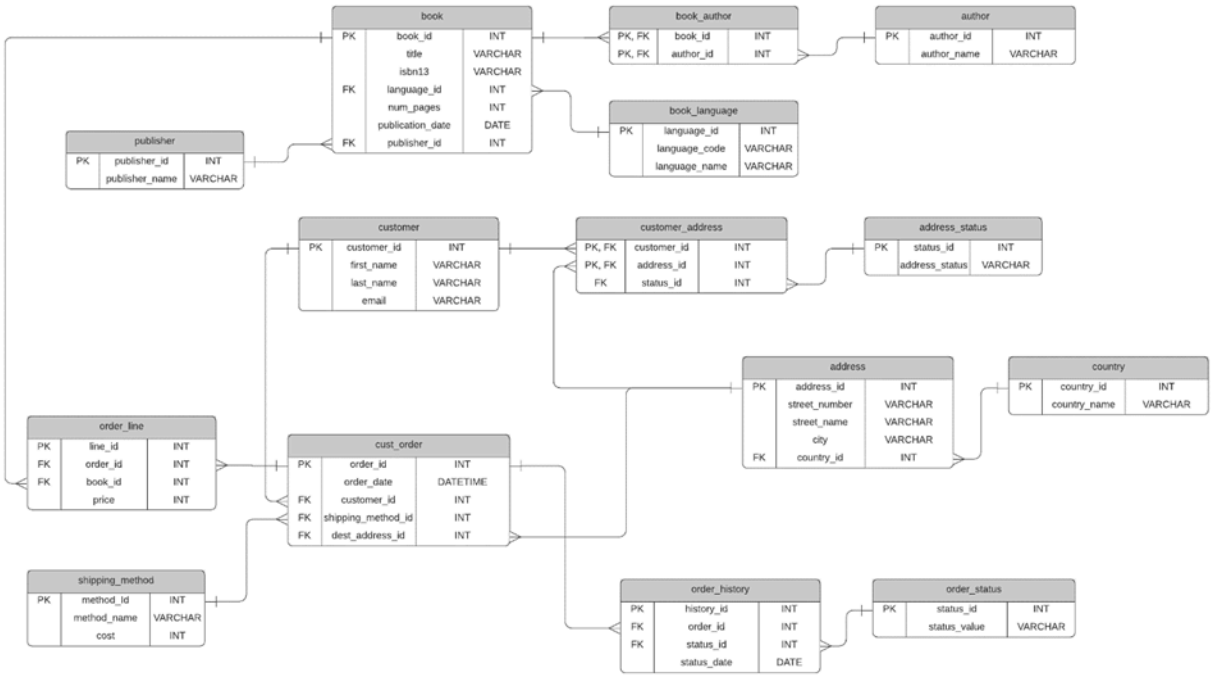
Practical project: Modeling, Building a Data Warehouse and BI Reports for Gravity Bookstore

Use-case Background

Gravity Bookstore is a database for a fictional bookstore that captures information about books, customers, and sales.

Please download the SQL files from the link below and run them in a new database named 'gravity_books' in your local SQL Server DB engine:
[databasestar/sample_databases/sample_db_gravity/gravity_sqlserver · GitHub]

ERD of 'gravity_books' transactional database:



Tables description:

- **book**: a list of all books available in the store.
- **book_author**: stores the authors for each book, which is a many-to-many relationship.
- **author**: a list of all authors.
- **book_language**: a list of possible languages of books.
- **publisher**: a list of publishers for books.
- **customer**: a list of the customers of the Gravity Bookstore.

- **customer_address**: a list of addresses for customers, as a customer can have more than one address, and an address has more than one customer.
- **address_status**: a list of statuses for an address, because addresses can be current or old.
- **address**: a list of addresses in the system.
- **country**: a list of countries that addresses are in.
- **cust_order**: a list of orders placed by customers.
- **order_line**: a list of books that are a part of each order.
- **shipping_method**: the possible shipping methods for an order.
- **order_history**: the history of an order, such as ordered, cancelled, delivered.
- **order_status**: the possible statuses of an order.

Requirements:

1. Model and develop 'gravity_books_dwh' Data Warehouse
    a. Please provide the DDL statements of table creation and a screenshot from the DWH ERD.

2. Define which approach (star schema, snowflake) of data warehouse used in your solution, and why.

3. Define a method to check and maintain the integrity between the fact and the dimensions (SQL).

4. Please, add a date dimension to the system to track the historical changes.

5. Design an SSIS project to populate the data from 'gravity_books' transactional database into the new target data warehouse 'gravity_books_dwh'.

6. Design an SSAS project (Tabular mode) and provide the main deliverables of the cube browsing.

7. Using either PowerPivot in Excel or Power BI Desktop, create BI self-service reporting for exploring gravity books OLAP cube.
    a. Please use the self-service canvas to explore the data and get business insights from it.
    b. Create sample analytical reports and one dashboard.

· Please provide screenshots from the output of each point above:

- Compress the entire solution files:
    - DWH DDL statements (format . sql)
    - ETL SSIS project
    - OLAP SSAS project
    - PowerPivot Excel or Power BI (format . xlsx or .pbix)

Note: Project Deadline is 25/1/2025.