

Data Architecture Overview

The Architecture for this use case is divided in three different environments: Production, Data Warehouse and Reporting (Figure 1).

The Production Environment is where transactional services live. In this environment, services are responsible for getting customers' information and storing in their respective databases.

Then, the datasets generated by the services are maintained in the Data Warehouse Environment, where Business Analysts and Analytics Engineers create new tables, improve data models, and work to turn raw data into easily consumable tables for analysis.

Finally, these tables feed into the Reporting Environment, where it is possible to create all sorts of dashboards and visualizations for monitoring and decision-making.

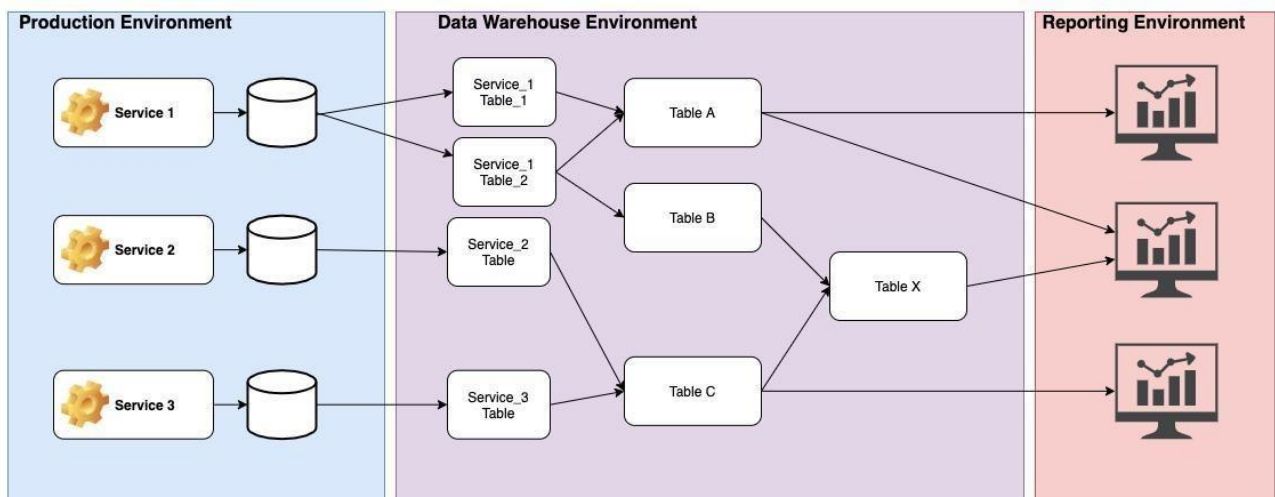


Figure 1. The environments: Production, DataWarehouse and Reporting. A slice of the table structure from the Data Warehouse Environment is depicted in Figure 2.

Apart from time (d_time, d_year, d_month, d_week, d_weekday), location (city, state, country), accounts, and customers tables, three tables store the financial movements of the accounts:

- transfer_ins: non PIX transfers made to an account (money arriving)
- transfer_outs: non PIX transfers made from an account (money leaving)
- pix_movements: transfers that are either received by or sent from an account using PIX

