Lyft – Delivery Service

ISTM 6202 Team Project

Team 06

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Executive Summary

Lyft is a multi-billion dollar company and is a major competitor in the ride-sharing industry. The company operates as a mobile platform that offers users the ability to secure transportation services for their daily needs. It connects users/passengers with independently contracted drivers. Lyft has continued to remain competitive in this market even after recent catalysts and downturns in the market.

However, Lyft must reposition itself to remain competitive against its fellow competitors and to open additional revenue streams. We propose adding a delivery feature to the Lyft platform. Through this added service, Lyft will be able to provide its customers with more services and drivers with additional income.

In our proposal we will outline the current systems and business processes Lyft uses, and our potential solution to this issue. We will design a conceptual, logical and physical design, with an updated business model, and provide sample queries and data.

Section I: Business Problem

1.1 Description of Organization and Its Problem(s)

INTRODUCTION OF THE ORGANIZATION

HISTORY

Lyft, Inc. is an American company that develops, markets, and operates a mobile app, offering ride-hailing, vehicles for hire, motorized scooters, a bicycle-sharing system, and rental cars, food delivery. It is based in San Francisco, California and operates in 644 cities in the United States and 12 cities in Canada. With a 32% market share, Lyft is the second-largest ridesharing company in the United States after Uber, (Bloomberg, 2020). According to Reuters, 2019, Lyft owns and operates multimodal transportation networks in the United States and Canada that offer access to a variety of transportation options through the Company's platform and mobile-based applications. Lyft, initially known as Zimride was founded by Marcus Cohn, John Zimmer, Rajat Suri, Matt van Horn, and Logan Green in 2007 as a long-distance intercity carpooling company headquartered in San Francisco, CA. (CNN business, 2018)

Logan Green had the inspiration for Zimride after sharing rides from the University of California, Santa Barbara campus to visit his girlfriend in Los Angeles. He had used Craigslist's ride boards but wanted to eliminate the anxiety of not knowing the passenger or driver. When Facebook opened its Application Program Interface (API) to third-party developers, Green said he thought there was the opportunity to link Zimride drivers and passengers through the Facebook Connect application. (Lawler, 2014). By using Facebook profile information, student drivers and passengers could learn about each other. Zimride eventually became the largest carpool company in the United States. The company name came from the country Zimbabwe, where, during a trip in 2005, Green observed locals sharing minivan taxis. Zimride launched at Cornell University, where, after six months, the service had signed up 20% of the campus. (lyftbusiness, 2015)

Lyft was launched in the summer of 2012 by computer programmers Logan Green and John Zimmer as a service of Zimride. In May 2013, the company officially changed its name from Zimride to Lyft. In July 2013, Lyft sold Zimride to Enterprise Holdings, the parent company of Enterprise Rent-A-Car, to enable the company to focus exclusively on the growth of Lyft. Whereas Zimride with Enterprise Holdings focused on college campuses, Lyft launched as a ridesharing company for shorter trips within cities. (Lawler, 2014)

Due to regulatory hurdles in New York City, the company altered its business model when establishing Lyft on the East Coast of the United States. Lyft's launch in New York City occurred on the evening of July 25, 2014, and, in accordance with the Taxi and Limousine Commission (TLC) and the approval of the Manhattan Supreme Court, only drivers registered with the TLC were permitted to drive Lyft-branded vehicles in New York City. In August 2014, the company introduced a shared ride concept, which provided cheaper fares.(Techcrunch, 2014)

In December 2015, Lyft became the first ridesharing company allowed to pick up passengers at Los Angeles International Airport. In December 2017, Lyft expanded into Canada, with operations in the Toronto, Hamilton and Ottawa metropolitan areas.

In December 2020, Lyft announced that it will launch a multi-city U.S. robotaxi service in 2023 with Motional. In April 2021, Lyft sold its self-driving car division to Toyota for $550 million. The division had partnerships with General Motors, NuTonomy, Ford Motor Company, GoMentum Station, and Magna International.(CNN business, 2018)

OPERATIONS

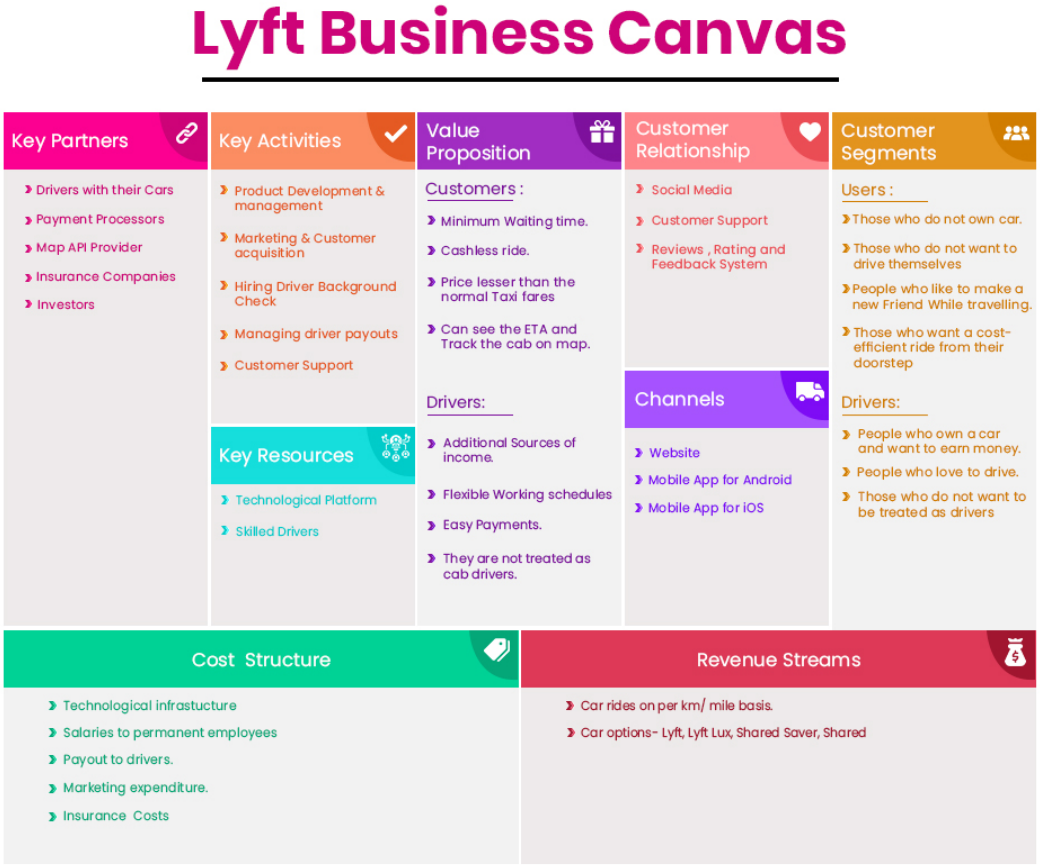
Lyft is a rideshare company. It operates a transportation platform that connects passengers with drivers to provide car sharing and transportation services via the Lyft mobile. The company designs, markets, and operates a mobile application that matches drivers with passengers who request rides, and also allows payment through the app. It also allows riders to schedule rides up to seven days in advance, (Lawler, 2014). Lyft operates a peer-to-peer marketplace for on-demand ridesharing in the United States and Canada. The company operates multimodal transportation networks that offer riders personalized and on-demand access to various mobility options. It provides ridesharing marketplace which provides; Express Drive, a flexible car rentals program for drivers; Lyft Rentals that provides vehicles for long-distance trips; and a network of shared bikes and scooters in various cities to address the needs of riders for short trips. Lyft Driver Center and Lyft Auto Care users. The Company's transportation network brings together rideshare, bikes, scooters, car rentals and transit all in one app. (lyftbusiness,2015)

The company also integrates third-party public transit data into the Lyft app to offer riders various transportation options. In addition, it offers autonomous vehicles; concierge for organizations; Lyft Pass that allows organizations to create custom transportation programs; enterprise programs, including monthly ride credits for daily commutes, supplementing public transit by providing rides for the first and last leg of commute trips, late-night rides home, and shuttle replacement rides; and transportation solutions that can be customized for events, such as recruiting events, conferences, celebrations, meetings, and company retreats. (lyftbusiness,2015)

According to the WSJ, 2021, Lyft, Inc. engages in the provision and management of an online social rideshare community platform. It provides access to a network of shared bikes and

scooters for shorter rides and first-mile and last-mile legs of multimodal trips, information about nearby public transit routes, and Lyft Rentals to offer riders a view of transportation options when planning any trip. The company according to, lyftbusiness, 2015, does not own any vehicles; instead, it receives a commission from each booking. Fares are quoted to the customer in advance but vary using a dynamic pricing model based on the local supply and demand at the time of the booking.

Table 1:



From Sagar, P. (2022, February 5). *Lyft Business Model: Knowing the inside out of ride-hailing giant*. aPurple. Retrieved February 22, 2022, from https://www.apurple.co/lyft-business-model/

NEW OPPORTUNITIES

In current development, Lyft aims to add additional options for Lyft end-users. They intend on adding Lyft delivery services that "actively works with businesses and organizations that need local delivery services" (Lyft, 2020). The delivery services would offer pick-up and delivery of food, autoparts, retail items, prescriptions, and potentially more (Lyft, 2020). Lyft is in the process of rolling out this service to more regions as they acquire more business partnerships.

The rideshare service intends on taking a different approach to their delivery platform. In late of 2021, Lyft partnered with Olo, a company that provides restaurants with an online ordering platform and drivers from other services (Pomranz, 2021). Olo currently holds partnerships with major market holders such as DoorDash, Grubhub, and Uber Eats (Pomranz, 2021). While competitors offer their users a platform to view a variety of restaurants, Lyft Delivery will allow restaurants to maintain their brand and platform by only offering its delivery services to them. Justin Paris, head of Lyft Delivery, stated that "his company wasn't looking to be a direct competitor to Uber Eats with its own ordering app, but instead simply wanted to open up revenue opportunities for their drivers and themselves" (Pomranz, 2021). Paris added, "as a transportation-focused company, we aren't interested in building consumer-facing marketplaces for groceries or food, but we can add real value in delivery both for drivers and partners via Dispatch's frictionless process and the scaled national network of drivers on Lyft's platform" (Pomranz, 2021).

