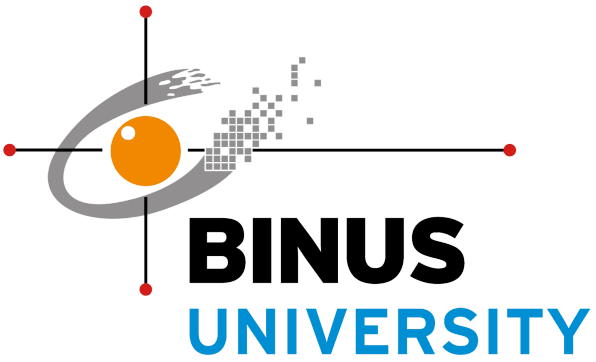
AOL PROJECT

Session 1-13



Dibuat Oleh :

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DAFTAR ISI

I. Company Profile..... 4
II. Company Business Process.....4
2. 1 Bisnis Proses Diagram..... 4
2.2 Bisnis Proses Deksripsi..... 4
1. Supplier..... 4
1.1 Sourcing dan Pengadaan..... 4
1.2 Pemenuhan Bea Cukai..... 5
2. Warehouse..... 5
2.1 Penerimaan dan Inspeksi..... 5
2.2 Penyimpanan dan Organisasi..... 5
3. Penjualan..... 5
3.1 Penawaran Produk..... 5
3.2 Manajemen Penjualan..... 5
3.3 Pengemasan dan Pengiriman..... 5
4. Manajemen Keuangan..... 6
4.1 Pemrosesan Pembayaran..... 6
5. Pemasaran dan Promosi..... 6
5.1. Strategi Pemasaran Online..... 6
III. Problem Statements.....6
3.1 Bukti Dokumentasi..... 6
3.2 Deskripsi Problem Statement..... 6
IV. Database Planning.....7
4.1 Mission Statement & Mission Objectives..... 7
Mission Statement..... 7
Mission Objectives..... 7
Hal hal yang kami tekankan adalah..... 7
Missione Objectives ABC Shop :..... 7
4.2 How data will be collected..... 8
4.3 How format should be specified..... 8
4.4 What necessary documentation will be needed..... 8
4.5 How design and implementation should be proceed..... 8
V. System Definition..... 8
5.1 Scope dan boundaries..... 8
5.2 View..... 8
VI. Requirement Collection and Analysis.....9
VII. Database Design.....9
7.1 Table Instance Chart..... 9
7.2 Structural and Procedural Business Rules..... 10
7.3 Identify..... 11
7.3.1 Entities & Attributes..... 11

7.3.2 Supertypes & Subtypes..... 12
7.4 Relationship..... 13
7.4.1 Transferable Relationship..... 13
7.4.2 Non-transferable Relationship..... 13
7.4.2.1 Customer - Cust Type..... 13
7.4.2.2 Sales - Sales Detail..... 13
7.4.2.3 Sales Detail - Product..... 13
7.4.2.4 Product - product Type..... 13
7.4.2.5 Product - Purchase Detail..... 14
7.4.2.6 Purchase - Purchase Detail..... 14
7.4.2.7 Purchase - Supplier..... 14
7.4.2.8 Sales = Customer..... 15
7.5 UID..... 15
7.5.1 Simple UID..... 15
7.5.2 Composite UID..... 15
7.5.3 Artificial UID..... 16
7.5.4 Secondary UID..... 16
VIII. Conceptual ER Modeling..... 17
8.1 Identify entity types..... 17
8.2 Identify relationship types..... 19
8.3 Identify and associate attributes with entity or relationship types..... 20
8.4 Determine attribute domains..... 20
8.5 Determine candidate, primary, and alternate key attributes..... 22
8.6 Consider use of enhanced modeling concepts (optional step)..... 23
8.7 Check model for redundancy..... 23
8.8 Validate conceptual model against user transactions..... 24
8.9 Review conceptual data model with user..... 24
IX. Logical ER Modeling & Normalization..... 25
9.1 Derive relations for logical data model..... 25
9.1.1 Strong entity:..... 25
1. MsSupplier..... 25
2. MsProduct..... 25
3. Batch..... 25
4. SalesHeader..... 25
5. MsCustomer..... 25
6. MsCustomerType..... 25
7. PurchaseHeader..... 25
9.2.2 Weak entity:..... 25
1. PurchaseDetail..... 25
2. SalesDetail..... 26
9.2 Normalization..... 26

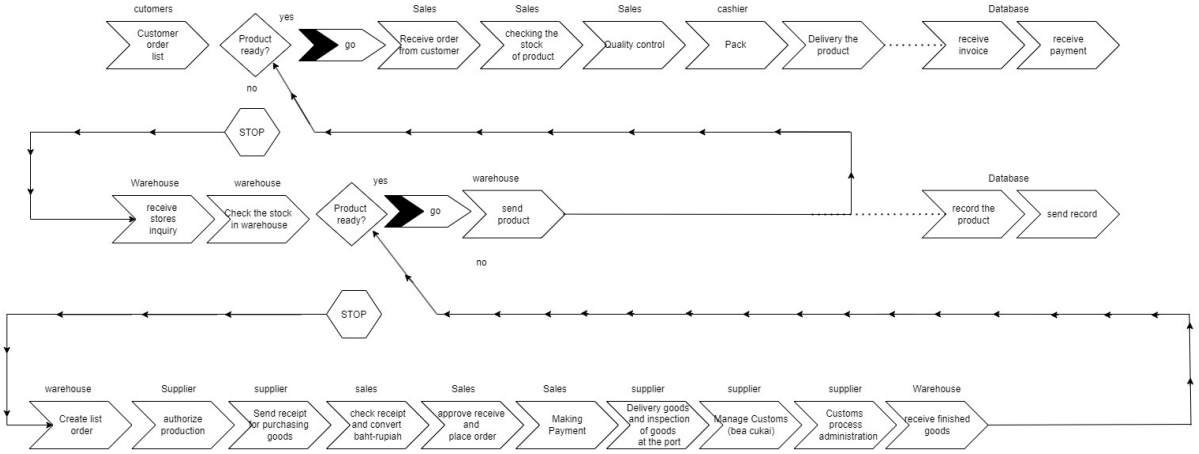
9.3 Validate relations against user transactions....31
9.4 Check Integrity Constraint....32
MsProduct....32
MsCustomer....32
PurchaseHeader....33
9.5 Review Logical Data Model with User....33

I. Company Profile

ABCShop merupakan online shop yang berfokus pada impor barang dari Thailand dan menjual produk tersebut melalui platform e-commerce seperti Shopee, Tokopedia, BukaLapak, Lazada, dan melalui beberapa distributor di Indonesia . Fokus utama dari bisnis ini pada awalnya adalah ikan hidup, makanan ikan dan vitamin ikan. Namun setelah melewati beberapa tahun, fokus dari bisnis ini bertambah menjadi makanan ikan, vitamin ikan, produk kesehatan manusia, sendal, dan sepatu.

II. Company Business Process

2. 1 Bisnis Proses Diagram



2.2 Bisnis Proses Dekripsi

1. Supplier

1.1 Sourcing dan Pengadaan

- Pertama-tama, dalam tahap impor, ABCShop melakukan identifikasi produk apa saja yang akan habis dalam waktu dekat, serta melihat produk yang sedang diminati di pasar.
- Sales akan mengirim list pesanan dan melakukan negosiasi mengenai harga dan syarat-syarat pembelian, ini termasuk harga untuk bea cukai, produk, dan ongkos kirim. ABCShop akan menghitung harga barang apakah sesuai atau tidak.
- Apabila harga sesuai, maka invoice akan dibuat untuk produk yang telah dipilih. Setelah administrasi selesai, maka barang pesanan akan dikirim ke pelabuhan

1.2 Pemenuhan Bea Cukai

- ABCShop mematuhi semua regulasi dan persyaratan bea cukai yang berlaku untuk produk impor.
- ABCShop menyiapkan semua dokumen yang diperlukan dan mengurus pemenuhan bea cukai, termasuk pembayaran bea dan pajak yang berlaku.

2. Warehouse

2.1 Penerimaan dan Inspeksi

- Setelah tiba di gudang, barang yang diterima diperiksa untuk menyesuaikan invoice dengan jumlah real nya.
- Catatan inventaris diperbarui sesuai dengan hasil penerimaan.

2.2 Penyimpanan dan Organisasi

- Produk disimpan dengan teratur untuk memudahkan pengambilan.
- Penjual terus memantau produk dan memastikan ketersediaan produk yang cukup.

3. Penjualan

3.1 Penawaran Produk

- Setelah barang-barang impor tersedia di gudang, ABCShop memasukkan informasi produk ke dalam platform e-commerce
- Informasi tersebut meliputi deskripsi produk, harga, gambar, dan stok yang tersedia.

3.2 Manajemen Penjualan

- Penjual memonitor dan mengelola pesanan yang masuk melalui platform e-commerce dan supplier
- Mereka berinteraksi dengan pelanggan, menjawab pertanyaan, memberikan informasi tentang produk, dan memproses pesanan pembelian.

3.3 Pengemasan dan Pengiriman

- Setelah pesanan diterima dan pembayaran divalidasi, produk yang dibeli dipersiapkan untuk dikemas.
- Produk dikemas dengan baik dan aman untuk pengiriman.

