Designing and creating a database

**Designing document:**

* **Requirement list:**

A worldwide logistics company should include numerous entities and attributes to manage and track the operations. Based on the provided information, there are several key entities and tables that are mandatory in the database for instances:

* Customers: A customer table contains the customers’ information that will take their id as a primary key, also including their full name, address, country, contact details and email address.
* Orders: An orders table contains what customers order from the e-commerce website. The table has the order id as a primary key, other keys are customer id, container id as a foreign key, and total price.
* Items: This table contains all the items in an order, including its id as a primary key, order id as a foreign key, quantity.
* Container: A container table details the information about a container, including which order it has. It has the container id as a primary key, its dimension and weight, container status and description.
* Warehouse: Including information about the warehouse, including its id, the country where it is located and its branch.
* Container transportation: This table is used for managing the transportation of containers, including transportation id as a primary key, container id to identify the container that is being transported, transport type, the departure and destination warehouse, expected and actual delivery date to control the transportation time.
* Delivery: This table is created for delivering the orders to end customers. That means the customer id is a mandatory key. In addition, the table should include the following information: delivery id as a primary key, container id, order id, departure warehouse, destination which is the customer’s address, shipment date, expected and actual delivery date.
* Invoice: An invoice table which contains its id as a primary key, customer id, order id, payment id, and invoice date for each customer will be easy to manage each delivered order.
* Payment: The purpose of this table is to check if the customer paid the invoice. That means it will contain the payment id as a primary key, invoice id, invoice paid to check whether the customer paid or not. If the customer paid the invoice, the payment method, date and description will be available in the table.
* Item information: including details of an item such as its id, the category id that it belongs to, the item’s name, descriptions and price.
* Category: This table provides the name of the category that an item belongs to.
* Review: Contains details about the customers’ satisfaction after their orders are delivered including the review id, customer id, item id and feedback.
* **Data Structure:**
* Table Customer:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| customerId | INT |  | No | PRIMARY |  |
| fullname | VARCHAR | 255 | No |  |  |
| userAddress | VARCHAR | 255 | No |  |  |
| country | VARCHAR | 255 | No |  |  |
| tel | VARCHAR | 255 | No |  |  |
| email | VARCHAR | 255 | No |  |  |

* Table Container:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| containerId | INT |  | No | PRIMARY |  |
| dimesion | DECIMAL(10,2) |  | No |  |  |
| weight | DECIMAL(10,2) |  | No |  |  |
| containerStatus | VARCHAR | 255 | No |  | Initial |
| description | VARCHAR | 255 | Yes |  |  |

* Table Warehouse:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| warehouseId | INT |  | No | PRIMARY |  |
| country | VARCHAR | 255 | No |  |  |
| branch | VARCHAR | 255 | No |  |  |

* Table Category:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| categoryId | INT |  | No | PRIMARY |  |
| categoryName | VARCHAR | 255 | Yes |  |  |

* Table ItemInfo:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| itemId | INT |  | No | PRIMARY |  |
| categoryId | INT |  | No | FOREIGN |  |
| name | VARCHAR | 255 | No |  |  |
| itemDescription | VARCHAR | 255 | Yes |  |  |
| price | DECIMAL(10,2) |  | No |  |  |

* Table CusOrder:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| orderId | INT |  | No | PRIMARY |  |
| customerId | INT |  | No | FOREIGN |  |
| containerId | INT |  | No | FOREIGN |  |
| totalPrice | DECIMAL(10,2) |  | No |  |  |

* Table Item:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| itemId | INT |  | No | PRIMARY |  |
| orderId | INT |  | No | FOREIGN |  |
| quantity | INT |  | No |  | 1 |

* Table Delivery:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| deliveryId | INT |  | No | PRIMARY |  |
| customerId | INT |  | No | FOREIGN |  |
| containerId | INT |  | No | FOREIGN |  |
| orderId | INT |  | No | FOREIGN |  |
| departure | VARCHAR | 255 | No |  |  |
| destination | VARCHAR | 255 | No |  |  |
| shipmentDate | DATETIME |  | No |  |  |
| expectedDeliveryDate | DATETIME |  | No |  |  |
| actualDeliveryDate | DATETIME |  | No |  |  |

* Table ContainerTrans:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| transportationId | INT |  | No | PRIMARY |  |
| containerId | INT |  | No | FOREIGN |  |
| transportType | VARCHAR | 255 | No |  |  |
| departureWarehouse | INT |  | No | FOREGIN |  |
| destinationWarehouse | INT |  | No | FOREIGN |  |
| expectedDeliveryDate | DATETIME |  | No |  |  |
| actualDeliveryDate | DATETIME |  | No |  |  |

* Table Payment:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| paymentId | INT |  | No | PRIMARY |  |
| invoicePaid | BOOLEAN |  | No |  |  |
| paymentMethod | VARCHAR | 255 | Yes |  |  |
| paymentDate | DATETIME | 255 | Yes |  |  |
| paymentDescription | VARCHAR | 255 | Yes |  |  |

* Table Invoice:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| invoiceId | BIGINT |  | No | PRIMARY |  |
| customerId | INT |  | No | FOREGIN |  |
| orderId | INT |  | No | FOREGIN |  |
| paymentId | INT |  | No | FOREGIN |  |
| invoiceDate | DATETIME |  | No |  |  |

* Table Review:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size** | **Null** | **Key** | **Default** |
| reviewId | INT |  | No | PRIMARY |  |
| customerId | INT |  | No | FOREIGN |  |
| itemId | INT |  | No | FOREIGN |  |
| Feedback | VARCHAR | 999 | No |  |  |

* **Assumption List:**
* Entities and relationships accurately represent a logistic system.
* All entities are identified by unique primary key, and tables must contain the appropriate attributes.
* Date and time fields follow the standard DATETIME format.
* Foreign key constraints ensure referential integrity to maintain the relationship between tables.
* Additional tables and columns may exist to support the company requirements, which are not covered in the schema.
* Data validation and error handling mechanisms are implemented.
* Security measures are implemented to protect sensitive information such as the customers and company information.
* The system supporting the database provides scalability and performance capabilities to handle logistic operations.
* Regular maintenance, optimization, and backup processes are implemented.
* **ERD Diagram:**

Ảnh có chứa ảnh chụp màn hình, văn bản, biểu đồ, mô hình 3d

Mô tả được tạo tự động

* **Database overview:**

A picture containing text, diagram, plan, parallel

Description automatically generated