Cal Poly Pomona

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The Zozo Company Sales Process Database

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CIS 3050.05

Professor Ahmed Azam

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Statement of Academic Honesty

My name is: Safa Alasady, I declare that, except where fully referenced no aspect of this project has been copied from any other source. I understand that any act of Academic Dishonesty such as plagiarism or collusion may result in serious offense and punishments. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others, nor will I help fellow students to violate the Code of Academic Honesty.

Name: Safa Alasady Date: 2/29/2024

Signature: 

Introduction

Within most organizations, databases might be needed and if so, they are usually extremely important. A database is extremely important because it stores significant information. At a more specific level, databases stores things like entities and relationships. The purposes of databases are to store, maintain, and being able to access data. The project Zozo Company that I, the student, will complete, is about designing a complete database management system so that general information management tasks like retrieval of information for the company can be completed. It is important that details are exactly like how Zozo Company wants the database management system to be.

Project Description

The first step is to make a table that has all the attributes, keys, what data type these attributes and keys are, and if they are null or not null. Then create the conceptual, logical, physical ERD (entity-relationship diagram) in Erwin and Visio. After, create a supertype and subtype relationship with any entity in the ERD. It is important to make sure that all formats are followed, and that all entities, attributes, and relationships are accurately labeled. Based on the initial entities, it is important to show the functional dependencies and normalization.

Requirements

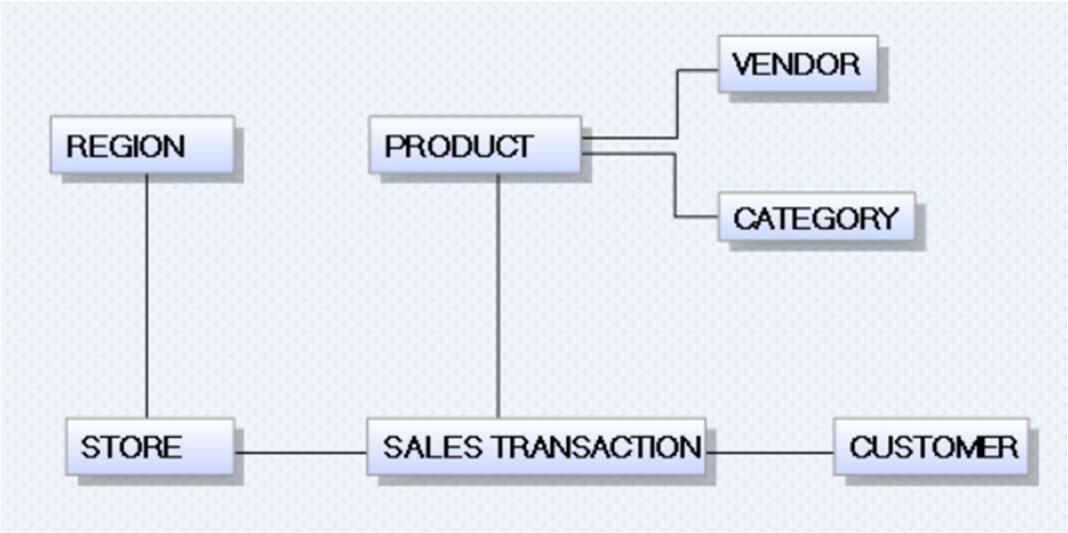
Requirements in the data models are initial entities, which are region, store, product, customer, and vendor. The following requirements for the database are for each product sold is product ID, product name, and price, for each category is category ID and category name, vendor is vendor ID and vendor name, store is store ID and zip code, and region is region ID and region name. There is also another entity which is sales transaction which formed by a bridge table with product and sales transaction, and it involves transaction ID and transaction date. There is only

one vendor which supplies one or more products. The product entity only belongs to one category and each category has one or more products. The store entity is in only one region and has one or more stores. The sale transaction happens only in one store and the store has one or more transactions happening. It also involves one customer, and each customer can be in one or more transactions. Besides the entity-relationship diagrams, the schemas for all relations, referential integrity constraints diagram, functional dependencies, and normalizations must be in alphabetical order, have proper capitalization, and lines between the relations.

