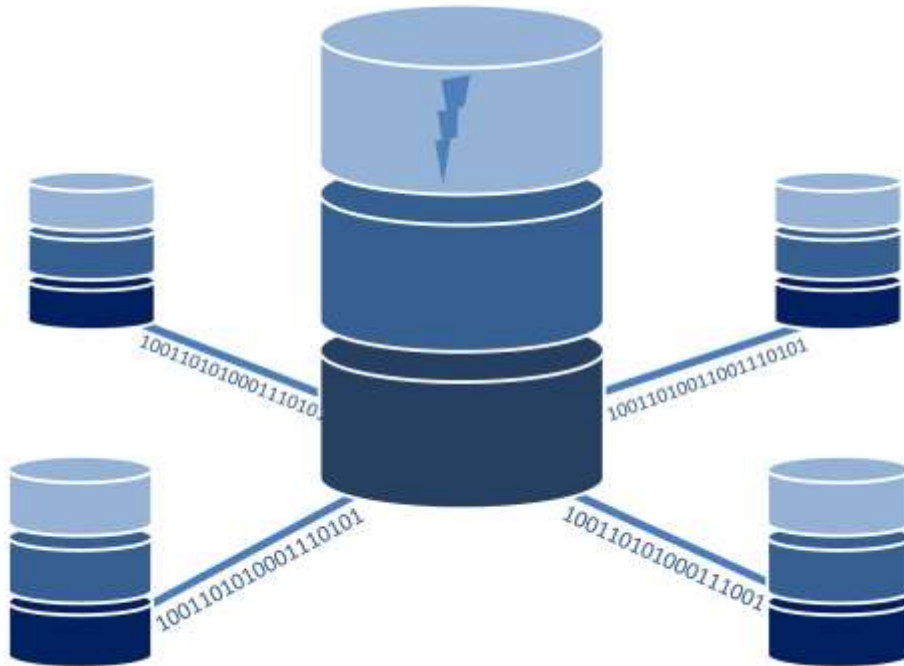


# Warehouse Database



DATABASE SYSTEMS (1) CSE227  
SUBMITTED TO: DR. HODA KORASHY

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## Description

This project's aim is to build a database system for a warehouse specialized in storing tech merchandise (TVs, Mobiles, Games, etc.) from the point they are received from a supplier till they are handed off to the proper distributor.

The database shall be responsible for keeping track of the complete life span of items inside the warehouse including all the data. However, this database will not include data like staff data, operating hours, etc. which can be added easily if needed.

## Requirements

### ENTITIES

**Initial** conversation with the stakeholders resulted in the following entities:

- **Item:** representing any singular item in the database, meaning that if we have 2 identical phones in the warehouse they will be saved in the database as 2 entries because it is required to have information about every single item inside the warehouse to be able to ship different amounts to different distributors.  
For each entity we need to keep its type, ID, time of arrival, time or shipping, location, color, size, description, producing company, screen size for TVs and Mobiles, Genre and platform for video games and voltage for chargers. It should be noticed that some of those attributed like size will be common among all identical items in the warehouse.
- **Supplier:** represent the company that supplies items to the warehouse. Every item has a supplier, but a supplier may not have supplied current items at a time.  
For each Supplier we need to keep their ID, contract start and termination dates, identifying information like mail, phone, address, etc. A supplier must be a company not an individual or a store.
- **Distributor:** The entity that receives items from the warehouse.  
For each Distributor we need to keep their ID, Tax register number, some identifying info like in the supplier as well as SSN for individual suppliers and commerce register number for companies.

