Purdue Mobile Food Solutions

Database Management System

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Background

General Info

Big Data

Management Firm

Located in West

Lafayette, IN

Expertise

Intel on food truck

industry :

- Supplier information
- location data
- event statistics
- licensing solutions

Project Purpose

Consolidate and Improve

Database :

- Provide increased

service quality

- Ensure information

security for clients

Project Introduction

Objective

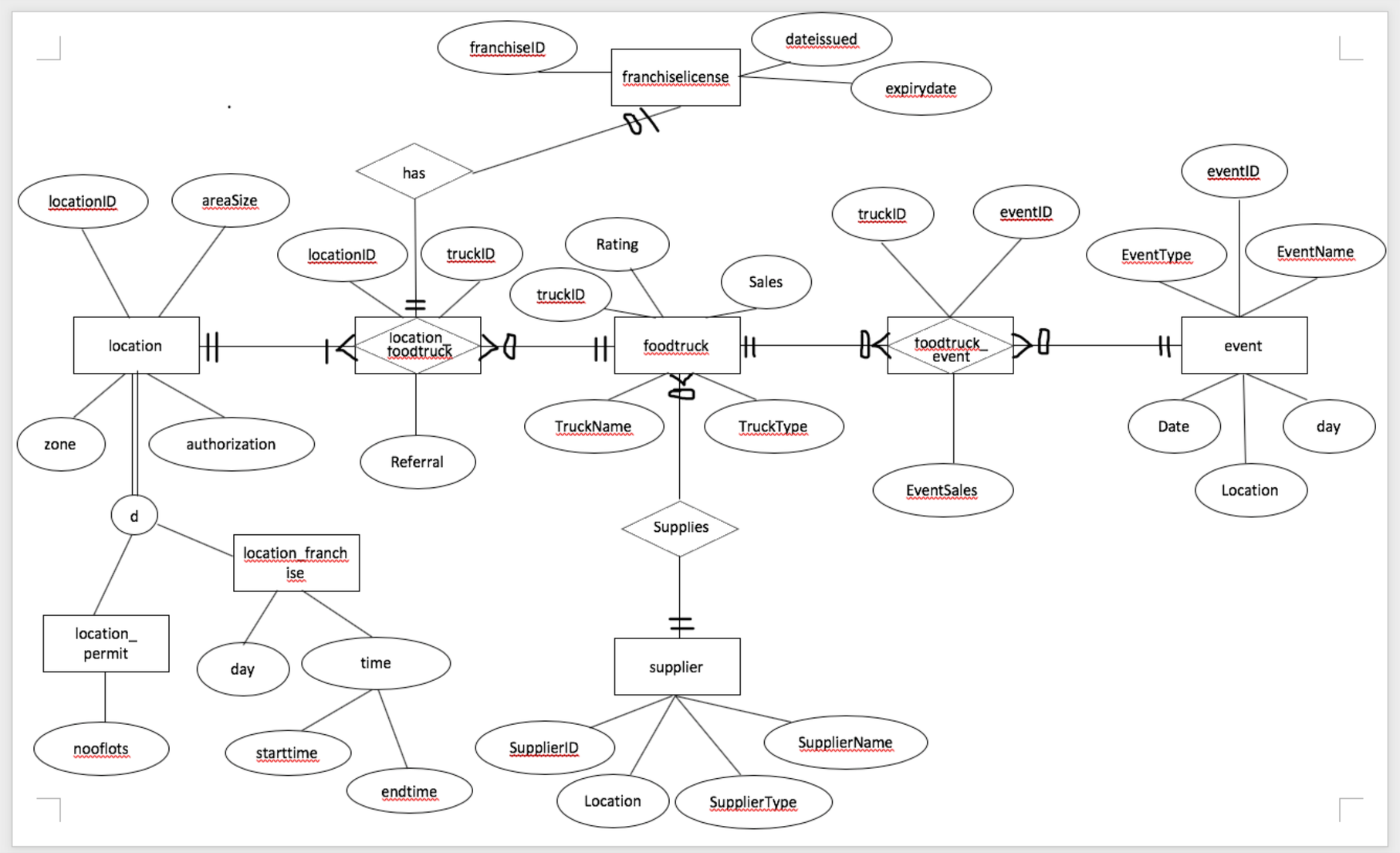
Creating an improved database in terms of :

- Accuracy
- Accessibility
- Security
- Scalability

Service Quality

Providing suggestions and query ideas for PMFS to utilise to improve their service to customers

ERD


franchiseID
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locationID
areaSize
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zone
authorization
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day
time
starttime
endtime
locationID
truckID
location toodtruck
Referral
Rating
truckID
Sales
foodtruck
TruckName
TruckType
Supplies
supplier
SupplierID
SupplierName
Location
SupplierType
truckID
eventID
toodtruck_ event
EventSales
eventID
EventType
EventName
event
Date
day
Location