4. **Manajemen Keuangan**

   4.1 Pemrosesan Pembayaran

   - Setelah penjualan dilakukan, ABSShop memproses pembayaran yang diterima dari platform e-commerce.
   - Penjual memantau dan memeriksa transaksi keuangan untuk memastikan akurasi dan mencatatnya kedalam excel

5. **Pemasaran dan Promosi**

   5.1. Strategi Pemasaran Online

III. Problem Statements

3.1 Bukti Dokumentasi

kiko Platin	72	470	33840	470	15904800	220900		Okiko Patinu	72	335000	24120000	
kiko Head	144	380	54720	470	25718400	178600		Okiko Head	144	310000	44640000	
kiko Quick	72	330	23760	470	11167200	155100		Okiko Quick	72	300000	21600000	
›p	100	190	19000	470	8930000	89300		Top	100	150000	15000000	
›p	100	215	21500	470	10105000	101050		Top	100	150000	15000000	
.9	500	140	70000	470	32900000	65800		9.9	500	95000	47500000	
lick	200	135	27000	470	12690000	63450		Mick	200	95000	19000000	
etick	104	350	36400	470	17108000	164500		Detick	104	450000	46800000	
›rhigh	120	24	2880	470	1353600	11280		Jerhigh	120	15000	1800000	
›nic	220	180	39600	470	18612000	84600		Ionic	220	95000	20900000	
r5	4	3600	14400	470	6768000	1692000		Cr5	4	2115000	8460000	
r8	2	3520	7040	470	3308800	1654400		Cr8	2	2068000	4136000	
r6	3	2400	7200	470	3384000	1128000		Cr6	3	1150000	3450000	
			0		0							
			0		0						272406000	62667610
			357340		167949800							
ngkir			19250	470	9047500							
					176997300							
ngkir	2,446	9000000	2201400000		22014000							
					10727090							
					209738390							

3.2 Deskripsi Problem Statement

1. Sulit untuk mendata dan membuat laporan mengenai laporan keuangan
2. Sulit mencatat produk yang baru datang
3. Sulit untuk mendata customer yang berasal dari beberapa applikasi
4. Sulit untuk melihat laporan akhir (Banyak produk yang paling laris)
5. Sulit untuk melihat stock terakhir

IV. Database Planning

4.1 Mission Statement & Mission Objectives

Mission Statement

- Aplikasi ini dibuat untuk mempermudah dan mengatasi masalah yang dihadapi oleh ABC Shop, untuk memastikan bahwa data yang diperoleh sudah sesuai dengan keadaan nyata.

Mission Objectives

- Pada tahap ini kami melakukan interview dengan pemilik ABC Shop untuk menanyakan detail dari mission statement.

Hal hal yang kami tekankan adalah

- Bisnis Proses
- Cara Penyimpanan data
- Struktur Bisnis

Missione Objectives ABC Shop :

To maintain (enter, update, and delete) data on MsSupplier
To maintain (enter, update, and delete) data on PurchaseHeader
To maintain (enter, update, and delete) data on PurchaseDetail
To maintain (enter, update, and delete) data on MsProduct
To maintain (enter, update, and delete) data on Batch
To maintain (enter, update, and delete) data on SalesDetail
To maintain (enter, update, and delete) data on SalesHeader
To maintain (enter, update, and delete) data on MsCustomer
To maintain (enter, update, and delete) data on MsCustomerType

To perform searches on MsSupplier
To perform searches on PurchaseHeader
To perform searches on PurchaseDetail
To perform searches on MsProduct
To perform searches on Batch
To perform searches on SalesDetail
To perform searches on SalesHeader
To perform searches on MsCustomer
To perform searches on MsCustomerType

To report on MsSupplier

To report on PurchaseHeader

To report on PurchaseDetail

To report on MsProduct

To report on Batch

To report on SalesDetail

To report on SalesHeader

To report on MsCustomer

To report on MsCustomerType

To track the status of MsSupplier

To track the status of each product

To track the status of purchase

4.2 How data will be collected

- Interviewing and examining documentation

4.3 How format should be specified

- Format File dalam bentuk excel
- Pengiriman File melalui Email

4.4 What necessary documentation will be needed

- Laporan Keluar masuk produk
- Laporan keuangan

4.5 How design and implementation should be proceed

- Mobile Application

V. System Definition

5.1 Scope dan boundaries

- Scope and Boundaries = Customer, Supplier, Warehouse

5.2 View

- Pemilik ABC Shop

VI. Requirement Collection and Analysis

- Centralized

VII. Database Design

7.1 Table Instance Chart

Table Name : Supplier

Column Name	SupplierID	SupplierName	SupplierAddress	SupplierTelp
KeyType	PK	Varchar(255)	Varchar(255)	INT
Nulls/Unique	-	-	-	-
Sample Data	SU001	HelloPupies	Jl.Permata Indah no 10	81915234543

Table Name : Purchase

Column Name	PurchaseID	SupplierID	PurchaseDate	KursBaht	TotalPurchaseRp	TotalPurchaseBaht
KeyType	PK	FK	DATE	INT	INT	INT
Nulls/Unique	-	-	-	-	-	-
Sample Data	PU001	SU001	19/08/21	485	81915234543	

Table Name: Purchase Detail

Column Name	PDetailID	PurchaseID	ProductID	Qty	KursBaht	TotalProductPriceRP	TotalProductPriceBaht
Key Type	PK	FK	FK	INT	INT	INT	INT
Nulls/Unique	*	*	*	*	-	*	*
Sample Data	PD001	PU001	PR001	200	485	Rp6.000.000	1405,35 Baht

Table Name: Product

Column Name	ProductID	ProductName	ProductTypeID	ProductPriceRP	ProductStock
Key Type	PK		PK	INT	INT
Nulls/Unique	*	*	*	*	*
Sample Data	PR001	Okiko Red	PT001	30000	200

Table Name: Sales Detail

Column Name	SDetailID	SalesID	ProductID	Qty	TotalSPrice
Key Type	PK	FK	FK	INT	INT
Nulls/Unique	*	*	*	*	*
Sample Data	SD001	S001	PR001	3	90000

Table Name : Sales

Column Name	SalesID	CustomerID	SalesDate	TotalSales
Key Type	PK	FK	Date	INT
Nulls/Unique	-	-	-	-
Sample Data	SI001	CU001	19/08/21	1.200.000

TableName : Customer

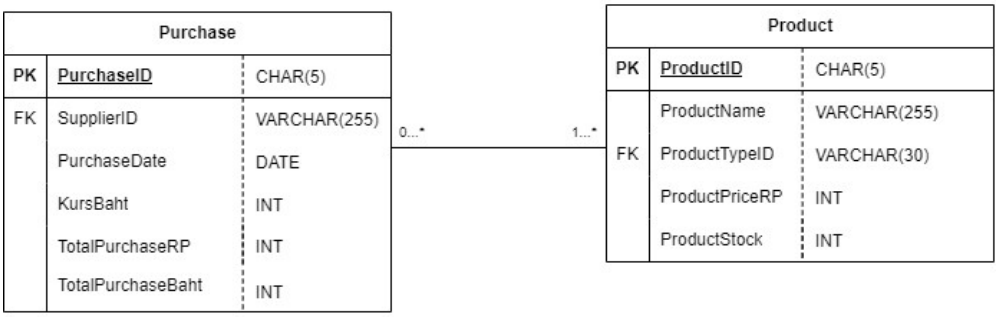
Column Name	CustomerID	CustTypeID	CustAdd	CustTelp
Key Type	PK	FK	Date	INT
Nulls/Unique	-	-	-	-
Sample Data	CU001	CT001	19/08/21	1.200.000

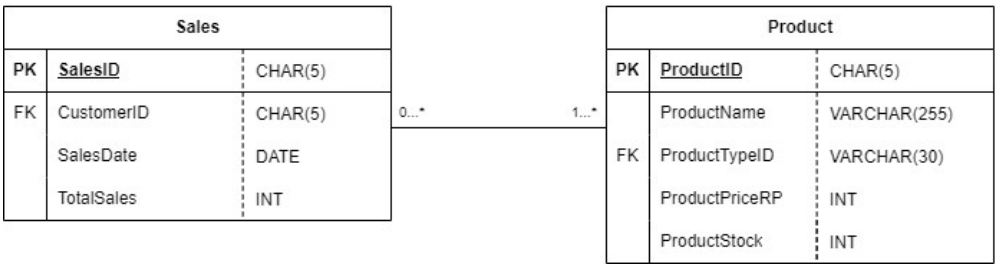
TableName : CustomerType

Column Name	CustTypeID	CustTypeName
Key Type	PK	Varchar(255)
Nulls/Unique	-	-
Sample Data	CT001	Riska

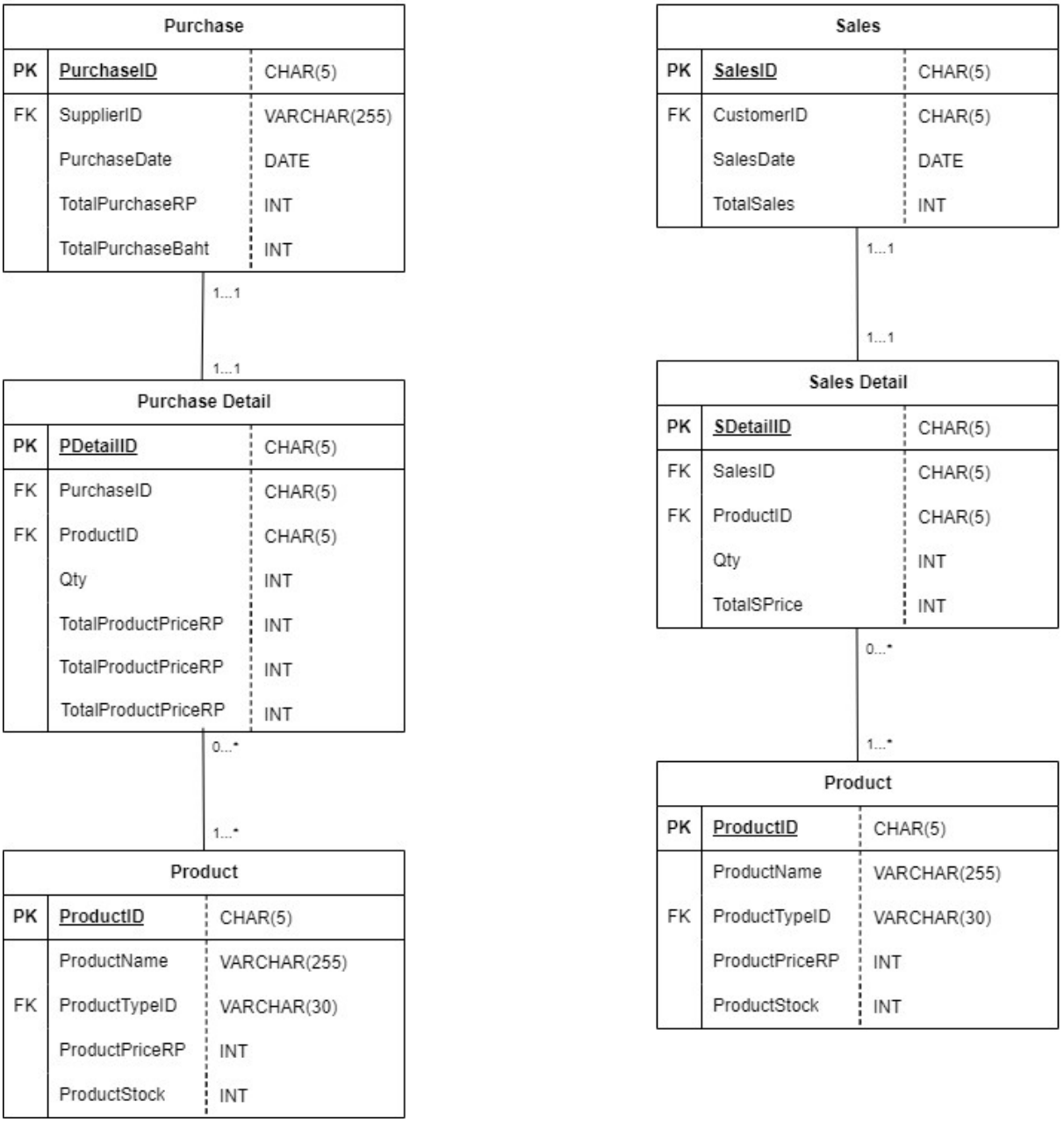
7.2 Structural and Procedural Business Rules