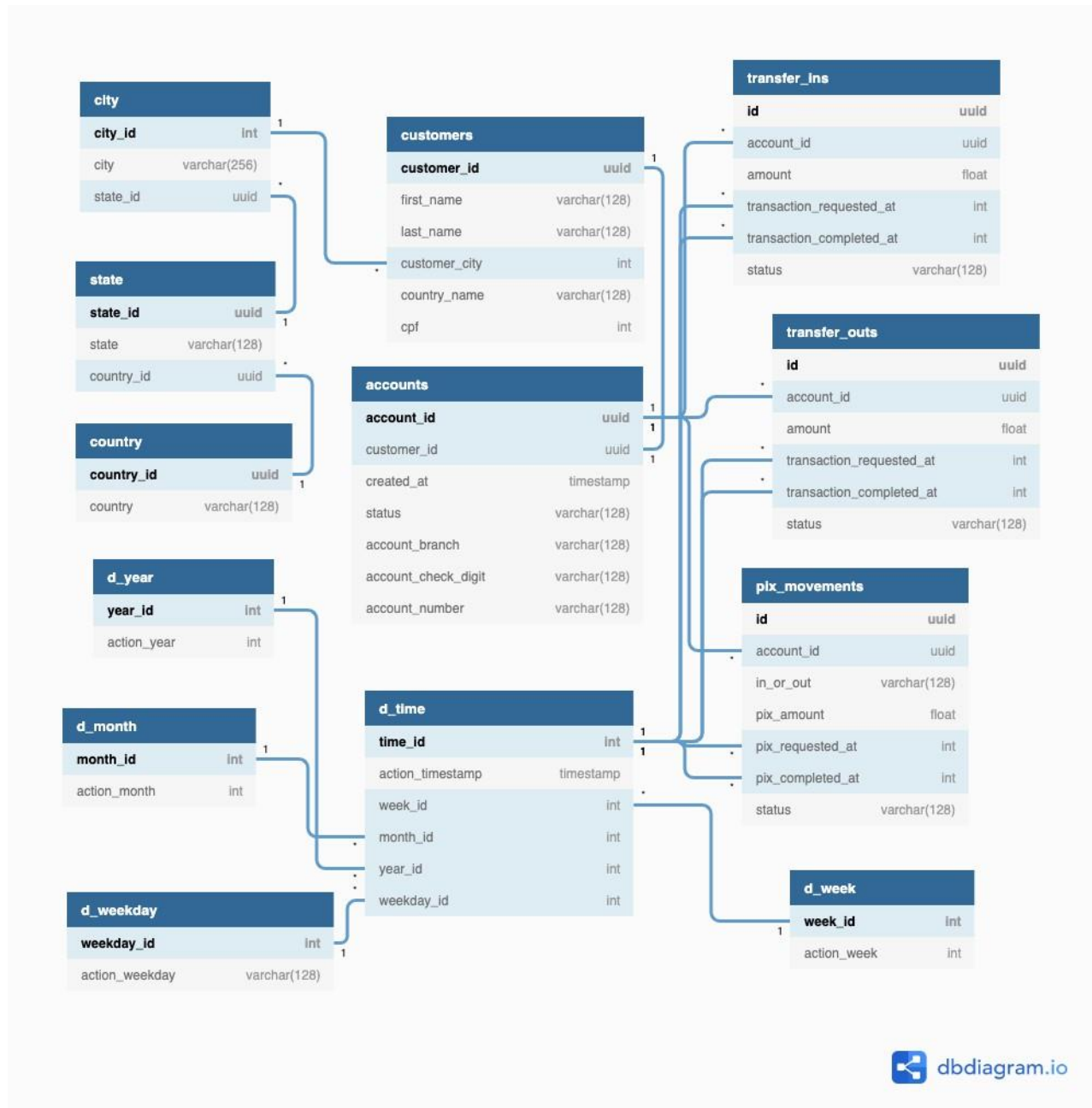


Figure 2. A slice of the table structure from the Data Warehouse Environment (diagram/table_diagram.png). You can check the code used to generate these diagrams on file (diagram/table_diagram.txt).

Business Context

To solve this case, you need to be familiar with the concept of "Account Monthly Balance". Account Monthly Balance is the amount of money a customer had in their account at the end of a given month. This information can be calculated by adding all the transfers in and subtracting all the transfers out from the previous account balance. Remember you should also consider transfers made by PIX, the newest Brazilian transfer method. You can see an example below:

Month	Customer	Total Transfer In	Total Transfer Out	Account Monthly Balance
1	A	1000	200	800
1	B	2000	0	2000
2	A	0	200	600
2	B	100	500	1600
2	C	500	100	400

Table 1. An example of account monthly balance data.

Here is a summary of what we expect from you:

1. Create a SQL file retrieving the monthly balance of all accounts