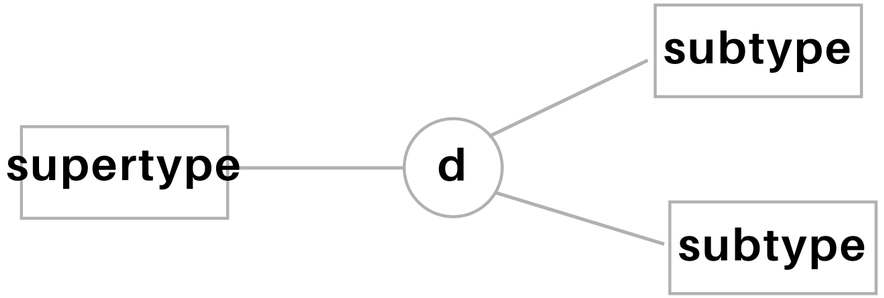
MAIN ERD COMPONENTS

4 Entities

- Location
- Foodtruck
- Supplier
- Event
- Franchise License

2 Associative Entities

- Location_Foodtruck
- Foodtruck_event



1 Supertype with 2 Subtypes

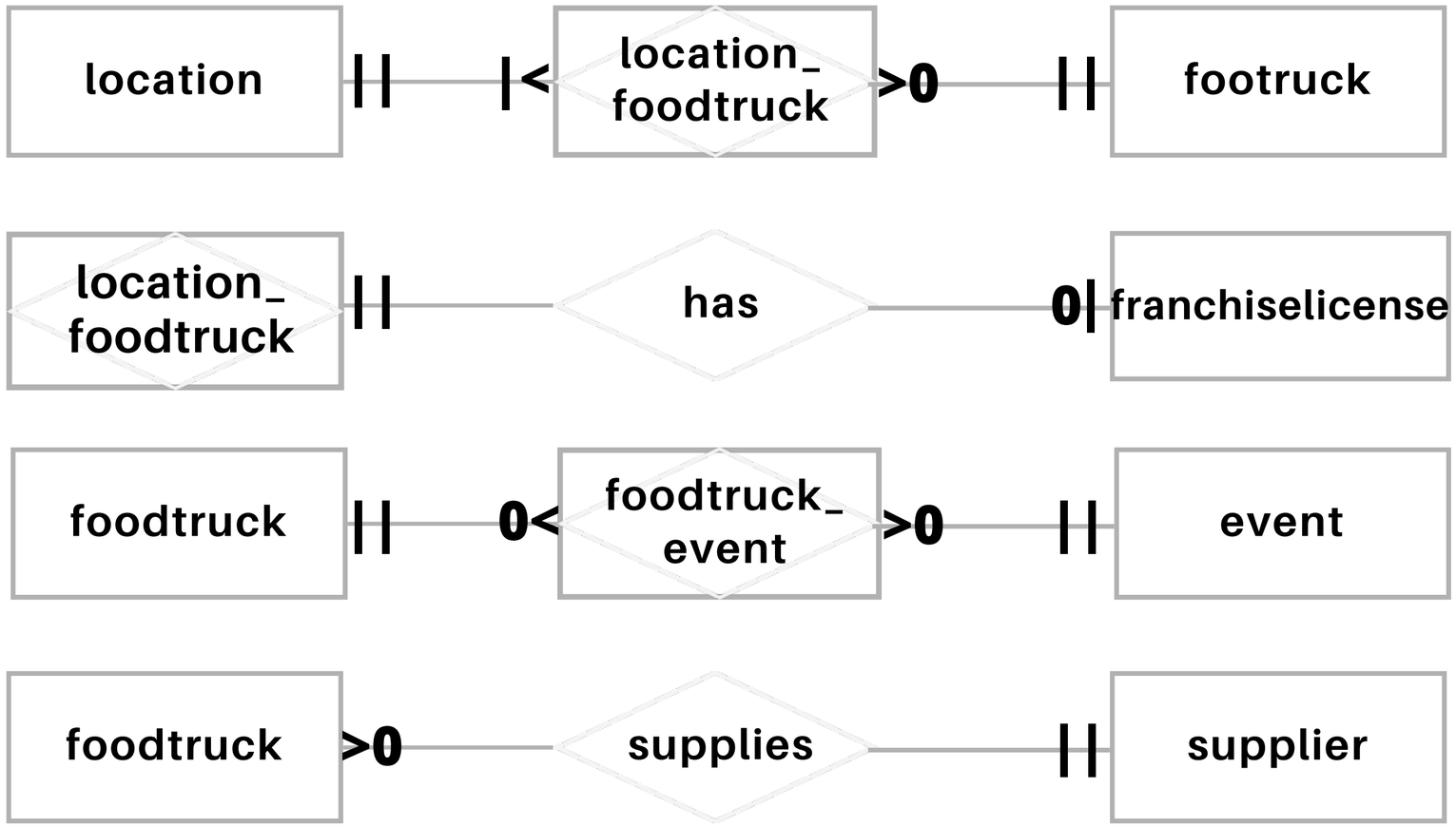
Supertype
Location

Subtype
Permit &
Franchise