Structural





Procedural

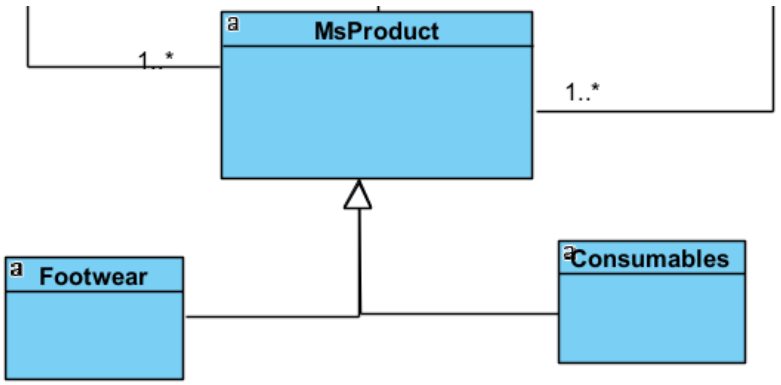


7.3 Identify

7.3.1 Entities & Attributes

ENTITIES	ATTRIBUTES
Supplier	**SupplierId(PK)**, SupplierName, SupplierAdd, SupplierTelp
Purchase	**PurchaseID(PK)** , SupplierID(FK), PurchaseDate, KursBaht, TotalPurchaseRp, TotalPurchaseBaht
PurchaseDetail	**PDetailID(PK)**, PurchaseID(FK), ProductID(FK), Qty, KursBaht, TotalProductPriceRp, TotalProductPriceBaht
Product	**ProductID(PK)**, ProductTypeID(FK), ProductPriceRp, ProductStock
SalesDetail	**SDetailID(PK)**, SalesID(FK), ProductID(FK), Qty, TotalSPrice
Sales	**SalesID(PK)**, CustomerID(FK), SalesDate, TotalSales
Customer	**CustomerID(PK)**, CustTypeID(FK), CustAdd, CustTelp
CustomerType	**CustTypeId(PK)**, CustTypeName

