

Generic Company Information

Name: Generic Flatpack Furniture Co. (GFFC)

Catchphrase: We sell you furniture, you give us money.

Company Specification:

Our company, Generic Flatpack Furniture Co. (GFFC) is a Swedish company which manufactures, distributes and sells affordable furniture. We are a vertically integrated company that handles our whole supply chain.

We have many outside suppliers that provide raw materials for our products, along with providing some finished goods we may sell. We have an online presence where customers may browse our catalogue of items, including the availability of items in selected stores.

In the store, our associates will be able to help customers find the products they want. Customers can go to a service counter and directly order items from that store's inventory or directly from the central warehouse. Items from the central warehouse can be picked up from our store or they can be delivered by third-party couriers.

Our supplies are catalogued along with the components they supply and the stock level. We like keeping catalogues of the available materials and products GFFC's suppliers can provide. If a new product is created, then we would like to ensure we can create enough stock using the raw materials we have.

The type of furniture we provide falls under a range of categories. Namely, those associated with the traditional rooms of the home, e.g. lounges, dining rooms, kitchens, bathrooms and bedrooms. We have recently expanded our product line to include an outdoor furniture section that incorporates jacuzzis.

Our online staff comes to a total of 20, including 4 Virtual Assistants. Each in-person branch has about 30 employees. We operate across 4 different regions, with our biggest two branches located in Slough and Swindon. There are 4 regional managers and 4 assistants to each of those regional managers. Our employees are trained to be flexible and fill in for each other, so each employee is trained to work in multiple roles such as customer assistants, warehouse workers, managers, etc.

GFFC has recently taken on a new CEO who has some very exacting standards. We want this system to take account of our vertically integrated model. Staff in branches should be able to book shifts and we should be able to track when a shift needs more staff. We also want the system to handle orders and products from both the central warehouse and an individual branch. Keeping track of how many build materials we have is needed and how many products we can produce.

Design Decisions

Tools we used

We decided to use draw.io for our logical and conceptual designs since it is free and easy to use and meets our requirements. Even though draw.io allows multiple users to interact on a project at the same time, we had some significant problems with this, as people would make edits that would contradict with each other, which caused data loss. We ended up having one person do all the diagrams and others would give them instructions or advice: multiple people did this and we'd switch roles regularly.

Once we normalised our design, we used SQL workbench to do our final design, since that can easily be converted into a database template and exported to raw SQL statements. Lastly, we used Figma to make our prototypes for the user interface. Again, Figma allows multiple users to edit a project at once, offering the team greater interaction and input on the final product. It allowed us to combine creative talents to produce a satisfying and user-friendly result.

General Design

We started by compartmentalising the system into three distinct packages: the Central Warehouse, the Branch and the Supply Chain. The Central Warehouse was the simplest as it only needed to process orders and store products to be ordered. The Supply Chain needs to store suppliers and their catalogues so we can buy build materials from them. It also needs to store a list of products we make and the build materials they use. The Branch is the most complex; it needs to list all our branches and keep track of their inventory, purchases and deliveries. We also need branches to keep track of their staff and the shifts.

Tables

Excluding joining tables, we have a total of 11 tables:

- Suppliers - stores information on suppliers (name, contact info, location)
- Staff - keeps track of company staff information
- MaterialsCatalogue - a catalogue of materials offered by our suppliers
- Shifts - for managing shifts at a particular branch
- Storage - keeps track of where our materials are stored
- Branches - information on the different branches of the company
- Products - a full table of all the products that the company sells
- Inventory - available products from the warehouse
- Orders - orders that branches have placed
- Warehouses - information about all of the company's warehouses
- Purchases - purchases customers have made

