Department of Computer Science and Engineering

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DBMS PROJECT-

LOGISTICS AND SHIPPING SERVICES

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INTRODUCTION:-

In today's fast-paced world, logistics and shipping services have become crucial to the success of businesses operating in the international market. With the rise of e-commerce and globalization, companies are constantly seeking ways to streamline their supply chain and enhance their delivery capabilities. This is where database logistics and shipping services come into play.

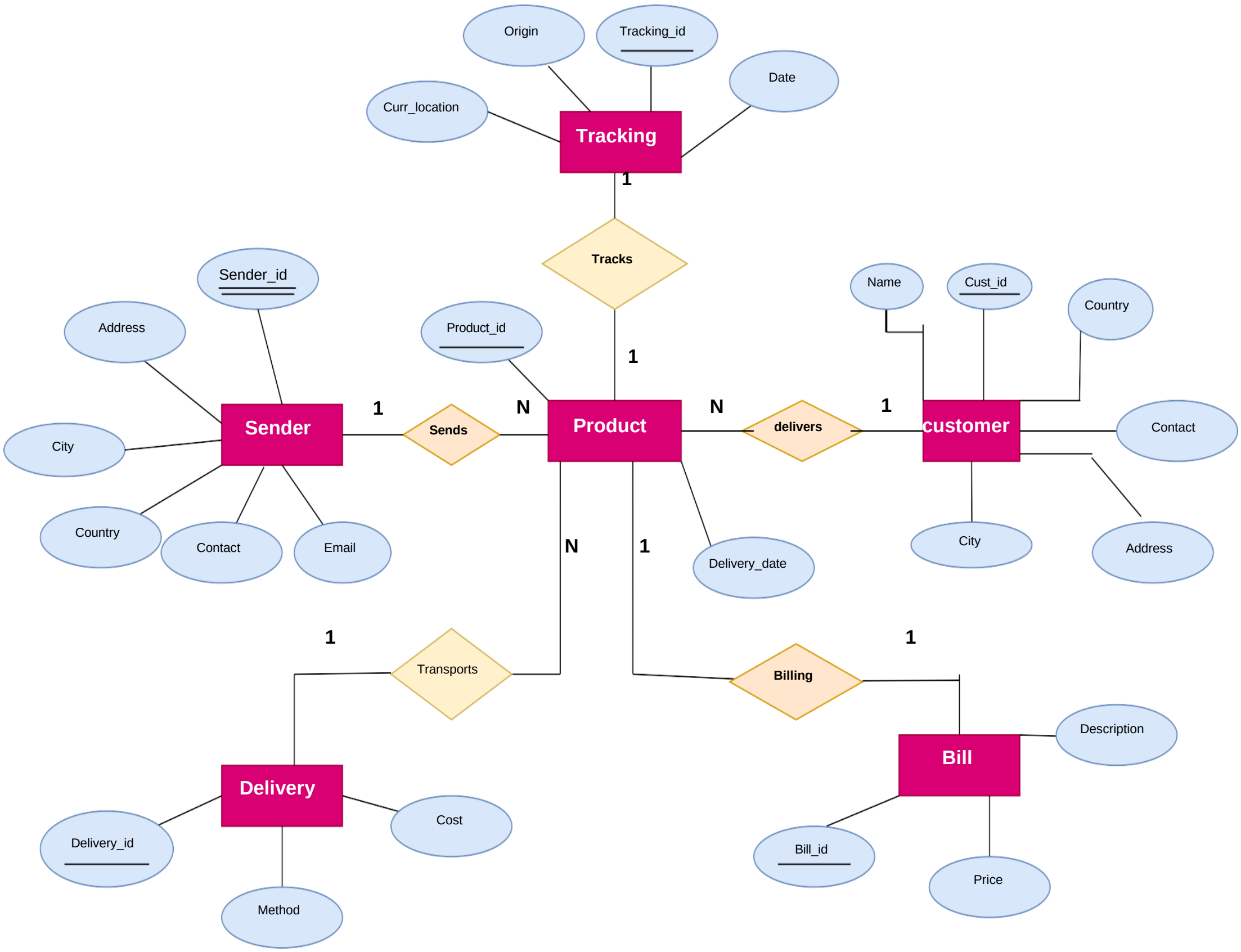
By leveraging the latest database technologies, these services help businesses optimize their logistics operations, reduce costs, and achieve greater efficiency. In this article, we will explore the benefits of using database logistics and shipping services and how they can help take your business to the next level.