PROBLEMS

One of the main problems of the Lyft is that it has a lot of customers thanks to low price ride service, but it only provides ride service. Thus, many customers use the ride service using Lyft, but use Uber Eats or other delivery applications when they need delivery services. In the case of big competitor Uber, a system has been well established that allows customers to receive rewards for Uber ride service when using Uber Eats, whereas Lyft has not yet. Because of these system differences, even customers who used Lyft could be leaked to other competitors due to the delivery service. In addition, the current situation can be inconvenient for Lyft drivers too. As Lyft provides a ride-only service, there are more cars waiting than competitors. If the current state of affairs continues, it could lead to very dangerous consequences for the company. Therefore, to solve this difficult market situation, our team thinks the best way is to implement a better-equipped delivery service as soon as possible.

1.2 As-IS Business Process Map

The following figure 1 is the As-Is business process map showing how Lyft's current ride system is processed. This business process map consists of three swim lanes, each consisting of customer, Lyft and driver.

Once, customers who want ride service open the Lyft app, log in or sign up, and then set the departure or current location and arrival location. After confirming the starting point, a user can check the estimated time until the vehicle arrives. Then, select a class of vehicle you want from economy class to luxury class, even riding with a bike. If the assigned vehicle arrives too late, a customer can cancel and choose another ride. When the vehicle selection is complete, the fee is paid from the registered card when you sign up, and the ride request is submitted.

When the customer's request will be sent to Lyft, and Lyft starts to search for a driver who is nearby the location and contact to be dispatched to the customer. The assigned driver departs to the pick up location, picks up the customer, and drives to the arrival location. Customer receives the message about driver rating and review from Lyft and the customer can select what percentage to pay for tips.

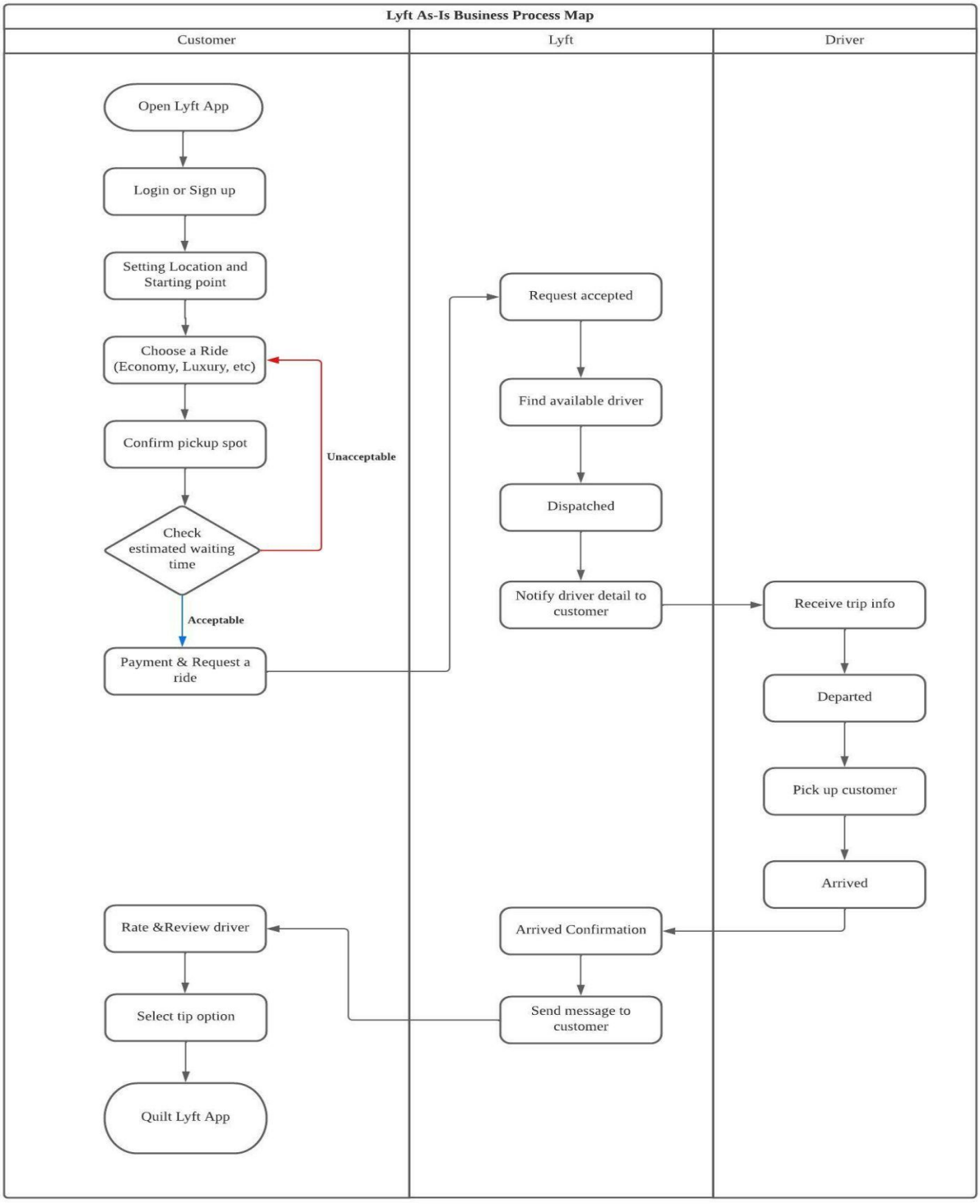


Figure 1. As-Is Business Process Map

1.3 Conceptual Database Design

The ERD for the company Lyft was built based on 3 client components, the Employee, the Customer, and the Driver. Starting with the Customer, the customer will have one to one relationships with Payment and one to many relationships with different Address (Pickup_Address and Destination_Address). Following up on Employee and Driver, there is a unary relationship inside the Employee table where one employee can manage multiple employees and each employee also has a one to many relationship with Driver for parallel management. A Driver will have a different vehicle that was registered under their name (one to many). Additionally, The Trip will have all the detail and required information(Foreign key) from all three clients to successfully process the data for both Customers and Employees.

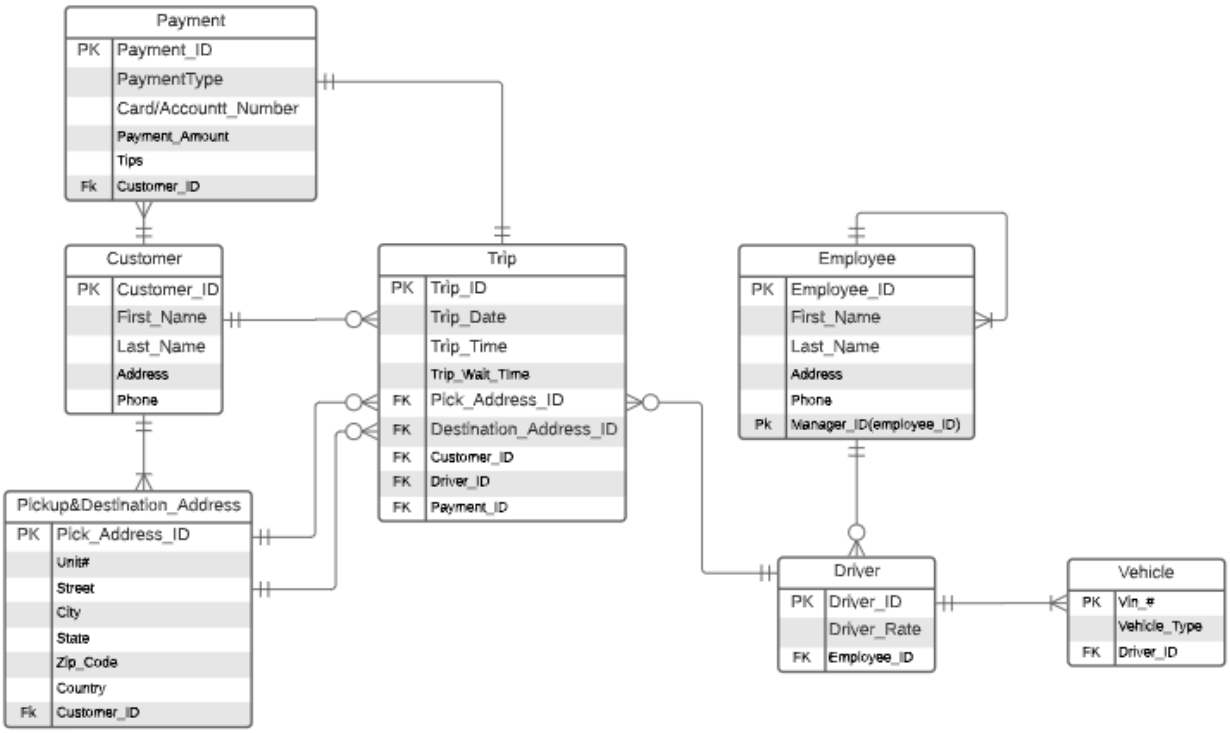


Figure 2. As-Is ERD

Section II: IT-Based Solution Development

2.1 Description of IT-based Solution

Fortunately, Lyft has great potential for growth through this To-Be system. Lyft still has many customers, drivers, corporate image & regulations, a great ride system, and so on. In this regard, Lyft already has many potential consumers. In addition, the current market environment is optimized to implement a delivery system quickly. The number of customers using delivery services is increasing exponentially while the current COVID pandemic situation continues for several years. This To-Be system is not a change to a completely new system, but an extension of the existing system. Even compared to its biggest competitor(Uber), customers using Uber for riding service also must use an Uber Eats app after installing it to use the delivery service, but our Lyft's To-Be system is configured so that they can select rides and delivery from the existing Lyft app.

