Project: Reliable Electronics Database

Reason for Opting This Database Design

Reliable Electronics faces critical issues with equipment tracking, excessive inventory costs, and inefficiencies in the maintenance department. Developing a robust, automated database system will improve operational efficiency, reduce losses, and provide real-time data to aid decision-making. This project aims to address these challenges through a well-designed relational database system that connects employees, equipment, materials, and maintenance requests efficiently.

By implementing this design, the goal is to understand how centralized systems can streamline operations, reduce costs, and improve accountability within a corporate environment.

Process Flow Description

- **Equipment Checkout:** Maintenance employees check out tools and equipment for assigned tasks through the system. A record of the equipment's condition and return status is maintained.
- **Material Request and Usage:** Employees request materials needed for tasks. Materials are retrieved from warehouses, with real-time tracking of stock levels.
- **Maintenance Requests:** Employees submit maintenance requests with details such as priority and description. Each request involves tools, materials, and employees assigned to resolve the issue.
- **Warehouse Management:** Centralized warehouses manage inventory, track stock, and process material orders from suppliers. The system ensures that materials and tools are efficiently distributed across locations.
- **Reporting and Accountability:** Supervisors receive reports on tool usage, material consumption, and maintenance request statuses. This ensures accountability and supports decision-making.

Database Design

Company Table

Purpose: Stores details about the company, such as name and location, for identifying organizations.

Primary Key: CompanyID

Employee Table

Purpose: Stores details about employees, their roles, and assigned work locations.

Primary Key: EmployeeID

Foreign Key: DepartmentID connects to the Department table. AssignedLocationID connects to the Building table.

Relationships: Each employee belongs to a department (DepartmentID). Each employee is assigned to a building (AssignedBuildingID).

Building Table

Purpose: Stores details about company locations, including address and building/plant information.

Primary Key: LocationID

Relationships: Serves as the work location for employees (AssignedBuildingID in Employee table). Associated with maintenance requests (BuildingID in Maintenance Request table).

Equipment Table

Purpose: Tracks equipment inventory, including type, value, and storage location.

Primary Key: EquipmentID

Foreign Key: WarehouseID connects to the Warehouse table.

Relationships: Equipment is stored in warehouses (WarehouseID). Equipment can be checked out by employees (EquipmentID in Equipment Checkout table).

Equipment Checkout Table

Purpose: Logs the check-out and return of equipment by employees, including due dates and return conditions.

Primary Key: CheckoutID

Foreign Key: EmployeeID connects to the Employee table. EquipmentID connects to the Equipment table.

Relationships: Tracks which employee (EmployeeID) checked out specific equipment (EquipmentID).

Warehouse Table

Purpose: Stores warehouse details, including name, location, and inventory capacity.

Primary Key: WarehouseID

Foreign Key: LocationID connects to the Building table.

Relationships: Warehouses are located at specific buildings (LocationID). Stores equipment, materials, and tools (WarehouseID in Equipment, Materials, and Tool tables).

Materials Table

Purpose: Tracks consumable materials like screws, nails, and plywood stored in warehouses.

Primary Key: MaterialID

Foreign Key: WarehouseID connects to the Warehouse table.

Relationships: Materials are stored in warehouses (WarehouseID). Used for maintenance tasks or requests (MaterialID in Maintenance Request table).

Tool Table

Purpose: Manages inventory of tools, including their condition and value.

Primary Key: ToolID

Foreign Key: WarehouseID connects to the Warehouse table.

Relationships: Tools are stored in warehouses (WarehouseID). Tools may be checked out via the equipment checkout process (EquipmentID in Equipment Checkout table).

Maintenance Request Table

Purpose: Stores details of maintenance requests, including priority, status, and location.

Primary Key: RequestID

Foreign Key: RequestedBy connects to the Employee table. LocationID connects to the Building table.

Relationships: Tracks the employee (RequestedBy) who submitted the request. Associated with specific buildings (LocationID).