R/S Cardinality
Total Specialization Rule

Disjoint Constraints
Disjoint

ERD RELATIONSHIPS

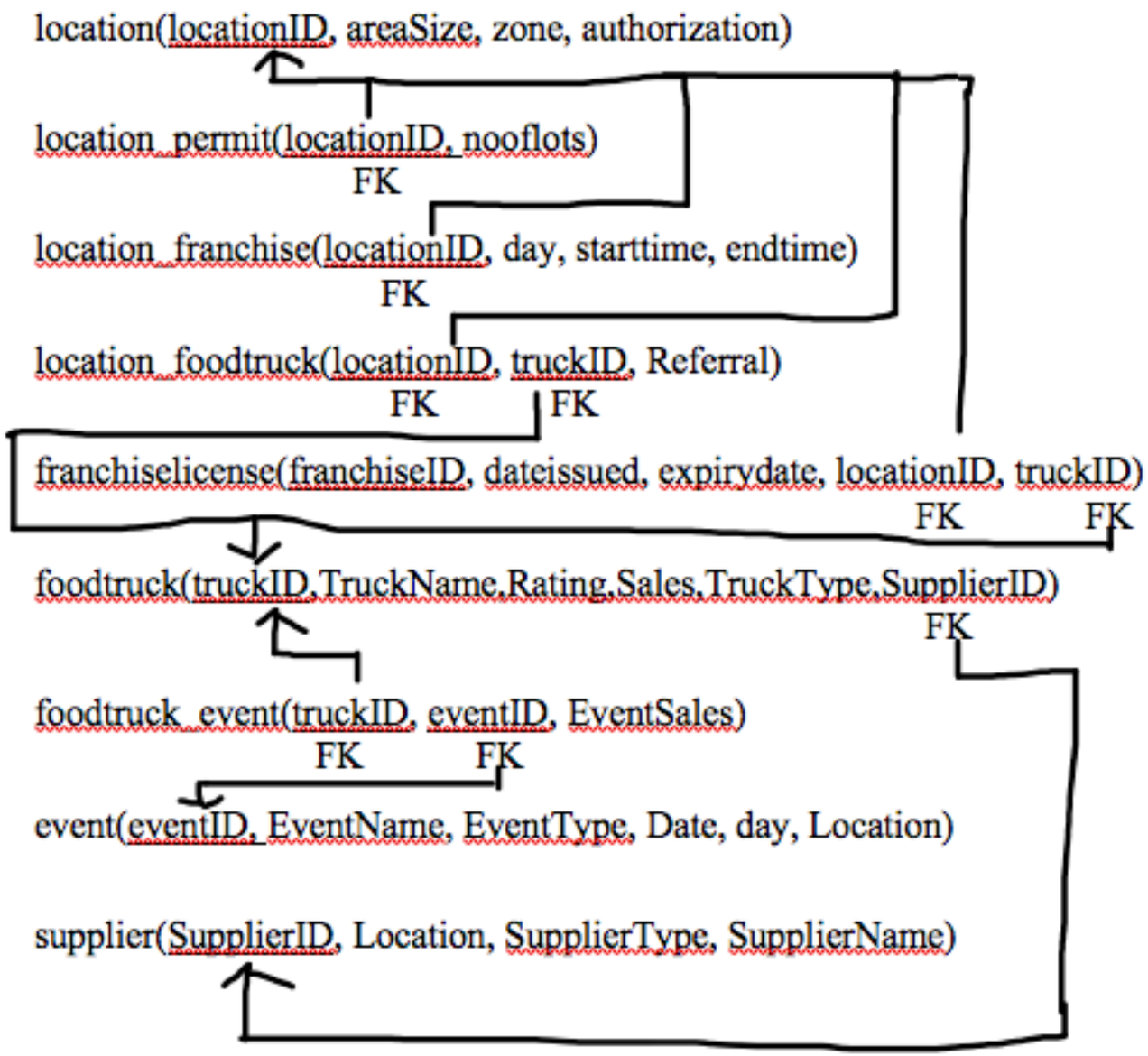


Relational Schema

Important Notes

All are already in 3NF

SupplierID (FK) in foodtruck entity
locationID and truckID (FK) in franchise license
locationID (FK) for subtypes permit and franchise



