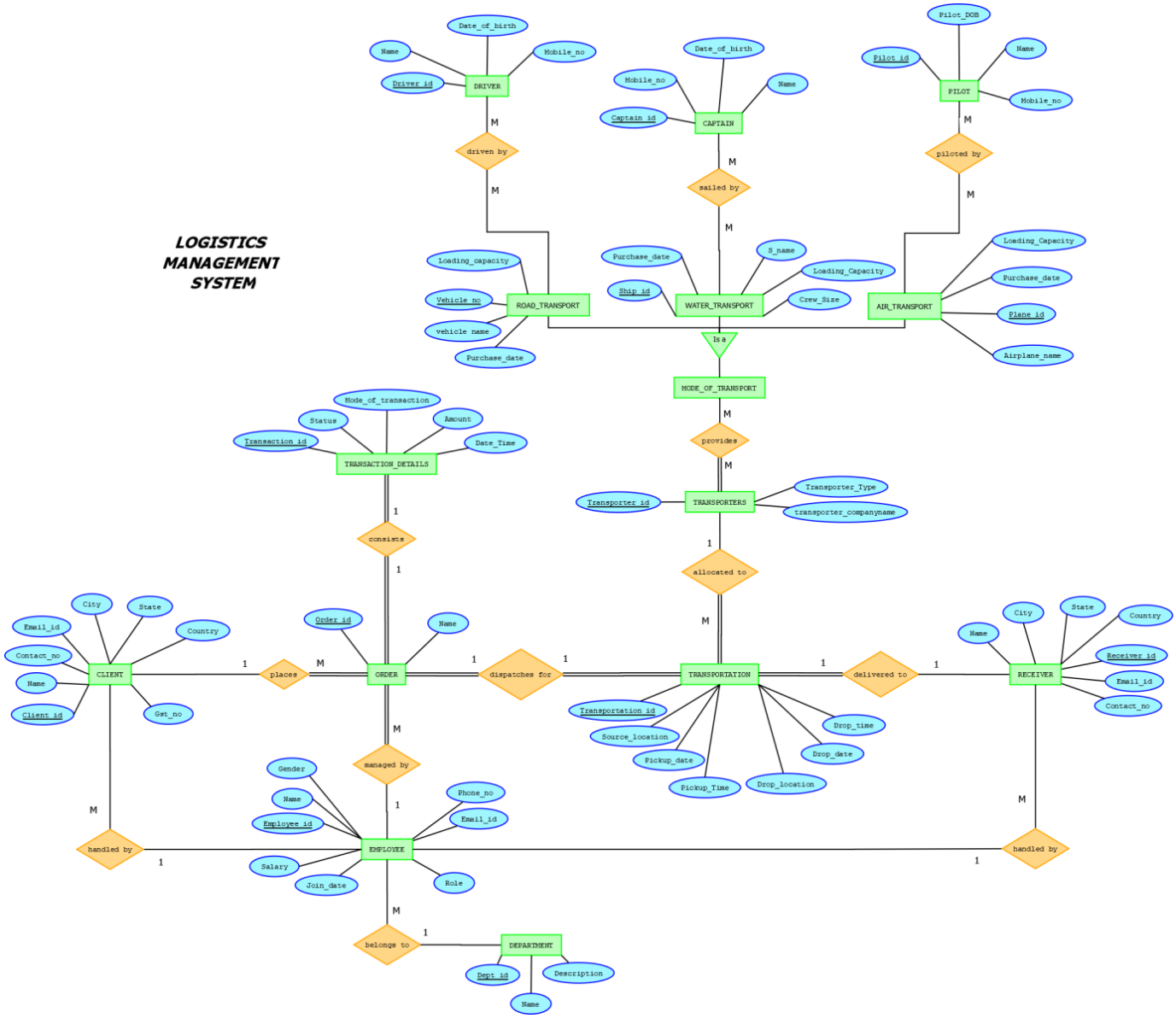
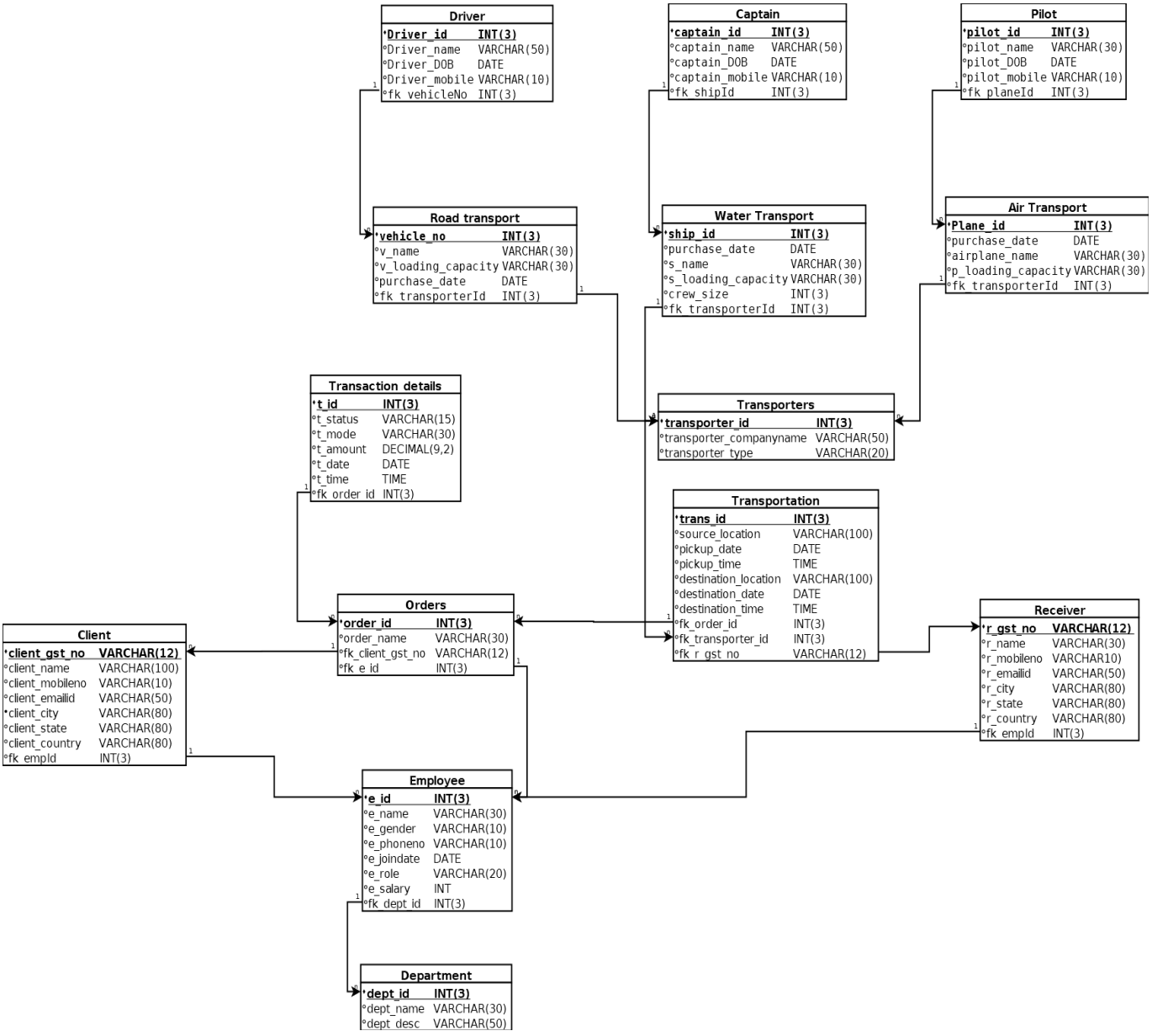
Entity Relation Diagram



