SRS Documentation

Bus Management

(Assignment 1)

Prepared by

DEBOPRIYO GHOSH **Roll-35**

SAIKAT JANA **Roll-50**

MOUSUMI MONDAL **Roll-40**

SARADINDU RANA **Roll-28**

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Contents

Assignment

You have to analyse the situation; prepare the requirements (functionalities i.e. the probable reports that may be needed by consumers); accordingly decide the data requirement, express it through E-R data model. clearly state the assumptions, if any.

A Country Bus Company owns a number of busses. Each bus is allocated to a particular route, although some routes may have several busses. Each route passes through a number of towns. One or more drivers are allocated to each stage of a route, which corresponds to a journey through some or all of the towns on a route. Some of the towns have a garage where busses are kept and each of the busses are identified by the registration number and can carry different numbers of passengers, since the vehicles vary in size and can be single or double-decked. Each route is identified by a route number and information is available on the average number of passengers carried per day for each route. Drivers have an employee number, name, address, and sometimes a telephone number.

1.Data Requirement

TOWNS: Each town has unique town name , the state in which the town is situated and area covered by this town.

BUSSES: Every bus has unique registration number which is given by the country.

TYPE: It describes the type of the bus. Every type of bus has an unique id which decide its size, deck number and number of passengers can travel in it. Size can be differentiating in large, medium and small. Deck may be single or double.

ROUTES: Every route has specific route number, average passenger i.e. number of passenger travel per day on this route.

DRIVERS: Each driver has unique employee id, name of driver, address and telephone number.

GARAGE: Every garage is situated in a particular town. Every garage has unique garage id given by country, capacity which denote maximum number of buses can be kept in the garage.

STAGES: Stage is the part of a long route. Each stage has specific stage id to identify stage of a route.

2.Assumptions

a. This is a simple Bus management system where every procedure is not same as the real-life management systems, here we can develop many functionalities according to our needs. Hence we are avoiding many complex situations which may occur in proper Bus management system. The system may have modified to generate a more improved version.

b. This Bus management system may contain one or many an administrator whose role is to organize the database and they are not a direct part of the database.

c. Whenever the User wants to find the route between two different bus stops he/she gives input to the system the source and destination bus stop. Now after receiving the input the system checks whether any route exist between the stop or not and displays the result accordingly. Multiple routs can originate from one bus stop. It is not necessary that there exists a route between two stops.

d. The system keeps track of the total buses and drivers and corresponding routes, hence it also knows the number of available buses in respect to each garage and each route. Now the booking ticket of the available buses is not a part of the database. And allocation of drivers and garages, changes of routes by admin can be modified with this system later on.