7.3.2 Supertypes & Subtypes



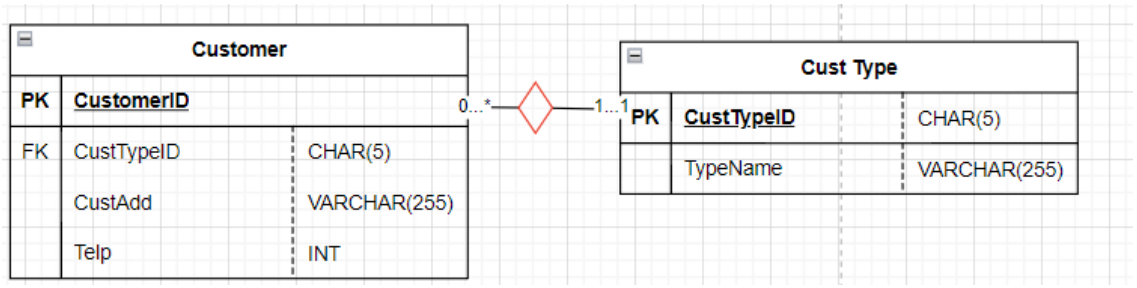
7.4 Relationship

7.4.1 Transferable Relationship

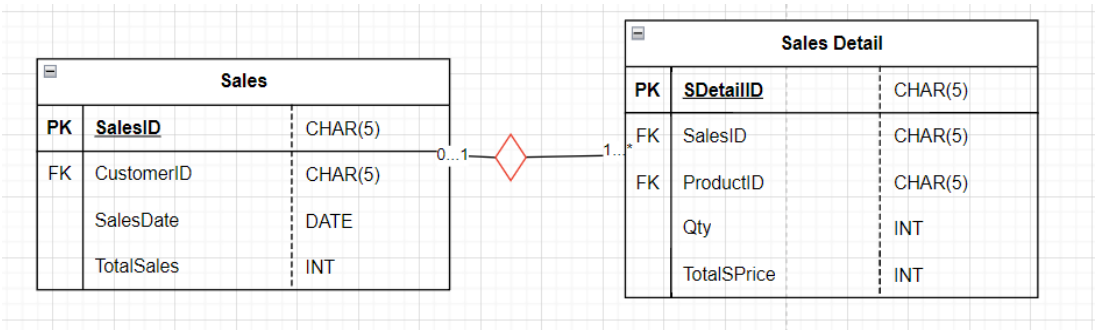
- Tidak ada

7.4.2 Non-transferable Relationship

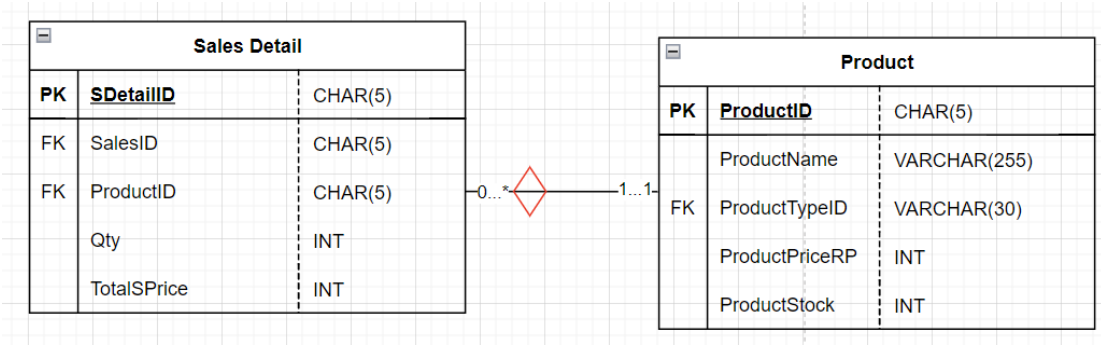
7.4.2.1 Customer - Cust Type



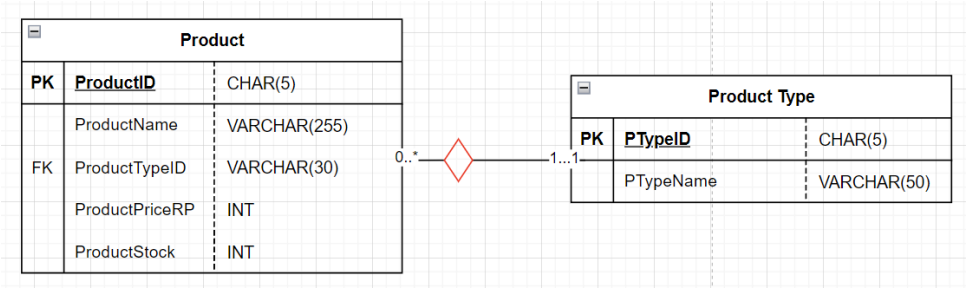
7.4.2.2 Sales - Sales Detail



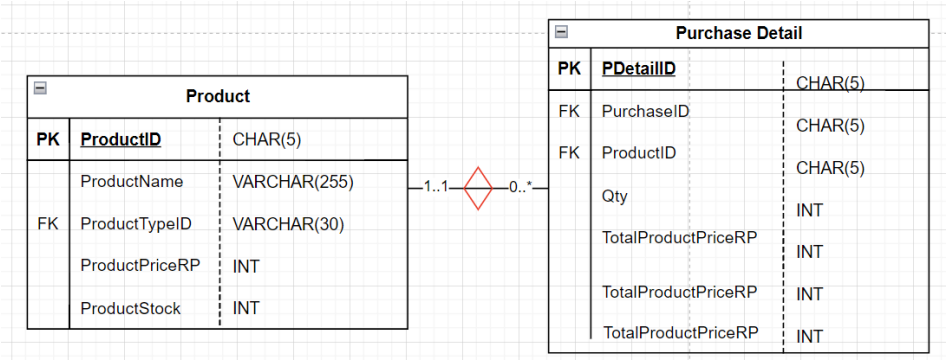
7.4.2.3 Sales Detail - Product



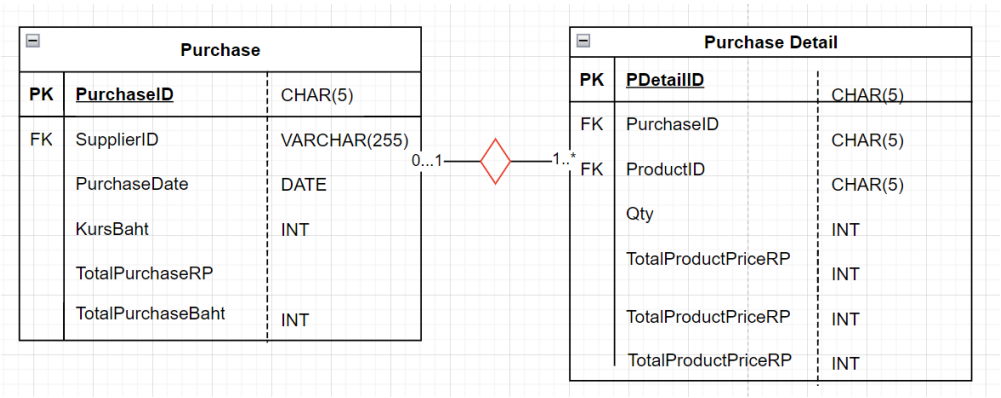
7.4.2.4 Product - product Type



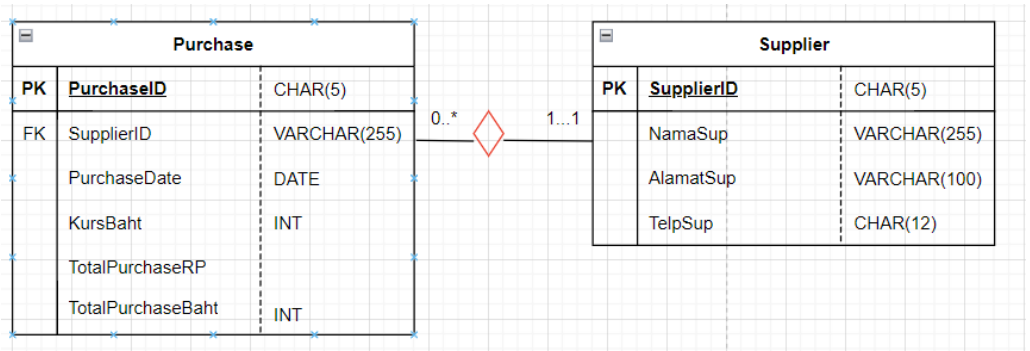
7.4.2.5 Product - Purchase Detail



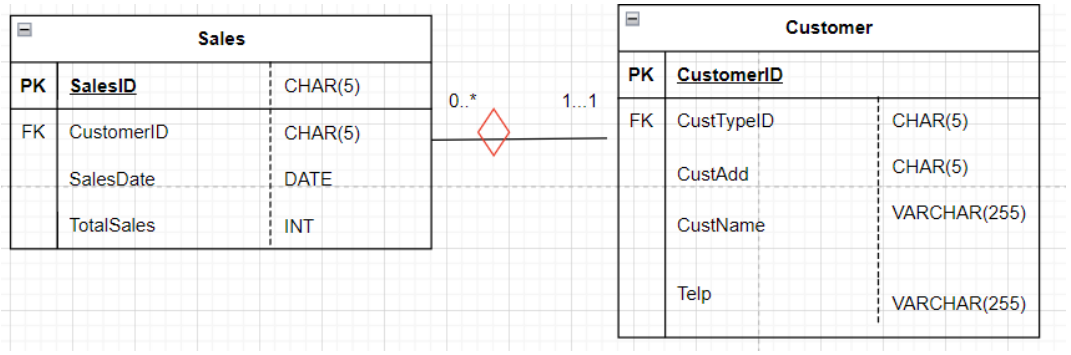
7.4.2.6 Purchase - Purchase Detail



7.4.2.7 Purchase - Supplier

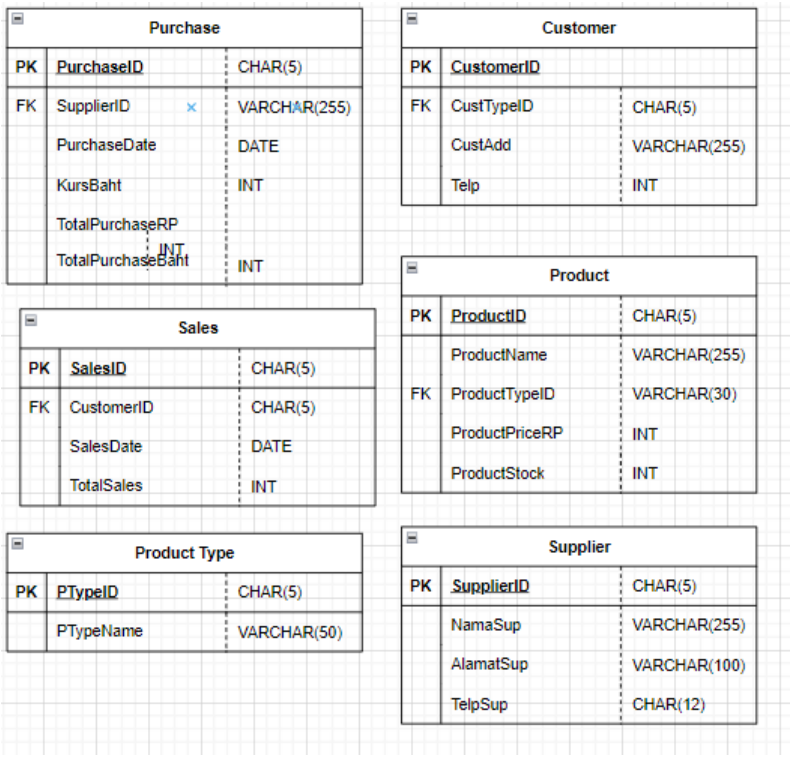


7.4.2.8 Sales - Customer



7.5 UID

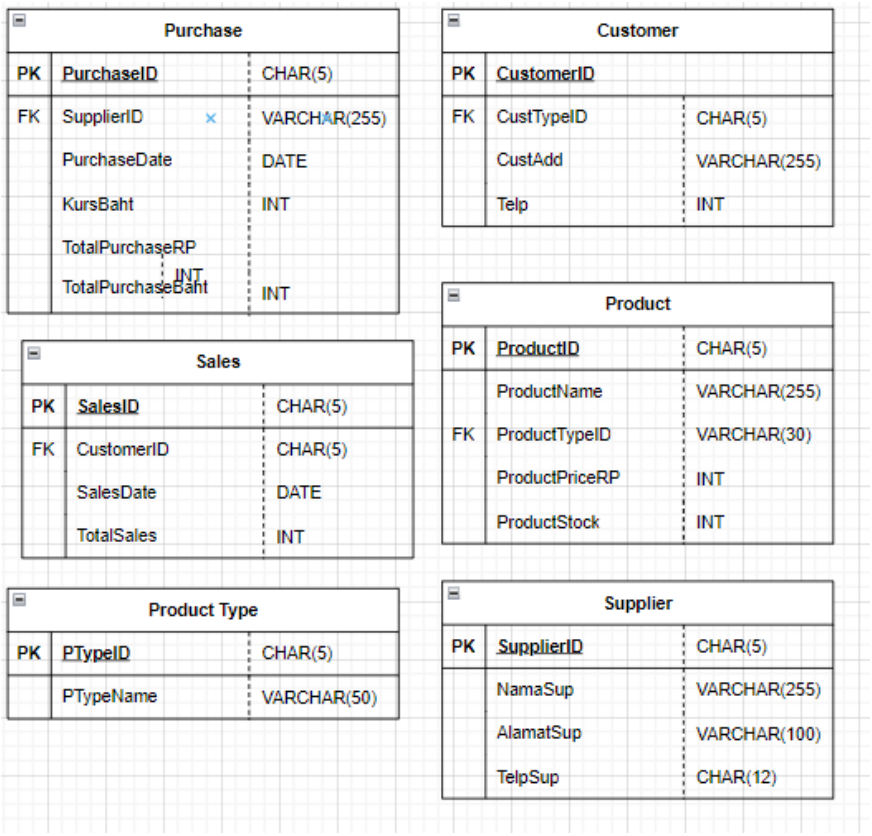
7.5.1 Simple UID



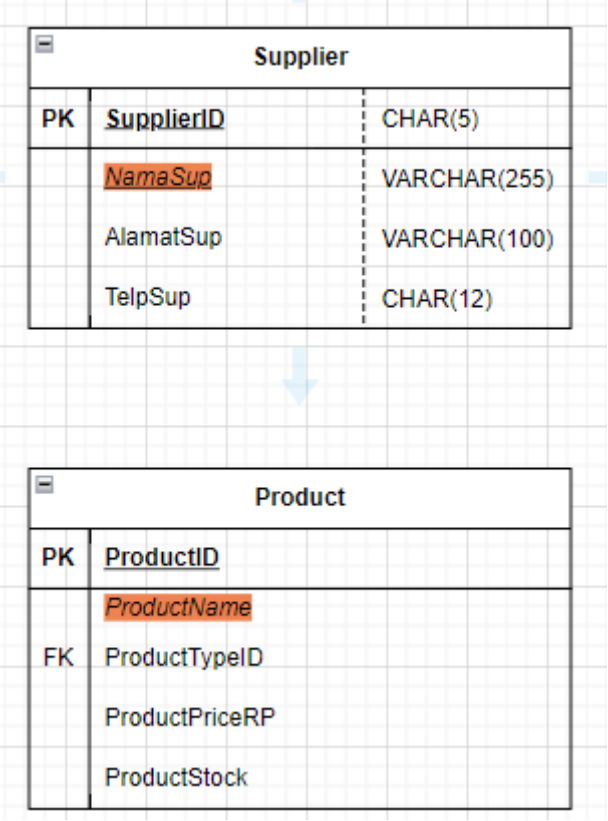
7.5.2 Composite UID

- Tidak ada

7.5.3 Artificial UID



7.5.4 Secondary UID

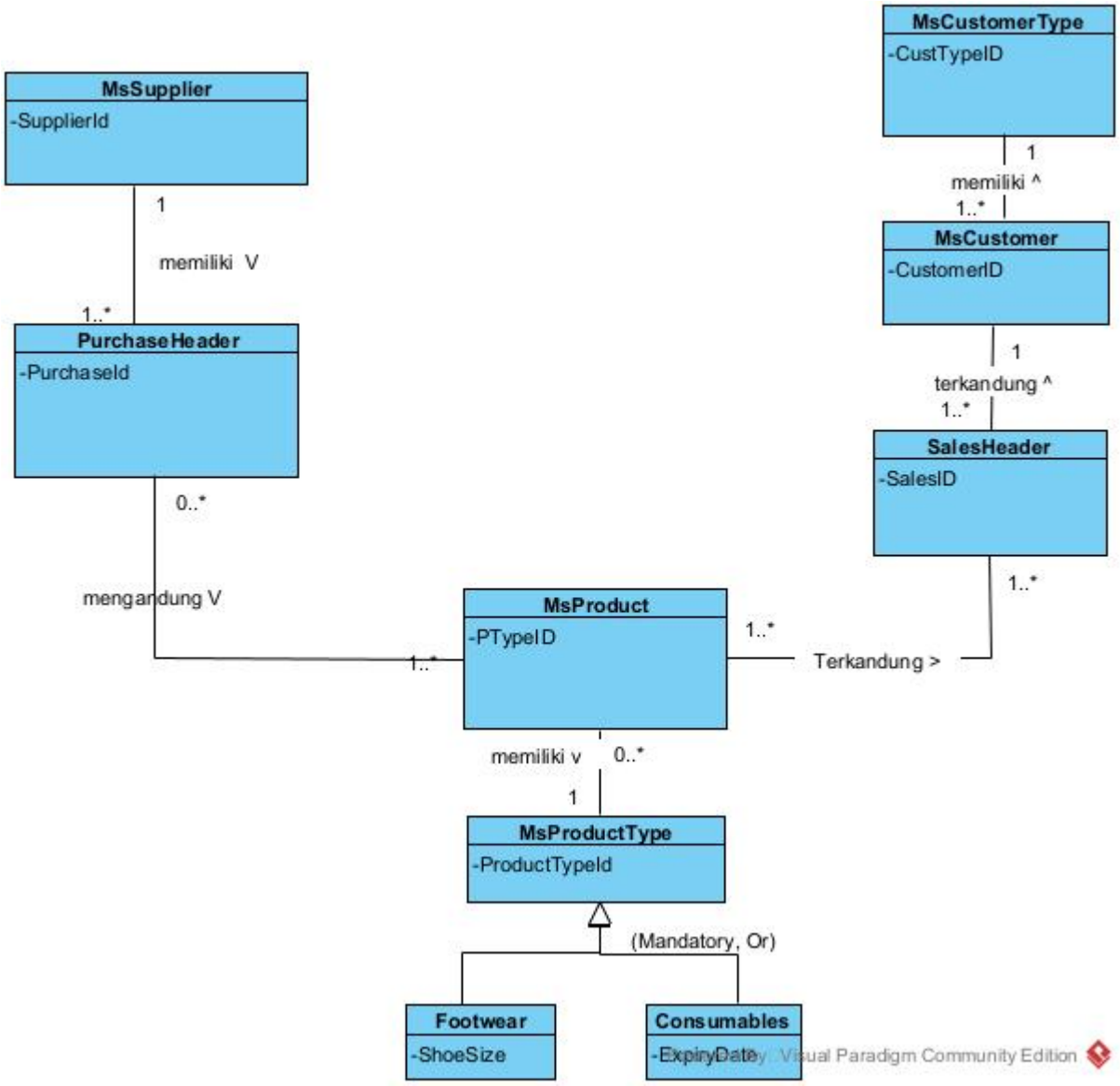


VIII. Conceptual ER Modeling

8.1 Identify entity types

Entity name	Description	Aliases	Occurence
MsSupplier	Entity yang merepresentasikan supplier yang bekerjasama dengan perusahan ABC	Supplier	MsSupplier memiliki hubungan zero to many terhadap PurchaseHeader karena setiap supplier bisa terdapat di 0 hingga banyak PurchaseHeader PurchaseHeader memiliki hubungan one to one terhadap MsSupplier karena setiap purchase header pasti memiliki 1 dan hanya 1 SupplierID
PurchaseHeader	entity yang merepresentasikan pembelian terhadap supplier yang dijalankan oleh perusahaan ABC	Order	PurchaseHeader memiliki hubungan one to one terhadap MsSupplier karena setiap purchase header pasti memiliki 1 dan hanya 1 SupplierID.
MsProduct	Entity yang merepresentasikan produk yang ada di gudang perusahaan ABC	Storage	MsProduct memiliki hubungan one to one terhadap MsProductType karena setiap ProductID pasti memiliki 1 dan hanya 1 PTypeID.
MsProductType	Entity yang merepresentasikan tipe dari produk yang ada di gudang perusahaan ABC	ProductType	MsProductType memiliki hubungan 1 to many terhadap MsProduct karena setiap PTypeID bisa terdapat di 1 hingga banyak MsProduct.

			MsProduct memiliki hubungan one to one terhadap MsProductType karena setiap ProductID pasti memiliki 1 dan hanya 1 PTypeID.
SalesHeader	entity yang merepresentasikan penjualan terhadap supplier yang dijalankan oleh perusahaan ABC	Sales	SalesHeader memiliki hubungan one to one terhadap MsCustomer karena setiap SalesHeader pasti memiliki 1 dan hanya 1 CustomerID.