### DERIVED ENTITIES

The following entities were derived based on the initial requirement to represent conflicts in attribute under the same entity:

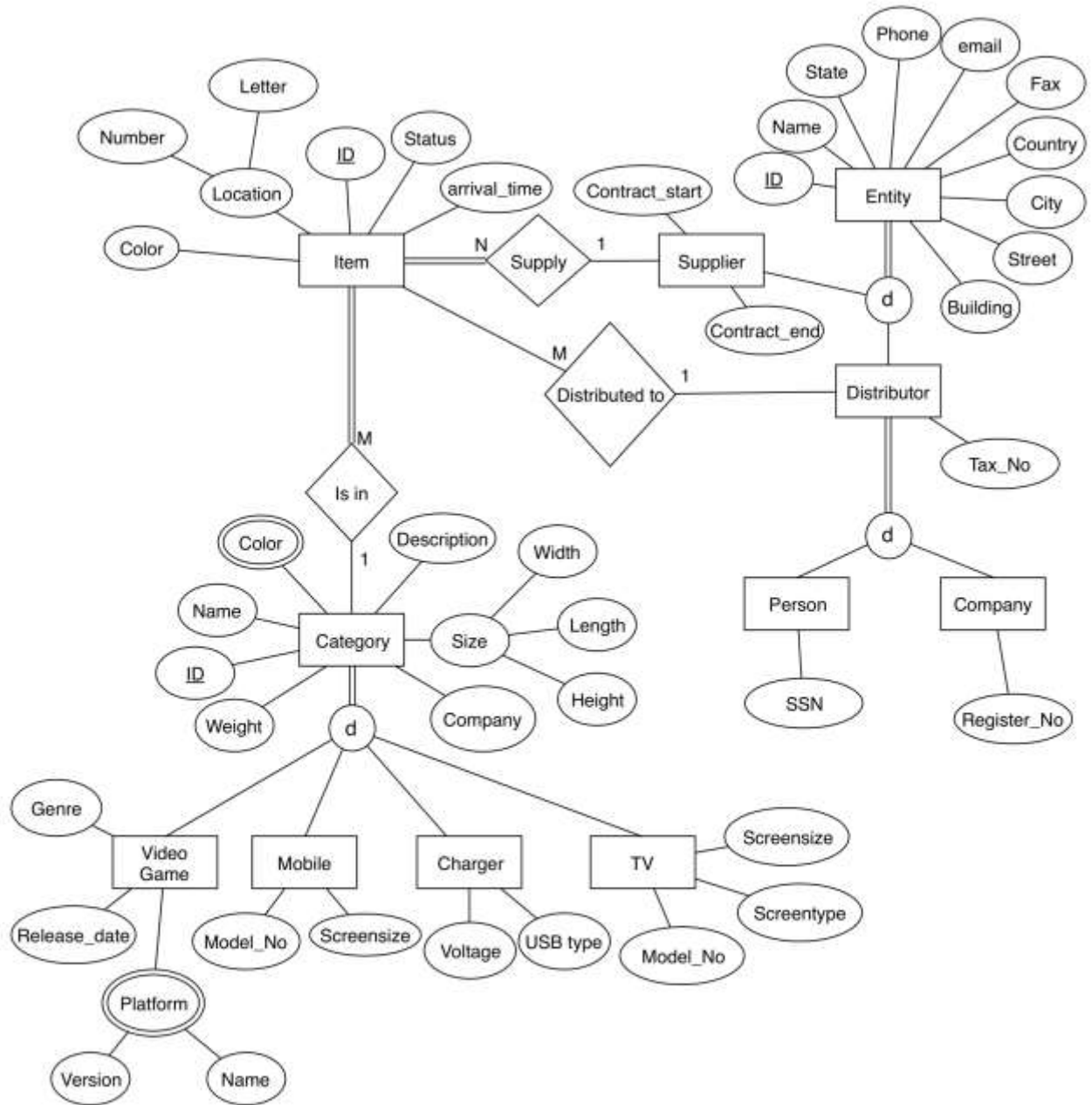
- **Category:** represents the model of an item to keep the common attributes across multiple items like weight, size, available colors, description and Name.
- **Video Game:** a category that holds platform information and genre.
- **Mobile:** a category that holds screen size and model number.