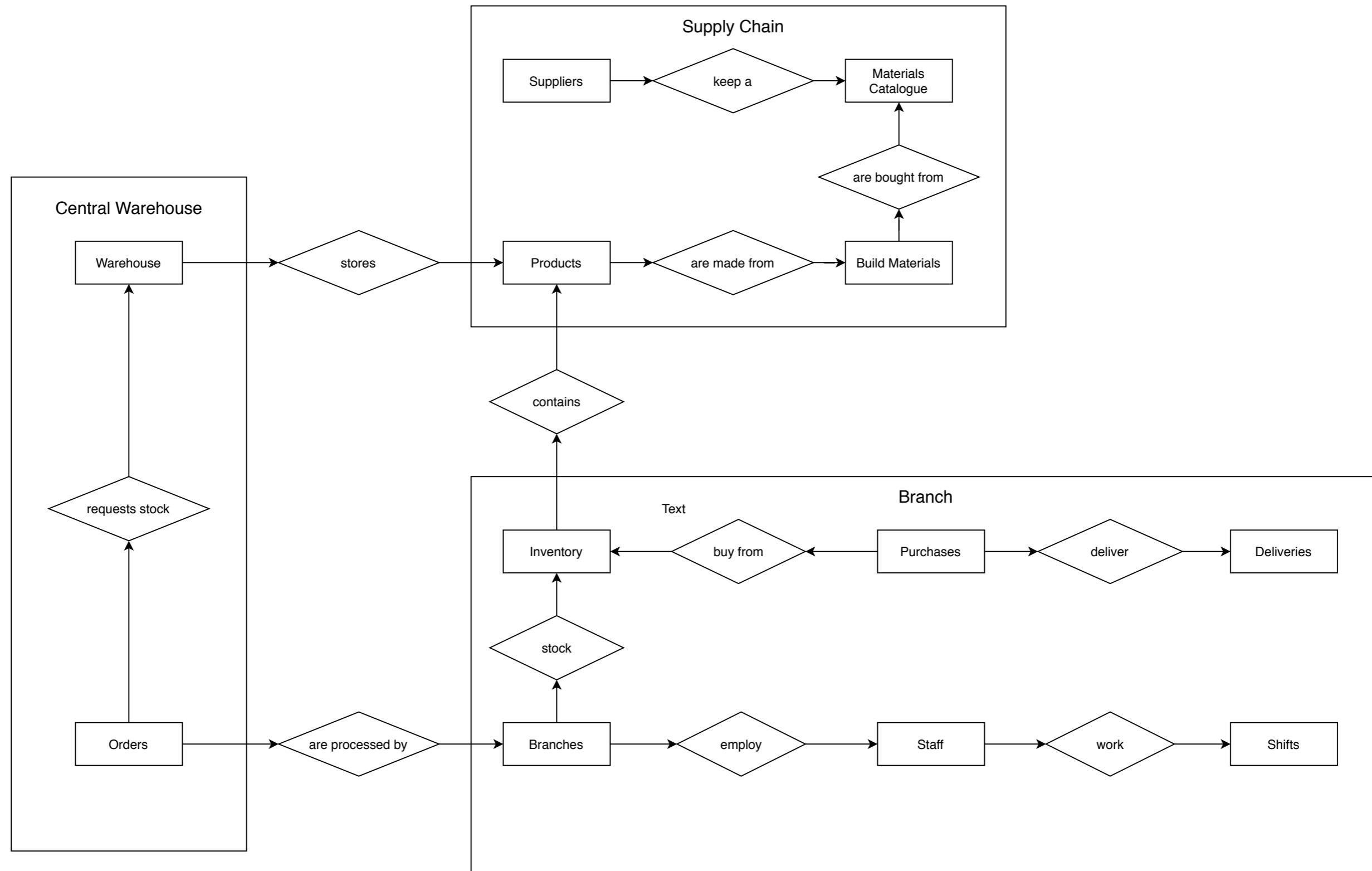
Since the company is mostly vertically integrated, there is a lot more information to keep track of since we manage a large proportion of the supply chain.