Schema Diagram



Functional Dependencies and Normalization Forms

- Client (This table follows 3NF and BCNF)

(client_gst_no, client_name, client_mobileno, client_emailid, client_city, client_state, client_country, fk_empId)

client_gst_no -> client_name

client_gst_no -> client_mobileno

client_gst_no -> client_emailid

client_gst_no -> client_city

client_gst_no -> client_state

client_gst_no -> client_country

client_gst_no -> fk_empId

Constraints:-

- Candidate Keys: { client_gst_no }
- Primary Key: { client_gst_no }
- Non-key Attributes: { client_name, client_mobileno, client_emailid, client_city, client_state, client_country, fk_empId }

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Order

(order_id,order_name, fk_client_gst_no, fk_e_id)

order_id -> order_name

order_id -> fk_client_gst_no

order_id -> fk_e_id

Constraints:-

- Candidate Keys: {order_id}
- Primary Key: {order_id }
- Non-key Attributes: {order_name, fk_client_gst_no, fk_e_id }

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Transactions (This table follows 3NF and BCNF)

(t_id,t_status,t_mode,t_amount,t_date,t_time,fk_order_id)

t_id -> t_status

t_id -> t_mode

t_id -> t_amount

t_id -> t_date

t_id -> t_time

t_id -> fk_order_id

Constraints:-

- Candidate Keys: { t_id }
- Primary Key: {t_id}
- Non-key Attributes: {t_status, t_mode, t_amount, t_date, t_time, fk_order_id}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Employee (This table follows 3NF and BCNF)

(e_id,e_name,e_gender,e_phoneno,e_joindate,e_role, e_salary, fk_dept_id)

e_id -> e_name

e_id -> e_gender

e_id ->e_phoneno

e_id -> e_joindate

e_id -> e_role

e_id -> fk_dept_id

e_id -> e_salary

Constraints:-

- Candidate Keys: {e_id }
- Primary Key: {e_id}
- Non-key Attributes: {e_name ,e_gender ,e_joindate ,e_role, e_salary, fk_dept_id}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Department (This table follows 3NF and BCNF)