MsCustomer	Entity yang merepresentasikan detail pelanggan dari perusahaan ABC	Customer	MsCustomer memiliki hubungan zero to many terhadap SalesHeader karena setiap CustomerID bisa terdapat di 0 hingga banyak SalesHeader. MsCustomer memiliki hubungan one to one terhadap MsCustomerType karena setiap CustomerID pasti memiliki 1 dan hanya 1 CustTypeID.
MsCustomerType	Entity yang merepresentasikan tipe dari setiap customer yang dimiliki oleh perusahaan ABC	CustomerType	MsCustomerType memiliki hubungan zero to many terhadap MsCustomer karena setiap CustTypeID bisa terdapat di 0 hingga banyak CustomerID.



8.2 Identify relationship types

Entity Name	Multiplicity	Relationship	Multiplicity	Entity Name
MsSupplier	1..1	Memiliki	0..*	PurchaseHeader
PurchaseHeader	0..*	Mengandung	1..*	MsProduct
MsProduct	0..*	Memiliki	1..1	Batch
MsProduct	1..*	Terkandung	0..*	SalesHeader
SalesHeader	1..*	Terkandung	1..1	MsCustomer

MsCustomer	0..*	Memiliki	1..1	MsCustomerType

8.3 Identify and associate attributes with entity or relationship types

- **Digabung di 8.4**

8.4 Determine attribute domains

Kelompok 1									
Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Valued	Candidate Key	Primary Key	Alternate Key	Attribute Domain
MsSupplier	SupplierID	Unique, to identify the supplier	5 variable characters	No	No	Yes	Yes	No	SU[0-9][0-9][0-9]
	SupplierName	Supplier's name	255 variable characters	No	No	Yes	No	Yes	Length >1 & Length < 255
	SupplierAdd	Supplier's address	10 variable characters	No	No	No	No	No	Length >1 & Length < 255
	SupplierPhone	Supplier's phone number	13 variable characters	No	Yes	No	No	No	length >10 & length <14

Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Valued	Candidate Key	Primary Key	Alternate Key	Attribute Domain
PurchaseHeader	PurchaseID	Unique, to identify the purchase header	5 variable characters	No	No	Yes	Yes	No	PU[0-9][0-9][0-9]
	TotalPurchaseRp	Total purchase of transaction in	15 variable integers	No	No	No	No	No	Int, length < 15

		Rupiah							
	PurchaseDate	The date of transaction	date	No	No	No	No	No	Date
	TotalPurchaseBaht	Total purchase of transaction in Baht	15 variable integers	No	No	No	No	No	length < 15
	Qty	The quantity of product bought	10 variable integers	No	No	No	No	No	length < 10

Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Valued	Candidate Key	Primary Key	Alternate Key	Attribute Domain
MsProduct	ProductID	Unique, to identify the product	100 variable characters	No	No	Yes	Yes	No	PR[0-9][0-9][0-9]
	ProductName	The product's name	10 variable integers	No	No	Yes	No	Yes	Length >1 & Length < 255
	ProductPriceRp	Product's price in Rupiah	10 variable integers	No	No	No	No	No	length < 15
	ProductPriceBaht	Product's price in Baht	5 variable characters	No	No	No	No	No	Length < 15

Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Val	Candidate	Primary	Alternate Key	Attribute Domain

