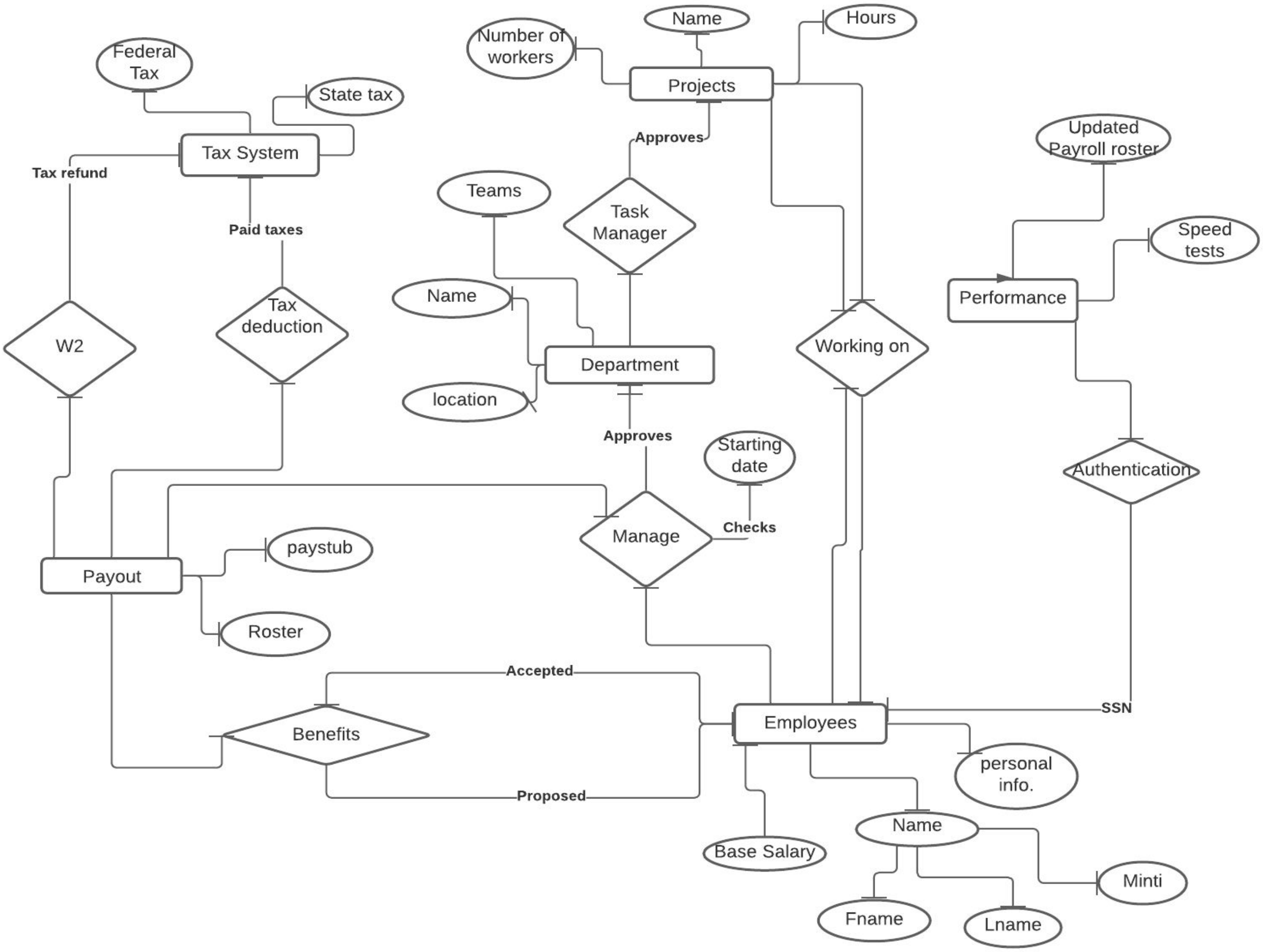
- **Dani Major**: Introduction, Appendix A - ER diagram cardinality ratios, and Conceptual design : cardinalities
- **Redghy Jean**: Appendix A - Full ER diagram outline, Conceptual design: entities and attributes, Relationships : relations and attributes.
- **Juana Tavera**: Requirement Analysis - user requirements, constraints, data requirements, and functional requirements

Appendix A

ER Diagram with cardinality ratios.



ER Diagram without cardinality ratios.


Federal Tax
State tax
Tax System
Tax refund
Paid taxes
W2
Tax deduction
Number of workers
Name
Hours
Projects
Approves
Task Manager
Teams
Name
Department
location
Approves
Starting date
Checks
Manage
Working on
Updated Payroll roster
Speed tests
Performance
Authentication
Payout
paystub
Roster
Accepted
Benefits
Proposed
Employees
SSN
personal info.
Name
Base Salary
Fname
Lname
Minti