With this To-Be system, Lyft can expect big improvement in various fields. First, most of the drivers who provide ride services tend to gather only in large cities, but it is expected that the delivery system will enable them to actively expand their business in small cities. Also, it’s not just a delivery service that means only food delivery from a restaurant. It enables delivery of the items customers want, such as vehicle supplies, pharmacies, daily necessities, clothing, etc, from the store of their choice.

2.2 To-Be Business Process Map

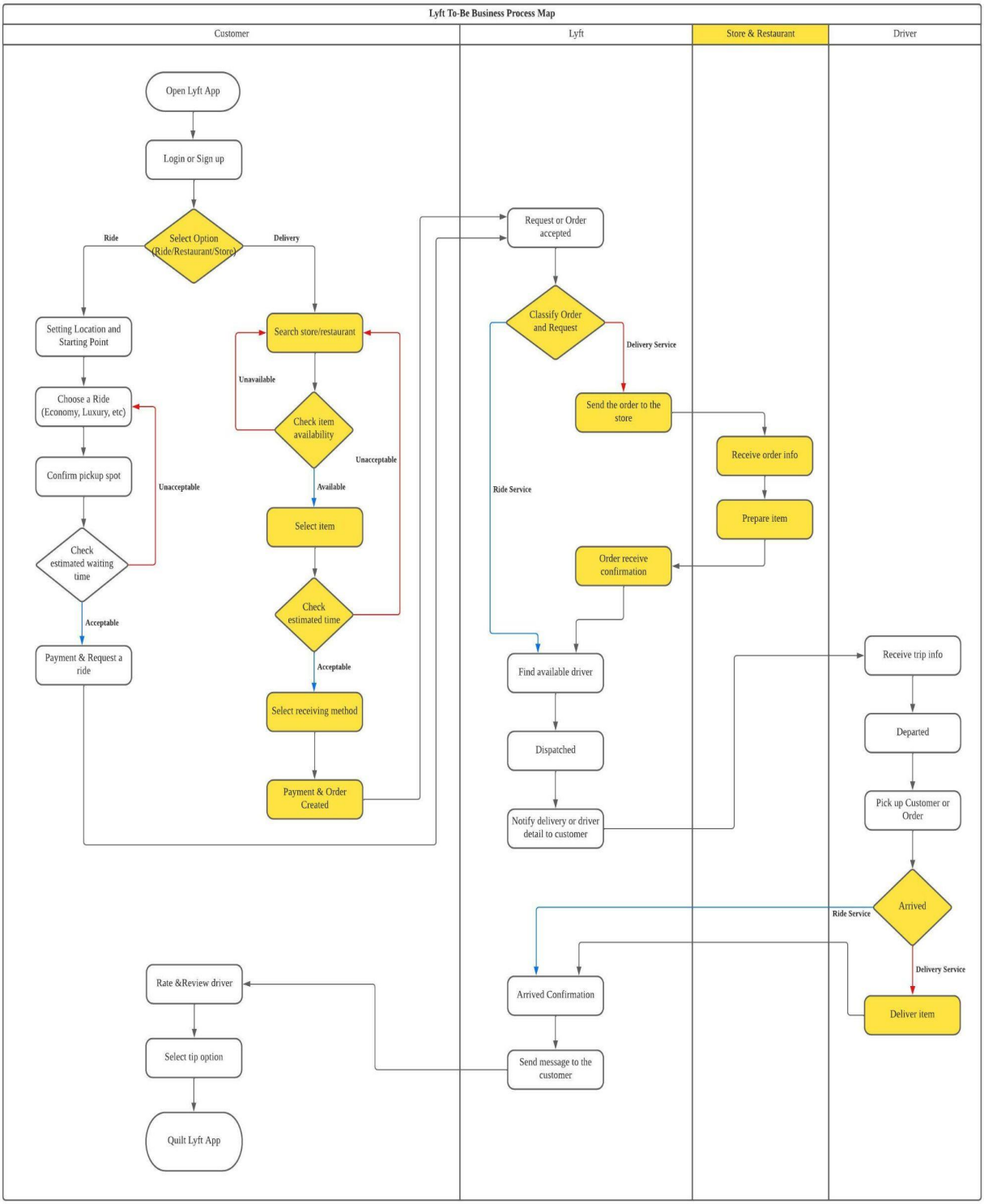
The following figure 3 is the To-be business process map. In the To-Be process map, one more swimlane(restaurant) has been added. On the figure3, the ride service process is the same as the As-Is process, and the added delivery service processes are filled with a yellow color. When customers open the Lyft application, they can choose a service type from several options, such as ride, food delivery, or other products delivery service from various stores. The ride service process is the same as described in 1.2, so this guideline is only for the delivery service.

Customers who want food or product delivery open the Lyft app, log in or sign up, and then choose one of deliveries. Then, select a specific store or restaurant that has a desired product and check whether an item is available. If an item is unavailable, go back to the previous step, and try looking for another retail store or restaurant. After selecting an item, customers are informed regarding the expected delivery time. If the time is not appropriate, customers can cancel it and search another store. If a customer wants multiple items, the customer can add items to their

shopping cart. After you select a delivery method and payment is completed, the order will be created.

The order details information is sent to the Lyft. Once Lyft receives the delivered order information, they will step into the classification process whether it is a ride request or a delivery service. After confirming that it is a delivery order, Lyft forwards the order information to the retail store for preparation. After that, Lyft searches for a driver who is nearby the store and contact to be dispatched to the store. The Lyft driver departs to the retail store and picks up the order, then drives to the delivery address. Customers receive the order item at the place where s/he selected. Lastly, Customers will receive a message about driver review, rating, and order confirmation with tipping for the driver.

With the To-Be process, consumers minimize the inconvenience of having to move to get the items or food they need. Through a way to get the items conveniently and inexpensively without moving, consumers will visit Lyft more often and more consumers will find Lyft. Moreover, drivers will also have more opportunities to generate revenue through delivery in a variety of ways. In sum, the To-Be process map solves the problems in the old process map and Lyft will be a great leap forward.



**Yellow represents new business process*

Figure 3. To-Be Business Process Map

2.3 Conceptual Database Design (To-Be ERD)

Brief Overview:

The new To-Be Erd was adding new IT functionalities to the extant systems. Based on the existing System we have, we are adding a new composite entity called Order_Detail. The Order_Detail was having both Trip_ID from Trip entity and Product ID from Product entity as its Primary keys. The Product entity is a SuperType for four categories: Retail_Store, Restaurants, Pharmacies, Car_Dealerships. The whole system will still process like a transportation system but note that we are adding a new column in Trip called Trip_type for passenger transportation and product delivery. The logical concepts for Trip_type of product delivery will look similar to original passenger transportation. However, the Pick_Address_ID will be the product pickup address, and the Destination_Address_ID will be the customer's current address.

5Cs:

Capture: In order for the system to process properly, the app will capture the customer's essential information(name, phone number, address information, payment information) from the Customer, Address, and Payment entity. Additionally, Driver's information like name, rating, vin_# will also be captured by the app. Customers will interact with the Lyft app to offer the required information for all essential entities. The trip entity will collect Driver information and the Order_Detail information from customer mobile or website input.

Convey:

The app will convey and collect all the data from the driver, customer, and product entity into the Trip entity. Both customer and driver will access trip information through their device. Therefore, the driver will receive the pickup location of the product, the destination of delivery, and the product details. The customer will receive driver information, car information, and an estimated waiting time.

Create:

The new feature will create/update a delivery history once the user has requested a product delivery service from the app. The rating for the product delivery process will also contribute to the driver's rating information. The new delivery history will be stored and prepared for analytic solutions regarding AI marketing and task distribution improvement.

Cradle:

All data from customers, drivers, products, and trips will be transported and stored at a database server maintained by Amazon Web Service or Microsoft Azure cloud platforms.

Communicate:

The Trip entity will become the core data source for communication between customers and drivers through their devices. Additionally, Lyft employees also have full access to the Trip entity for better customer services and analytics. Customer will be using their mobile device to request orders and trips from the Lyft app. On the other hand, Drivers will receive transportation requests or delivery services through their mobile devices too. The Lyft employee will corporate with both users for better user and customer relationship management.

