Gramedia Warehousing System

Group 3

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Company Overview

Gramedia is one of the leading companies in Indonesia that operates in the publishing industry, selling books and literature-related goods. As a large company, Gramedia has a wide network of bookstores throughout the country, selling various types of books, magazines, stationery, and literature-related products.

Organization Structure

1. **CEO**
   The CEO is responsible for the overall success of Gramedia, including the supply chain management of the retail business. The CEO sets the strategic direction for the company and oversees the implementation of that strategy.
2. **Director of Supply Chain Management**
   The Director of Supply Chain Management is responsible for the development and execution of Gramedia's supply chain strategy. This includes overseeing the procurement, warehousing, transportation, and delivery of goods.
3. **Manager of Supply Chain Operations**
   The Manager of Supply Chain Operations is responsible for the day-to-day operations of the supply chain. This includes managing inventory levels, scheduling deliveries, and resolving any supply chain disruptions.
4. **Warehouse Manager**
   The Warehouse Manager is responsible for the efficient and accurate operation of the warehouse. This includes overseeing the receiving, storage, and picking of goods.
5. **Transportation Manager**
   The Transportation Manager is responsible for the transportation of goods from the warehouse to branch stores and customers. This includes managing the fleet of vehicles, negotiating shipping rates, and tracking shipments.
6. **Customer Service Manager**
   The Customer Service Manager is responsible for ensuring that customers are satisfied with their experience with Gramedia. This includes resolving any customer complaints or issues related to the supply chain.
7. **Staff**

The staff of the supply chain management department includes warehouse workers, transportation drivers, and customer service representatives. These employees are responsible for carrying out the day-to-day operations of the supply chain.