Example Product Lifecycle

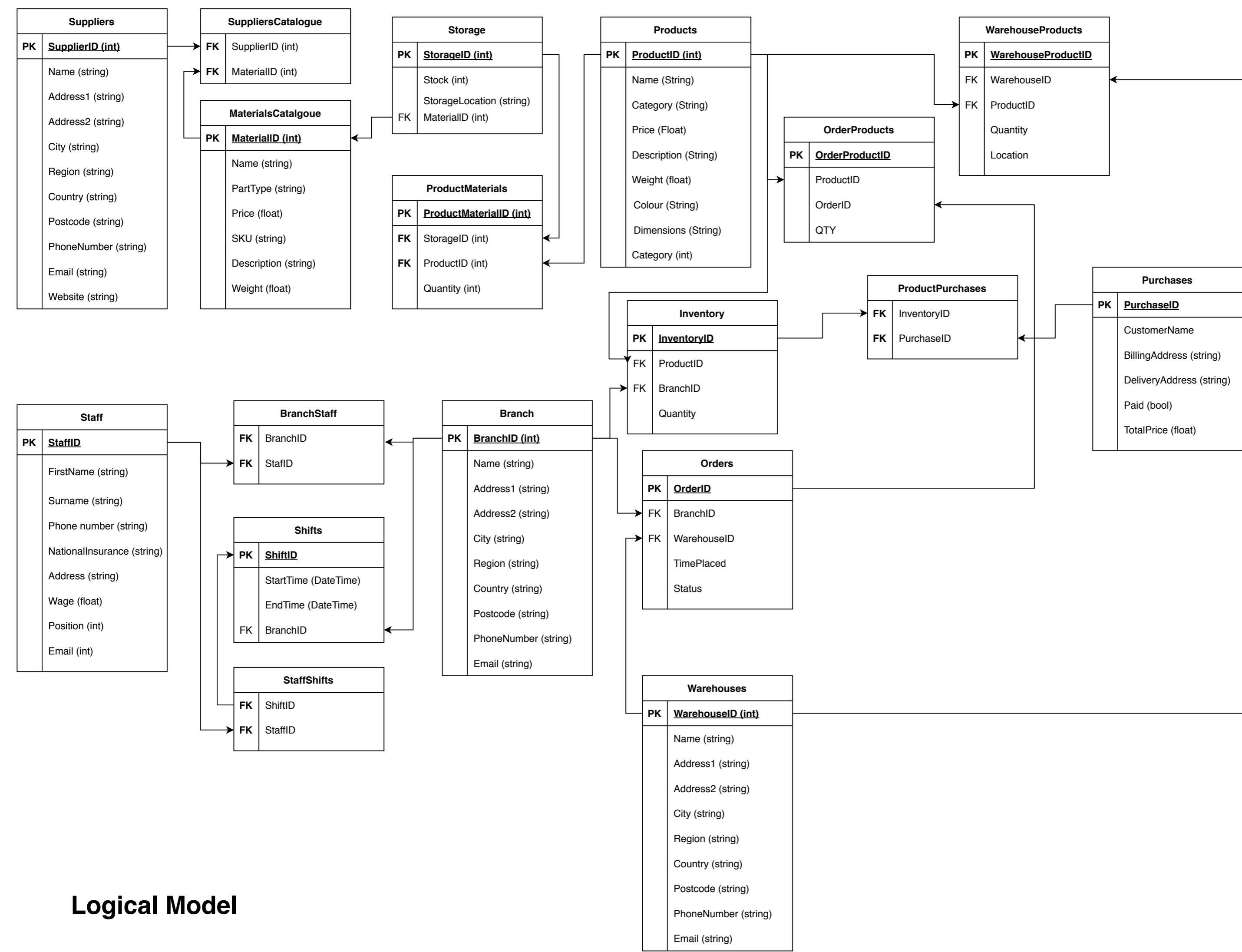
We will use a plank of medium-density fibreboard (MDF) as a demonstration of how our product supply chain works. The MDF plank begins as an item stored in MaterialsCatalogue, which can also be found in storage. The plank is then chosen to be turned into a shelf, which is listed in Products and stored in the warehouse. The Slough branch places an order (tracked in Orders) for 50 of these shelves to be kept in stock. The shelf made from our original plank is included in this order and is stored in Inventory. A customer then makes a purchase at the Slough branch for three of these shelves - the purchase is logged in Purchases, the quantity of shelves in that branches' inventory decreases by 3, and the customer walks away with three shelves.