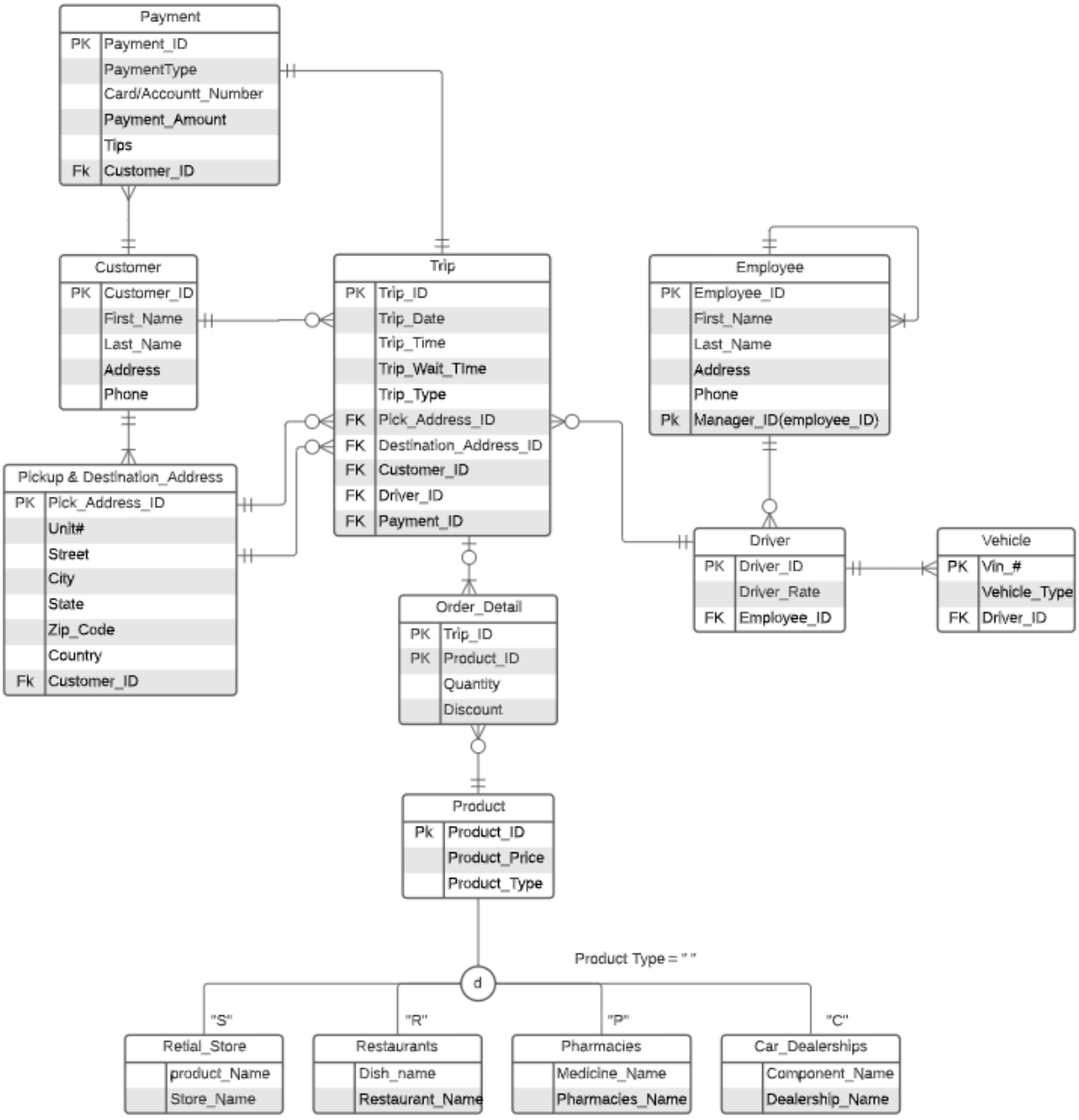


Figure 4. To-Be ERD

2.4 Business Function to Data Entity Matrix

DATA ENTTY TYPES / BUSINESS FUNCTIONS	CUSTOMER	EMPLOYEE	TRIP	PAYMENT	ADDRESS	DRIVER	VEHICLE	PRODUCT	ORDER
PRODUCT DEVELOPMENT & MGT	X	X						X	
MARKETING & CUSTOMER ACQUISITION	X	X				X	X	X	
BOOKING	X		X	X	X	X	X		X
DRIVER HIRE & BACKGROUND CHECKS	X	X			X	X	X		
PICK- UP & DELIVERIES	X		X	X	X	X	X		X
TRACKING ORDER	X		X		X	X	X		X
REQUEST/ CANCEL RIDE	X		X	X	X	X	X		X
COMMUNI-CATION	X	X				X			X
CUSTOMER SUPPORT	X	X		X		X			X

**X = Data entity used within business functions*

Figure 5. Business Function to Data Entity Matrix

Customer is a critical data entity in the business functions followed by the driver and their vehicle.

PRODUCT DEVELOPMENT & MANAGEMENT

The core mandate of the product development and management function is to bring out a new product to the market or develop an existing one just as this function brought Lyft to the market and developed it.

This function will jointly and closely work with specific customers to develop and improve functions that meet their specific needs. Considering customers' needs first ultimately produces effective results and satisfies the end user. Here customer ratings and referrals will be vital to improve the company's competitive performance. Employees involved in developing products

ensure a smooth running application for stakeholders especially, customers. They are involved in research and development to come up with new and innovative ways to better suit the needs of customers. They also engage prototyping methods to arrive at a system that works best for the user. They consider new trends or markets in-order to stay in competition and keep or improve their position in the marketplace.

MARKETING AND ACQUISITION

This function involves marketing the product ultimately. In many respects, this is the function that connects with and showcases the brand to customers and stakeholders. Employees involved here tend to use techniques to increase the perceived value of the product over time. It is marketed through social media and other media platforms to customers who want to place orders and drivers who want to make extra money with their vehicles.

BOOKING

Here, the product enables the customer to perform this function by placing an order or embarking on a trip, making payment and confirming destination.

DRIVER HIRE AND BACKGROUND CHECKS

This function performed by an employee focuses on various background checks through the DMV, local police, etc. confirming driving history, address, condition of vehicle for the safety and comfort of the customer as well as items to be delivered.

PICK UP AND DELIVERIES

This business function involves drivers picking up customers and deliveries when an order has been placed, an exact location has been confirmed and payment has successfully gone through.

TRACKING ORDER

This business function allows the customer to track all deliveries on every trip to ensure the right order gets to the right destination.

REQUEST / CANCEL ORDER/RIDE

This business function allows the customer to request a ride or place an order and has the option to cancel at-will. In the event of canceling funds held from a registered debit card will be refunded to the customer.

COMMUNICATION

Here the customer is able to communicate with drivers to confirm pick-up locations, extend wait times, change destinations and add extra pick-ups among others when an order has been placed.

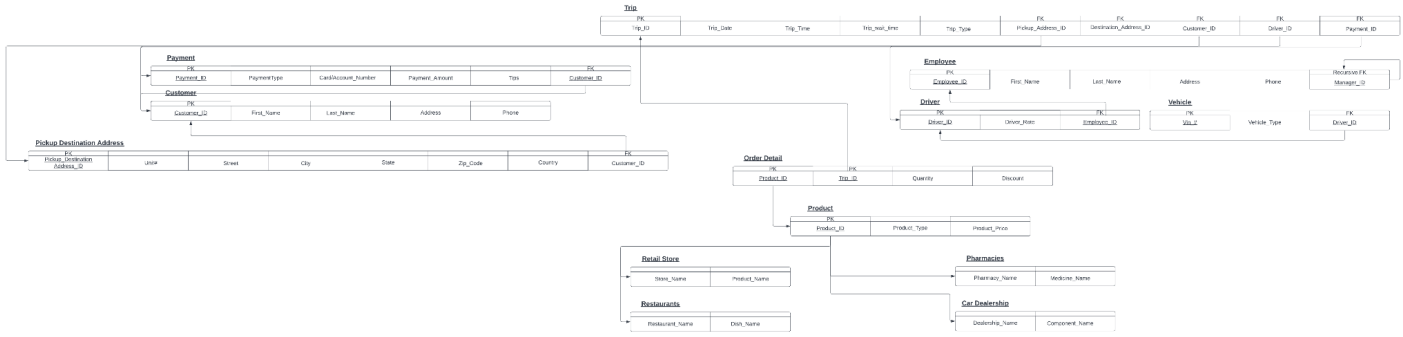
CUSTOMER SUPPORT

A function that allows customers to reach out to employees about issues pertaining orders, payments. Also, they are able to write reviews and suggest a much better suited service. Drivers reach out to employees when experiencing challenges with the service or having access to monies earned after trips.

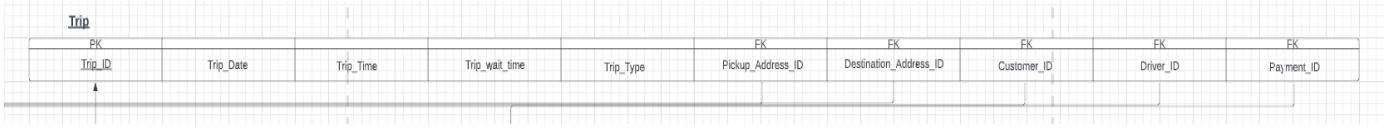
2.5 Logical Database Design

In this section, we are mapping our Entity Relationship Diagram found in Section II to a Relational Schema. The relational schema is normalized to the third normal form. By doing so we remove partial and transitive dependencies. This aids the system by reducing redundancy, avoiding database anomalies, and reducing delay time in querying the database.

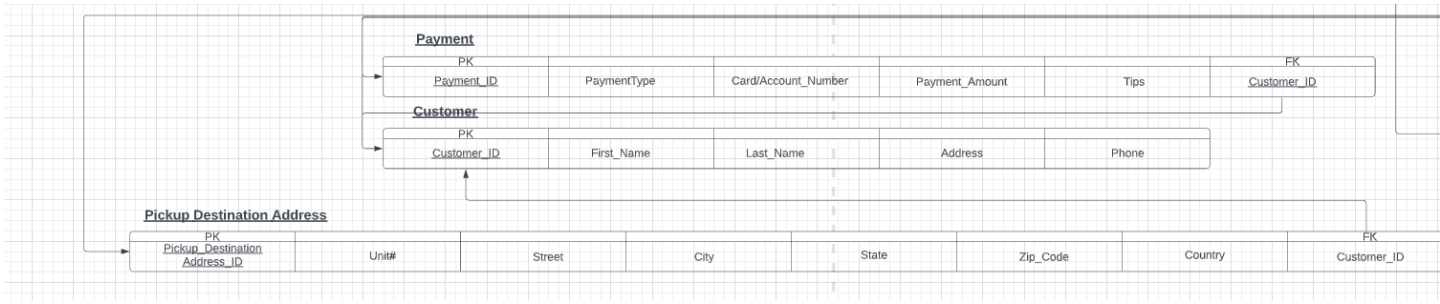
ENTIRE RELATIONAL SCHEMA:



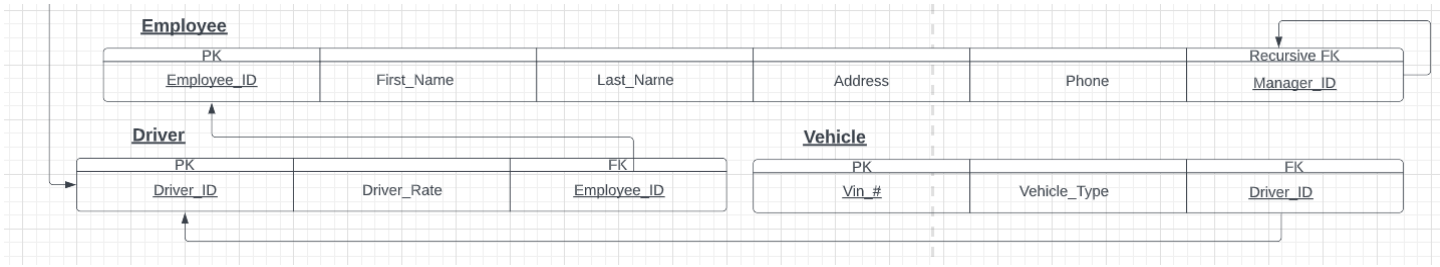
TRIP RELATION:



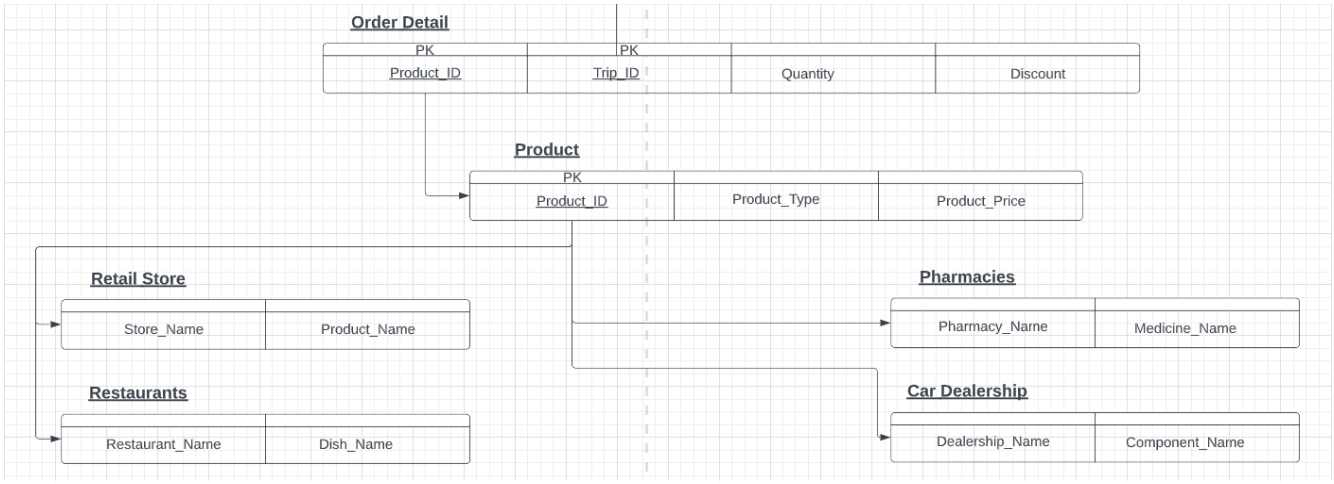
PAYMENT/CUSTOMER SECTION:



DRIVER/EMPLOYEE SECTION:



ORDER/PRODUCT SECTION:



Section III: Database Implementation

3.1 Physical Database Design

```
CREATE DATABASE LYFT;

CREATE TABLE EMPLOYEE (
employee_ID int(100) NOT NULL AUTO_INCREMENT,
first_name varchar(60),
last_name varchar(60),
address varchar(100),
phone varchar(100),
manager_ID int(100),
PRIMARY KEY (employee_ID),
FOREIGN KEY (manager_ID) REFERENCES Employee(employee_ID)
);

CREATE TABLE DRIVER (
driver_ID int(100),
driver_rate int(100),
employee_ID int(100),
PRIMARY KEY (driver_ID),
FOREIGN KEY (employee_ID) REFERENCES Employee(employee_ID)
);

CREATE TABLE VEHICLE(
vin_ID varchar(100),
vehicle_type varchar(100),
```

```
driver_ID int(100),
PRIMARY KEY (vin_ID),
FOREIGN KEY (driver_ID) REFERENCES Driver(driver_ID)
);

CREATE TABLE CUSTOMER(
customer_ID int(100) NOT NULL AUTO_INCREMENT,
first_name varchar(60),
last_name varchar(60),
address varchar(100),
phone varchar(100),
PRIMARY KEY (customer_ID)
);

CREATE TABLE PAYMENT(
payment_ID int(100),
payment_type varchar(60),
card_account_number varchar(60),
payment_amount int(100),
tips int(100),
customer_ID int(100),
PRIMARY KEY (payment_ID),
FOREIGN KEY (customer_ID) REFERENCES Customer(customer_ID)
);

CREATE TABLE PICKUP_DESTINATION_ADDRESS(
pickup_address_destination_address_ID int(100),
```

```
unit int(40),
street varchar(100),
city varchar(100),
state varchar(100),
zip_code int (60),
country varchar(100),
customer_ID int(100) NOT NULL,
PRIMARY KEY (pickup_address_destination_address_ID),
FOREIGN KEY (customer_ID) REFERENCES Customer(customer_ID)
);

CREATE TABLE PRODUCT(
product_ID int(100),
product_price int(100),
product_type varchar(100),
PRIMARY KEY (product_ID)
);

CREATE TABLE RETAIL_STORE(
product_ID int(100),
product_name varchar(100),
store_name varchar(100),
FOREIGN KEY (product_ID) REFERENCES Product(product_ID)
);

CREATE TABLE RESTAURANT(
product_ID int(100),
```

```
restaurant_name varchar(100),
dish_name varchar(100),
FOREIGN KEY (product_ID) REFERENCES Product(product_ID)
);

CREATE TABLE PHARMACY(
product_ID int(100),
pharmacy_name varchar(100),
medicine_name varchar(100),
FOREIGN KEY (product_ID) REFERENCES Product(product_ID)
);

CREATE TABLE CAR_DEALERSHIP(
product_ID int(100),
dealership_name varchar(100),
component_name varchar(100),
FOREIGN KEY (product_ID) REFERENCES Product(product_ID)
);
CREATE TABLE TRIP (
trip_ID int(100) NOT NULL,
trip_date date,
trip_time time,
trip_wait_time varchar(50),
pickup_address_ID int(100),
destination_address_ID int(100),
customer_ID int(100) NOT NULL,
driver_ID int(100) NOT NULL,
```

payment_ID int(100) NOT NULL,

PRIMARY KEY (trip_ID),

FOREIGN KEY (pickup_address_ID) REFERENCES PICKUP_DESTINATION_ADDRESS(pickup_address_destination_address_ID),

FOREIGN KEY (destination_address_ID) REFERENCES PICKUP_DESTINATION_ADDRESS(pickup_address_destination_address_ID),

FOREIGN KEY (customer_ID) REFERENCES Customer(customer_ID),

FOREIGN KEY (driver_ID) REFERENCES Driver(driver_ID),

FOREIGN KEY (payment_ID) REFERENCES Payment(payment_ID)

);

CREATE TABLE ORDER_DETAIL(

trip_ID int(100),

product_ID int(100),

quantity int(100),

discount int(100),

CONSTRAINT PK_Order PRIMARY KEY (trip_ID, product_ID),

FOREIGN KEY (trip_ID) REFERENCES Trip(trip_ID),

FOREIGN KEY (product_ID) REFERENCES Product(product_ID));

3.2.1 Insert Data

<CUSTOMER>

Insert into customer (customer_ID, first_name, last_name, address, phone) values

(1, 'Janie', 'Sherman', '4917 N Recreation Ave Fresno, California(CA), 93726', '(559) 291-7847'),

(2, 'Justin', 'Carter', '3103 23rd St Everett, Washington(WA), 98201', '(425) 322-5281'),

(3, 'Wayne', 'Padilla', '290 Van Buren Carolina Rd Nettleton, Mississippi(MS), 38858', '(662) 963-3207'),

(4, 'Pat', 'Drake', '21 Hawkview Rd Hudson, New Hampshire(NH), 03051', '(603) 883-8250'),

(5, 'Sabrina', 'Hardy', '1035 Parkburg Rd Pinson, Tennessee(TN), 38366', '(731) 424-1619'),

(6, 'Vickie', 'Klein', '601 W Round St Landis, North Carolina(NC), 28088', '(704) 855-7778'),

(7, 'Bob', 'Bridges', '174 W Barney St Gouverneur, New York(NY), 13642', '(315) 535-4109'),

(8, 'Jimmy', 'Wise', '10105 Vaughan Ave Hastings, Florida(FL), 32145', '(386) 329-8404'),

(9, 'Kim', 'Wheeler', '9400 W Lone Beech Dr Muncie, Indiana(IN), 47304', '(765) 759-9274'),

(10, 'Nicolas', 'Cook', '2817 Partridge Dr S Hopkins, South Carolina(SC), 29061', '(803) 834-6809');

<PAYMENT>

Insert into payment (payment_ID, payment_type, card_account_number, payment_amount, tips, customer_ID) Values

(1, 'Visa', '4556883758786015', 35, 5, 6),

(2, 'Visa', '4024007154166531', 45, 5, 3),

(3, 'Visa', '4539595722225159', 20, 3, 5),

(4, 'Mastercard', '5563543370621457', 60, 8, 1),

(5, 'Mastercard', '5186620132613258', 38, 6, 9),

(6, 'Mastercard', '5348564717843564', 70, 9, 2),

(7, 'American Express', '344923584040461', 30, 2, 9),

(8, 'American Express', '379905840104528', 15, 0, 1),

(9, 'Visa', '4485750161994476', 83, 11, 4),

(10, 'Mastercard', '5298577094772578', 33, 5, 7);

<PICKUP_DESTINATION_ADDRESS>

Insert into Pickup_Destination_Address (Pickup_Address_Destination_Address_ID, unit, street, city, state, zip_code, country, customer_ID) Values