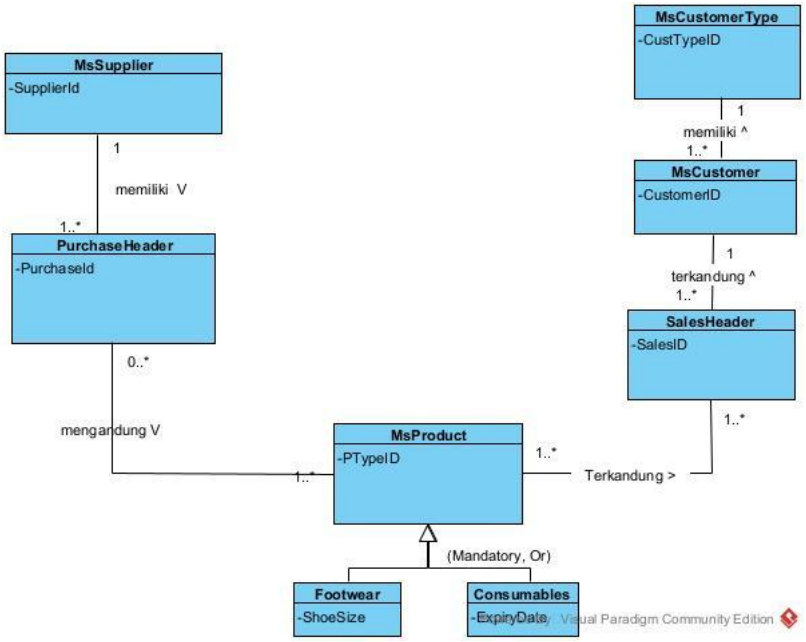
					ued	Key	Key		
MsProduct Type	ProductType ID	Unique, to identify the product type	5 variable characters	No	No	Yes	Yes	No	PT[0-9][0-9][0-9]
	ProductType Date	Product type's date	date	No	No	Yes	No	Yes	DATE
Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Valued	Candidate Key	Primary Key	Alternate Key	Attribute Domain
Sales Header	SalesID	Unique, to identify the sales header	5 variable characters	No	No	Yes	Yes	No	SI[0-9][0-9][0-9]
	SalesDate	The date of transaction	date	No	No	No	No	No	DATE
	TotalSales	Total sales of transaction	10 variable integers	No	No	No	No	No	Int, length < 15
	Qty	The quantity of product sold	10 variable integers	No	No	No	No	No	Int, length < 10
Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Valued	Candidate Key	Primary Key	Alternate Key	Attribute Domain
MsCustomer	CustomerID	Unique, to identify the customer	5 variable characters	No	No	Yes	Yes	No	CU[0-9][0-9][0-9]
	CustName	Customer's name	255 variable characters	No	No	Yes	No	Yes	Length >1 & Length < 255
	CustAdd	Customer's address	255 variable characters	No	No	No	No	No	Length >1 & Length < 255
	CustPhone	Customer's phone number	13 variable characters	No	No	No	No	No	length >10 & length <14
Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Valued	Candidate Key	Primary Key	Alternate Key	Attribute Domain
MsCustome	CustomerTy	Unique, to	5 variable	No	No	Yes	Yes	No	CT[0-9][0-9][0-9]

rType	peID	identify the customer type	characters						
	CustTypeName	Customer's type name	255 variable characters	No	No	Yes	No	Yes	Length >1 & Length < 255

8.5 Determine candidate, primary, and alternate key attributes

Entity Name	Candidate Keys	Primary Keys	Alternate Keys
MsSupplier	SupplierID SupplierName	SupplierID	SupplierName
PurchaseHeader	PurchaseID	PurchaseID	-
MsProduct	ProductID ProductName	ProductID	ProductName
Batch	BatchID ProductPrice Qty	BatchID	-
SalesHeader	SalesID	SalesID	-
MsCustomer	CustomerID CustomerName	CustomerID	CustomerName
MsCustomerType	CustTypeID CustTypeName	CustTypeID	CustTypeName

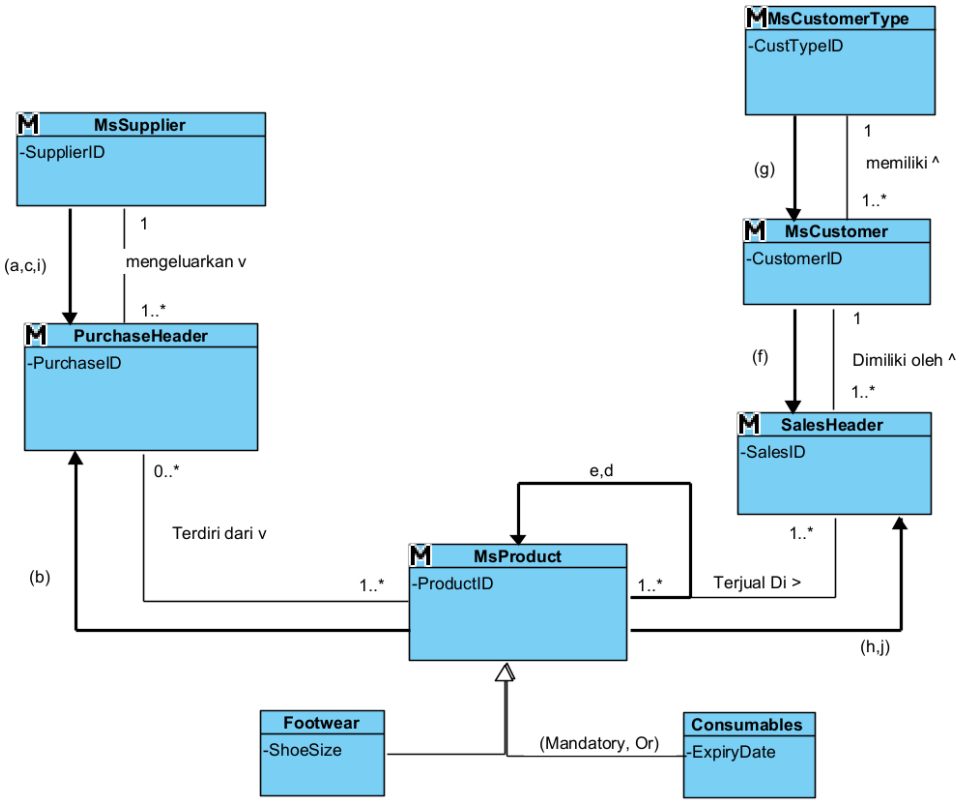
8.6 Consider use of enhanced modeling concepts (optional step)



8.7 Check model for redundancy

- **Tidak ada redundancy**

8.8 Validate conceptual model against user transactions



a. Owner dapat melihat daftar purchase dari setiap supplier
b. User dapat melihat produk apa saja di setiap purchase
c. melihat jumlah pesanan yang dibeli dari setiap supplier
d User dapat melihat produk apa saja yang ada di setiap product type
e. User dapat melihat product type dari produk yang ada
f. user dapat melihat customer order di bulan tertentu
g. Seller melihat detail customer melalui customer type
h. Seller melihat total perhitungan pendapatan dalam kurun waktu tertentu
i. User dapat melihat total biaya yang dikeluarkan dari setiap supplier
j. User dapat melihat barang terlaris yang telah dibeli

8.9 Review conceptual data model with user

Setelah melakukan interview, pemilik bisnis setuju dengan sistem database dan use case yang dapat dijalankan. Hal ini dikarenakan semua proses bisnis utama yang user butuhkan sudah terpenuhi melalui proses bisnis yang kami gambarkan.

Seluruh kebutuhan yang diinginkan (pencatatan sales, pencatatan purchase, akumulasi pendapatan setiap bulan) sudah terpenuhi melalui proses bisnis tersebut

IX. Logical ER Modeling & Normalization

9.1 Derive relations for logical data model

9.1.1 Strong entity:

1. **MsSupplier**
    a. SupplierID, SupplierfName, SupplierlName, SupplierPhone
    b. Primary key: SupplierID
2. **SalesHeader**
    a. Salesid, CustomerID, SalesDate
    b. Primary key: Salesid
    c. Foreign key: CustomerID references MsCustomer(CustomerID)
3. **MsCustomer**
    a. CustomerID, CustTypeID, CustfName, CustlName, CustStreetname, CustStreetNo, CustKodePos, CustPhone
    b. Primary key: CustomerID
    c. Foreign key: CustTypeID references MsCustomerType(CustTypeID)
4. **MsCustomerType**
    a. CustTypeID, TypeName
    b. Primary key: CustTypeID
5. **Consumabless**
    a. ConsumablesID, ConsumabkesName, ConsumablesPrice, Qty
    b. Primary Key : ConsumablesID
6. **MsSize**
    a. SizeId, FootwearSize
    b. Primary Key : SizeId
7. **FootwareDetail**
    a. FootwareID, FootwareName, FootwarePrice
    b. PrimaryK key: FootwareID
8. **PurchaseHeader**

a. PurchaseID, SupplierID, PurchaseDate
b. Primary key: PurchaseID
c. Foreign key: SupplierID references MsSupplier (SupplierID)

9.2.2 Weak entity:

1. **PurchaseDetail_Consumables**
   a. PurchaseID, ConsumablesID, consumablesPurchasePrice, Qty
   b. Foreign Key: PurchaseID, ConsumablesID
2. **Footwear**
   a. SizeId, FootwearID,Qty
   b. Foreign Key: SizeId, FootwearID
3. **SalesDetail_Consumables**
   a. SalesId,ConsumablesID, ConsumablesSalesPrice, Qty
   b. Foreign Key: SalesId, ConsumablesID
4. **SalesDetail_Footwear**
   a. SalesId, SizeId, FootwearID, FootwearSalesPrice, Qty
   b. Foreign Key: SalesId, SizeId, FootwearID
5. **PurchaseDetail_Footwear**
   a. PurchaseID, SizeId, FootwearID, FootwearPurchasePrice, Qty
   b. Foreign Key: PurchaseID, SizeId, FootwearID

9.2 Normalization

MsSupplier			
UNF			
SupplierID	supplierFName	supplierLName	supplierPhone
1NF			
SupplierID(PK)	supplierFName	supplierLName	supplierPhone
2NF			
SupplierID(PK)	supplierFName	supplierLName	supplierPhone
3NF			
SupplierID(PK)	supplierFName	supplierLName	supplierPhone

PurchaseHeader					
UNF					
PurchaseID	*SupplierID*	PurchaseDate	supplierFName	supplierLName	supplierPhone
1NF					
PurchaseID (PK)	*SupplierID*	PurchaseDate			
2NF					
PurchaseID (PK)	PurchaseDate	*SupplierID*	supplierFName	supplierLName	supplierPhone
3NF					
PurchaseID (PK)	PurchaseDate				
SupplierID (PK)	supplierFName	supplierLName	supplierPhone		