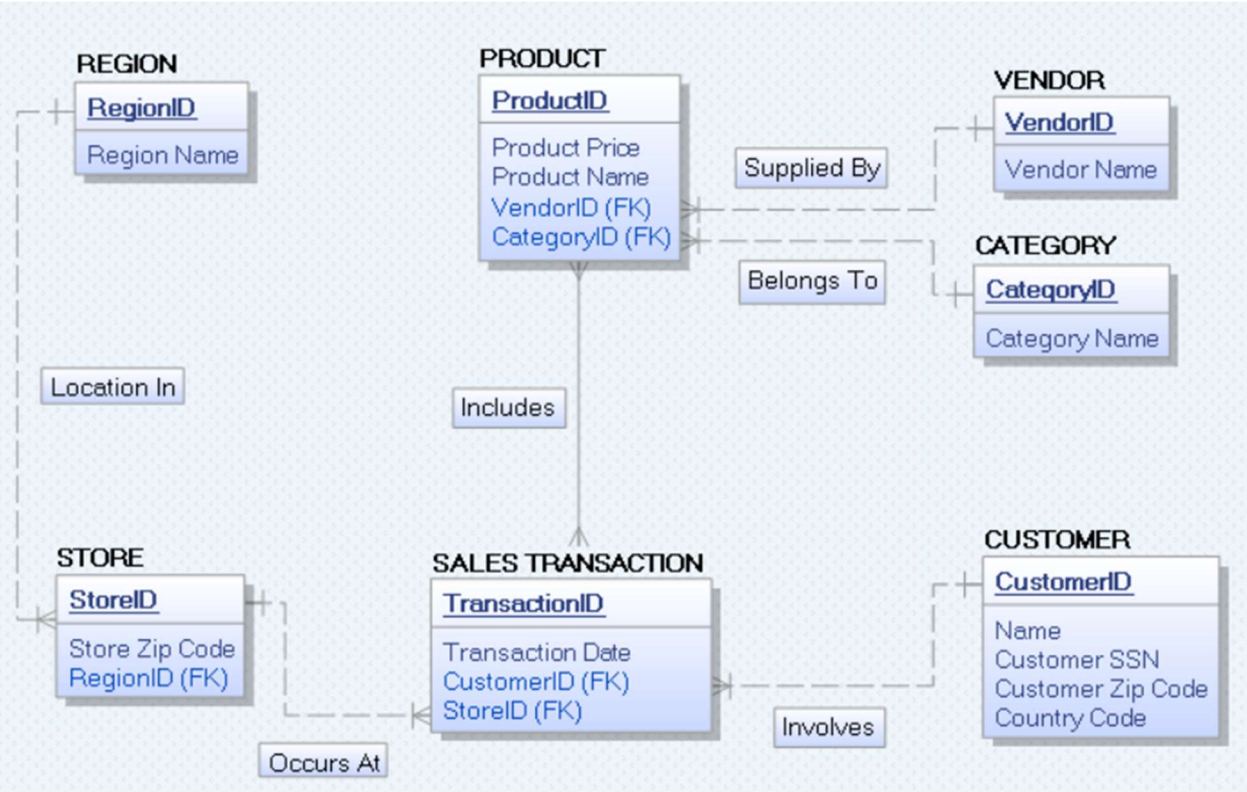
Attributes, Keys, Null/Not Null Data Type Table