Company Business Process

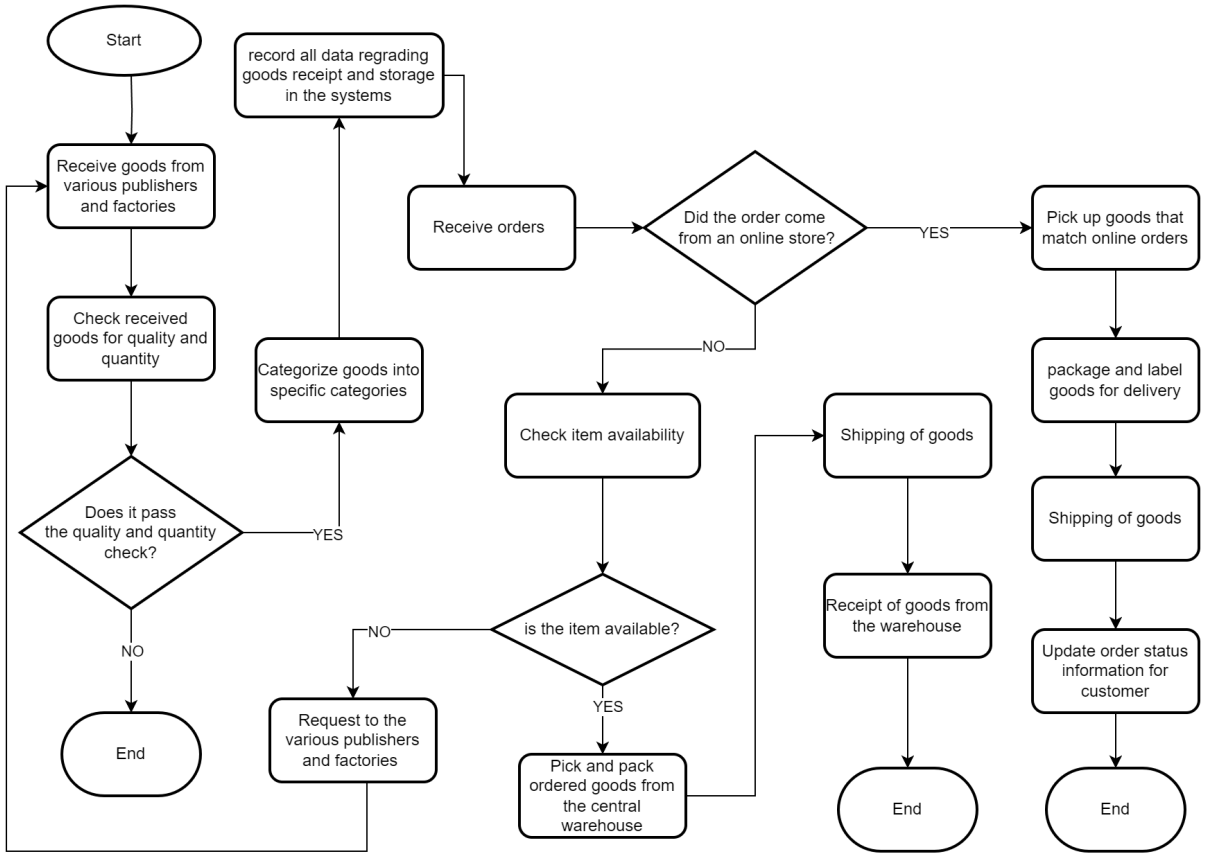


Figure 1. *End-to-End Process of Gramedia Warehouse*

Gramedia itself has a **main central warehouse** that acts as a distribution and storage center for various products, including books from various publishers and stationery products from various factories. When the warehouse receives goods from various publishers and factories, there is one staff member who handles the entry of goods and checks the receipt of goods provided. Items from publishers are separated and grouped by certain categories, such as author, publisher, and type of book, which makes tracking easier and more efficient stock management. On the other hand, factory products, such as stationery, are also separated according to type. After initial inspection, which includes quality and quantity, these goods are stored in the warehouse with the help of **identification technology such as barcodes or RFID**. All data regarding the receipt and storage of goods is recorded in the system.

After the goods are in the warehouse, the goods will be sent to various existing branch stores. The process of sending goods to Gramedia branch stores involves a series of strict stages, starting with **picking up orders from the branch store**. The team in charge, with one of the staff leaders, will take the goods that have been stored in the warehouse according to the outgoing goods document and pack them carefully. Then, staff will guarantee that deliveries are carried out in accordance with established quality and time standards.

Other than that Gramedia warehouse **sends goods to customers directly through online sales**. This process involves delivering goods ordered online by customers. After receiving an order from the e-commerce platform, the warehouse picks up the goods that match the order. Then the goods are packaged and labeled according to delivery. Then the delivery team updates the order status in real-time in the system to provide the right information to customers.

Problem Statement

Gramedia needs a database system that can manage all goods entering the main warehouse. The system can record when the goods come in, namely when the warehouse receives goods from the vendor and when the goods go out, namely when transactions occur with branches and online customers. Some data can also be accessed by branches and customers to track the stock of goods available when they want to make a transaction.

Database Planning

Business Mission

- Mission Statements : To provide a wide range of literature-related goods to customers across Indonesia, ensuring quality and efficiency in distribution.
- Mission Objectives : To maintain a well-organized inventory system, ensure timely delivery to branch stores and online customers, and uphold high standards of quality control.

Current Information Systems Evaluation

- Strengths : Efficient categorization and storage of goods, use of technology (barcodes/RFID) for tracking, structured process for dispatching goods to branches and online customers.
- Weaknesses : Not explicitly mentioned, but potential areas could be in handling returns, managing out-of-stock situations, or dealing with discrepancies in inventory.

IT Opportunities for Competitive Advantages

- Implementing advanced analytics to predict sales trends and optimize inventory.
- Integrating systems with e-commerce platforms for real-time inventory updates.
- Using AI for quality checks to reduce human error.