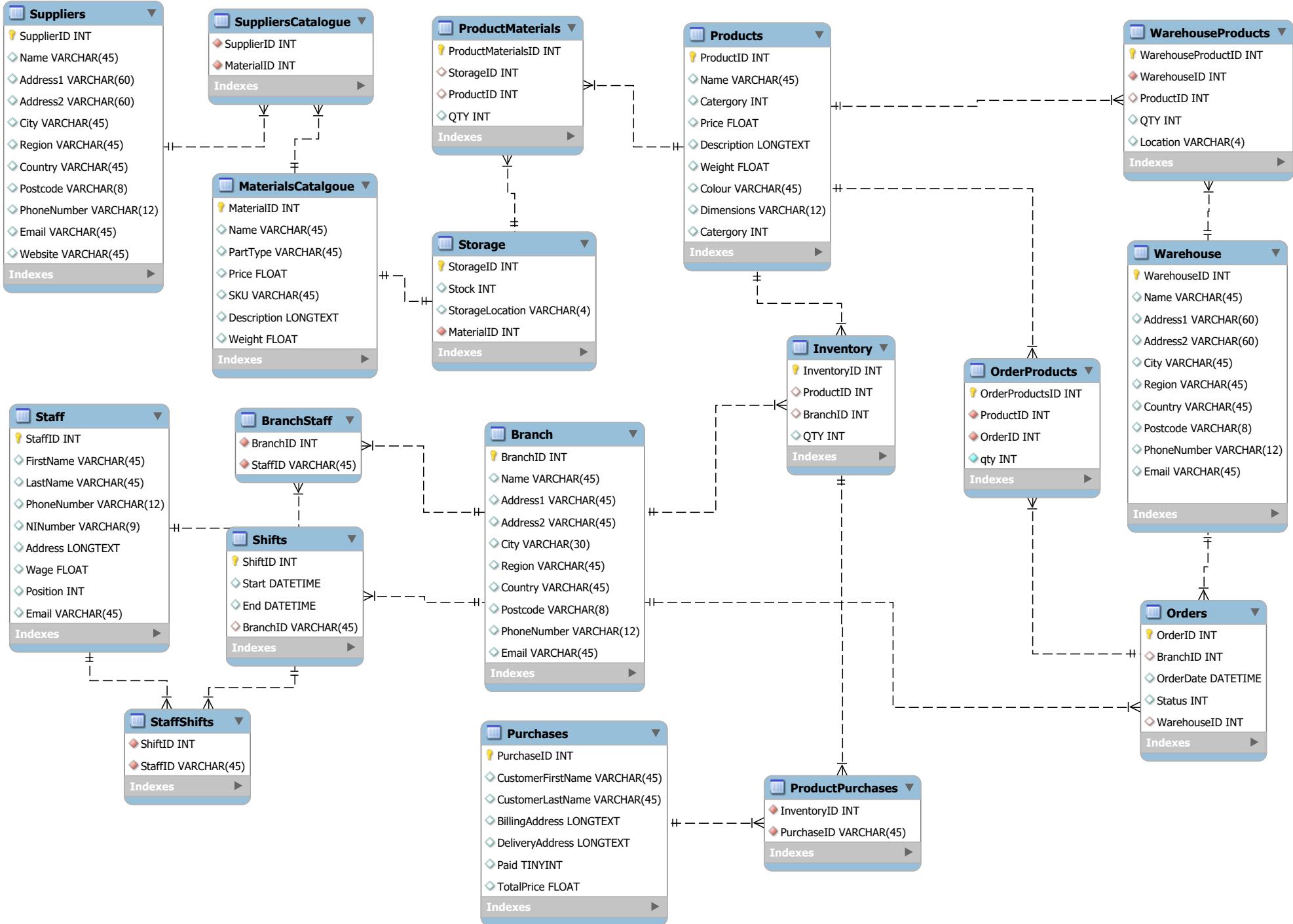
Image Acknowledgements:

- Product Page:
 - Rugs: Isabelle Taylor on Pexels -
<https://www.pexels.com/photo/close-up-of-gray-cable-knit-cloth-1421253/>
 - Shelves: <https://www.ikea.com/gb/en/>