Entity	Attributes	Data Type	Null/Not Null
Region	RegionID (PK)	integer(10)	Not Null
	Region Name	varchar(255)	Null
Store	StoreID (PK)	integer(10)	Not Null
	Store Zip Code	integer(10)	Null
	RegionID (FK)	integer(10)	Not Null
Product	ProductID (PK)	integer(10)	Not Null
	Product Price	numeric(19,2)	Null
	Product Name	varchar(255)	Null
	VendorID (FK)	integer(10)	Not Null
	CategoryID (FK)	integer(10)	Not Null
Includes	TransactionID (PK)	integer(10)	Not Null
	ProductID (PK)	integer(10)	Not Null
	Quantity	integer(10)	Null
Sales Transaction	TransactionID (PK)	integer(10)	Not Null
	Transaction Date	date	Null
	StoreID (FK)	integer(10)	Not Null
	CustomerID (FK)	integer(10)	Not Null
Vendor	VendorID (PK)	integer(10)	Not Null
	Vendor Name	varchar(255)	Null
Category	CategoryID (PK)	integer(10)	Not Null
	Category Name	varchar(255)	Null
Customer	CustomerID (PK)	integer(10)	Not Null
	Name	char(25)	Null
	Customer SSN	integer(9)	Null
	Customer Zip Code	integer(10)	Null
	Country Code	integer(10)	Null

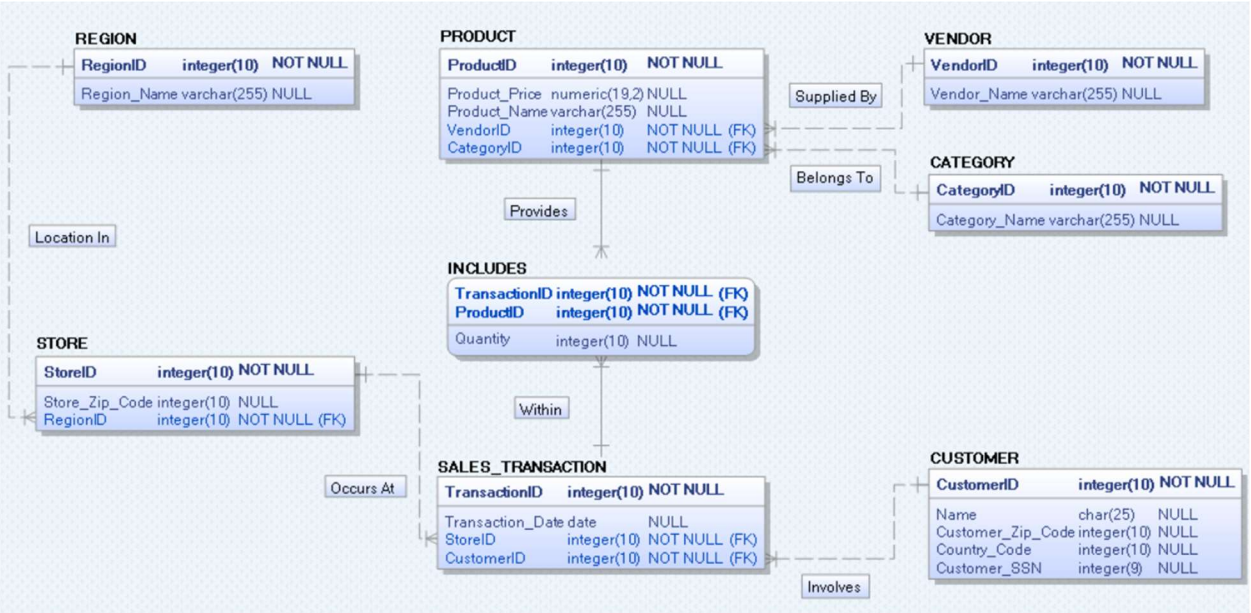
Conceptual Entity Relationship Diagram in Erwin