(1, 806, '3436 Summit Ct NE', 'Washington', 'DC', 20018, 'US', 1),

(2, 113, 'One Micro Soft Way', 'Redmond', 'WA', 20018, 'US', 2),

(3, 713, '34 County Rd', 'Corinth', 'MS', 38834, 'US', 3),

(4, 005, '14 Troy Smith Ln', 'Spruce Pine', 'NC', 28777, 'US', 4),

(5, 117, '673 Alta Vista Dr', 'Gatlinburg', 'TN', 37738, 'US', 5),

(6, 133, '7337 Toxaway Dr NW', 'Knoxville', 'TN', 37909, 'US', 6),

(7, 028, '1111 Marcus Ave', 'New Hyde Park', 'NY', 11042, 'US', 7),

(8, 12, '6886 Hanging Vine Way', 'Tallahassee', 'FL', 32317, 'US', 8),

(9, 336, '11126 N 1000th W', 'Demotte', 'IN', 46310, 'US', 9),

(10, 05, '2829 New Market Rd', 'Hartsville', 'SC', 29550, 'US', 10),

(11, 121, '3458 Nash Pl SE', 'Washington', 'DC', 20019, 'US', 1),

(12, 025, 'Po Box 1297', 'Ocean Park', 'WA', 20018, 'US', 2),

(13, 022, '352 Leonard Rd', 'Jackson', 'MS', 39206, 'US', 3),

(14, 334, '185 Fairway Ln', 'Spruce Pine', 'NC', 28777, 'US', 4),

(15, 151, '7337 Toxaway Dr NW', 'Knoxville', 'TN', 37909, 'US', 5),

(16, 259, '7108 Lawford Rd', 'Knoxville', 'TN', 37919, 'US', 6),

(17, 319, '135 Hillcrest Ave', 'Southampton', 'NY', 11968, 'US', 7),

(18, 45, '689 Wellington Station Blvd', 'Ormond Beach', 'FL', 32174, 'US', 8),

(19, 188, '1113 Cottage Cir', 'Seymour', 'IN', 47274, 'US', 9),

(20, 188, '283 Bells Rd', 'Allendale', 'SC', 29810, 'US', 10);

<EMPLOYEE>

Insert into Employee (employee_ID, first_name, last_name, address, phone, manager_ID) Values

(1, 'Cathy', 'Dean', '14 Linton Pl Keansburg, New Jersey(NJ), 07734', '(732) 495-3908', null),

(2, 'Tim', 'Boyd', 'Flat Iron Rd Smyrna, New York(NY), 13464', '(607) 627-6203', null),

(3, 'Allan', 'Martinez', '1520 Munn Ave Hillside, New Jersey(NJ), 07205', '(973) 923-5949', 1),

(4, 'Rosemarie', 'Luna', '136 Terrace Dr Middlefield, Ohio(OH), 44062', '(440) 632-9288', 1), (

5, 'Kristopher', 'Alexander', '2241 Lexington Dr Barksdale Afb, Louisiana(LA), 71110', '(318) 584-6255', 1),

(6, 'Elisa ', 'Dixon', '1040 S Kimbles Rd #YARDLEY Morrisville, Pennsylvania(PA), 19067', '(215) 493-2232', 2),

(7, 'Erika', 'Lawson', '430 W Manheim St Philadelphia, Pennsylvania(PA), 19144', '(215) 951-7047', 2),

(8, 'Marvin', 'Crawford', '112 Weather Vane Dr Cherry Hill, New Jersey(NJ), 08002', '(856) 667-7581', 2),

(9, 'Ted', 'Benson', '5220 N 230th Ave Buckeye, Arizona(AZ), 85326', '(623) 327-1687', 2),

(10, 'Elizabeth', 'Barnett', '13316 Jay St NW Andover, Minnesota(MN), 55304', '(763) 862-5644', 2);

<DRIVER>

Insert into Driver (driver_ID, driver_rate, employee_ID) Values

(1, 4.75, 5),

(2, 3.75, 6),

(3, 4.85, 7),

(4, 4.95, 8),

(5, 4.25, 9),

(6, 4.25, 3),

(7, 4.5, 4),

(8, 4.7, 2),

(9, 4.8, 10),

(10, 4.65, 1);

<VEHICLE>

Insert into Vehicle (vin_ID, vehicle_type, driver_ID) Values

('JH4DC4460TS005270', 'SUV', 1),

('WBACD432XWAV64423', 'Sedan', 2),

('4F4ZR17V7XTM07477', 'Sedan', 3),

('1G1AF1F57A7192174', 'Truck', 4),

('ZFF78VHA2F0209560', 'Coupe', 5),

('ZHWUC1ZF1GLA03871', 'Coupe', 5),

('WP0CB2A80EK140228', 'Coupe', 6),

('1C6RD6KT4CS332867', 'SUV', 7),

('JHMCG56492C003897', 'SUV', 8),

('2T3DK4DV8CW082696', 'SUV', 9),

('7T3AK4D68TR062466', 'Truck', 10);

<TRIP>

Insert into Trip (trip_ID, trip_date, trip_time, trip_wait_time, pickup_address_ID, destination_address_ID, customer_ID, driver_ID, payment_ID) Values

(1, '20190601', '153000', '15', 1, 11, 1, 1, 4),

(2, '20190705', '183000', '11', 2, 12, 2, 2, 7),

(3, '20200103', '170000', '8', 3, 13, 3, 2, 2),

(4, '20200119', '090000', '12', 4, 14, 4, 3, 9),

(5, '20200110', '110000', '5', 5, 15, 5, 4, 3),

(6, '20200110', '130000', '5', 6, 16, 6, 5, 1),

(7, '20200521', '113500', '9', 7, 17, 7, 1, 10),

(8, '20200521', '163500', '15', 18, 8, 8, 2, 8),

(9, '20200601', '181600', '6', 9, 19, 9, 3, 5),

(10, '20200601', '192000', '6', 9, 20, 9, 3, 6);

<PRODUCT>

Insert into Product (product_ID, product_price, product_type) Values

(1, 20, 'retail_store'),

(2, 30, 'retail_store'),

(3, 40, 'retail_store'),

(4, 30, 'Restaurant'),

(5, 40, 'Restaurant'),

(6, 50, 'Restaurant'),

(7, 50, 'Pharmacy'),

(8, 60, 'Pharmacy'),

(9, 70, 'Pharmacy'),

(10, 100, 'Car_Dealership'),

(11, 200, 'Car_Dealership'),

(12, 250, 'Car_Dealership');

<STORE>

Insert into Retail_Store (product_ID, product_name, store_name) Values

(1, 'Water', 'Target'),

(2, 'Facial tissue', 'Target'),

(3, 'Apple juice', 'Whole Food');

Insert into Restaurant (product_ID, restaurant_name, dish_name) Values

(4, 'Flavio', 'Salsiccia Pizza'),

(5, 'Flavio', 'Spaghetti Bolognese'),

(6, 'McDonald', 'Big Mac');

Insert into Pharmacy (product_ID, pharmacy_name, medicine_name) Values

(7, 'CVS', 'Pain Killer'),

(8, 'CVS', 'Adalimumab'),

(9, 'CVS', 'Apixaban');

Insert into Car_Dealership (product_ID, dealership_name, component_name) Values

(10, 'Mercedes-Benz of Arlington', 'sedan car battery'),

(11, 'NTB', 'continental all season tire'),

(12, 'CarSmart', 'continental summer season tire');

Insert into Order_Detail (trip_ID, product_ID, quantity, discount) Values

(2, 9, 1, 0),

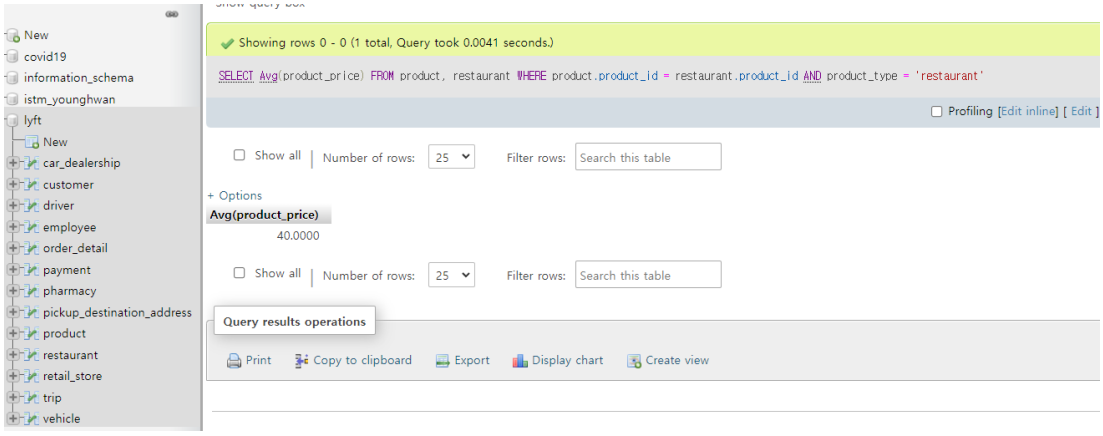
(1, 2, 2, 0),

(8, 11, 1, 0.525);

3.2.2 Write Queries

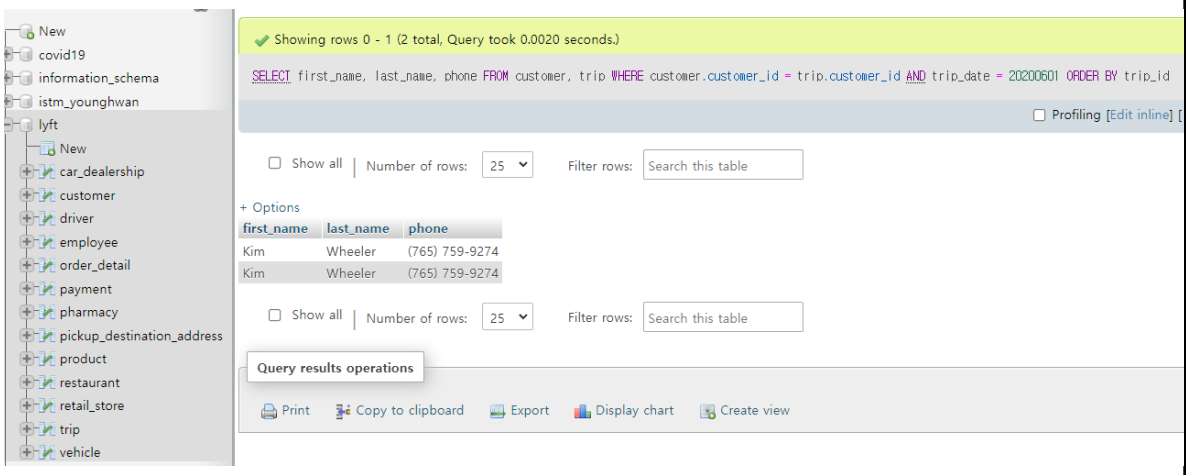
1. Average product price of registered restaurants.

```
SELECT Avg(product_price) FROM product, restaurant

WHERE product.product_id = restaurant.product_id AND product_type = 'restaurant';
```