- Charger: a category that holds output voltage.
- TV: a category that holds Model no. and screen type .
- Person: a distributor representing a person with an SSN.
- Company: a distributor representing a company with a commercial register number.
- Entity: a superclass for distributor and supplier to hold their common information like email, fax, address, Name, etc.

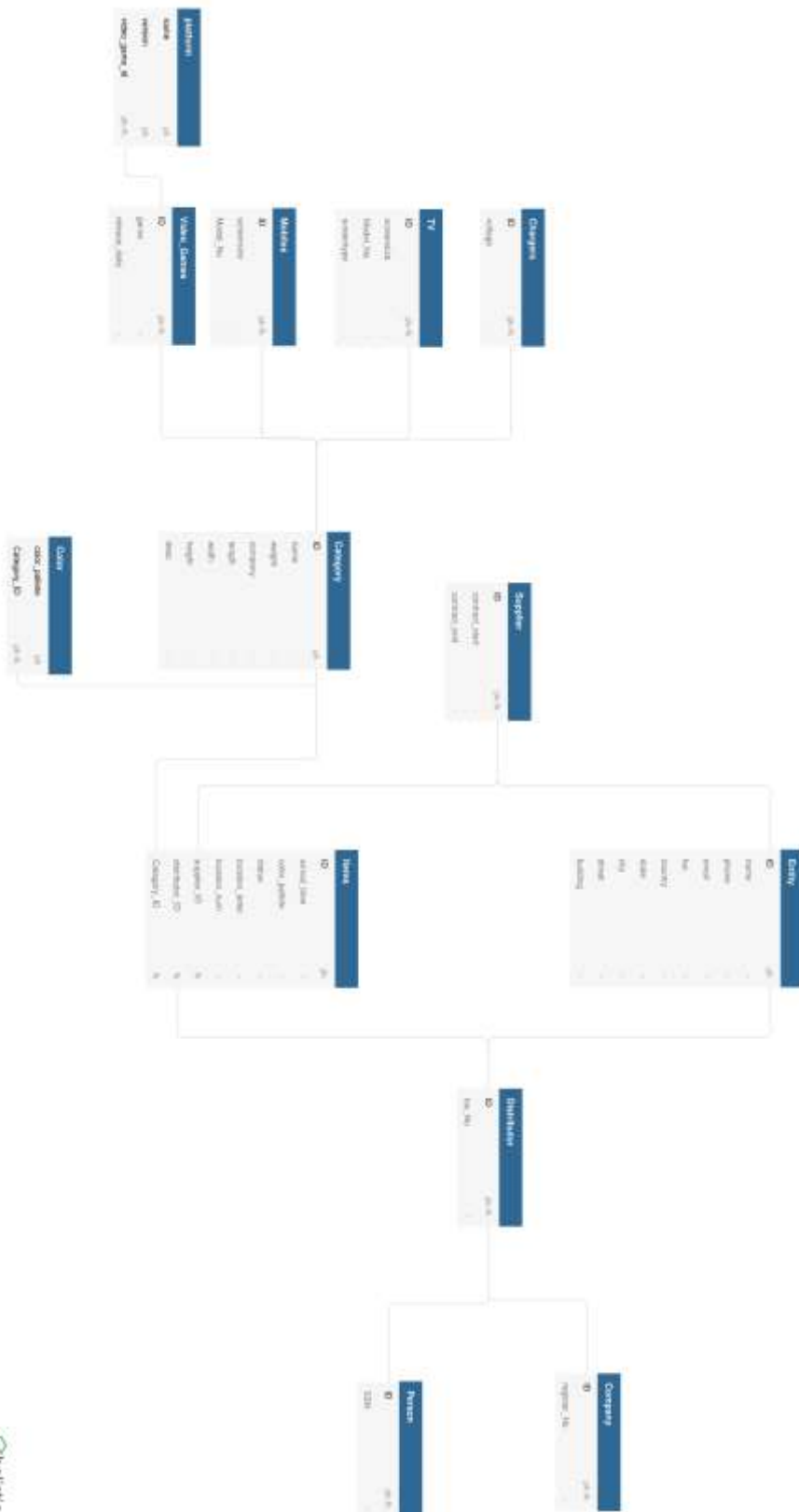
## Assumptions

1. Item must be supplied by one supplier only while a supplier may supply many items
2. Distributor may receive many items, item may be sent to multiple distributors
3. Item must have one category, but a category may have many items.
4. platform is a multivalued composite attribute in videogame
5. A distributor is either a company or a person
6. Both distributors and suppliers have a common superclass called entity
7. Color is a multivalued attribute in category as one category can have multiple possible colors; however, an item has one color only.
8. Location is a composite attribute in item consisting of a letter and a number(E.g. A5).
9. TIMESTAMP is used for attributes associated with time.
10. INTEGER is used for all IDs and any value that is an integer in nature
11. FLOAT is used for size, voltage and screen size.
12. VARCHAR and CHAR are used for all other generic attributes like SSN.

## EER Diagram



# Relational Model



# SQL Sample

## CREATING TABLES

```
1. CREATE TABLE Entity
2. (
3.     ID INTEGER PRIMARY KEY,
4.     name VARCHAR(100),
5.     phone VARCHAR(20),
6.     email VARCHAR(25),
7.     fax VARCHAR(30),
8.     country VARCHAR(20),
9.     state VARCHAR(20),
10.    city VARCHAR(20),
11.    street VARCHAR(20),
12.    building VARCHAR(20)
13. );
14.
15. CREATE TABLE Supplier
16. (
17.     ID INTEGER PRIMARY KEY,
18.     contract_start DATE,
19.     contract_end DATE
20. );
21.
22. CREATE TABLE Items
23. (
24.     ID INTEGER PRIMARY KEY,
25.     arrival_time TIMESTAMP,