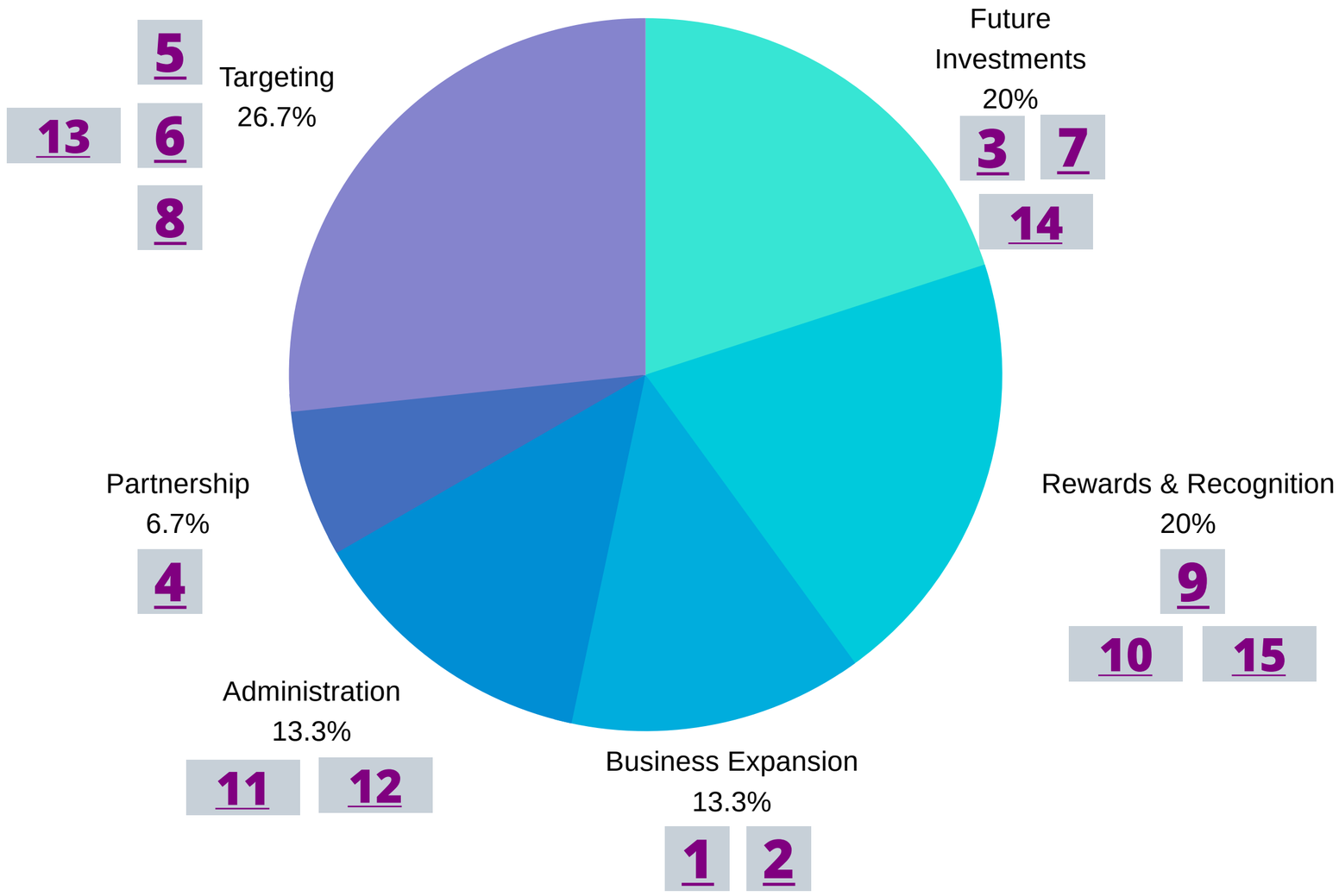
Database Implementation

Entity	Event						foodtruck_event			franchiselicense					location				location_foodtruck		
Column Name	EventID	EventName	EventType	Date	Day	Location	EventID	truckID	EventSales	franchiseID	locationID	truckID	dateissued	expirydate	locationID	zone	areaSize	authorization	locationID	truckID	Referral
varchar(20)	/						/	/		/	/	/			/				/	/	
text		/	/		/	/										/		/			/
datetime				/									/	/							
int									/								/				
NOT NULL	/						/	/		/	/	/			/				/	/	
Primary Key	/						/	/		/					/				/	/	
Foreign Key											/	/									

Entity	location_permit		location_franchise				supplier				foodtruck					
Column Name	locationID	nooflots	locationID	day	starttime	endtime	SupplierID	Location	SupplierType	SupplierName	truckID	TruckName	Sales	Rating	TruckType	SupplierID
varchar(20)	/		/				/				/					/
text				/				/	/	/		/			/	
datetime					/	/										
int		/											/	/		
NOT NULL	/		/				/				/					/
Primary Key	/		/				/				/					
Foreign Key																/