This database will contain the senders and the customers details once he/she plans on sending an item to be shipped such as name, email, address , etc. This will be helpful in the case of an item being returned back to the sender .We also store the dimensions the cost of the shipment considering other factors like mode of shipment

ER Model Assumptions

- A sender can send multiple packages to multiple receivers and is uniquely identified by his/her sender ID.
- Each package can be sent to only one receiver but a receiver can receive multiple packages and is Identified by his/her receiver ID.
- Products store information such as date of order, delivery date and weight which is uniquely identified by their Order ID.
- The sender can prefer his own method of delivery which associates each package to a Transport ID that can determine the cost per unit of the package and allows multiple senders to have the same Transport ID.
- Each package will finally have its own bill that stores its total cost of transportation along with a unique Transaction ID.
- After shipping the packages, they can also be tracked by the company's servers which are recognized by its Tracking ID that can identify its current location.

ER MODEL


Origin
Tracking_id
Date
Curr_location
Tracking
1
Tracks
1
Sender_id
Address
Product_id
Name
Cust_id
Country
Sender
1
Sends
N
Product
N
delivers
1
customer
Contact
City
Country
Contact
Email
N
1
Delivery_date
City
Address
1
Transports
Billing
1
Description
Delivery
Bill
Delivery_id
Cost
Method
Bill_id
Price

FUNCTIONAL DEPENDENCIES

SENDER

SENDER(**SENDER_ID(PK),** EMAIL, ADDRESS, CONTACT , CITY ,COUNTRY)

Since all the fields depend on SENDER_ID, (SENDER_ID)+→R

Hence , SENDER_ID is a Primary Key

DELIVERY

DELIVERY(**DELIVERY_ID(PK),**METHOD,COST)

Since all the fields depend on DELIVERY_ID, (DELIVERY_ID)+→R

Hence , DELIVERY_ID is a Primary Key

TRACKING

TRACKING(**TRACKING_ID(PK),**ORIGIN,CURRENT_LOCATION,DESTINATION,DATE)

Since all the fields depend on TRACKING_ID, (TRACKING_ID)+→R

Hence , TRACKING_ID is a Primary Key

PRODUCT

PRODUCT(**PRODUCT_ID(PK),**SENDER_ID**(FK),**DELIVERY_ID**(FK),**TRACKING_ID**(FK),**
CUST_ID(**FK**),BILL_ID**(FK),**DELIVERY_DATE)

Since all the fields depend on PRODUCT_ID, (PRODUCT_ID)+→R

Hence , PRODUCT_ID is a Primary Key

BILL

BILL(**BILL_ID(PK),**DESCRIPTION,PRICE)

Since all the fields depend on BILL_ID, (BILL_ID)+→R

Hence , BILL_ID is a Primary Key

CUSTOMER

CUSTOMER(**CUST_ID(PK),**NAME,CONTACT,ADDRESS,CITY,COUNTRY)

Since all the fields depend on CUST_ID, (CUST_ID)+→R

Hence , CUST_ID is a Primary Key

NORMALIZATION FOR LOGISTICS AND SHIPPING

1) Sender

Primary Key: Sender_ID

All attributes depend on the Sender_ID, hence the table is 2NF.

All attributes depend directly on Sender_ID, hence the table is in 3NF.

All determinants(Sender_ID) are candidate keys, hence the table is in BCNF.

2) PRODUCT

Primary key: PRODUCT_ID

All attributes depend on the PRODUCT_ID, hence the table is 2NF.

All attributes depend directly on PRODUCT_ID, hence the table is in 3NF.

All determinants(PRODUCT_ID) are candidate keys, hence the table is in BCNF.

3) Delivery

Primary key: DELIVERY_ID

All attributes depend on the DELIVERY_ID or hence the table is 2NF.

All attributes depend directly on DELIVERY_ID , hence the table is in 3NF.

All determinants(DELIVERY_ID) are candidate keys, hence the table is in BCNF.

4)Billing

Primary Key: BILL_ID

All attributes depend on the BILL_ID, hence the table is 2NF.
All attributes depend directly on BILL_ID, hence the table is in 3NF.
All determinants(BILL_ID) are candidate keys, hence the table is in BCNF.

5)Tracking

Primary Key: Tracking_ID
All attributes depend on the Tracking_ID, hence the table is 2NF.
All attributes depend directly on Tracking_ID, hence the table is in 3NF.
All determinants(Tracking_ID) are candidate keys, hence the table is in BCNF.