26.     color_pallette VARCHAR(10),
27.     status varchar(255),
28.     location_letter CHAR(1),
29.     location_num CHAR(3),
30.     supplier_ID INTEGER,
31.     distributor_ID INTEGER,
32.     Category_ID INTEGER
33. );
34.
35. CREATE TABLE Distributor
36. (
37.     ID INTEGER PRIMARY KEY,
38.     tax_No VARCHAR(40)
39. );
40.
41. CREATE TABLE Company
42. (
43.     ID INTEGER PRIMARY KEY,
44.     register_No VARCHAR(40)
45. );
46.
47. CREATE TABLE Person
48. (
49.     ID INTEGER PRIMARY KEY,
50.     SSN VARCHAR(20)
51. );
52.
53. CREATE TABLE TV
54. (
55.     ID INTEGER PRIMARY KEY,
```

```

56.    screensize FLOAT,
57.    Model_No VARCHAR(20),
58.    screentype VARCHAR(10)
59. );
60.
61. CREATE TABLE Chargers
62. (
63.     ID INTEGER PRIMARY KEY,
64.     voltage FLOAT
65. );
66.
67. CREATE TABLE Category
68. (
69.     ID INTEGER PRIMARY KEY,
70.     name VARCHAR(100),
71.     weight FLOAT,
72.     company VARCHAR(50),
73.     length FLOAT,
74.     width FLOAT,
75.     height FLOAT,
76.     desc VARCHAR(500)
77. );
78.
79. CREATE TABLE Mobiles
80. (
81.     ID INTEGER PRIMARY KEY,
82.     screensize FLOAT,
83.     Model_No VARCHAR(20)
84. );
85.
86. CREATE TABLE Video_Games
87. (
88.     ID INTEGER PRIMARY KEY,
89.     genre VARCHAR(20),
90.     release_date DATE
91. );
92.
93. CREATE TABLE platform
94. (
95.     name VARCHAR(20) PRIMARY KEY,
96.     version VARCHAR(20) PRIMARY KEY,
97.     video_game_id INTEGER PRIMARY KEY
98. );
99.
100.     CREATE TABLE Color
101.     (
102.         color_pallette VARCHAR(10) PRIMARY KEY,
103.         Category_ID INTEGER PRIMARY KEY
104.     );
105.
106.     ALTER TABLE Supplier ADD FOREIGN KEY (ID) REFERENCES Entity (ID);
107.
108.     ALTER TABLE Items ADD FOREIGN KEY (supplier_ID) REFERENCES Supplier (ID)
109. ;
110.     ALTER TABLE Items ADD FOREIGN KEY (distributor_ID) REFERENCES Distributor (ID);
111.
112.     ALTER TABLE Items ADD FOREIGN KEY (Category_ID) REFERENCES Category (ID)
113. ;