PurchaseDetail_Footwear					
UNF					
PurchaseID	*SupplierID*	PurchaseDate	supplierFName	supplierLName	supplierPhone
FootwearID	FootwearName	FootwearPrice			
Sizeid	FootwearSize	Qty	FootwearPurchasePrice	Qty	
1NF					
PurchaseID	*SupplierID*	PurchaseDate	supplierFName	supplierLName	supplierPhone
FootwearID	FootwearName	FootwearPrice			
Sizeid	FootwearSize	Qty	FootwearPurchasePrice	Qty	
2NF					

PurchaseID	FootwearID	Sizeid	FootwearPurchasePrice	Qty	
PurchaseID	*SupplierID*	PurchaseDate	supplierFName	supplierLName	supplierPhone
FootwearID	FootwearName	FootwearPrice	Sizeid	FootwearSize	Qty
3NF					
PurchaseID	*SupplierID*	PurchaseDate			
SupplierID	supplierFName	supplierLName	supplierPhone		
FootwearID	Sizeid	Qty			
FootwearID	FootwearName	FootwearPrice			

Sizeid	FootwearSize

Footwear					
UNF					
FootwearID	FootwearName	FootwearPrice	Sizeid	FootwearSize	Qty
1NF					
FootwearID	FootwearName	FootwearPrice	Sizeid	FootwearSize	Qty
2NF					
FootwearID	Sizeid	Qty			
FootwearID	FootwearName	FootwearPrice			
Sizeid	FootwearSize				
3NF					
FootwearID	Sizeid	Qty			
FootwearID	FootwearName	FootwearPrice			
Sizeid	FootwearSize				

FootwearDetail		
UNF		
FootwearID	FootwearName	FootwearPrice
1NF		
FootwearID	FootwearName	FootwearPrice
2NF		
FootwearID	FootwearName	FootwearPrice
3NF		
FootwearID	FootwearName	FootwearPrice

MsSize	
UNF	
Sizeid	FootwearSize
1NF	
Sizeid	FootwearSize
2NF	
Sizeid	FootwearSize

3NF	
Sizeid	FootwearSize

SalesDetail_Footwear										
UNF										
Salesid	SalesDate	*CustomerID*	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
FootwearID	FootwearName	FootwearPrice	Sizeid	FootwearSize	Qty	FootwearSalesPrice	Qty			
1NF										
Salesid	SalesDate	*CustomerID*	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
FootwearID	FootwearName	FootwearPrice	Sizeid	FootwearSize	Qty	FootwearSalesPrice	Qty			
2NF										
Salesid	FootwearID	Sizeid	FootwearSalesPrice	Qty						
Salesid	SalesDate	*CustomerID*	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
FootwearID	FootwearName	FootwearPrice	Sizeid	FootwearSize	Qty					
3NF										
FootwearID	Sizeid	Qty								
FootwearID	FootwearName	FootwearPrice								

Sizeid	FootwearSize	Qty

Salesid	SalesDate	*CustomerID*

CustomerID	*CustTypeID*	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone

CustTypeID	TypeName

PurchaseDetail_Consumables

UNF

PurchaseID	Purchase Date	ConsumablesID	ConsumablesName	ConsumablesPrice	Qty	ConsumablesPurchasePrice	Qty

1NF

PurchaseID	Purchase Date	ConsumablesID	ConsumablesName	ConsumablesPrice	Qty	ConsumablesPurchasePrice	Qty

2NF

PurchaseID	ConsumablesID	ConsumablesPurchasePrice	Qty

PurchaseID	Purchase Date

ConsumablesID	ConsumablesName	ConsumablesPrice	Qty

3NF

PurchaseID	ConsumablesID	ConsumablesPurchasePric	Qty

		e	
PurchaseID	Purchase Date		
ConsumablesID	ConsumablesName	Consumables Price	Qty

Consumables			
UNF			
ConsumablesID	ConsumablesName	ConsumablesPrice	Qty
1NF			
ConsumablesID	ConsumablesName	ConsumablesPrice	Qty
2NF			
ConsumablesID	ConsumablesName	ConsumablesPrice	Qty
3NF			
ConsumablesID	ConsumablesName	ConsumablesPrice	Qty

SalesDetail_Consumables										
UNF										
Salesid	SalesDate	CustomerID	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
ConsumablesID	ConsumablesName	ConsumablesPrice	Qty	ConsumablesSalesPrice	Qty					
1NF										
Salesid	SalesDate	CustomerID	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
ConsumablesID	ConsumablesName	ConsumablesPrice	Qty	ConsumablesSalesPrice	Qty					

2NF

ConsumablesID	Salesid	ConsumablesSalesPrice	Qty

Salesid	SalesDate	CustomerID	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone

ConsumablesID	ConsumablesName	ConsumablesPrice	Qty

3NF

Salesid	SalesDate	CustomerID	CustTypeID

CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone

SalesHeader

UNF

Salesid	SalesDate	*CustomerID*	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone

1NF

Salesid	SalesDate	*CustomerID*	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone

2NF

Salesid	SalesDate	*CustomerID*	CustTypeID	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone

