

---

# IMS Logical

Logical database model documentation

---

# Table of contents

|                                     |           |
|-------------------------------------|-----------|
| <b>1. Model details</b>             | <b>3</b>  |
| <b>2. Entities</b>                  | <b>4</b>  |
| 1.1. Entity Product                 | 4         |
| 1.2. Entity Provider                | 4         |
| 1.3. Entity Order                   | 5         |
| 1.4. Entity Order_Detail            | 5         |
| 1.5. Entity Transfer                | 5         |
| 1.6. Entity Customer                | 6         |
| 1.7. Entity Delivery                | 6         |
| 1.8. Entity Delivery_Detail         | 6         |
| 1.9. Entity Inventory               | 7         |
| 1.10. Entity Warehouse              | 7         |
| 1.11. Entity Location               | 8         |
| <b>3. Associations</b>              | <b>9</b>  |
| <b>4. Entity relationships</b>      | <b>10</b> |
| <b>5. Association relationships</b> | <b>12</b> |
| <b>6. Areas</b>                     | <b>13</b> |
| <b>7. Notes</b>                     | <b>14</b> |

---

# 1. Model details

**Model name:**

IMS Logical

**Version:**

1.0

**Description:**

Simple Inventory Management System database model

---

## 2. Entities

### 2.1. Entity Product

**Description:**

standard product attributes

#### 2.1.1. Attributes

| Attribute name     | Type          | Is mandatory | Is primary identifier | Description                                    |
|--------------------|---------------|--------------|-----------------------|--|
| productID          | Integer       | yes          | yes                   | unique product ID number                       |
| productSKU         | Varchar(100)  | yes          | no                    | internal product code (stock keeping unit)     |
| productUPC         | Varchar(100)  | yes          | no                    | external product code (universal product code) |
| productName        | Varchar(100)  | yes          | no                    | product name                                   |
| productDescription | Varchar(1000) | yes          | no                    | detailed product description                   |
| productCategory    | Varchar(100)  | yes          | no                    | product category (denormalized for simplicity) |
| reorderQuantity    | Integer       | yes          | no                    | for units not available for single unit order  |

### 2.2. Entity Provider

**Description:**

provider of products

#### 2.2.1. Attributes

| Attribute name | Type    | Is mandatory | Is primary identifier | Description |
|----------------|---------|--------------|-----------------------|-------------|
| providerID     | Integer | yes          | yes                   | unique ID   |

|                 |              |     |    |   |
|-----------------|--------------|-----|----|---|
| providerName    | Varchar(100) | yes | no | name of provider                                  |
| providerAddress | Varchar(200) | yes | no | address of provider (denormalized for simplicity) |

## 2.3. Entity Order

### 2.3.1. Attributes

| Attribute name | Type    | Is mandatory | Is primary identifier | Description   |
|----------------|---------|--------------|-----------------------|---------------|
| orderID        | Integer | yes          | yes                   | unique ID     |
| orderDate      | Date    | yes          | no                    | date of order |

## 2.4. Entity Order\_Detail

### Description:

detailed view of an order

### 2.4.1. Attributes

| Attribute name | Type    | Is mandatory | Is primary identifier | Description                 |
|----------------|---------|--------------|-----------------------|-----------------------------|
| orderDetailID  | Integer | yes          | yes                   | unique ID                   |
| orderQuantity  | Integer | yes          | no                    | number of products in order |
| estimatedDate  | Date    | yes          | no                    | estimated arrival date      |
| arrivalDate    | Date    | yes          | no                    | actual arrival date         |

## 2.5. Entity Transfer

### Description:

warehouse transfer entity.

### 2.5.1. Attributes

| Attribute name | Type    | Is mandatory | Is primary identifier | Description |
|----------------|---------|--------------|-----------------------|-------------|
| transferID     | Integer | yes          | yes                   | unique ID   |

|                  |         |     |    |                                |
|------------------|---------|-----|----|--------------------------------|
| transferQuantity | Integer | yes | no | number of products transferred |
| sendDate         | Date    | yes | no | date products were sent out    |
| receiveDate      | Date    | yes | no | date products were received    |

## 2.6. Entity Customer

### 2.6.1. Attributes

| Attribute name  | Type         | Is mandatory | Is primary identifier | Description                                       |
|-----------------|--------------|--------------|-----------------------|---|
| customerID      | Integer      | yes          | yes                   | unique ID   |
| customerName    | Varchar(100) | yes          | no                    | name of customer                                  |
| customerAddress | Varchar(200) | yes          | no                    | address of customer (denormalized for simplicity) |

## 2.7. Entity Delivery

### 2.7.1. Attributes

| Attribute name | Type    | Is mandatory | Is primary identifier | Description              |
|----------------|---------|--------------|-----------------------|--------------------------|
| deliveryID     | Integer | yes          | yes                   | unique ID                |
| saleDate       | Integer | yes          | no                    | date of sale to customer |