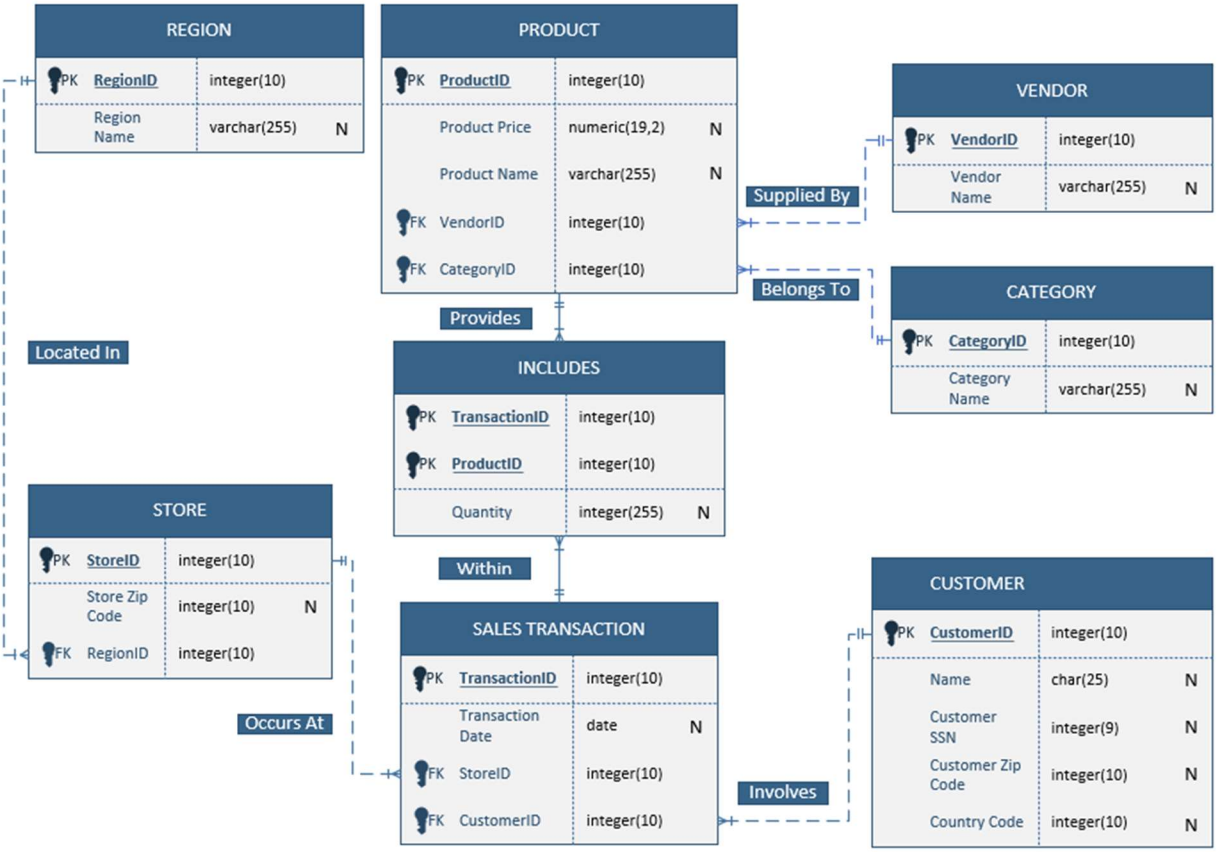
Logical Entity Relationship Diagram in Erwin



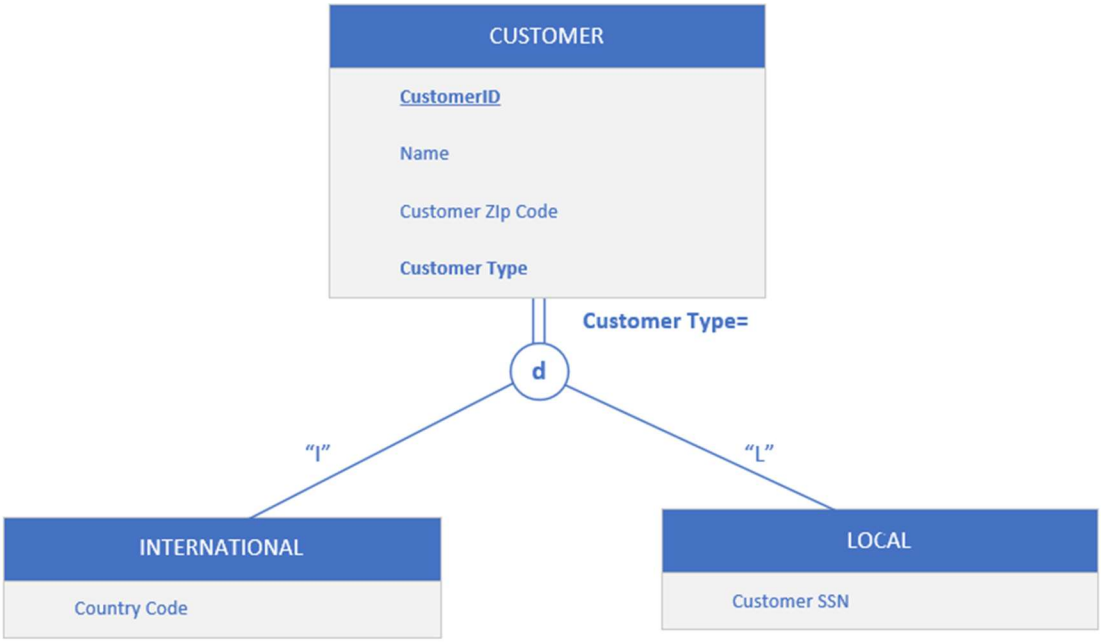
Physical Entity Relationship Diagram in Erwin