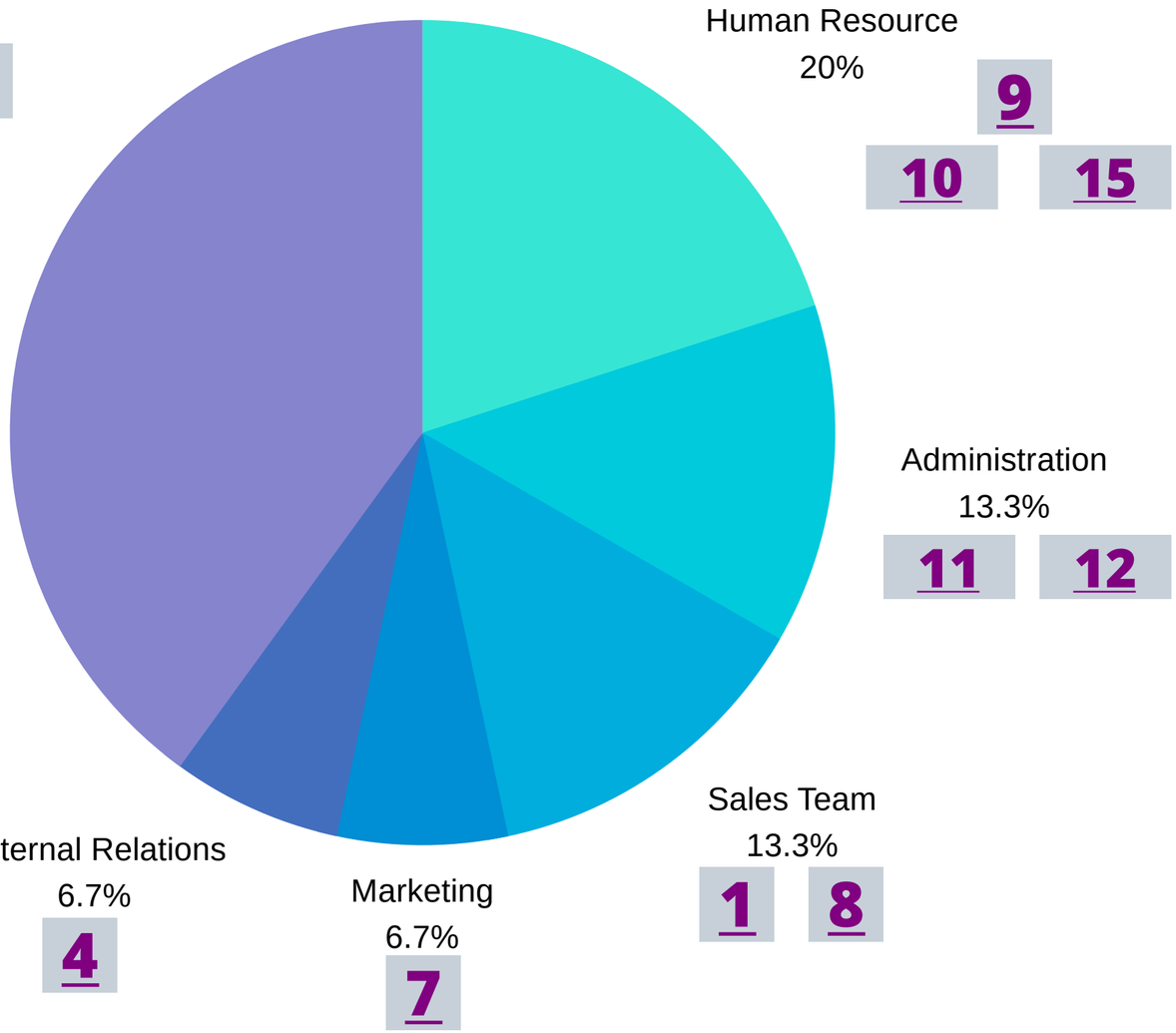
SQL QUERIES

Each query and their Business Purpose



SQL QUERIES

Each query and the Department they aim to serve



SQL QUERIES

1 | Business Expansion | Sales Team

After finding the most profitable truck types combined with their average ratings, Purdue Mobile Food Solutions (PMFS) hopes to purchase more of the most popular and efficient truck types in the future so that budgets will be spent more efficiently in business expansion. This query gives PMFS an overview of each TruckType's sales by location, event, average event sales, total sales and average rating.

RIGHT JOIN and SUBQUERY :
List the total sales (Event Sales and Location sales) for each truck type in descending order and provide the average rating for each truck type

```
SELECT foodtruck. TruckType, SUM(foodtruck.Sales+TotalEventSales) AS TotalSales,
SUM(TotalEventSales) AS TotalEventSales, SUM(Sales) AS TotalLocationSales,
AVG(AVGEventSales) AS AVGEventSales
FROM foodtruck
RIGHT JOIN(
SELECT SUM(EventSales) as TotalEventSales, truckID, COUNT(*), AVG(EventSales)
AS AVGEventSales
FROM foodtruck_event
GROUP BY truckID) A
ON foodtruck.truckID = A.truckID
GROUP BY foodtruck.TruckType
ORDER BY foodtruck.Sales+TotalEventSales DESC;
```

TruckType	TotalSales	TotalEventSales	TotalLocationSales	AVGEventSales
Burger	55389	34216	21173	760.35555333
Taco	40504	24226	16278	757.48334000
Subs	24595	16424	8171	743.64287143

SQL QUERIES

2 Business Expansion Business Ops

The CFO of PMFS wants to figure out the overall area size and number of locations in which employee authorization is required so that they can plan their business expansion and budget more carefully since such authorization is acquired through negotiations and time-consuming.