6)Customer

Primary Key: CUST_ID
All attributes depend on the CUST_ID, hence the table is 2NF.
All attributes depend directly on CUST_ID, hence the table is in 3NF.
All determinants(CUST_ID) are candidate keys, hence the table is in BCNF.

RELATIONAL SCHEMA FOR LOGISTICS AND COURIER

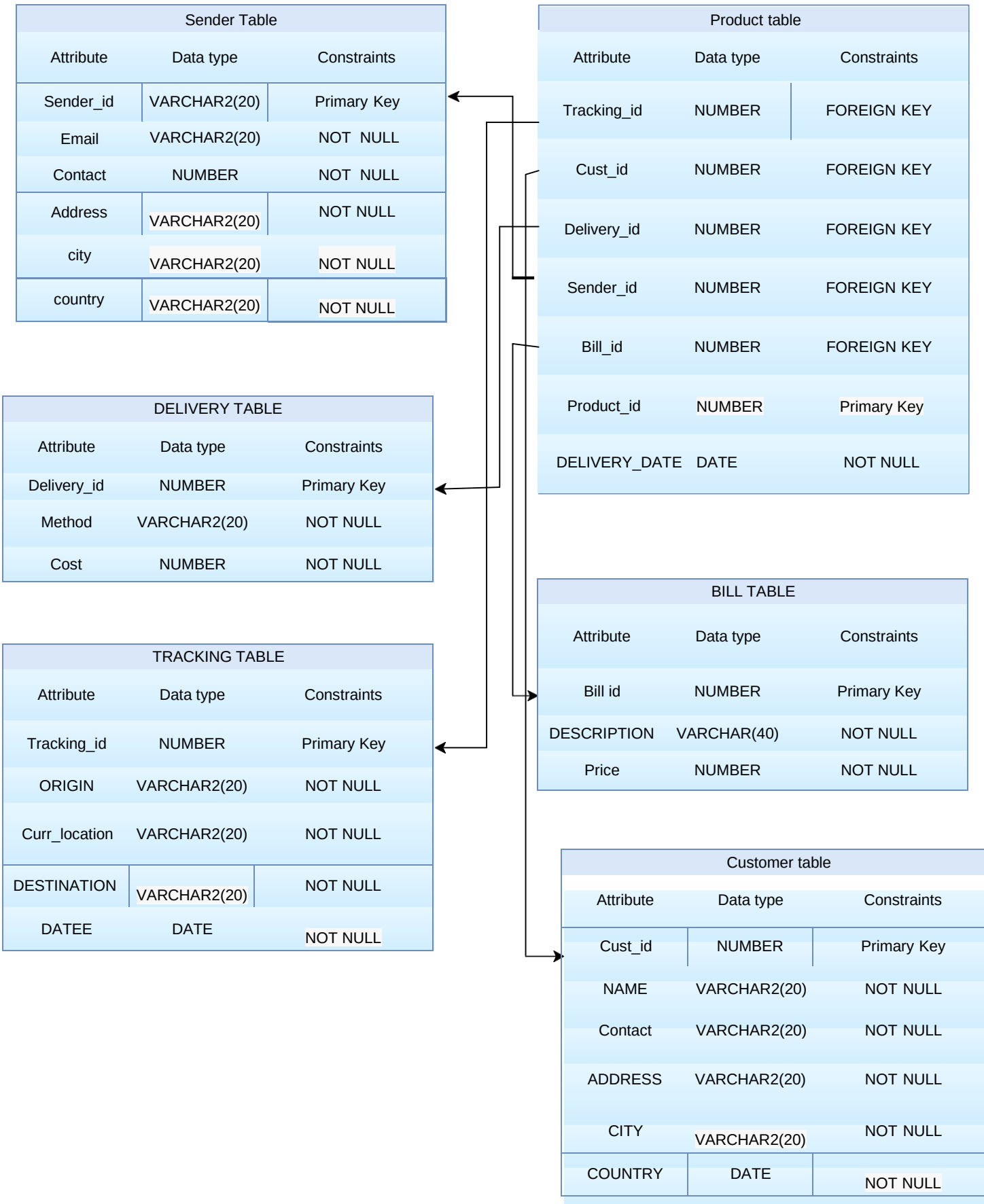

Sender Table
Attribute
Data type
Constraints
Sender_id
VARCHAR2(20)
Primary Key
Email
VARCHAR2(20)
NOT NULL
Contact
NUMBER
NOT NULL
Address
VARCHAR2(20)
NOT NULL
city
VARCHAR2(20)
NOT NULL
country
VARCHAR2(20)
NOT NULL
Product table
Attribute
Data type
Constraints
Tracking_id
NUMBER
FOREIGN KEY
Cust_id
NUMBER
FOREIGN KEY
Delivery_id
NUMBER
FOREIGN KEY
Sender_id
NUMBER
FOREIGN KEY
Bill_id
NUMBER
FOREIGN KEY
Product_id
NUMBER
Primary Key
DELIVERY_DATE
DATE
NOT NULL
DELIVERY TABLE
Attribute
Data type
Constraints
Delivery_id
NUMBER
Primary Key
Method
VARCHAR2(20)
NOT NULL
Cost
NUMBER
NOT NULL
BILL TABLE
Attribute
Data type
Constraints
Bill id
NUMBER
Primary Key
DESCRIPTION
VARCHAR(40)
NOT NULL
Price
NUMBER
NOT NULL
TRACKING TABLE
Attribute
Data type
Constraints
Tracking_id
NUMBER
Primary Key
ORIGIN
VARCHAR2(20)
NOT NULL
Curr_location
VARCHAR2(20)
NOT NULL
DESTINATION
VARCHAR2(20)
NOT NULL
DATEE
DATE
NOT NULL
Customer table
Attribute
Data type
Constraints
Cust_id
NUMBER
Primary Key
NAME
VARCHAR2(20)
NOT NULL
Contact
VARCHAR2(20)
NOT NULL
ADDRESS
VARCHAR2(20)
NOT NULL
CITY
VARCHAR2(20)
NOT NULL
COUNTRY
DATE
NOT NULL

TABLE CREATION FOR LOGISTICS AND SHIPPING

SENDER:-

(Stores details about the person sending the package.)

```
CREATE TABLE SENDER (
  SENDER_ID NUMBER NOT NULL ,