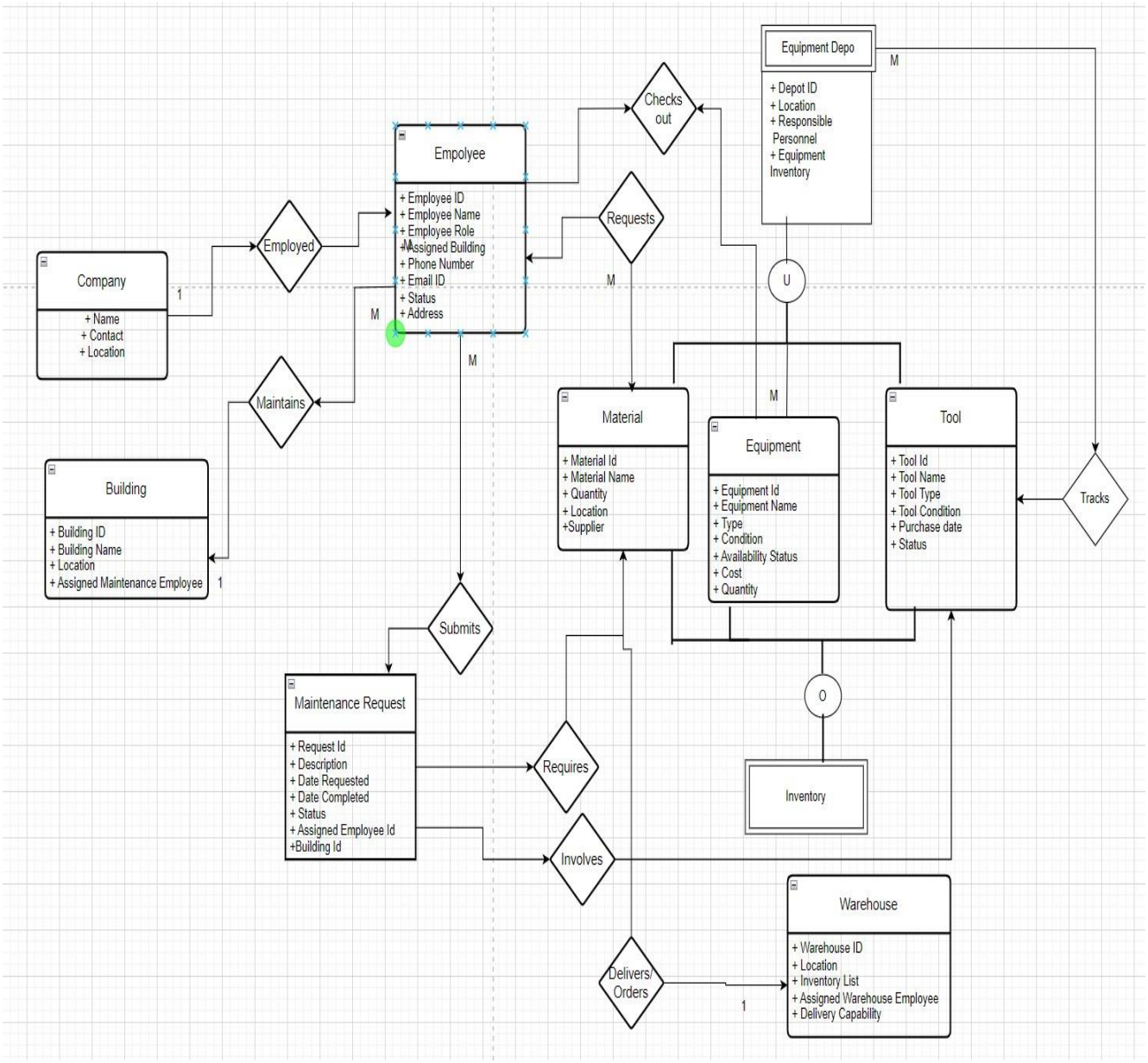
Department Table

Purpose: Organizes employees into departments and stores department details.

Primary Key: DepartmentID

Relationships: Employees are linked to departments (DepartmentID in Employee table).

EER Diagram



Relationships between tables

The company maintains **multiple buildings**, each assigned a maintenance employee responsible for overseeing its upkeep. Employees working in these buildings can submit **maintenance requests**, which are linked to the building and handled by assigned employees. The equipment **depot** manages various equipment items, categorized by type, condition, and availability, and employees can check out equipment as needed. Warehouses play a critical role by storing inventory, including materials, tools, and equipment, which are tracked individually. Maintenance requests often require materials sourced from warehouse inventory. Tools are also managed within the system and are allocated to employees for specific tasks. **Warehouses** are supervised by assigned employees who manage inventory and handle deliveries to ensure smooth operations.