Conceptual Model







Search Catalogue



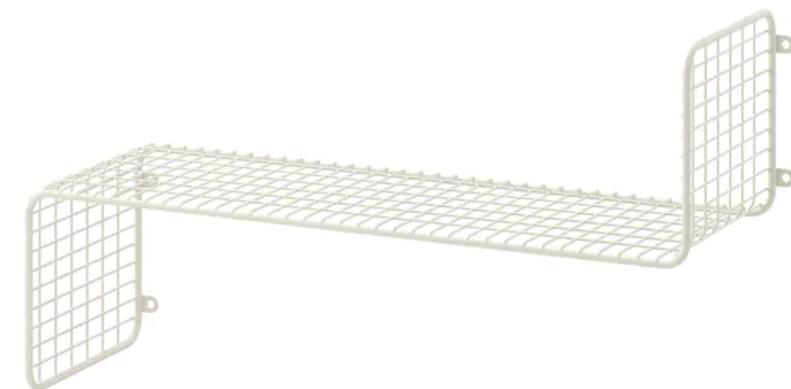
Sort by ▾



Shelf

£10

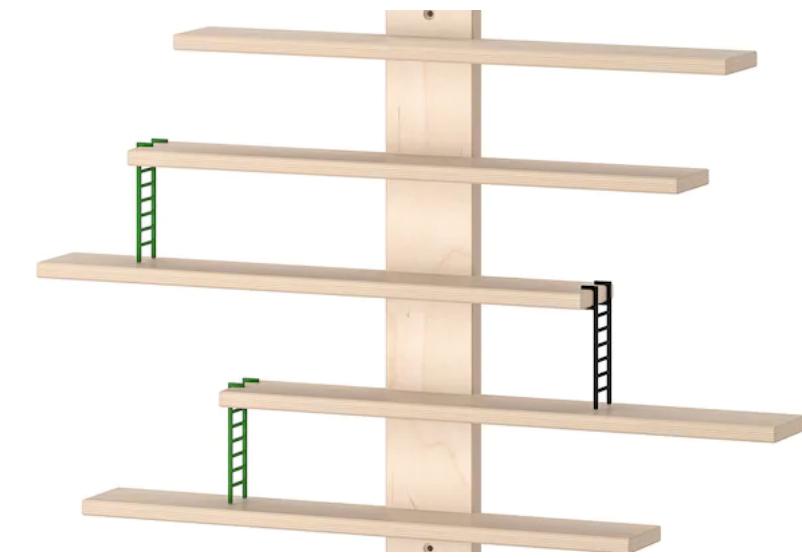
200x30x3cm



Crappy metal shelf

£8

60x20x3



Kids' shelf

£15

37x37x3



Practical shelf

£18

101x20x3



Hipster shelf

£25

120x25x3



Hanging shelf

£12

80x20x3



Basket



X

1



X

1



X

1



Shelf
200x30X3cm

Crappy metal shelf
60x20x3

Kids' shelf
37x37x3

£10.00

£8.00

£15.00

Total £33.00

[Advance to Checkout](#)

Checkout

Name*

Enter your first and last name.

Hugh Mungous

Email address

Enter an email address that we can use to contact you.

example@example.com

Phone number

Enter your phone number so we can call you if needed.

01234 567890

Delivery address

Enter your delivery address.

Flat 1

1 Example Street

Exampleton

EX1 1EX

My billing address is the same as my delivery address

I agree to the Terms and Conditions*

I agree to the Privacy Policy*

Credit/Debit card
Checkout





Search Catalogue



Special Offers



Bathroom



Outdoors



Accessories



Decoration



Beds and Mattresses



Kitchen



Furniture



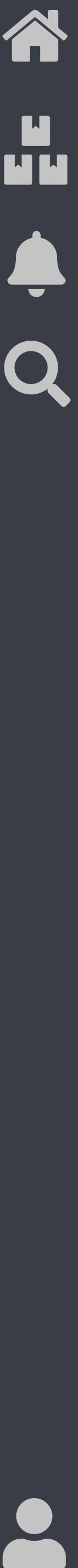
Textiles



Lighting



Rugs



Shift Management

| Date | Time ▼ | Slots left | Staff on Shift | Choose Shift | Cancel Shift |
|-----------|-------------|------------|----------------|---------------------------------|-------------------------|
| 2069/4/20 | 04:20-10:00 | 5/7 | 7 | <button>Select Shift</button> | <button>Cancel</button> |
| 2069/4/20 | 10:00-16:20 | 4/20 | 20 | <button>Select Shift</button> | <button>Cancel</button> |
| 2069/4/20 | 16:20-22:00 | 6/9 | 9 | <button>Select Shift</button> | <button>Cancel</button> |
| 2069/4/21 | 04:20-10:00 | 5/7 | 7 | <button>Select Shift</button> | <button>Cancel</button> |
| 2069/4/21 | 10:00-16:20 | 4/20 | 20 | <button>Select Shift</button> | <button>Cancel</button> |
| 2069/4/21 | 16:20-22:00 | 6/9 | 9 | <button>Select Shift</button> | <button>Cancel</button> |
| 2069/4/22 | 04:20-10:00 | 5/7 | 7 | <button>Shift selected</button> | <button>Cancel</button> |
| 2069/4/22 | 10:00-16:20 | 4/20 | 20 | <button>Shift selected</button> | <button>Cancel</button> |
| 2069/4/22 | 16:20-22:00 | 6/9 | 9 | <button>Shift selected</button> | <button>Cancel</button> |



Search Inventory



| Item Name ▲ | Location | Price | Weight | Dimensions (WxDxH) | SKU No | Quantity | View Item Page |
|--------------------|----------|-------|--------|--------------------|--------|----------|---------------------------|
| Crappy metal shelf | A1 | £8 | 1.00kg | 60x20x3cm | 1001 | 69 | View Item |
| Hanging shelf | A1 | £12 | 1.00kg | 80x20x3cm | 1002 | 21 | View Item |
| Hipster shelf | A1 | £25 | 1.00kg | 120x25x3cm | 1003 | 0 | View Item |
| Kids shelf | A1 | £15 | 1.00kg | 37x37x3cm | 1004 | 1 | View Item |
| Practical shelf | A1 | £18 | 1.00kg | 101x20x3cm | 1005 | 99 | View Item |
| Shelf | A1 | £10 | 1.00kg | 200x30x3cm | 1006 | 20 | View Item |