3.Entity-Relationship Diagram

A. Attribute

TOWNS: { Town_name , State, Area }

BUSSES: { Reg_no }

TYPE: { Type_id , Size , Deck , Passenger_no }

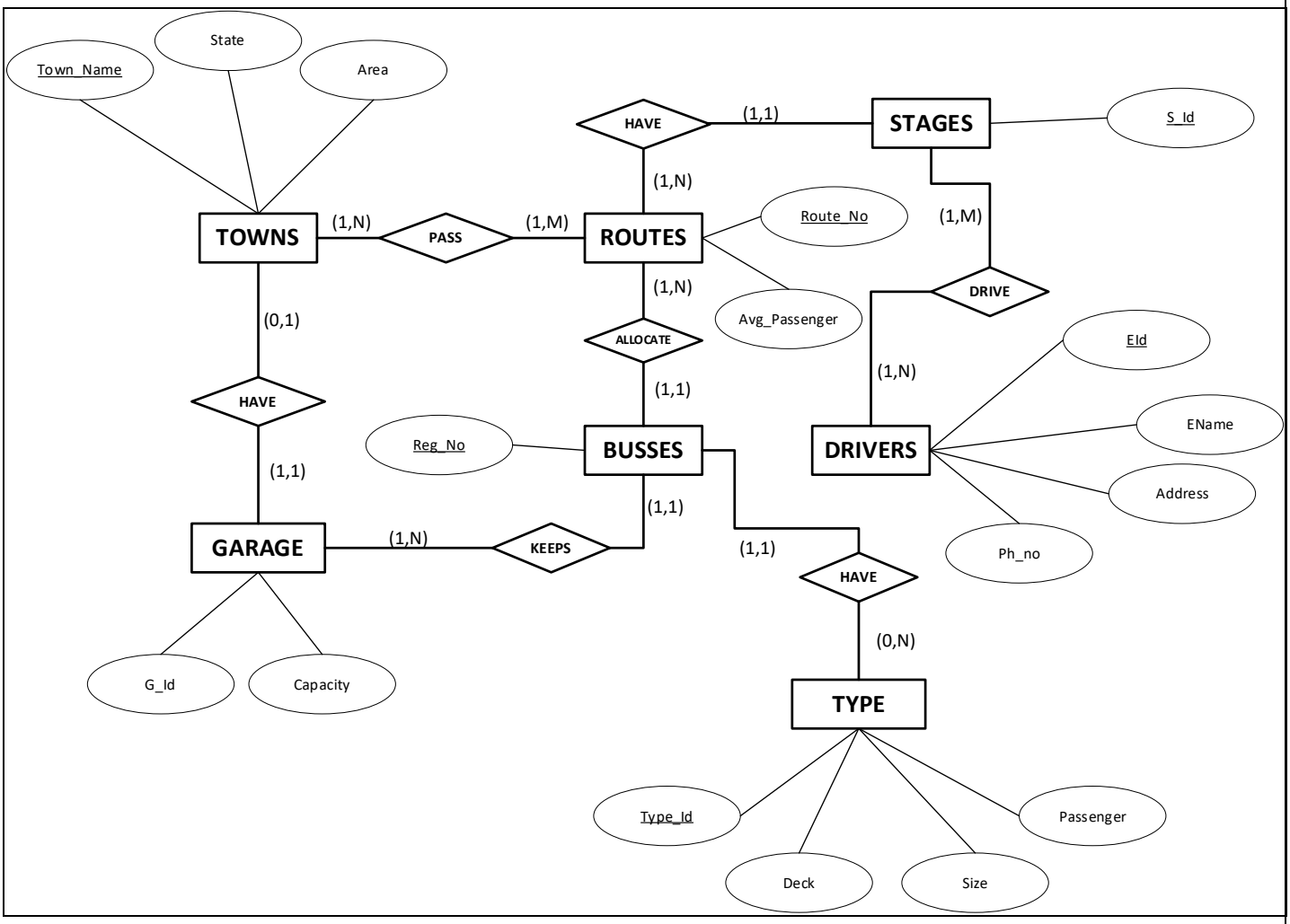
ROUTES: { Route_no , Avg_passenger }

DRIVERS: { E_id , E_name , Address , Tel_no }

GARAGE: { G_id , Capacity}

STAGES: { S_id }

B. Diagram

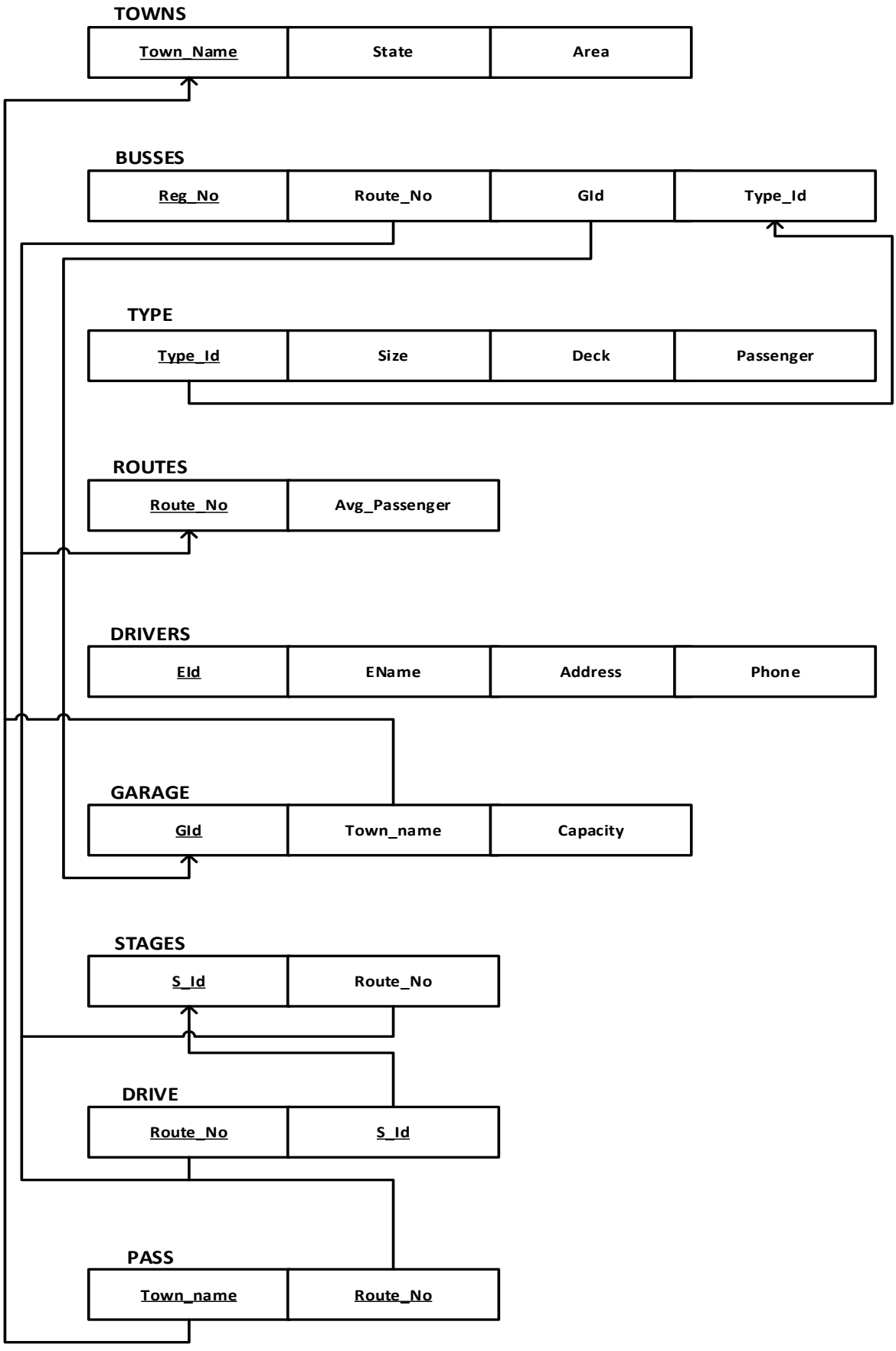


4. Relationships

1. A bus is allocated to a route and a route may have several busses.
2. Bus-route (N:1) is serviced by
3. A route comprises of one or more stages.
4. Route-stage (1:N) comprises
5. One or more drivers are allocated to each stage and one driver may drive one or more stages.
6. Driver-stage (N:M) is allocated
7. A route passes through some or all of the towns.
8. Route-town (M:N) passes-through
9. Some of the towns have a garage.
10. Garage-town (1:1) is situated
11. A garage keeps buses and each bus has one `home' garage.
12. Garage-bus (1:N) is garaged
13. Each bus has a specific type.
14. Bus-type(N:1) specified

5. Relation Schema

RELATION SCHEMA



6. Normalization of Relational Schema

Towns {Town_name ,State , Area }

Town_name -> {State, Area}

Town_name is the candidate key.

There is no multi valued attribute so the table is in 1nf.

Town_name is the primary key so there is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

BUSSES { Reg_no , G-id ,Type_id, Route_no}

Reg_no->G-id ,Type_id, Route_no

Reg_no is the candidate key.

There is no multi valued attribute so the table is in 1nf.

Reg_no is the primary key so there is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

TYPE {Type_id, Size, Deck, Passenger_no}