GROUP BY:

List the total area size and count for zones in which employee authorization is required.

```
SELECT authorization, zone, SUM(areaSize) as Total_Area_authoriz_by_empl, COUNT(*) AS NumberofLocations
FROM location
WHERE authorization ="employee"
GROUP BY zone;
```

	authorization	zone	Total_Area_authoriz_by_empl	NumberofLocations
▶	Employee	Industrial	102	10

SQL QUERIES

3 Future Investments Business Ops

In order to save gasoline costs and make investments transit into profits more efficiently, PMFS wants to target some “golden” locations to deploy food trucks in search of more visits, reputation, and sales. After this query provides them with the top 5 most profitable locations, PMFS can check and ensure they always have a truck at those locations to maximise profit. Other than that, PMFS can also learn which zones are associated with the high sales locations and research to more locations under the same zone tagging to deploy foodtrucks.

INNER JOIN AND GROUP BY :

List five most profitable locations to deploy food trucks. Display their sales, location and zone.

```
SELECT SUM(Sales),location_foodtruck.locationID,location.zone
FROM foodtruck
INNER JOIN location_foodtruck
ON foodtruck.truckID = location_foodtruck.truckID
INNER JOIN location
ON location_foodtruck.locationID = location.locationID
GROUP BY locationID
ORDER BY sum(Sales) DESC
LIMIT 5;
```

	SUM(Sales)	locationID	zone
▶	7870	C7	Public
	7567	B6	Industrial
	6889	C8	Public
	6584	B7	Industrial
	6102	D3	School

SQL QUERIES

4

Partnership

External Relations

Suppliers of PMFS vary in type and scale. It is time to know what customers like most. With the analyses, PMFS can cut its budgets in purchasing less popular food and focus on cooperating with the most popular and profitable suppliers.

LEFT JOIN and GROUP BY :

List five suppliers whose food was the most popular.

```
SELECT sum(Sales),supplier.SupplierID,supplier.SupplierType
FROM foodtruck
LEFT JOIN supplier
ON foodtruck.SupplierID = supplier.SupplierID
GROUP BY SupplierID
ORDER BY sum(Sales) DESC
LIMIT 5;
```

sum(Sales)	SupplierID	SupplierType
4090	S019	Tacos
3988	S004	Burgers
3534	S002	Burgers
2948	S007	Burgers
2797	S001	Burgers

SQL QUERIES

5

Targeting

Business Ops

Events are great places to increase the popularity and sales of PMFS. However, there have been so many events taking place in this city. PMFS does not have enough employees and budgets to attend all of them. It is strongly recommended that PMFS target the three most profitable event types and gain reputation and sales from them.

INNER JOIN and GROUP BY:
List Top 3 event types that incurs the most sales.

```
SELECT sum(EventSales),EventType
FROM foodtruck
INNER JOIN foodtruck_event
ON foodtruck.truckID = foodtruck_event.TruckID
INNER JOIN event
ON event.EventID = foodtruck_event.EventID
GROUP BY event.EventType
ORDER BY sum(EventSales) DESC
LIMIT 3;
```

	sum(EventSales)	EventType
▶	17303	Food Truck Fair
	15470	Sports Tournament
	14570	State Fair

SQL QUERIES ——————— 6 Targeting Business Ops

To plan budgets and earn profits better, PMFS wants to know which zone has the highest average sales per truck and then compares it to the number of trucks it currently has in that zone to determine if PMFS needs to rearrange the current truck positioning.

INNER JOIN and GROUP BY :
List every zones average sales and the associated number of trucks

```
SELECT location.zone,location.authorization, AVG(foodtruck.sales) AS AVGSalesPerZone,
COUNT(foodtruck.truckID) AS NumberOfTrucks
FROM  location
INNER JOIN location_foodtruck
ON location.locationID = location_foodtruck.locationID
INNER JOIN foodtruck
ON location_foodtruck.truckID = foodtruck.truckID
GROUP BY location.zone,location.authorization
ORDER BY AVG(foodtruck.sales) DESC;
```

zone	authorization	AVGSalesPerZone	NumberOfTrucks
Public	N/A	1624.5000	22
Residential	City	1518.6818	22
School	Admin.	1491.5263	19
Industrial	Employee	1285.4375	32

SQL QUERIES

7

Future Investments

Marketing

Advertisements have been a great method in expanding business and gaining reputation. After knowing the most successful referral methods, PMFS can invest more into that type while cutting budgets on other inefficient referral methods to attract trucks. Considering the high number of “Other” referrals, PMFS can also look into other types of advertising that they have not actively engaged in but is driving high volume.