SQL Create Commands

Suppliers

```
CREATE TABLE IF NOT EXISTS `mydb`.`Suppliers` (
  `SupplierID` INT NOT NULL,
  `Name` VARCHAR(45) NULL,
  `Address1` VARCHAR(60) NULL,
  `Address2` VARCHAR(60) NULL,
  `City` VARCHAR(45) NULL,
  `Region` VARCHAR(45) NULL,
  `Country` VARCHAR(45) NULL,
  `Postcode` VARCHAR(8) NULL,
  `PhoneNumber` VARCHAR(12) NULL,
  `Email` VARCHAR(45) NULL,
  `Website` VARCHAR(45) NULL,
  PRIMARY KEY (`SupplierID`),
  UNIQUE INDEX `SupplierID_UNIQUE` (`SupplierID` ASC) VISIBLE)
```

MaterialsCatalogue

```
CREATE TABLE IF NOT EXISTS `mydb`.`MaterialsCatalogue` (
  `MaterialID` INT NOT NULL,
  `Name` VARCHAR(45) NULL,
  `PartType` VARCHAR(45) NULL,
  `Price` FLOAT NULL,
  `SKU` VARCHAR(45) NULL,
  `Description` LONGTEXT NULL,
  `Weight` FLOAT NULL,
  PRIMARY KEY (`MaterialID`),
  UNIQUE INDEX `MaterialID_UNIQUE` (`MaterialID` ASC) VISIBLE)
```

SuppliersCatalogue

```
CREATE TABLE IF NOT EXISTS `mydb`.`SuppliersCatalogue` (
  `SupplierID` INT NOT NULL,
  `MaterialID` INT NOT NULL,
  INDEX `fk_SuppliersCatalogue_MaterialsCatalogue1_idx` (`MaterialID` ASC) VISIBLE,
  CONSTRAINT `fk_SuppliersCatalogue_Suppliers1`
    FOREIGN KEY (`SupplierID`)
    REFERENCES `mydb`.`Suppliers` (`SupplierID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_SuppliersCatalogue_MaterialsCatalogue1`
    FOREIGN KEY (`MaterialID`)
    REFERENCES `mydb`.`MaterialsCatalogue` (`MaterialID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Storage

```
CREATE TABLE IF NOT EXISTS `mydb`.`Storage` (
  `StorageID` INT NOT NULL,
  `Stock` INT NULL,
  `StorageLocation` VARCHAR(4) NULL,
  `MaterialID` INT NOT NULL,
  UNIQUE INDEX `StorageID_UNIQUE` (`StorageID` ASC) VISIBLE,
  PRIMARY KEY (`StorageID`),
  INDEX `fk_Storage_MaterialsCatalogue1_idx` (`MaterialID` ASC) VISIBLE,
  CONSTRAINT `fk_Storage_MaterialsCatalogue1`
    FOREIGN KEY (`MaterialID`)
    REFERENCES `mydb`.`MaterialsCatalogue` (`MaterialID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Products

```
CREATE TABLE IF NOT EXISTS `mydb`.`Products` (
  `ProductID` INT NOT NULL,
  `Name` VARCHAR(45) NULL,
  `Category` INT NULL,
  `Price` FLOAT NULL,
  `Description` LONGTEXT NULL,
  `Weight` FLOAT NULL,
  `Colour` VARCHAR(45) NULL,
  `Dimensions` VARCHAR(12) NULL,
  `Category` INT NULL,
  PRIMARY KEY (`ProductID`))
```

ProductMaterials

```
CREATE TABLE IF NOT EXISTS `mydb`.`ProductMaterials` (
  `ProductMaterialsID` INT NOT NULL,
  `StorageID` INT NULL,
  `ProductID` INT NULL,
  `QTY` INT NULL,
  PRIMARY KEY (`ProductMaterialsID`),
  INDEX `fk_ProductMaterials_Storage1_idx` (`StorageID` ASC) VISIBLE,
  INDEX `fk_ProductMaterials_Products1_idx` (`ProductID` ASC) VISIBLE,
  CONSTRAINT `fk_ProductMaterials_Storage1`
    FOREIGN KEY (`StorageID`)
    REFERENCES `mydb`.`Storage` (`StorageID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_ProductMaterials_Products1`
    FOREIGN KEY (`ProductID`)
    REFERENCES `mydb`.`Products` (`ProductID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Staff