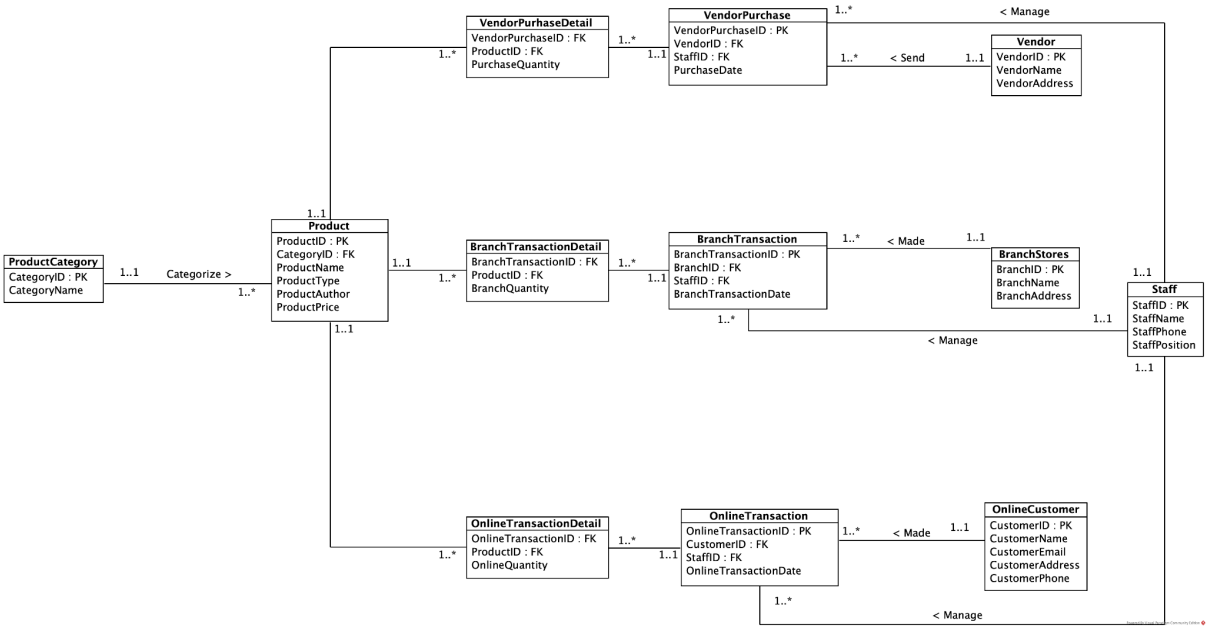
Corporate Data Model

- User Needs : Accurate tracking of goods, timely delivery, quality assurance.
- Standards : Compliance with industry standards for warehousing and distribution, adherence to quality standards set by publishers and manufacturers.
- Legal Requirement : Compliance with local laws and regulations related to warehousing, distribution, and e-commerce.

Fact-finding Techniques

Research : By reviewing the existing data of the company's business process and procedures, Gramedia could gather information about their current system and workflows. This analysis will help to identify their mistakes and look for opportunities for improvement or replacement to their system.