LEFT JOIN and GROUP BY:

List the total number of trucks associated with each referral

```
SELECT location_foodtruck.Referral,COUNT(foodtruck.truckID) AS NoOfTrucks
FROM foodtruck
LEFT JOIN location_foodtruck
ON foodtruck.truckID = location_foodtruck.truckID
WHERE foodtruck.TruckType = "Burger"
GROUP BY location_foodtruck.Referral
ORDER BY COUNT(foodtruck.truckID) DESC;
```

Referral	NoOfTrucks
Other	15
Ad	11
Facebook	11
Word of Mouth	8
Email	6

SQL QUERIES

8 | Targeting | Sales Team

PMFS wants to know which truck type performs best in attracting customers and promoting sales during each event so that it can plan more specifically and deploy that truck type more in the incoming events.

INNER JOIN and SUBQUERY:
List the truck type that has the highest average sales for each event type.

```
SELECT EventType, TruckType, NoofTrucks,
Max(AVGTruckSales) AS TopAVGSalesPerTruck
FROM ( SELECT event.EventType, foodtruck.TruckType, COUNT(foodtruck.TruckID)AS NoofTrucks,
        AVG(foodtruck_event.EventSales)AS AVGTruckSales
        FROM event
        INNER JOIN foodtruck_event
        ON event.EventID = foodtruck_event.EventID
        INNER JOIN foodtruck
        ON foodtruck.TruckID = foodtruck_event.TruckID
        GROUP BY event.EventType, foodtruck.TruckType
        ORDER BY event.EventType DESC, AVG(foodtruck_event.EventSales) DESC) A
GROUP BY EventType
ORDER BY TopAVGSalesPerTruck DESC;
```

EventType	TruckType	NoofTrucks	TopAVGSalesPerTruck
Sports Tournament	Subs	5	854.8000
Concert	Subs	3	854.6667
State Fair	Burger	14	782.8571
Food Truck Fair	Taco	11	755.5455
Fund Raiser	Subs	5	742.0000

SQL QUERIES

9 | Rewards & Recognition | Human Resource

PMFS has received several calls that praised its service in Location B1. Therefore, we want to award employees in this area according to their contributions to sales, which can act as an encouragement to other employees.

RIGHT JOIN:
List the top 3 highest rated food trucks at Location B1 with the corresponding method of referral.

```
SELECT foodtruck.TruckName, foodtruck.Rating, location_foodtruck.Referral
FROM foodtruck
RIGHT JOIN location_foodtruck
ON foodtruck.truckID = location_foodtruck.truckID
WHERE location_foodtruck.locationID=
ORDER BY Rating DESC
LIMIT 3;
```

	TruckName	Rating	Referral
▶	Bill's Burger4	5	Facebook
	Bill's Burger3	4	Other
	Bill's Burger15	1	Ad

SQL QUERIES

10 | Rewards & Recognition | Human Resource

It is necessary that PMFS boost sales by encouraging its employees and awarding them accordingly. But first of all, it needs to figure out the sales champions during these months.

LEFT JOIN and GROUP BY:
List all the food trucks which have event sales greater than $800.

```
SELECT foodtruck.TruckName, foodtruck_event.EventSales
FROM foodtruck
LEFT JOIN foodtruck_event
ON foodtruck.truckID = foodtruck_event.TruckID
GROUP BY foodtruck.TruckName
HAVING foodtruck_event.EventSales>800
ORDER BY foodtruck_event.EventSales DESC;
```

TruckName	EventSales
Bil's Taco2	984
Bil's Taco10	980
Bil's Burger15	966
Bil's Burger8	965
Bil's Taco4	959
Bil's Burger7	956
Bil's Taco5	937
Bil's Burger2	933
Bil's Burger10	912
Bil's Taco6	910
Bil's Subs5	908
Bil's Burger14	899
Bil's Subs4	888
Bil's Taco1	828
Bil's Burger9	813
Bil's Taco8	812
Bil's Subs2	804

SQL QUERIES

11 | Administration | Administration

PMFS realized that there was a system error a few months ago that caused their franchise officer to not receive notifications on their expired licenses. PMFS now needs to find out which licenses has expired and apply for a renewal as soon as possible to avoid any penalty from the authorities. Before renewing any licenses, PMFS also studies the trucks performance at the specific location to determine if the license is worth renewing or not.