```



```

114.     ALTER TABLE Distributor ADD FOREIGN KEY (ID) REFERENCES Entity (ID);
115.
116.     ALTER TABLE Company ADD FOREIGN KEY (ID) REFERENCES Distributor (ID);
117.
118.     ALTER TABLE Person ADD FOREIGN KEY (ID) REFERENCES Distributor (ID);
119.
120.     ALTER TABLE TV ADD FOREIGN KEY (ID) REFERENCES Category (ID);
121.
122.     ALTER TABLE Chargers ADD FOREIGN KEY (ID) REFERENCES Category (ID);
123.
124.     ALTER TABLE Mobiles ADD FOREIGN KEY (ID) REFERENCES Category (ID);
125.
126.     ALTER TABLE Video_Games ADD FOREIGN KEY (ID) REFERENCES Category (ID);
127.
128.     ALTER TABLE platform ADD FOREIGN KEY (video_game_id) REFERENCES Video_Ga
mes (ID);
129.
130.     ALTER TABLE Color ADD FOREIGN KEY (Category_ID) REFERENCES Category (ID)
;

```

## INSERTING INTO TABLES

```

1.  INSERT INTO Entity
2.  Values (1, "Westroos Company",+20111, "amidn@westros.com",+20112,"Egypt","Cairo"
,"Mokattam","nine","8127");
3.
4.  INSERT INTO Supplier
5.  Values (1,'2019-5-8','2019-12-30');
6.
7.
8.
9.  INSERT INTO Entity
10. Values (2, "winterfell Company",+20111, "amidn@winterfell.com",+20223,"Spain","b
arcelona","NAN","81","54");
11.
12. INSERT INTO Distributor
13. Values (2,"99987887");
14.
15. INSERT INTO Company
16. values (2,"555555");
17.
18.
19.
20. INSERT INTO Category
21. values (1,"Samsung Mobile Phone",400,"Samsung",5,3,4,"Mobile Phone comes with ch
arger and headphone");
22.
23. INSERT INTO Category
24. values (2,"LG TV",2500,"LG",20,10,5,"Smart TV comes with remote and two AAA batt
eries");
25.
26.
27.
28. INSERT INTO Mobiles
29. values (1,5,"Note 4");
30.
31. INSERT INTO TV
32. values (2,43,"Smart ooo","LED");
33.
34.

```

```

35.
36. INSERT INTO item
37. values (1, '2019-1-10 01:56:11', "Blue", "Pending", 'A', '33', 1, NULL, 1);
38.
39. INSERT INTO item
40. values (2, '2019-5-8 12:24:01', "Black", "Orderd", 'S', '21', 1, 2, 2);

```

## UPDATING TABLES' TUPLES

```

1. UPDATE Entity set Country = "USA" WHERE ID = 1;
2. UPDATE Supplier set contract_start = '2019-5-7' WHERE ID = 1;
3. UPDATE Distributor set Tax_no = "48928347" WHERE ID = 2;
4. UPDATE Category set Company = "Huawei" WHERE ID = 1;
5. UPDATE Mobile set Model_no = "P7" WHERE ID = 1;