## 2.8. Entity Delivery\_Detail

### Description:

detailed view of delivery

### 2.8.1. Attributes

| Attribute name   | Type    | Is mandatory | Is primary identifier | Description                  |
|------------------|---------|--------------|-----------------------|------------------------------|
| deliveryDetailID | Integer | yes          | yes                   | unique ID                    |
| deliveryQuantity | Integer | yes          | no                    | number of products delivered |

|               |      |     |    |                        |
|---------------|------|-----|----|------------------------|
| estimatedDate | Date | yes | no | estimated arrival date |
| arrivalDate   | Date | yes | no | actual arrival date    |

## 2.9. Entity Inventory

### Description:

relational entity between product and warehouse

### 2.9.1. Attributes

| Attribute name    | Type    | Is mandatory | Is primary identifier | Description  |
|-------------------|---------|--------------|-----------------------|--|
| inventoryID       | Integer | yes          | yes                   | unique ID  |
| quantityAvailable | Integer | yes          | no                    | quantity on-hand   |
| minStockQuantity  | Integer | yes          | no                    | minimum number of units required to ensure no shortages at warehouse                     |
| maxStockQuantity  | Integer | yes          | no                    | maximum number of units required to ensure no shortages at warehouse                     |
| reorderPoint      | Integer | yes          | no                    | when the number of product units reaches this point, a purchase order must be generated. |

## 2.10. Entity Warehouse

### Description:

physical storage area within a 'Location'

### 2.10.1. Attributes

| Attribute name | Type | Is mandatory | Is primary identifier | Description |
|----------------|------|--------------|-----------------------|-------------|
|----------------|------|--------------|-----------------------|-------------|

|                        |              |     |     |                   |
|------------------------|--------------|-----|-----|-------------------|
| sourceWarehouseID      | Integer      | yes | yes | unique ID         |
| destinationWarehouseID | Integer      | yes | yes |                   |
| warehouseName          | Varchar(100) | yes | no  | name of warehouse |

## 2.11. Entity Location

### Description:

inventory locations

### 2.11.1. Attributes

| Attribute name  | Type         | Is mandatory | Is primary identifier | Description  |
|-----------------|--------------|--------------|-----------------------|--|
| locationID      | Integer      | yes          | yes                   | unique location ID                                     |
| locationName    | Varchar(100) | yes          | no                    | name of location                                       |
| locationAddress | Varchar(200) | yes          | no                    | full address of location (denormalized for simplicity) |



---

## 3. Associations

---

## 4. Entity relationships

### 4.1. Entity relationship Order->Provider

|          |      |       |
|----------|------|-------|
| Provider | 1..* | Order |
|          | <->  |       |

### 4.2. Entity relationship Order\_Detail->Order

|       |      |              |
|-------|------|--------------|
| Order | 1..* | Order_Detail |
|       | <->  |              |

### 4.3. Entity relationship Delivery->Customer

|          |      |          |
|----------|------|----------|
| Customer | 1..* | Delivery |
|          | <->  |          |

### 4.4. Entity relationship Delivery\_Detail->Delivery

|          |      |                 |
|----------|------|-----------------|
| Delivery | 1..* | Delivery_Detail |
|          | <->  |                 |

### 4.5. Entity relationship Warehouse->Location

|          |      |           |
|----------|------|-----------|
| Location | 1..* | Warehouse |
|          | <->  |           |

### 4.6. Entity relationship Order\_Detail->Product

|         |      |              |
|---------|------|--------------|
| Product | 1..* | Order_Detail |
|         | <->  |              |

### 4.7. Entity relationship Transfer->Product

|         |      |          |
|---------|------|----------|
| Product | 1..* | Transfer |
|         | <->  |          |

### 4.8. Entity relationship Order\_Detail->Warehouse

|           |      |              |
|-----------|------|--------------|
| Warehouse | 1..* | Order_Detail |
|           | <->  |              |

#### 4.9. Entity relationship Inventory->Warehouse

|           |      |           |
|-----------|------|-----------|
| Warehouse | 1..* | Inventory |
|           | <->  |           |

#### 4.10. Entity relationship Inventory->Product

|         |      |           |
|---------|------|-----------|
| Product | 1..* | Inventory |
|         | <->  |           |

#### 4.11. Entity relationship Transfer->Warehouse(Source)

|           |      |          |
|-----------|------|----------|
| Warehouse | 1..* | Transfer |
|           | <->  |          |

#### 4.12. Entity relationship Transfer->Warehouse(Destination)

|           |      |          |
|-----------|------|----------|
| Warehouse | 1..* | Transfer |
|           | <->  |          |

#### 4.13. Entity relationship Delivery\_Detail->Product

|         |      |                 |
|---------|------|-----------------|
| Product | 1..* | Delivery_Detail |
|         | <->  |                 |

#### 4.14. Entity relationship Delivery\_Detail->Warehouse

|           |      |                 |
|-----------|------|-----------------|
| Warehouse | 1..* | Delivery_Detail |
|           | <->  |                 |

---

## 5. Association relationships

---

## 6. Areas

---

## 7. Notes