  EMAIL VARCHAR(255) NOT NULL,
  CONTACT NUMBER NOT NULL,
  ADDRESS VARCHAR(255) NOT NULL,
  CITY VARCHAR(255) NOT NULL,
  COUNTRY VARCHAR(255) NOT NULL,
  PRIMARY KEY (SENDER_ID)
);
```

CUSTOMER:-

(Stores details about the person receiving the package.)

```
CREATE TABLE CUSTOMER (
  CUST_ID NUMBER NOT NULL ,
  NAME VARCHAR(255) NOT NULL,
  CONTACT NUMBER NOT NULL,
  ADDRESS VARCHAR(255) NOT NULL,
  CITY VARCHAR(255) NOT NULL,
  COUNTRY VARCHAR(255) NOT NULL,
  PRIMARY KEY (CUST_ID)
```

```
);
```

PRODUCT:-

(Stores details about the product)

```
CREATE TABLE PRODUCT (
  PRODUCT_ID NUMBER ,
  DELIVERY_ID NUMBER ,
  TRACKING_ID NUMBER ,
  BILL_ID NUMBER ,
  DELIVERY_DATE DATE NOT NULL,
  SENDER_ID NUMBER ,
  CUST_ID NUMBER ,
  PRIMARY KEY (PRODUCT_ID),
  FOREIGN KEY (DELIVERY_ID) REFERENCES DELIVERY
(DELIVERY_ID),
  FOREIGN KEY (TRACKING_ID) REFERENCES TRACKING
(TRACKING_ID),
  FOREIGN KEY (BILL_ID) REFERENCES BILL (BILL_ID),
FOREIGN KEY (SENDER_ID) REFERENCES SENDER
(SENDER_ID),
  FOREIGN KEY (CUST_ID) REFERENCES CUSTOMER (CUST_ID)
);
```

DELIVERY:-

(Stores details about the costs associated with different

shipping options)

```
CREATE TABLE DELIVERY (
  DELIVERY_ID NUMBER NOT NULL,
  METHOD VARCHAR(255) NOT NULL,
  COST NUMBER NOT NULL,
  PRIMARY KEY (DELIVERY_ID)
);
```

TRACKING:-

(Stores details about the tracking of the package.)

```
CREATE TABLE TRACKING (
  TRACKING_ID NUMBER NOT NULL,
  ORIGIN VARCHAR(255) NOT NULL,
  CURRENT_LOCATION VARCHAR(255) NOT NULL,
  DESTINATION VARCHAR(255) NOT NULL,
  DATEE DATE NOT NULL,
  PRIMARY KEY (TRACKING_ID)
);
```