(dept_id, dept_name, dept_desc)

dept_id->dept_name

dept_id->dept_desc

Constraints:-

- Candidate Keys: {dept_id}
- Primary Key: {dept_id}
- Non-key Attributes: {dept_name,dept_desc }

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- # Transportation (This table follows 3NF and BCNF)

(trans_id,fk_order_id,source_location,pickup_date,pickup_time,destination_location,destination_date,destination_time, fk_transporter_id, fk_r_gst_no)

Trans_id -> fk_order_id

Trans_id -> source_location

Trans_id -> pickup_date

Trans_id -> pickup_time

Trans_id -> destination_location

Trans_id -> destination_date

Trans_id -> destination_time

Trans_id -> fk_transporter_id,

Trans_id -> fk_r_gst_no

Constraints:-

- Candidate Keys: {trans_id}
- Primary Key: {trans_id}
- Non-key Attributes: {fk_order_id,source_location, pickup_date, pickup_time, destination_location, destination_date , destination_time, fk_transporter_id, fk_r_gst_no }

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Transporter (This table follows 3NF and BCNF)

(transporter_id,transporter_companyname,transporter_type)

transporter_id->transporter_companyname

transporter_id-> transporter_type

Constraints:-

- Candidate Keys: {transporter_id}
- Primary Key: {transporter_id}
- Non-key Attributes: {transporter_companyname, transporter_type }

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Road Transport (This table follows 3NF and BCNF)

(vehicle_no, v_name, v_loading_capacity ,purchase_date,fk_transporterId)

vehicle_no->v_name

vehicle_no->v_loading_capacity

vehicle_no->purchase_date

vehicle_no->fk_transporterId

Constraints:-

- Candidate Keys: {vehicle_no}
- Primary Key: {vehicle_no}
- Non-key Attributes: {v_name, v_loading_capacity, purchase_date, fk_transporterId}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Water Transport (This table follows 3NF and BCNF)

(ship_id,purchase_date, s_name, s_loading_capacity,crew_size,fk_transporterId)

ship_id->purchase_date

ship_id -> s_name

ship_id-> s_loading_capacity

ship_id->crew_size

ship_id->fk_transporterId

Constraints:-

- Candidate Keys: {ship_id}
- Primary Key: {ship_id}
- Non-key Attributes: {purchase_date, s_loading_capacity, crew_size, s_name, fk_transporterId}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key

- Air Transport (This table follows 3NF and BCNF)

(Plane_id, purchase_date, airplane_name, p_loading_capacity, fk_transporterId)

Plane_id -> purchase_date

Plane_id -> airplane_name

Plane_id -> p_loading_capacity

Plane_id -> fk_transporterId

Constraints:-

- Candidate Keys: {Plane_id}
- Primary Key: {Plane_id}
- Non-key Attributes: {purchase_date, airplane_name, p_loading_capacity, fk_transporterId}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key

- Driver (This table follows 3NF and BCNF)

(Driver_id,Driver_name,Driver_DOB,Driver_mobile,fk_vehicleNo)

Driver_id -> Driver_name

Driver_id -> Driver_DOB

Driver_id -> Driver_mobile

Driver_id -> fk_vehicleNo

Constraints:-

- Candidate Keys: {Driver_id}
- Primary Key: {Driver_id}
- Non-key Attributes: {Driver_name, Driver_DOB, Driver_mobile, fk_vehicleNo}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Captain (This table follows 3NF and BCNF)

(captain_id,captain_name,captain_DOB, captain_mobile,fk_shipId)

captain_id -> captain_name

captain_id -> captain_DOB

captain_id -> captain_mobile

captain_id -> fk_shipId

Constraints:-

- Candidate Keys: {captain_id}
- Primary Key: {captain_id }
- Non-key Attributes: {captain_name,captain_DOB, captain_mobile, fk_shipId}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Pilot (This table follows 3NF and BCNF)

(pilot_id,pilot_name,pilot_DOB,pilot_mobile,fk_planeId)

pilot_id -> pilot_name

pilot_id -> pilot_DOB

pilot_id -> pilot_mobile

pilot_id -> fk_planeId

Constraints:-

- Candidate Keys: {pilot_id}
- Primary Key: {pilot_id}
- Non-key Attributes: {pilot_name,pilot_DOB, pilot_mobile,fk_planeId}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.

- Receiver (This table follows 3NF and BCNF)

(r_gst_no,r_name,r_mobileno,r_emailid,r_address, r_city, r_state, r_country ,fk_empId)

r_gst_no -> r_name

r_gst_no -> r_mobileno

r_gst_no -> r_emailid

r_gst_no -> r_city

r_gst_no -> r_state

r_gst_no -> r_country

r_gst_no -> fk_empId

Constraints:-

- Candidate Keys: {r_id }
- Primary Key: {r_id}
- Non-key Attributes: {r_name, r_mobileno, r_emailid, r_city, r_state, r_country, fk_empId}

Normalization Details:-

This table is in 3NF and BCNF because it doesn't have multiple values, partial dependencies, transitive dependencies and for every Functional Dependency, LHS is super key.