Physical Entity Relationship Diagram in Visio



Supertype/Subtype Relationship



This relationship is between one supertype CUSTOMER, and two subtypes INTERNATIONAL and LOCAL. It first started originally with CUSTOMER and it was understood that there could be different types of customers, international and local customers. In order to differentiate, Country Code is placed under INTERNATIONAL and to separate customers in the United States from international customers, Customer SSN is placed under LOCAL. This is disjoint because customers can be a member of only one subtype, not both. It is total specialization because customer must be a member of at least one subtype.

Schema For All Relations

CATEGORY

CategoryID	CategoryName

CUSTOMER

CustomerID	CustomerName	CustomerZipCode	CountryCode	CustomerSSN

INCLUDES

TransactionID	ProductID	Quantity

PRODUCT

ProductID	ProductPrice	ProductName	VendorID	CategoryID

REGION

RegionID	RegionName

SALES TRANSACTION

TransactionID	TransactionDate	StoreID	CustomerID

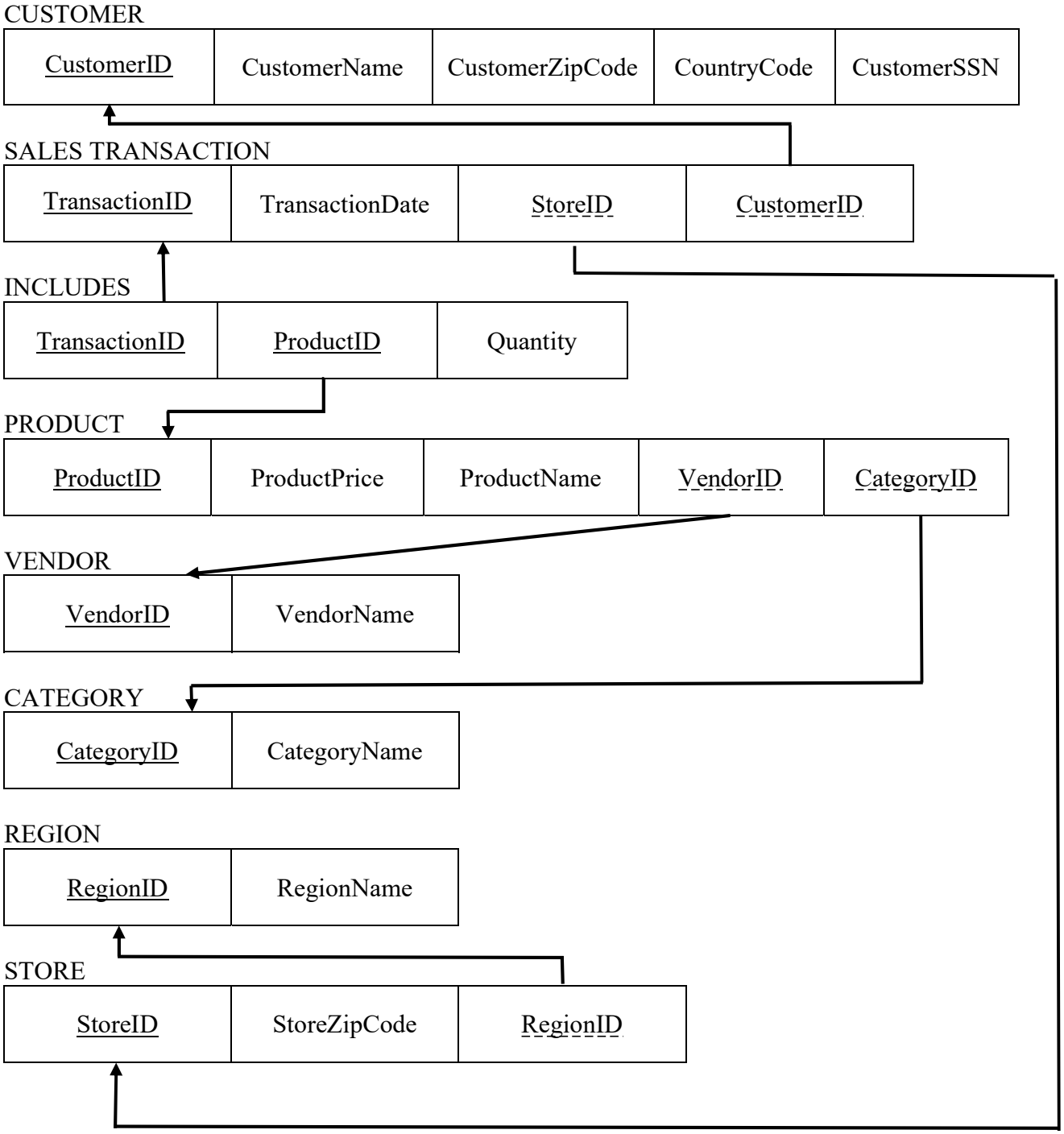
STORE

StoreID	StoreZipCode	RegionID

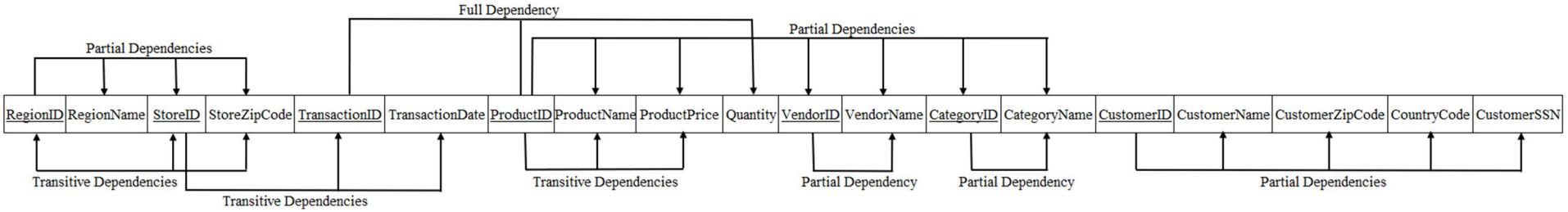
VENDOR

VendorID	VendorName

Referential Integrity Constraints Diagram



Functional Dependencies



Normalization

RegionID	RegionName	StoreID	StoreZipCode	TransactionID	TransactionDate	ProductID	ProductName	ProductPrice	Quantity	VendorID	VendorName	CategoryID	CategoryName	CustomerID	CustomerName	CustomerZipCode	CountryCode	CustomerSSN