Logical ER Modelling & Normalization



Physical Database Design

```
CREATE DATABASE Gramedia
GO
USE Gramedia
GO

CREATE TABLE Vendor (
   VendorID CHAR(4) PRIMARY KEY NOT NULL
            CONSTRAINT VendorID
      CHECK (VendorID LIKE 'V[0-9][0-9][0-9]'),
   VendorName VARCHAR(255) NOT NULL,
   VendorAddress VARCHAR(255) NOT NULL
);

CREATE TABLE ProductCategory (
   CategoryID CHAR(5) PRIMARY KEY NOT NULL
      CONSTRAINT CHK_CategoryID
      CHECK (CategoryID LIKE 'CG[0-9][0-9][0-9]'),
   CategoryName VARCHAR(255) NOT NULL
);

CREATE TABLE Product (
   ProductID CHAR(5) PRIMARY KEY NOT NULL
      CONSTRAINT CHK_ProductID
      CHECK (ProductID LIKE 'PD[0-9][0-9][0-9]'),
   CategoryID CHAR(5) FOREIGN KEY REFERENCES ProductCategory(CategoryID),
   ProductName VARCHAR(255) NOT NULL,
   ProductType VARCHAR(255),
   ProductAuthor VARCHAR(255),
   ProductPrice INT NOT NULL
);

CREATE TABLE Staff (
   StaffID CHAR(4) PRIMARY KEY NOT NULL
            CONSTRAINT StaffID
            CHECK(StaffID LIKE 'S[0-9][0-9][0-9]'),
   StaffName VARCHAR(255) NOT NULL,
   StaffPhone VARCHAR(15) NOT NULL,
   StaffPosition VARCHAR(255) NOT NULL
);

CREATE TABLE VendorPurchase (
   VendorPurchaseID CHAR(5) PRIMARY KEY NOT NULL
      CONSTRAINT  VendorPurchaseID
      CHECK(VendorPurchaseID LIKE 'VP[0-9][0-9][0-9]'),
   VendorID CHAR(4) FOREIGN KEY REFERENCES Vendor(VendorID),
   StaffID CHAR(4) FOREIGN KEY REFERENCES Staff(StaffID),
```

```
    PurchaseDate DATE NOT NULL
 )

CREATE TABLE VendorPurchaseDetail (
  VendorPurchaseID CHAR(5) FOREIGN KEY REFERENCES VendorPurchase(VendorPurchaseID),
  ProductID CHAR(5) FOREIGN KEY REFERENCES Product(ProductID),
  PurchaseQuantity INT NOT NULL,
  PRIMARY KEY (VendorPurchaseID, ProductID)
)

CREATE TABLE BranchStores (
    BranchID CHAR(4) PRIMARY KEY NOT NULL
            CONSTRAINT BranchID
       CHECK(BranchID LIKE 'B[0-9][0-9][0-9]'),
    BranchName VARCHAR(255) NOT NULL,
    BranchAddress VARCHAR(255) NOT NULL
)

CREATE TABLE BranchTransaction (
    BranchTransactionID CHAR(5) PRIMARY KEY NOT NULL
            CONSTRAINT BranchTransactionID
            CHECK(BranchTransactionID LIKE 'BD[0-9][0-9][0-9]'),
    StaffID CHAR(4) FOREIGN KEY REFERENCES Staff(StaffID),
    BranchID CHAR(4) FOREIGN KEY REFERENCES BranchStores(BranchID),
    BranchTransactionDate DATE NOT NULL
)
CREATE TABLE BranchTransactionDetail (
    BranchTransactionID CHAR(5) FOREIGN KEY REFERENCES
BranchTransaction(BranchTransactionID) ,
    ProductID CHAR(5) FOREIGN KEY REFERENCES Product(ProductID),
    BranchQuantity INT NOT NULL
    PRIMARY KEY (BranchTransactionID, ProductID)
)

CREATE TABLE OnlineCustomer (
    CustomerID CHAR(4) PRIMARY KEY
       CONSTRAINT CustomerID
       CHECK(CustomerID LIKE 'C[0-9][0-9][0-9]'),
    CustomerName VARCHAR(255) NOT NULL,
    CustomerEmail VARCHAR(255) NOT NULL,
    CustomerAddress VARCHAR(255) NOT NULL,
    CustomerPhone VARCHAR(15) NOT NULL
)

CREATE TABLE OnlineTransaction (
          CustomerTransactionID CHAR(5) PRIMARY KEY NOT NULL
            CONSTRAINT CustomerTransactionID
       CHECK(CustomerTransactionID LIKE 'OT[0-9][0-9][0-9]'),
```

```
        CustomerID CHAR(4) FOREIGN KEY REFERENCES OnlineCustomer(CustomerID),