Type_id ->{ Size, Deck, Passenger_no}

Type_id is the candidate key.

There is no multi valued attribute so the table is in 1nf.

Type_id is the primary key so there is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

ROUTES {Route_no, Avg_passenger}

Route_no -> {Avg_passenger}

Route_no is candidate key .

There is no multi valued attribute so the table is in 1nf.

Route_no is the primary key so there is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

DRIVERS {E_id, E_name, Address, Tel_no}

E_id-> {E_name, Address, Tel_no}

E_id is candidate key.

There is no multi valued attribute so the table is in 1nf.

E_id is the primary key so there is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

GARAGE {G_id, Town_name, Capacity}

G_id -> { Town_name, Capacity}

G_id is the candidate key.

There is no multi valued attribute so the table is in 1nf.

G_id is the primary key so there is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

STAGES {S_id, Route_no}

S_id -> { Route_no}

S_id is the candidate key.

There is no multi valued attribute so the table is in 1nf.

S_id is the primary key so there is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

DRIVE {E_id, S_id}

E_id, S_id is a composite primary key.

There is no multi valued attribute so the table is in 1nf.

There is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.

PASS {Town_name,Route_no}

E_id, S_id is a composite primary key.

There is no multi valued attribute so the table is in 1nf.

There is no partial dependency, so the relation is in 2nf.

The table is in 3nf as there is no transitive dependency.