```

## DELETING TABLES' TUPLES

```

1. DELETE FROM Entity WHERE ID = 1;
2. DELETE FROM Supplier WHERE contract_start = '2019-5-7';
3. DELETE FROM Entity WHERE Tax_no = "48928347";
4. DELETE FROM Entity WHERE Company = "Huawei";
5. DELETE FROM Entity WHERE Model_no = "P7";

```

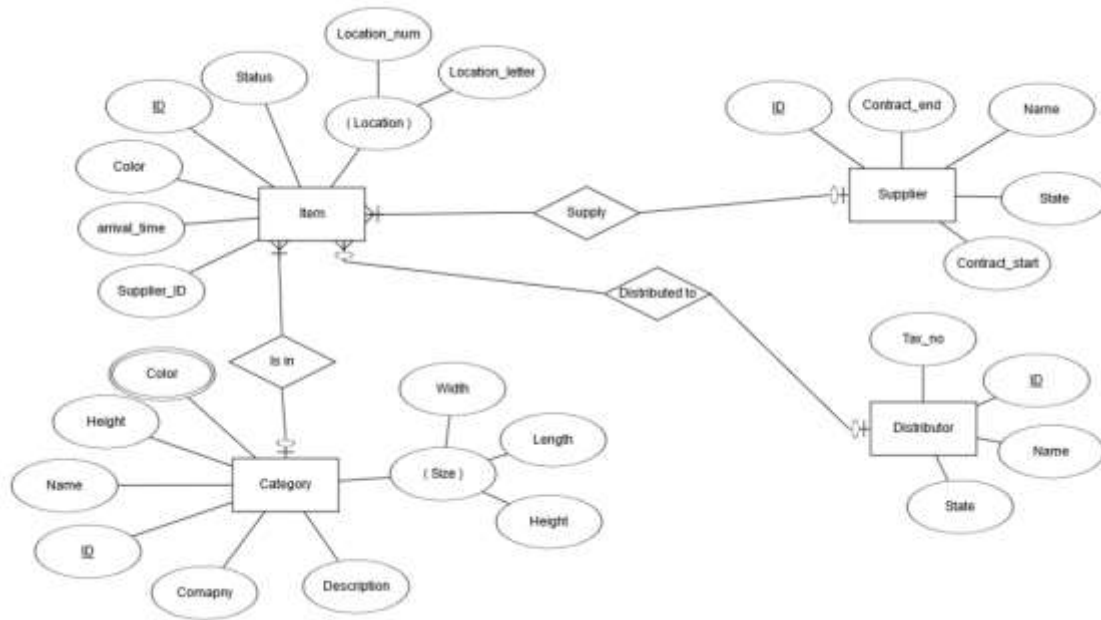
## RETRIEVING FROM TABLES

```

1. SELECT * FROM Category WHERE ID = 2;
2.
3. SELECT email, Tax_no -- select email and tax_no of all distributors from spain
4. FROM Entity, Distributor
5. WHERE Entity.ID = Distributor.ID
6.     AND Country = "spain";
7.
8. SELECT contract_start, Name -- select contract date and name all distributors
9. FROM Entity, Distributor
10. WHERE Entity.ID = Distributor.ID;
11.
12. SELECT Name, COUNT(*) -- number of huawei phones in the warehouse
13. FROM Mobile, Category
14. WHERE Mobile.ID = Category.ID
15.     AND Category.Company = "Huawei";
16.
17. SELECT Company, COUNT(*) --
    group phones by company and select all companies with more than 5 phones
18. FROM Mobile, Category
19. WHERE Mobile.ID = Category.ID
20. GROUP BY Category.Company
21. HAVING COUNT(*) > 5;

```

## ER ERD lab Sample



## Relational Model ERD lab Sample