```
CREATE TABLE IF NOT EXISTS `mydb`.`Staff` (
  `StaffID` INT NOT NULL,
  `FirstName` VARCHAR(45) NULL,
  `LastName` VARCHAR(45) NULL,
  `PhoneNumber` VARCHAR(12) NULL,
  `NINumber` VARCHAR(9) NULL,
  `Address` LONGTEXT NULL,
  `Wage` FLOAT NULL,
  `Position` INT NULL,
  `Email` VARCHAR(45) NULL,
  PRIMARY KEY (`StaffID`))
```

Branch

```
CREATE TABLE IF NOT EXISTS `mydb`.`Branch` (
  `BranchID` INT NOT NULL,
  `Name` VARCHAR(45) NULL,
  `Address1` VARCHAR(45) NULL,
  `Address2` VARCHAR(45) NULL,
  `City` VARCHAR(30) NULL,
  `Region` VARCHAR(45) NULL,
  `Country` VARCHAR(45) NULL,
  `Postcode` VARCHAR(8) NULL,
  `PhoneNumber` VARCHAR(12) NULL,
  `Email` VARCHAR(45) NULL,
  PRIMARY KEY (`BranchID`))
```

BranchStaff

```
CREATE TABLE IF NOT EXISTS `mydb`.`BranchStaff` (
  `BranchID` INT NOT NULL,
  `StaffID` VARCHAR(45) NOT NULL,
  CONSTRAINT `fk_BranchStaff_Branch1`
    FOREIGN KEY (`BranchID`)
    REFERENCES `mydb`.`Branch` (`BranchID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_BranchStaff_Staff1`
    FOREIGN KEY (`StaffID`)
    REFERENCES `mydb`.`Staff` (`StaffID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Shifts

```
CREATE TABLE IF NOT EXISTS `mydb`.`Shifts` (
  `ShiftID` INT NOT NULL,
  `Start` DATETIME NULL,
  `End` DATETIME NULL,
  `BranchID` VARCHAR(45) NULL,
  PRIMARY KEY (`ShiftID`),
  INDEX `fk_Shifts_Branch1_idx` (`BranchID` ASC) VISIBLE,
  CONSTRAINT `fk_Shifts_Branch1`
    FOREIGN KEY (`BranchID`)
    REFERENCES `mydb`.`Branch` (`BranchID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

StaffShifts

```
CREATE TABLE IF NOT EXISTS `mydb`.`StaffShifts` (
  `ShiftID` INT NOT NULL,
  `StaffID` VARCHAR(45) NOT NULL,
  INDEX `fk_StaffShifts_Shifts1_idx` (`ShiftID` ASC) VISIBLE,
  INDEX `fk_StaffShifts_Staff1_idx` (`StaffID` ASC) VISIBLE,
  CONSTRAINT `fk_StaffShifts_Shifts1`
    FOREIGN KEY (`ShiftID`)
    REFERENCES `mydb`.`Shifts` (`ShiftID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_Staffshifts_Staff1`
    FOREIGN KEY (`StaffID`)
    REFERENCES `mydb`.`Staff` (`StaffID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Inventory

```
CREATE TABLE IF NOT EXISTS `mydb`.`Inventory` (
  `InventoryID` INT NOT NULL,
  `ProductID` INT NULL,
  `BranchID` INT NULL,
  `QTY` INT NULL,
  PRIMARY KEY (`InventoryID`),
  INDEX `fk_Inventory_Products1_idx` (`ProductID` ASC) VISIBLE,
  INDEX `fk_Inventory_Branch1_idx` (`BranchID` ASC) VISIBLE,
  CONSTRAINT `fk_Inventory_Products1`
    FOREIGN KEY (`ProductID`)
    REFERENCES `mydb`.`Products` (`ProductID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_Inventory_Branch1`
    FOREIGN KEY (`BranchID`)
    REFERENCES `mydb`.`Branch` (`BranchID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Purchases

```
CREATE TABLE IF NOT EXISTS `mydb`.`Purchases` (
  `PurchaseID` INT NOT NULL,
  `CustomerFirstName` VARCHAR(45) NULL,
  `CustomerLastName` VARCHAR(45) NULL,
  `BillingAddress` LONGTEXT NULL,
  `DeliveryAddress` LONGTEXT NULL,
  `Paid` TINYINT NULL,
  `TotalPrice` FLOAT NULL,
  PRIMARY KEY (`PurchaseID`))
```

ProductPurchases