BILL:-

(Stores details about the final cost.)

```
CREATE TABLE BILL (
```

```
 BILL_ID NUMBER NOT NULL,
 DESCRIPTION VARCHAR(255) NOT NULL,
 PRICE NUMBER NOT NULL,
 PRIMARY KEY (BILL_ID)
);
```

INSERTION IN THE TABLES

1) SENDER

```
INSERT INTO SENDER values
(1001,'kapil@gmail.com',942972987,'parkavenue','delhi','india');

INSERT INTO SENDER values (1002,'john@gmail.com',313972987,'age
r','nyc','usa');

INSERT INTO SENDER values (1003,'raj@gmail.com',944972987,'raj
avenue','mumbai','india');

INSERT INTO SENDER values (1004,'abc@gmail.com',942972987,'abc
avenue','dhaka','bangladesh');

INSERT INTO SENDER values (1005,'kiel@gmail.com',232972987,'kiel
avenue','helde','uk');

INSERT INTO SENDER values
(1006,'insane@gmail.com',942972987,'insane avenue','london','uk');

INSERT INTO SENDER values (1007,'abhi@gmail.com',942972987,'hung
avenue','banglore','india');
```

INSERT INTO SENDER values (1008,'rana@gmail.com',942972987,'park avenue','mumbai','india');

INSERT INTO SENDER values (1009,'madal@gmail.com',942972987,'hvfj','haryana','india');

2)CUSTOMER

INSERT INTO CUSTOMER VALUES (2001,'RANA',72492466,'RAJU GALI','WARANGAL','INDIA');

INSERT INTO CUSTOMER VALUES (2002,'ABHI',23692466,'WGL GALI','LONDON','UK');

INSERT INTO CUSTOMER VALUES (2003,'MADAL',98492466,'IND GALI','NYC','USA');

INSERT INTO CUSTOMER VALUES (2004,'GOKANI',90492466,'GOKANI GALI','RAJKOT','INDIA');

INSERT INTO CUSTOMER VALUES (2005,'TASKIN',243636466,'TASK ROAD','WARANGAL','INDIA');

INSERT INTO CUSTOMER VALUES (2006,'KAPIL',92492466,'PARK ROAD','HARYANA','INDIA');

INSERT INTO CUSTOMER VALUES (2007,'ABHINAV',02492466,'JOHN AVENUE','NYC','USA');

INSERT INTO CUSTOMER VALUES (2008,'JOHN',72492466,'JOHN GALI','JAKARTA','HUNGARY');

INSERT INTO CUSTOMER VALUES (2009,'ALEX',82492466,'ALEX HALES','OVAL','UK');

3)DELIVERY

INSERT INTO DELIVERY VALUES (3001,'ROAD',1500);

INSERT INTO DELIVERY VALUES (3002,'SEA',7500);

INSERT INTO DELIVERY VALUES(3003,'AIR',6500);

INSERT INTO DELIVERY VALUES(3004,'ROAD',4500);

INSERT INTO DELIVERY VALUES(3005,'ROAD',3500);

INSERT INTO DELIVERY VALUES(3006,'AIR',2000);

INSERT INTO DELIVERY VALUES(3007,'SEA',1500);

4)TRACKING

INSERT INTO TRACKING VALUES(4001,'MUMBAI','DELHI','NYC','10-APR-2023');

INSERT INTO TRACKING VALUES(4002,'LONDON','NYC','JAKARTA','11-MAR-2023');

INSERT INTO TRACKING VALUES(4003,'MUMBAI','DHAKA','DELHI','19-APR-2023');

```
INSERT INTO TRACKING VALUES(4004,'BANGLORE','LONDON','NYC','17-APR-2023');

INSERT INTO TRACKING VALUES(4005,'NYC','DELHI','LONDON','12-APR-2023');

INSERT INTO TRACKING VALUES(4006,'DELHI','MUMBAI','NYC','13-APR-2023');

INSERT INTO TRACKING
VALUES(4007,'BANGLORE','DELHI','LONDON','11-APR-2023');

INSERT INTO TRACKING VALUES(4008,'DELHI','MUMBAI','NYC','13-APR-2023');
```

5)BILL

```
INSERT INTO BILL VALUES(1,'ADD',6476);

INSERT INTO BILL VALUES(2,'MUL',6000);

INSERT INTO BILL VALUES(3,'DIFF',9000);

INSERT INTO BILL VALUES(4,'ADD',5476);

INSERT INTO BILL VALUES(5,'INC',4888);

INSERT INTO BILL VALUES(6,'ADD',4476);
```