RIGHT JOIN and SUBQUERY:
List the franchise licenses that are currently expired. Also display their validity duration and average sales per valid year.

```
SELECT A.*, foodtruck.Sales/validityduration AS AVGSalesPerYear
FROM foodtruck
RIGHT JOIN （SELECT locationID, truckID, expirydate,
DATEDIFF(franchiselicense.expirydate,franchiselicense.dateissued)/365 AS validityduration
FROM franchiselicense) A
ON foodtruck.truckID = A.truckID
WHERE expirydate<CURDATE();
```

locationID	truckID	expirydate	validityduration	AVGSalesPerYear
A6	M15	2020-03-24 00:00:00	2.0000	437.0000
B8	COS34	2019-07-20 00:00:00	2.0000	612.5000

SQL QUERIES

Many of the foodtrucks under PMFS has deploying a lot of foodtrucks are different locations. After the recent tightening of number of lots per permit location, PMFS needs to find out if they have too many trucks at any locations or if they're currently at the max number allowed so that they stop deploying any foodtrucks at that locations.

INNER JOIN and SUBQUERY:

List the locations which has a total truck count that's more than or equal to the permitted no of lots.

```
SELECT location_permit.locationID, location_permit.nooflots, TruckCount
FROM location_permit
INNER JOIN( SELECT COUNT(*) AS TruckCount, locationID
FROM location_foodtruck
GROUP BY locationID) A
ON location_permit.locationID = A.locationID
WHERE location_permit.nooflots < TruckCount OR location_permit.nooflots = TruckCount;
```

	locationID	nooflots	TruckCount
▶	A5	4	4
	C1	3	4

SQL QUERIES

13 | Targeting | Business Ops

During a recent performance review after an event, PMFS noticed that there were trucks that usually have low sales amount generating much higher event sales. PMFS wants to find out which trucks share this trait and redirect these trucks operating time to cater events more than location based sales.

RIGHT JOIN and SUBQUERY:
List trucks that has an average event sales that's higher than their regular sales

```
SELECT foodtruck.truckID, foodtruck.TruckName, foodtruck.Sales, AverageEventSales
FROM foodtruck
RIGHT JOIN (SELECT AVG(foodtruck_event.EventSales) AS AverageEventSales, foodtruck_event.truckID
FROM foodtruck_event
GROUP BY foodtruck_event.TruckID
ORDER BY foodtruck_event.EventSales DESC) A
ON A.truckID = foodtruck.truckID
WHERE foodtruck.Sales < AverageEventSales;
```

truckID	TruckName	Sales	AverageEventSales
COS33	Bill's Burger7	794	887.3333
M11	Bill's Subs5	396	849.6667
COS23	Bill's Taco1	590	664.5000
COS35	Bill's Burger9	601	905.3333
M23	Bill's Subs6	450	677.0000

SQL QUERIES

14

Future Investments

Business Ops

Franchise permits are expensive and PMFS needs to decide ways to better decide which licenses to obtain. PMFS decides that they want to study if different days of the week affects the average sales amount per truck.

LEFT JOIN and GROUP BY:
List the average sales amount for the days that franchise locations are open.

```
SELECT location_franchise.locationID, Count(DISTINCT(location_franchise.locationID)) AS
LocationCount,AVG(Sales), day
FROM location_franchise
LEFT JOIN location_foodtruck
ON location_franchise.locationID = location_foodtruck.locationID
LEFT JOIN foodtruck
ON location_foodtruck.truckID = foodtruck.truckID
GROUP BY day
ORDER BY AVG(Sales) DESC;
```

locationID	LocationCount	AVG(Sales)	day
B8	2	1548.8333	Sunday
B6	1	1513.4000	Monday
C4	1	1397.0000	Tuesday
A7	3	1229.1538	Saturday
A6	1	1163.0000	Friday
A8	1	1100.6667	Wednesday

SQL QUERIES

15 | Rewards & Recognition | Human Resource

The foodtruck manager of PMFS is trying to remember which truck had the highest sales during a particular event. He only knows that the event was held on Monday and that the name started with F. He believes he can determine which truck it was if he had a list of all the highest sale amount from events that suits his description.

LEFT JOIN and SUBQUERY:
List the Max event sales for any event that starts with F and occurred on Monday. Display this information with the truckID.

```
SELECT EventName,truckID, Date, day, MaxSales
FROM event
LEFT JOIN (SELECT MAX(EventSales) AS MaxSales, eventID, truckID
FROM foodtruck_event
GROUP BY eventID) A
ON event.eventID = A.eventID
WHERE EventName LIKE "F%" AND Day="Monday"
ORDER BY MaxSales DESC
```

EventName	truckID	Date	day	MaxSales
Fund Raiser 6	COS12	2020-03-27 00:00:00	Monday	993
Fund Raiser 5	COS13	2018-07-05 00:00:00	Monday	809
Fund Raiser 2	M11	2018-07-24 00:00:00	Monday	756
Food Truck Fair 5	M13	2017-07-20 00:00:00	Monday	666