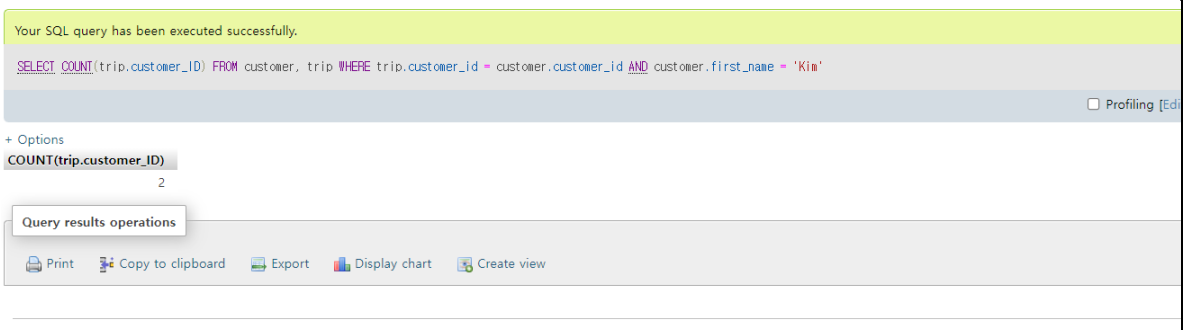
2. Display customer information (first_name, last_name, phone, trip_type) of the trip date 2020/06/01. Sort the results first by the trip_ID.

```
SELECT first_name, last_name, phone FROM customer, trip

WHERE customer.customer_id = trip.customer_id AND trip_date = 20200601

ORDER BY trip_id;
```



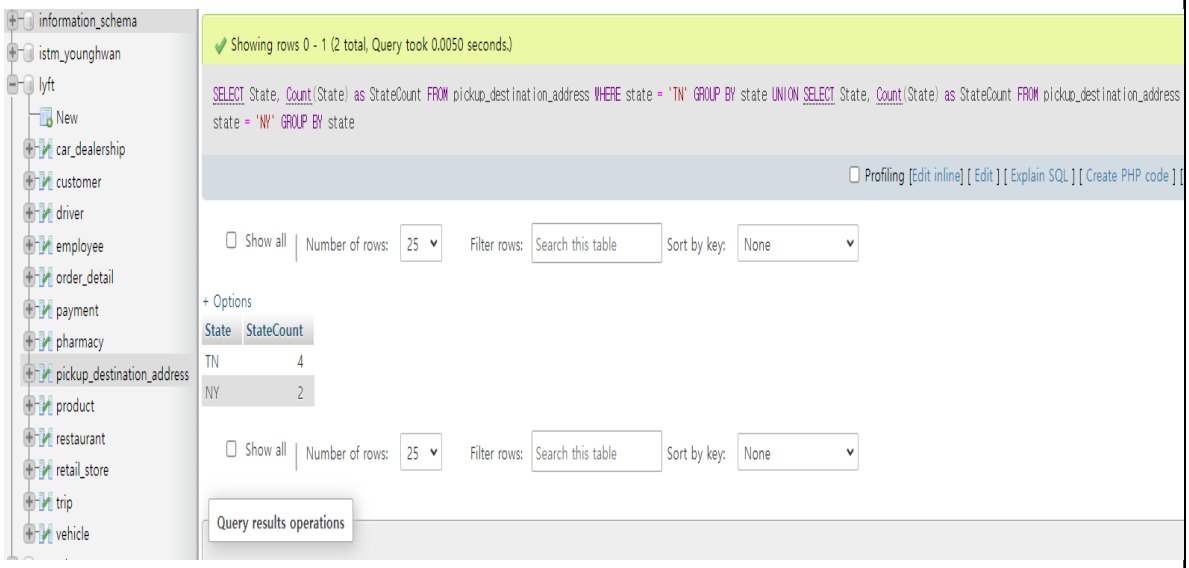
3. Count of customerID whose first name is “Kim”.

```
SELECT COUNT(trip.customer_ID)  FROM customer, trip

WHERE trip.customer_id = customer.customer_id AND customer.first_name = ‘Kim’;
```



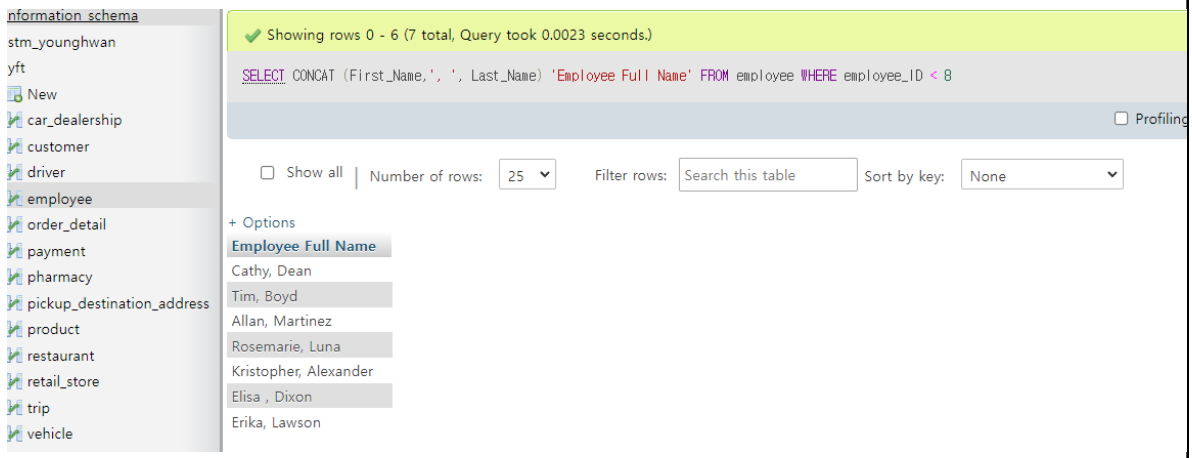
4. Count the number of Tennessee State for pickup and destination address and the number of New York State for pickup and destination address.

```
SELECT State, Count(State) as StateCount FROM pickup_destination_address

WHERE state = 'TN'

GROUP BY state

UNION

SELECT State, Count(State) as StateCount FROM pickup_destination_address

WHERE state = 'NY'

GROUP BY state;
```



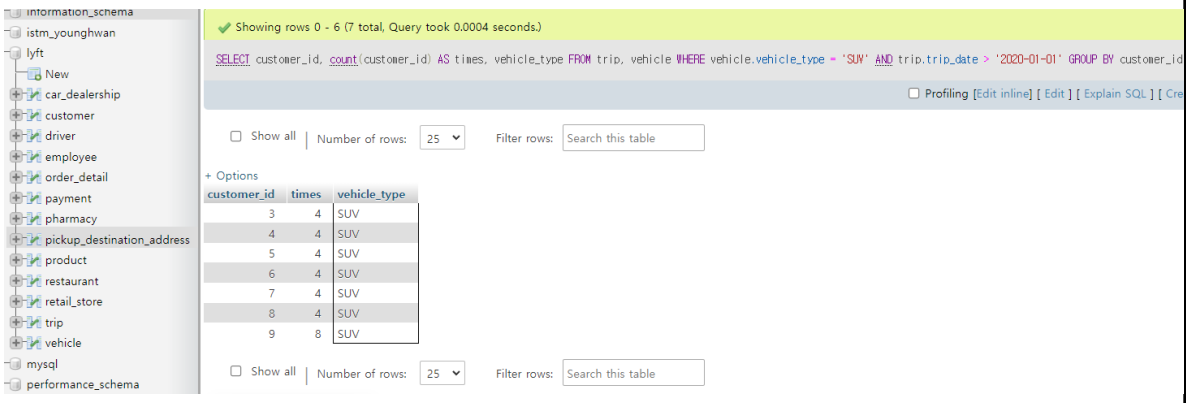
5. Display employee's full name of the person whose employee ID number is under 8.

```
SELECT CONCAT (First_Name,', ', Last_Name) 'Employee Full Name' FROM employee

WHERE employee_ID < 8;
```



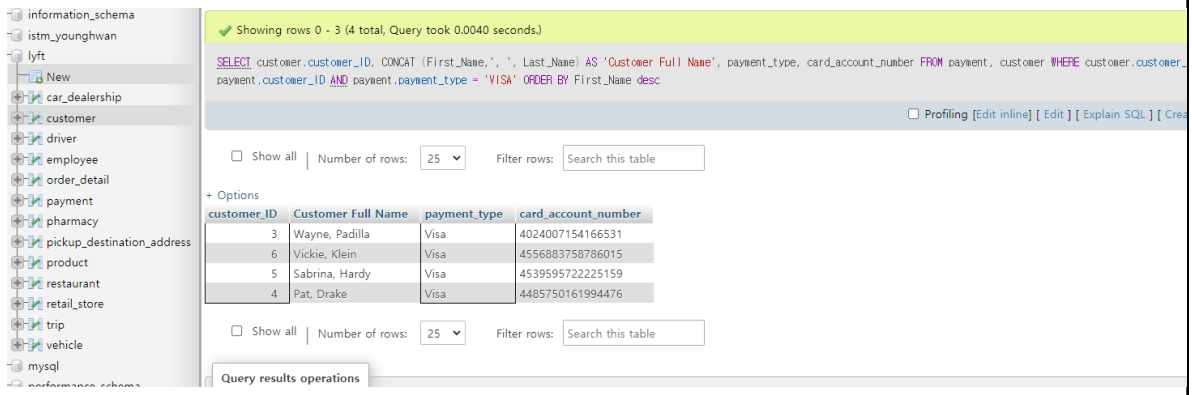
6. Display customers' ID and the number of trips using the SUV vehicle type from 2020.

```
SELECT customer_id, count(customer_id) AS times, vehicle_type

FROM trip, vehicle

WHERE vehicle.vehicle_type = 'SUV'

AND trip.trip_date > '2020-01-01'

GROUP BY customer_id;
```