6)PRODUCT

```
INSERT INTO PRODUCT VALUES(11,3001,4001,1,'11-APR-2023',1001,2001);

INSERT INTO PRODUCT VALUES(12,3002,4002,2,'12-APR-2023',1002,2002);

INSERT INTO PRODUCT VALUES(13,3003,4003,3,'15-APR-2023',1003,2003);

INSERT INTO PRODUCT VALUES(14,3004,4004,4,'18-APR-2023',1004,2004);

INSERT INTO PRODUCT VALUES(15,3005,4005,5,'19-APR-2023',1005,2005);

INSERT INTO PRODUCT VALUES(16,3006,4006,6,'11-APR-2023',1006,2006);

INSERT INTO PRODUCT VALUES(17,3007,4007,NULL,'20-APR-2023',1007,2007);

INSERT INTO PRODUCT VALUES(18,NULL,4008,NULL,'21-APR-2023',1008,2008);

INSERT INTO PRODUCT VALUES(19,NULL,NULL,NULL,'23-APR-2023',1009,2009);
```

TABLES AFTER CREATION

SENDER

SENDER_ID	EMAIL	CONTACT	ADDRESS	CITY	COUNTRY
1001	kapil@gmail.com	942972987	parkavenue	delhi	india
1002	john@gmail.com	313972987	age r	nyc	usa
1003	raj@gmail.com	944972987	raj avenue	mumbai	india
1004	abc@gmail.com	942972987	abc avenue	dhaka	banglades
1005	kiel@gmail.com	232972987	kiel avenue	helde	uk
1006	insane@gmail.com	942972987	insane avenue	london	uk
1007	abhi@gmail.com	942972987	hung avenue	banglore	india
1008	rana@gmail.com	942972987	park avenue	mumbai	india
1009	madal@gmail.com	942972987	hvfj	haryana	india

CUSTOMER

CUST_ID	NAME	CONTACT	ADDRESS	CITY	COUNTRY
2001	RANA	72492466	RAJU GALI	WARANGAL	INDIA
2002	ABHI	23692466	WGL GALI	LONDON	UK
2003	MADAL	98492466	IND GALI	NYC	USA
2004	GOKANI	90492466	GOKANI GALI	RAJKOT	INDIA
2005	TASKIN	243636466	TASK ROAD	WARANGAL	INDIA
2006	KAPIL	92492466	PARK ROAD	HARYANA	INDIA
2007	ABHINAV	2492466	JOHN AVENUE	NYC	USA
2008	JOHN	72492466	JOHN GALI	JAKARTA	HUNGARY
2009	ALEX	82492466	ALEX HALES	OVAL	UK

TRACKING

TRACKING_ID	ORIGIN	CURRENT_LOCATION	DESTINATION	DATEE
4001	MUMBAI	DELHI	NYC	10-APR-2023
4002	LONDON	NYC	JAKARTA	11-MAR-2023
4003	MUMBAI	DHAKA	DELHI	19-APR-2023
4004	BANGLORE	LONDON	NYC	17-APR-2023
4005	NYC	DELHI	LONDON	12-APR-2023
4006	DELHI	MUMBAI	NYC	13-APR-2023
4007	BANGLORE	DELHI	LONDON	11-APR-2023
4008	DELHI	MUMBAI	NYC	13-APR-2023

DELIVERY

DELIVERY_ID	METHOD	COST
3001	ROAD	1500
3002	SEA	7500
3003	AIR	6500
3004	ROAD	4500
3005	ROAD	3500
3006	AIR	2000
3007	SEA	1500

BILL

BILL_ID	DESCRIPTION	PRICE
1	ADD	6476
2	MUL	6000
3	DIFF	9000
4	ADD	5476
5	INC	4888
6	ADD	4476

PRODUCT

PRODUCT_ID	DELIVERY_ID	TRACKING_ID	BILL_ID	DELIVERY_DATE	SEND
11	3001	4001	1	11-APR-2023	1001
12	3002	4002	2	12-APR-2023	1002
13	3003	4003	3	15-APR-2023	1003
14	3004	4004	4	18-APR-2023	1004
15	3005	4005	5	19-APR-2023	1005
16	3006	4006	6	11-APR-2023	1006
17	3007	4007		20-APR-2023	1007
18		4008		21-APR-2023	1008
19				23-APR-2023	1009