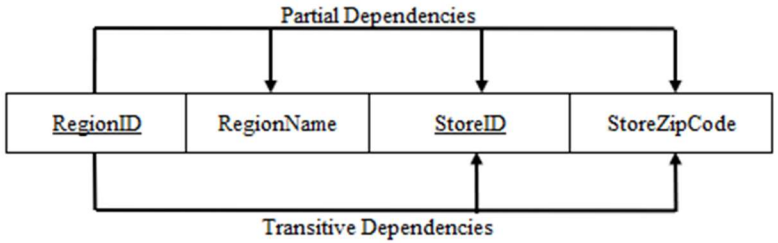
1NF

CustomerID	CustomerName	CustomerZipCode	CountryCode	CustomerSSN

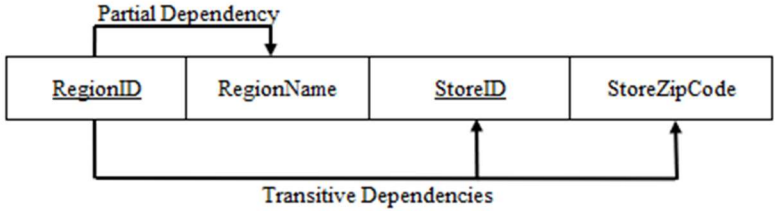
CUSTOMER (3NF)

TransactionID	ProductID	Quantity

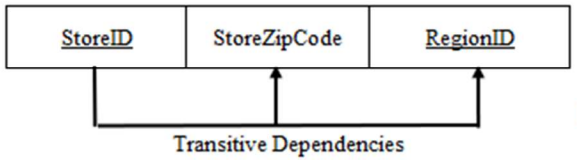
INCLUDES (3NF)



1NF



1NF



2NF

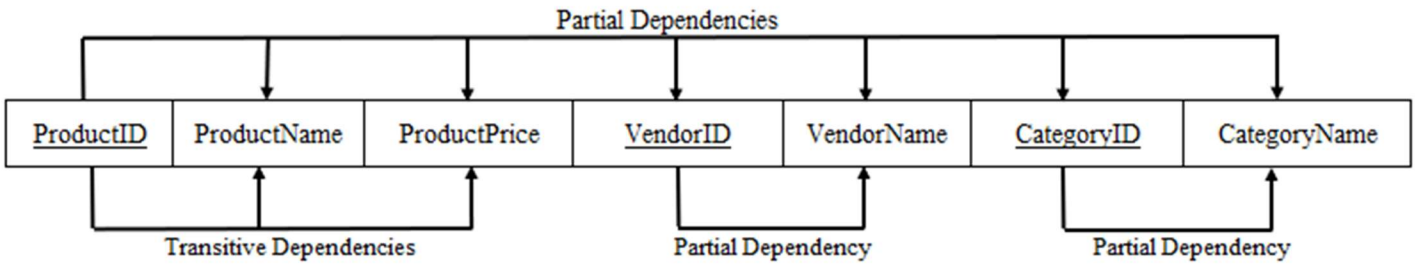
RegionID	RegionName

REGION (3NF)

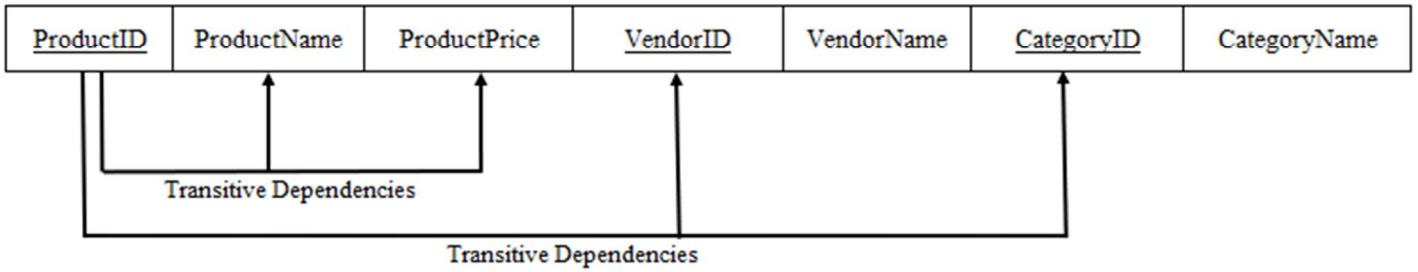
Removed Partial Dependencies. RegionID and RegionName left with only Transitive Dependencies. Therefore, relation is in 3NF.