        StaffID CHAR(4) FOREIGN KEY REFERENCES Staff(StaffID),
        OnlineTransactionDate DATE NOT NULL
)

CREATE TABLE OnlineTransactionDetail (
   CustomerTransactionID CHAR(5) FOREIGN KEY REFERENCES
OnlineTransaction(CustomerTransactionID),
   ProductID CHAR(5) FOREIGN KEY REFERENCES Product(ProductID),
   OnlineQuantity INT NOT NULL,
   PRIMARY KEY (CustomerTransactionID, ProductID)
)

INSERT INTO Vendor VALUES
   ('V001', 'PT. Simpati Jaya', 'Jl. Anggrek No.30 '),
   ('V002', 'PT. Makmur Selalu', 'Jl. Gunung Sinabung No. 23'),
   ('V003', 'PT. Jaya Selalu', 'Jl. Amalia No. 9'),
   ('V004', 'PT.  Akram', 'Jl. W.R Supratman No. 7'),
   ('V005', 'PT. Taman Prospek', 'Jl. Sudirman No. 40'),
   ('V006', 'PT. Cemara Jaya', 'Jl. Gajah Mada No. 50'),
   ('V007', 'PT. Gagah Terdepan','Jl. Salak No. 3'),
   ('V008', 'PT. Abadi Jaya', 'Jl. Kijang No. 6'),
   ('V009', 'PT. Cahaya Mulia', 'Jl. Permata Indah No. 82'),
   ('V010', 'PT. Cakra Wiratama','Jl. Rawa Belok No. 69');

INSERT INTO ProductCategory (CategoryID, CategoryName)
VALUES
   ('CG001', 'Books'),
   ('CG002', 'Items');

INSERT INTO Product VALUES
   ('PD001', 'CG001', 'The Great Gatsby', NULL, 'F. Scott Fitzgerald', 50000),
   ('PD002', 'CG001', 'To Kill a Mockingbird', NULL, 'Harper Lee', 75000),
   ('PD003', 'CG001', '1984', NULL, 'George Orwell', 30000),
   ('PD004', 'CG001', 'The Catcher in the Rye', NULL, 'J.D. Salinger', 40000),
   ('PD005', 'CG001', 'The Hobbit', NULL, 'J.R.R. Tolkien', 86000);

INSERT INTO Staff VALUES
   ('S001', 'John Salim', '0831241493', 'Sales Associate'),
   ('S002', 'Jacob Smith', '08123913132', 'Manager'),
   ('S003', 'Julian Bob', '0831283174', 'Customer Service Rep'),
   ('S004', 'Sarah Lily', '08314124', 'Inventory Specialist'),
   ('S005', 'Mark Wilson', '0831231254', 'Tech Support'),
   ('S006', 'Emily Sarah', '0831823123', 'Marketing Coordinator'),
   ('S007', 'Chris Martin', '08418248176', 'IT Specialist'),
   ('S008', 'Jessica Iskandar', '084218412', 'Store Supervisor'),
   ('S009', 'Kevin Julian', '0841241241', 'Financial Analyst'),
   ('S010', 'Laura Kamila', '081241478', 'Human Resources Manager');
```

```
INSERT INTO VendorPurchase VALUES
   ('VP001', 'V001', 'S001', '2022-02-22'),
   ('VP002', 'V002', 'S002', '2022-05-12'),
   ('VP003', 'V003', 'S003', '2023-04-20'),
   ('VP004', 'V004', 'S004', '2023-06-09'),
   ('VP005', 'V005', 'S005', '2023-10-30');

INSERT INTO VendorPurchaseDetail VALUES
   ('VP001', 'PD003', 2),
   ('VP001', 'PD001', 1),
   ('VP002', 'PD005', 6),
   ('VP003', 'PD002', 1),
   ('VP003', 'PD005', 2);

INSERT INTO BranchStores VALUES
   ('B001', 'Main Branch', 'Jl. Pine St'),
   ('B002', 'Downtown Store', 'Jl. Maple Ave'),
   ('B003', 'Westside Outlet', 'Jl. Oak St'),
   ('B004', 'Tech Plaza', 'Jl. Tech Ave'),
   ('B005', 'City Center Mall', 'Jl. Mall Lane'),
   ('B006', 'Gadget Zone', 'Jl. Gadget Rd'),
   ('B007', 'EcoMarket', 'Jl. Eco St'),
   ('B008', 'Innovation Hub', 'Jl. Innovation Ave'),
   ('B009', 'FutureMall', 'Jl. Future Lane'),
   ('B010', 'QuickStop', '999 Quick Blvd');

INSERT INTO BranchTransaction VALUES
   ('BD001', 'S001', 'B001', '2022-01-11'),
   ('BD002', 'S001', 'B002', '2022-01-19'),