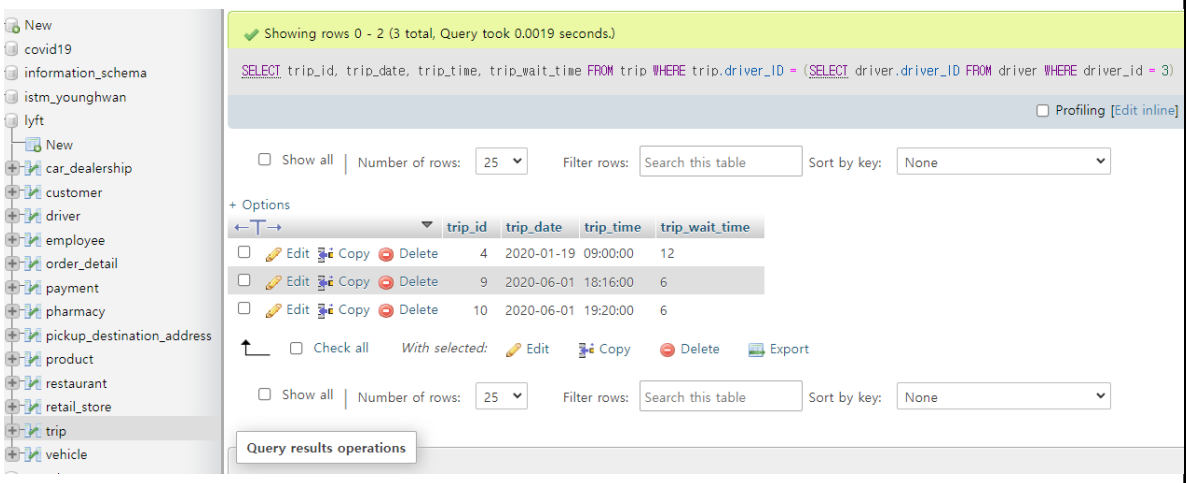
7. Display customer information (CustomerID, full name, payment type and account number) using VISA card type. Sort the results of the customer's full name descending order.

```
SELECT customer.customer_ID, CONCAT (First_Name,', ', Last_Name) AS 'Customer Full Name', payment_type, card_account_number

FROM payment, customer

WHERE customer.customer_ID = payment.customer_ID AND payment.payment_type = 'VISA'

ORDER BY First_Name desc;
```



8. Display trip information (trip ID, Date, Time, Waiting time) of the driver who is driver id = 3, by using subquery.

```
SELECT trip_id, trip_date, trip_time, trip_wait_time
FROM trip
WHERE trip.driver_ID =
    (SELECT driver.driver_ID
    FROM driver
    WHERE driver_id = 3);
```

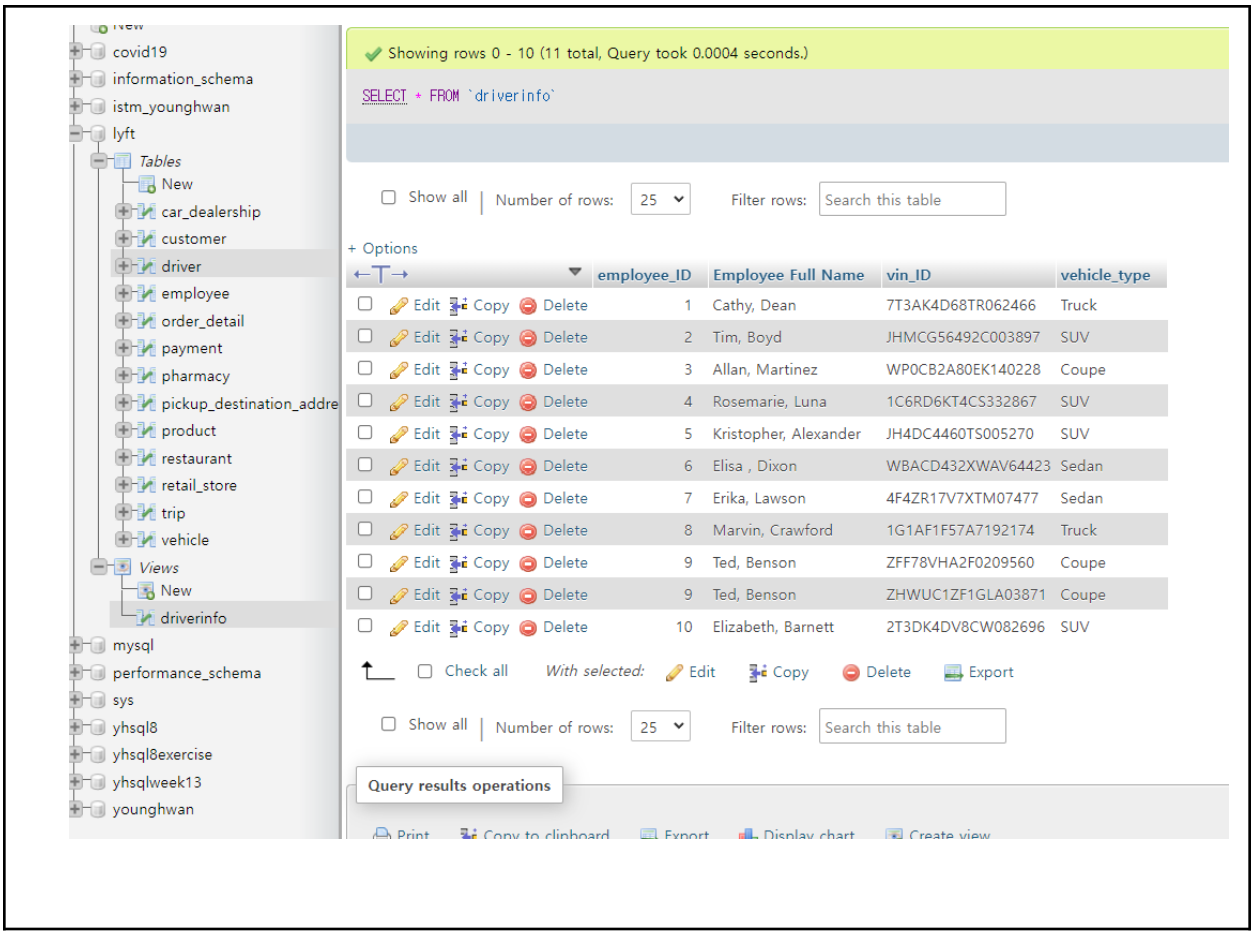


9. Display product id and discounted items from various partner shops (retail stores, restaurants, pharmacies and car dealerships).

```
SELECT order_detail.product_ID AS discounted_productID, retail_store.product_name,
restaurant.dish_name, pharmacy.medicine_name, car_dealership.component_name

FROM order_detail

LEFT JOIN retail_store ON order_detail.product_ID = retail_store.product_ID

LEFT JOIN restaurant ON order_detail.product_ID = restaurant.product_ID

LEFT JOIN pharmacy ON order_detail.product_ID = pharmacy.product_ID

LEFT JOIN car_dealership ON order_detail.product_ID = car_dealership.product_ID

WHERE order_detail.discount > 0;
```

10. Create a View which shows the driver's vehicle information (employeeID, full name, vehicle's vin number and vehicle type)

```
CREATE VIEW DriverInfo AS

SELECT employee.employee_ID, CONCAT(employee.First_Name,', ',
employee.Last_Name) AS 'Employee Full Name',

vehicle.vin_ID, vehicle_type

FROM employee, driver, vehicle

WHERE employee.employee_ID = driver.employee_ID

AND driver.driver_ID = vehicle.driver_ID;
```


covid19
information_schema
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lyft
Tables
New
car_dealership
customer
driver
employee
order_detail
payment
pharmacy
pickup_destination_addre
product
restaurant
retail_store
trip
vehicle
Views
New
driverinfo
mysql
performance_schema
sys
yhsql8
yhsql8exercise
yhsqlweek13
younghwan
Showing rows 0 - 10 (11 total, Query took 0.0004 seconds.)
SELECT * FROM `driverinfo`
Show all | Number of rows: 25 Filter rows: Search this table
+ Options
employee_ID Employee Full Name vin_ID vehicle_type
Edit Copy Delete 1 Cathy, Dean 7T3AK4D68TR062466 Truck
Edit Copy Delete 2 Tim, Boyd JHMCG56492C003897 SUV
Edit Copy Delete 3 Allan, Martinez WP0CB2A80EK140228 Coupe
Edit Copy Delete 4 Rosemarie, Luna 1C6RD6KT4CS332867 SUV
Edit Copy Delete 5 Kristopher, Alexander JH4DC4460TS005270 SUV
Edit Copy Delete 6 Elisa , Dixon WBACD432XWAV64423 Sedan
Edit Copy Delete 7 Erika, Lawson 4F4ZR17V7XTM07477 Sedan
Edit Copy Delete 8 Marvin, Crawford 1G1AF1F57A7192174 Truck
Edit Copy Delete 9 Ted, Benson ZFF78VHA2F0209560 Coupe
Edit Copy Delete 9 Ted, Benson ZHWUC1ZF1GLA03871 Coupe
Edit Copy Delete 10 Elizabeth, Barnett 2T3DK4DV8CW082696 SUV
Check all With selected: Edit Copy Delete Export
Show all | Number of rows: 25 Filter rows: Search this table
Query results operations
Print Copy to clipboard Export Display chart Create view

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