```
CREATE TABLE IF NOT EXISTS `mydb`.`ProductPurchases` (
  `PurchaseID` INT NOT NULL,
  `PurchaseID` VARCHAR(45) NOT NULL,
  INDEX `fk_ProductPurchases_Purchases1_idx` (`PurchaseID` ASC) VISIBLE,
  INDEX `fk_ProductPurchases_Inventory1_idx` (`InventoryID` ASC) VISIBLE,
  CONSTRAINT `fk_ProductPurchases_Purchases1`
    FOREIGN KEY (`PurchaseID`)
    REFERENCES `mydb`.`Purchases` (`PurchaseID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_ProductPurchases_Inventory1`
    FOREIGN KEY (`InventoryID`)
    REFERENCES `mydb`.`Inventory` (`InventoryID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Warehouse

```
CREATE TABLE IF NOT EXISTS `mydb`.`Warehouse` (
  `WarehouseID` INT NOT NULL,
  `Name` VARCHAR(45) NULL,
  `Address1` VARCHAR(60) NULL,
  `Address2` VARCHAR(60) NULL,
  `City` VARCHAR(45) NULL,
  `Region` VARCHAR(45) NULL,
  `Country` VARCHAR(45) NULL,
  `Postcode` VARCHAR(8) NULL,
  `PhoneNumber` VARCHAR(12) NULL,
  `Email` VARCHAR(45) NULL,
  PRIMARY KEY (`WarehouseID`),
  UNIQUE INDEX `SupplierID_UNIQUE` (`WarehouseID` ASC) VISIBLE)
```

WarehouseProducts

```
CREATE TABLE IF NOT EXISTS `mydb`.`WarehouseProducts` (
  `WarehouseProductID` INT NOT NULL,
  `WarehouseID` INT NOT NULL,
  `ProductID` INT NULL,
  `QTY` INT NULL,
  `Location` VARCHAR(4) NULL,
  PRIMARY KEY (`WarehouseProductID`),
  INDEX `fk_WarehouseProducts_Warehouse1_idx` (`WarehouseID` ASC) VISIBLE,
  INDEX `fk_WarehouseProducts_Products1_idx` (`ProductID` ASC) VISIBLE,
  CONSTRAINT `fk_WarehouseProducts_Warehouse1`
    FOREIGN KEY (`WarehouseID`)
    REFERENCES `mydb`.`Warehouse` (`WarehouseID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_WarehouseProducts_Products1`
    FOREIGN KEY (`ProductID`)
    REFERENCES `mydb`.`Products` (`ProductID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

Orders

```
CREATE TABLE IF NOT EXISTS `mydb`.`Orders` (
  `OrderID` INT NOT NULL,
  `BranchID` INT NULL,
  `OrderDate` DATETIME NULL,
  `Status` INT NULL,
  `WarehouseID` INT NULL,
  PRIMARY KEY (`OrderID`),
  INDEX `fk_Orders_Branch1_idx` (`BranchID` ASC) VISIBLE,
  INDEX `fk_Orders_Warehouse1_idx` (`WarehouseID` ASC) VISIBLE,
  CONSTRAINT `fk_Orders_Branch1`
    FOREIGN KEY (`BranchID`)
    REFERENCES `mydb`.`Branch` (`BranchID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_Orders_Warehouse1`
    FOREIGN KEY (`WarehouseID`)
    REFERENCES `mydb`.`Warehouse` (`WarehouseID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

OrderProducts

```
CREATE TABLE IF NOT EXISTS `mydb`.`OrderProducts` (
  `OrderProductsID` INT NOT NULL,
  `ProductID` INT NOT NULL,
  `OrderID` INT NOT NULL,
  `qty` INT NOT NULL,
  PRIMARY KEY (`OrderProductsID`),
  INDEX `fk_OrderProducts_Products1_idx` (`ProductID` ASC) VISIBLE,
  INDEX `fk_OrderProducts_Orders1_idx` (`OrderID` ASC) VISIBLE,
  CONSTRAINT `fk_OrderProducts_Products1`
    FOREIGN KEY (`ProductID`)
    REFERENCES `mydb`.`Products` (`ProductID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_OrderProducts_Orders1`
    FOREIGN KEY (`OrderID`)
    REFERENCES `mydb`.`Orders` (`OrderID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```