CS3700 - Introduction to Database Systems

Assignment-1: Database Design

Group - 10

Postal Delivery Database System

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1 Domain Description

Domain: Postal Delivery Service

Description:

In a postal delivery service, there are multiple branches, each of which has a unique branch ID and address consisting of building number, street name, city name, and pin code. Each employee in the company is identified by a unique employee ID, and has a home branch. Each employee has a name (first name, middle name, and last name), DOB, age, multiple phone numbers, and emails. Each Branch is managed by an employee(manager).

A person can send or receive one or more packages. Each package has a unique package ID and weight. Each person who sends or receives a package is assigned a unique person ID, additionally he/she has a name, phone number(s), and address.

A person directly gives his/her package to the nearest branch. Each branch collects all the packages and groups them into containers based on the destination addresses. Each container has a unique container ID and travels from branch to branch starting at its source branch till it reaches its destined branch. Multiple containers are allocated journeys, which represent shipments from one branch to another branch without intermediate stops. The containers embark on these journeys, continuously moving from one branch to another until they reach their destined branch. Each Journey has a unique journey ID and is driven by one employee. Each Journey has a start time, start date, and end time, end date from respective start and end branches. Each container is assumed to have at least one journey.

After the containers arrive at the destined branch, the packages are grouped into baskets based on the streets. Each basket within a branch is assigned a unique basket ID, distinguishing it from others within the same branch. These baskets are retrieved by branch employees at a designated time known as the "picked time." Additionally, each package contained within a basket is associated with both an expected delivery time and an actual delivery time.

2 Broad Purpose

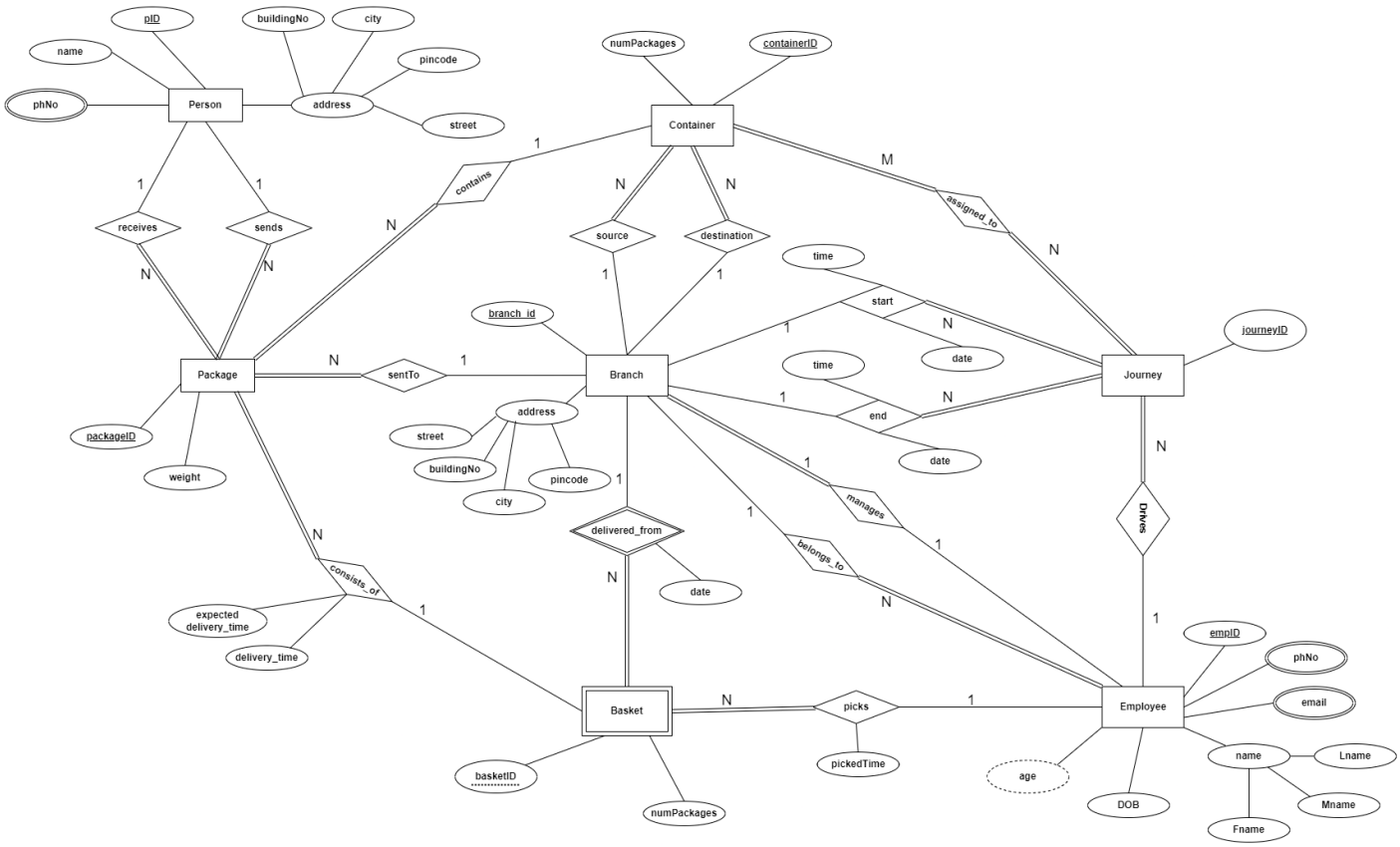
The database model described facilitates efficient package tracking within the postal delivery service. It enables the monitoring of packages as they move through the system, including tracking container journeys between branches and the status of individual packages. This functionality supports real-time visibility into the location and expected delivery times of packages.

Additionally, the database serves as a comprehensive employee management tool. It stores essential employee information such as unique IDs, contact details, and as-

signed roles within the organization. This facilitates the efficient allocation of tasks, management of work schedules, and tracking of employee performance.

Furthermore, the database supports performance analysis by providing access to key metrics such as delivery times and journey durations. By leveraging insights derived from the database, the postal delivery service can enhance route efficiency, reduce delivery times, and ultimately improve overall service quality for its customers.

3 ER Model



4 Relational Database