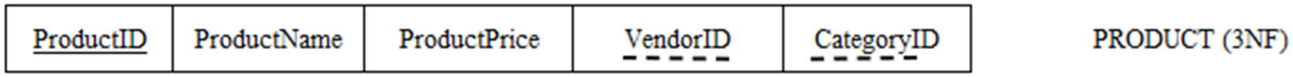
StoreID	RegionName	RegionID

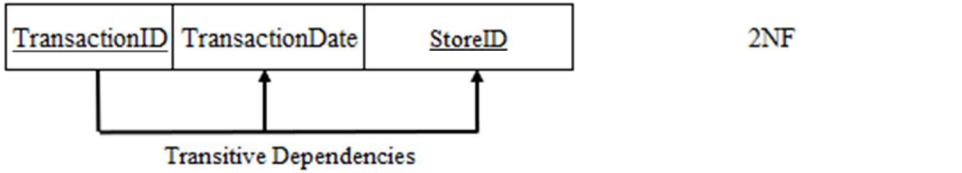
STORE (3NF)


Partial Dependencies
ProductID
ProductName
ProductPrice
VendorID
VendorName
CategoryID
CategoryName
1NF
Transitive Dependencies
Partial Dependency
Partial Dependency


VendorID
VendorName
VENDOR (3NF)
CategoryID
CategoryName
CATEGORY (3NF)


ProductID
ProductName
ProductPrice
VendorID
VendorName
CategoryID
CategoryName
2NF
Transitive Dependencies
Transitive Dependencies


ProductID
ProductName
ProductPrice
VendorID
CategoryID
PRODUCT (3NF)


TransactionID
TransactionDate
StoreID
2NF
Transitive Dependencies


TransactionID
TransactionDate
StoreID
SALES TRANSACTION (3NF)

CustomerID	CustomerName	CustomerZipCode	CountryCode	CustomerSSN

CUSTOMER (3NF)

TransactionID	ProductID	Quantity

INCLUDES (3NF)

RegionID	RegionName

REGION (3NF)

StoreID	RegionName	RegionID

STORE (3NF)

VendorID	VendorName

VENDOR (3NF)

CategoryID	CategoryName

CATEGORY (3NF)

ProductID	ProductName	ProductPrice	VendorID	CategoryID

PRODUCT (3NF)

TransactionID	TransactionDate	StoreID

SALES TRANSACTION (3NF)

Lessons Learned and Recommendations

Many lessons that were learned were being able to essentially replicate a real-life example of a database and how it would be implemented to complete database tasks like, collecting, updating, and retrieving information or data. Completing this project, I was able to understand how to use important data modeling programs, erwin Data Modeler and Microsoft Visio. Besides entity-relationship diagrams, I learned that business rules are crucial because they provide structure and consistency to relationships but is also primarily how the business operates. I also learned that relations are a key step in making sure that through the six properties of relations and referential integrity constraint, data stays organized and keeps data consistency.

I recommend that the requirements are more specified in the project instructions. There were many times where I was confused, and I needed to ask questions. To resolve this problem that I also see when talking to other students in the class would be showing an example or sample of the project to give some direction to students, or maybe even go through a short trail run of a creating database before assigning the project so that students already have an idea on how to start.

Conclusion

Databases play a critical role in organizations by acting as a system of important data. The Zozo Company project has a job which we must complete. The job is to create a database management system for their sales process that perfectly aligns with their requirements. The majority of this project was creating data models, relations, enhanced entity-relationship diagram in different programs with different requirements like business rules like one to one, one to many, and many to many, certain relationships, and proper formatting. Although this project was sometimes difficult and very confusing at times, I learned a lot about databases and how they work. It also pushed me to learn more about specific details about databases that I would not learn reading the textbook. I also made a lot of mistakes that I had to go back to correct, but it allowed me to learn how to identify these mistakes in a real-life setting. Completing this project showed that without databases, data would be not as organized compared to using a database, accessing data would be very difficult, and in general, make simple tasks difficult for organizations which is why databases are important to have.

References

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