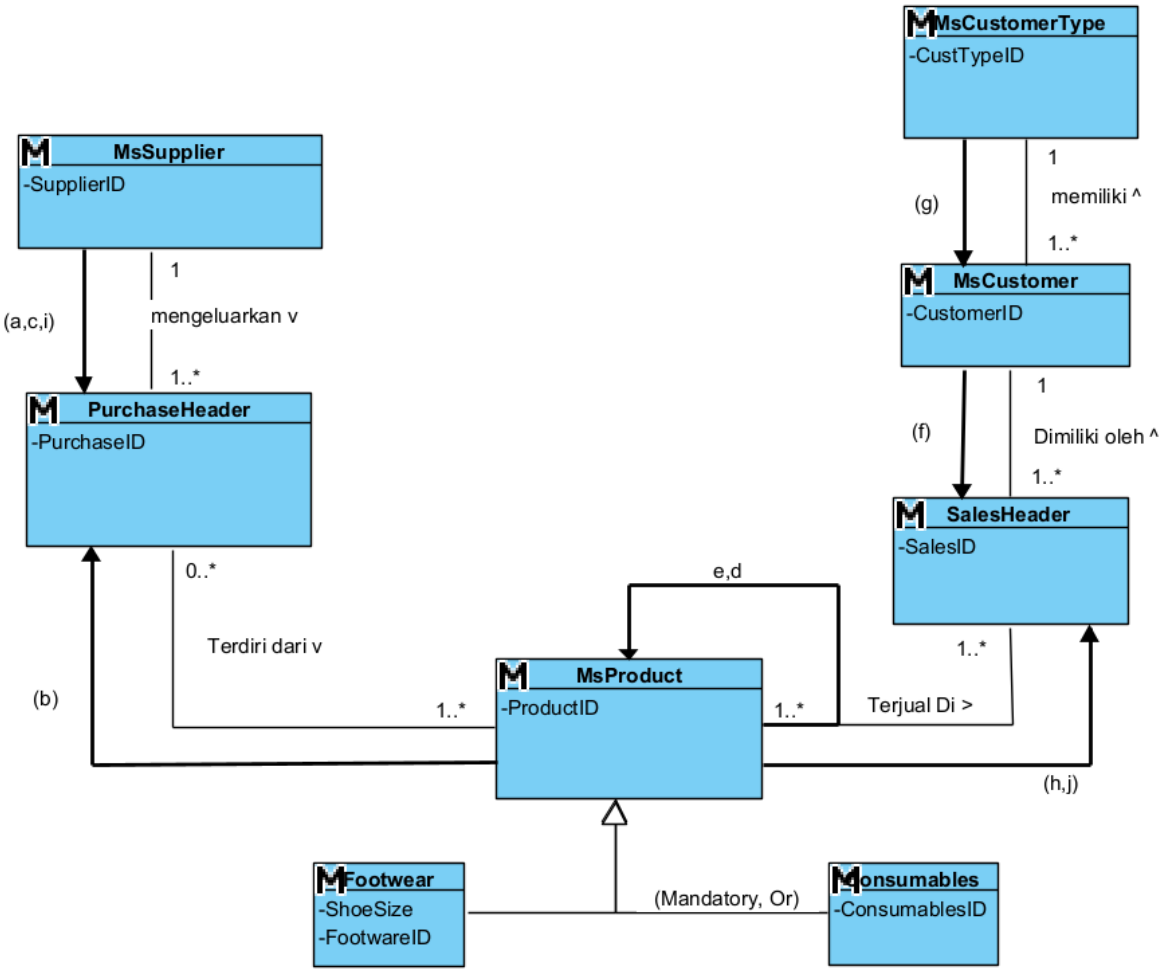
3NF

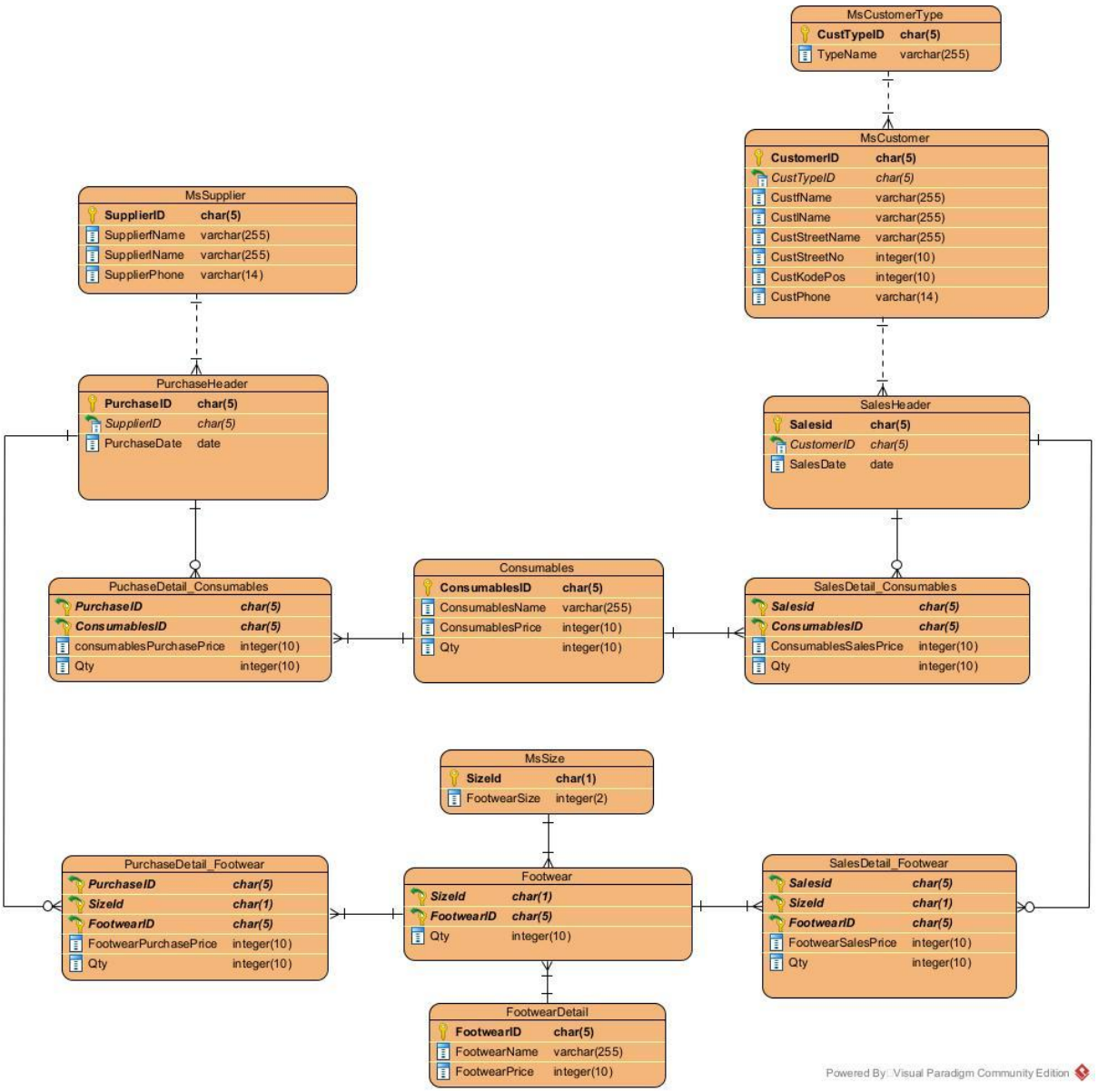
Salesid	SalesDate	*CustomerID*

CustomerID	*CustTypeID*	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone			
CustTypeID	TypeName									

MsCustomer								
UNF								
CustomerID	*CustTypeID*	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
1NF								
CustomerID	*CustTypeID*	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
2NF								
CustomerID	*CustTypeID*	TypeName	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone
3NF								
CustomerID	*CustTypeID*	CustfName	CustlName	CustStreetName	CustStreetNo	CustKodePos	CustPhone	
CustTypeID	TypeName							
MsCustomerType								
CustTypeID	TypeName							

9.3 Validate relations against user transactions





9.4 Check Integrity Constraint

MsCustomer

a. CustomerID, CustTypeID, CustfName, CustlName, CustStreetname, CustStreetNo, CustKodePos, CustPhone
b. Primary key: CustomerID
c. Foreign key: CustTypeID references MsCustomerType(CustTypeID) ON UPDATE CASCADE ON DELETE SET NULL

PurchaseHeader

a. PurchaseID, PurchaseDate, SupplierID
b. Primary key: PurchaseID
c. Foreign key: SupplierID references MsSupplier (SupplierID) UPDATE CASCADE ON DELETE SET NULL

Footwear

a. FootwearID, SizeID, Qty
b. Primary key: FootwearID, SizeID
c. Foreign key: FootwearID REFERENCES FootwearDetail(FootwearID) ON UPDATE CASCADE ON DELETE DO NOTHING,
d. Foreign key: SizeID REFERENCES MsSize(SizeID) ON UPDATE CASCADE ON DELETE DO NOTHING

PurchaseDetail_Footwear

a. PurchaseID, FootwearID, SizeID, FootwearPurchasePrice, Qty
b. **Primary Key:** PurchaseID, FootwearID, SizeID
c. **Foreign Key:** PurchaseID CHAR(5) REFERENCES PurchaseHeader(PurchaseID)ON UPDATE CASCADE ON DELETE SET NULL,
d. FootwearID CHAR(5) REFERENCES FootwearDetail(FootwearID) ON UPDATE CASCADE ON DELETE SET NULL,
e. SizeID CHAR(1) REFERENCES MsSize(SizeID) ON UPDATE CASCADE ON DELETE SET NULL,

PurchaseDetail_Consumables

a. PurchaseID, ConsumablesID ConsumablesPurchasePrice,
b. Primary Key: PurchaseID, ConsumablesID
c. Foreign Key: (PurchaseID) REFERENCES PurchaseHeader(PurchaseID) ON UPDATE CASCADE ON DELETE CASCADE

SalesHeader

a. SalesID, SalesDate, CustomerID
b. Primary Key: SalesID
c. Foreign Key: CustomerID REFERENCES MsCustomer(CustomerID)ON UPDATE CASCADE ON DELETE CASCADE

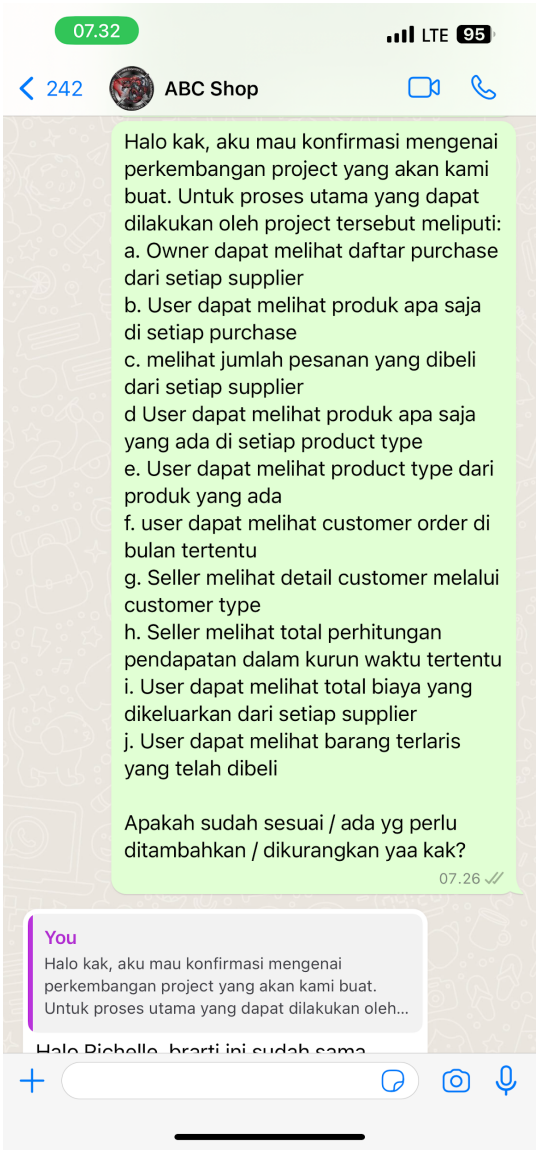
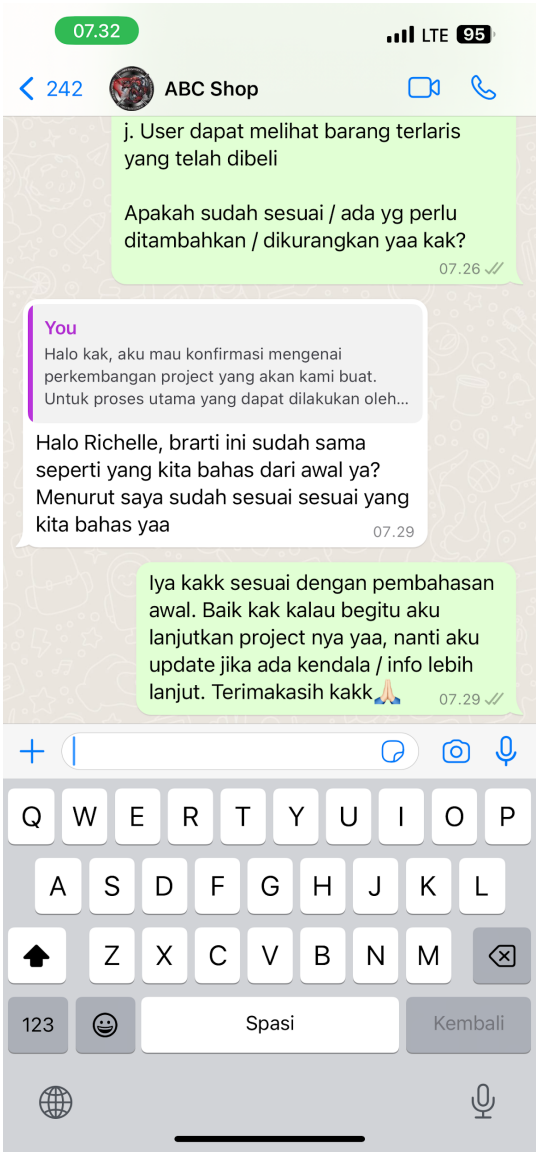
SalesDetail_Consumables

a. Qty, SalesID, ConsumablesID
b. Primary Key:
c. Foreign Key:

```
CREATE TABLE SalesDetail_Footwear (
    Qty INTEGER NOT NULL ,
    SalesID CHAR(5) REFERENCES SalesHeader(SalesID)ON UPDATE CASCADE ON DELETE CASCADE,
    FootwearID CHAR(5) REFERENCES FootwearDetail(FootwearID) ON UPDATE CASCADE,
```

PRIMARY KEY(SalesID,FootwearID)
)

SalesDetail_Footwear

d. PurchaseID
e. Primary Key:
f. Foreign Key:

9.5 Review Logical Data Model with User