   ('BD003', 'S002', 'B003', '2022-06-10'),
   ('BD004', 'S003', 'B004', '2023-01-21'),
   ('BD005', 'S003', 'B005', '2023-05-18');

INSERT INTO BranchTransactionDetail VALUES
   ('BD001', 'PD001', 10),
   ('BD001', 'PD003', 15),
   ('BD002', 'PD004', 13),
   ('BD003', 'PD002', 10);

INSERT INTO OnlineCustomer VALUES
   ('C001', 'Monica Panggabean', 'monica.p@gmil.com', 'Jl. Sarong Kanan No. 56', 082111519638),
   ('C002', 'Elisabeth Dwihardhani', 'dhani@yaho.com', 'Jl. Benda Turun No. 30', 081111559644),
   ('C003', 'Rini Ekawati', 'rini.eka@yuhu.com', 'Jl. Rafflesia No. 31', 086785977863),
   ('C004', 'Aji Baroto', 'barotot@gmil.com', 'Jl. Permisi No. 17', 081162739090),
   ('C005', 'Ahmad Kurniawan', 'krnahmad@yaho.com', 'Jl. Sarong Kanan No. 56', 082111519638),
   ('C006', 'Fajar Nugroho', 'nnngrohofjr@yaho.com', 'Jl. Afrika No. 6', 082198490193),
```

```
    ('C007', 'Maya Sari', 'sarimaya123@yuhoo.com', 'Jl. Gajah Mada No. 8', 082111519638),
    ('C008', 'Herman Darmawan', 'Hermawan@yaho.com', 'Jl. Kebun Jambu No. 1', 082111749174),
    ('C009', 'Excel Kapan', 'when@gmil.co.id', 'Jl. Melati No. 14A', 082111519638),
    ('C010', 'Dewi Rahayu', 'puspitanita@inlook.com', 'Jl. Merdeka No. 42', 082111519638);

INSERT INTO OnlineTransaction VALUES
    ('OT001', 'C001', 'S005', '2023-01-01'),
    ('OT002', 'C002', 'S003', '2023-01-01'),
    ('OT003', 'C003', 'S005', '2023-01-01'),
    ('OT004', 'C004', 'S001', '2023-01-01'),
    ('OT005', 'C005', 'S002', '2023-01-01');

INSERT INTO OnlineTransactionDetail VALUES
   ('OT001', 'PD001', 3),
   ('OT002', 'PD001', 2),
   ('OT002', 'PD002', 2),
   ('OT002', 'PD003', 5),
   ('OT003', 'PD001', 6);

SELECT COUNT(*) AS [Total Customer]
FROM OnlineCustomer

SELECT COUNT(*) AS [Total Purchase]
FROM VendorPurchase

SELECT COUNT(ProductID) AS [Total Product]
FROM Product

SELECT COUNT(*) AS [Total Transaction]
FROM (SELECT * FROM BranchTransaction UNION ALL SELECT * FROM OnlineTransaction)
AS total_transaction

SELECT COUNT(*) AS [Total Stores]
FROM BranchStores

SELECT COUNT(*) AS [Total Supplier]
FROM Vendor

SELECT * FROM Vendor
SELECT * FROM BranchStores
SELECT * FROM OnlineCustomer

SELECT * FROM Product
        WHERE CategoryID = ‘CG001’
SELECT * FROM Product
        WHERE CategoryID = ‘CG002’

SELECT VendorPurchaseID, VendorName,  [PIC] = StaffName, PurchaseDate
```

```
FROM VendorPurchase vp JOIN Vendor v ON vp.VendorID = v.VendorID JOIN Staff s ON s.StaffID
= vp.StaffID

SELECT [Vendor Purchase ID] = vp.VendorPurchaseID,
        [Vendor ID] = vp.VendorID,
        [Vendor Name] = VendorName,
        [PIC] = s.StaffID+ '-'+StaffName,
   [Purchase Date] = PurchaseDate,

   [Product ID] = p.ProductID,
   [Product Name] = ProductName,
   [Quantity] = PurchaseQuantity
FROM VendorPurchase vp JOIN Vendor v ON vp.VendorID = v.VendorID JOIN Staff s ON s.StaffID
= vp.StaffID JOIN VendorPurchaseDetail vpd ON vp.VendorPurchaseID = vpd.VendorPurchaseID
JOIN Product p ON vpd.ProductID = p.ProductID
WHERE VendorPurchaseID = 'BD001';
```

Link User Interface:
https://www.figma.com/file/TV3skqrjfOKHSmV856xdZ7/Untitled-(Copy)?type=design&mode=design&t=uSzb3HpAF32uOJXH-1

Reference

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