

Lecture of database designing



Scenario Based Learning

Indice

1. Storyline

2. Introduction

3. Entities

4. Relationships

5. Attributes

6. Verification



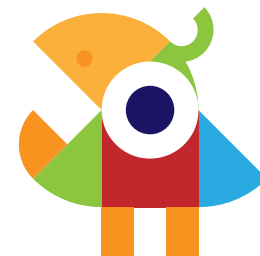
01.

Storyline



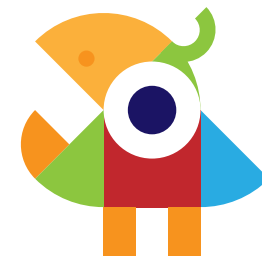
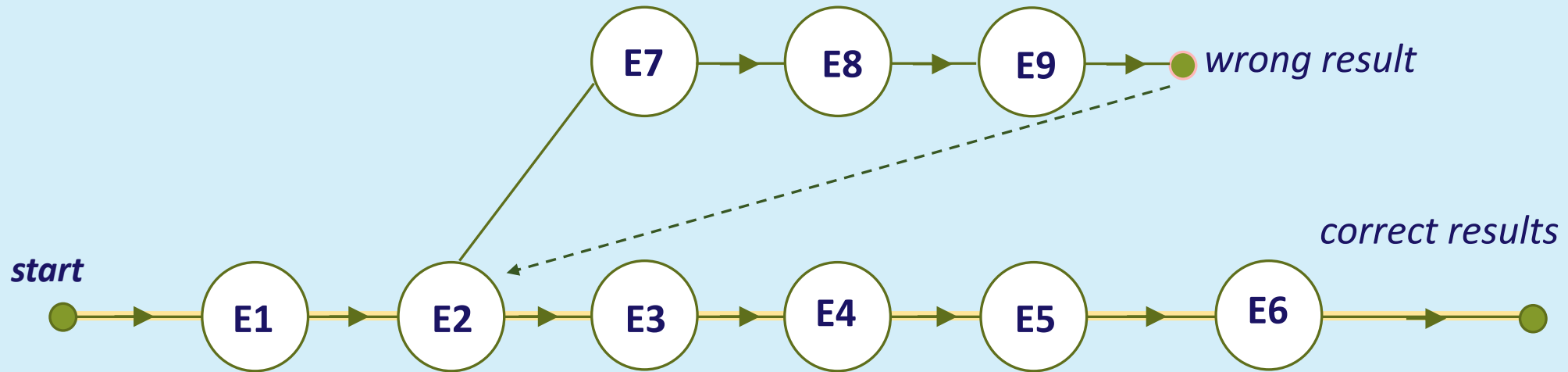
Storyline

- **Goal of lecture:** Learning basic concepts of relational databases on the example of a real database
- **Example of database:** Internet shop with customizable gifts



Storyline

STORYLINE SBL USED IN THIS LECTURE



02.

Stage E1 - Introduction



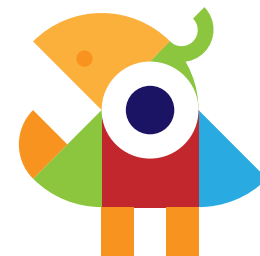
E1 - Introduction

- **Most popular database systems [1]:**
 - MySQL
 - PostgreSQL
 - Microsoft SQL Server
 - DB2



E1 - Introduction

- A good database design starts with a list of the data that you want to include in your database and what you want to be able to do with the database later on. In this stage you must try not to think in tables or columns, but just think: "What do I need to know?"
- Don't take this too lightly, because if you find out later that you forgot something, usually you need to start all over. Adding things to database is mostly a lot of work [2].



03.

Stage E2 - Entities



E2 - Entities

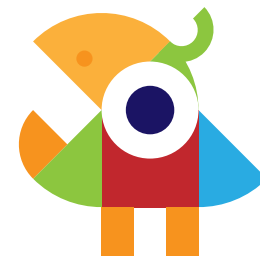
- Imagine that you are creating a website for a shop; what kind of information do you have to deal with?

In a shop you sell your products to customers. The "Shop" is a location; "Sale" is an event; "Products" are things; and "Customers" are people.

These are all entities that need to be included in your database.

- But what other things are happening when selling a product?

A customer comes into the shop, approaches the vendor, asks a question and gets an answer. "Vendors" also participate, and because vendors are people, we need a vendors entity [2].



E2 - Entities



Personalized Decanters



Personalized Cutting Boards



Canvas Prints



Personalized Pillows & Pillow Cases



Holiday Decor



Ornaments



Just Added



Gifts For Him



Gifts For Her



Gifts For Kids



Personalized Photo Gifts



Sale Gift Starting at \$5.99



Weddings



Countdown to Christmas

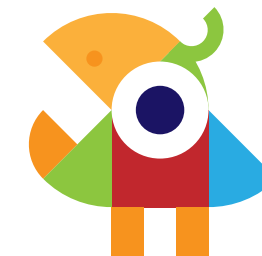


Stickers



Baby Shower

Sources: www.agiftpersonalized.com , <https://www.zazzle.co.uk/>



E2 - Entities

- **Basic entities:**

Customers

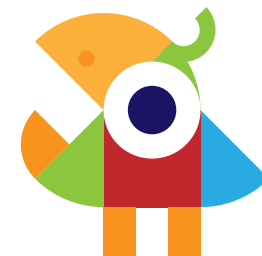
Orders

Products

Vendors

Manufacturers

Are mentioned entities enough to build a gift shop? If no go to 24 slide.



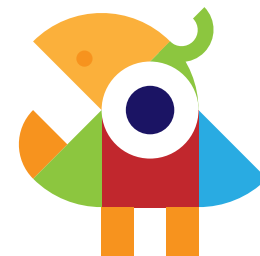
04.

Stage E7 - Relationships



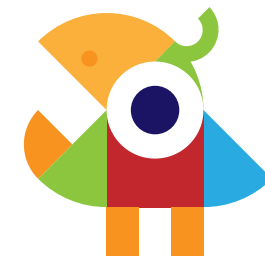
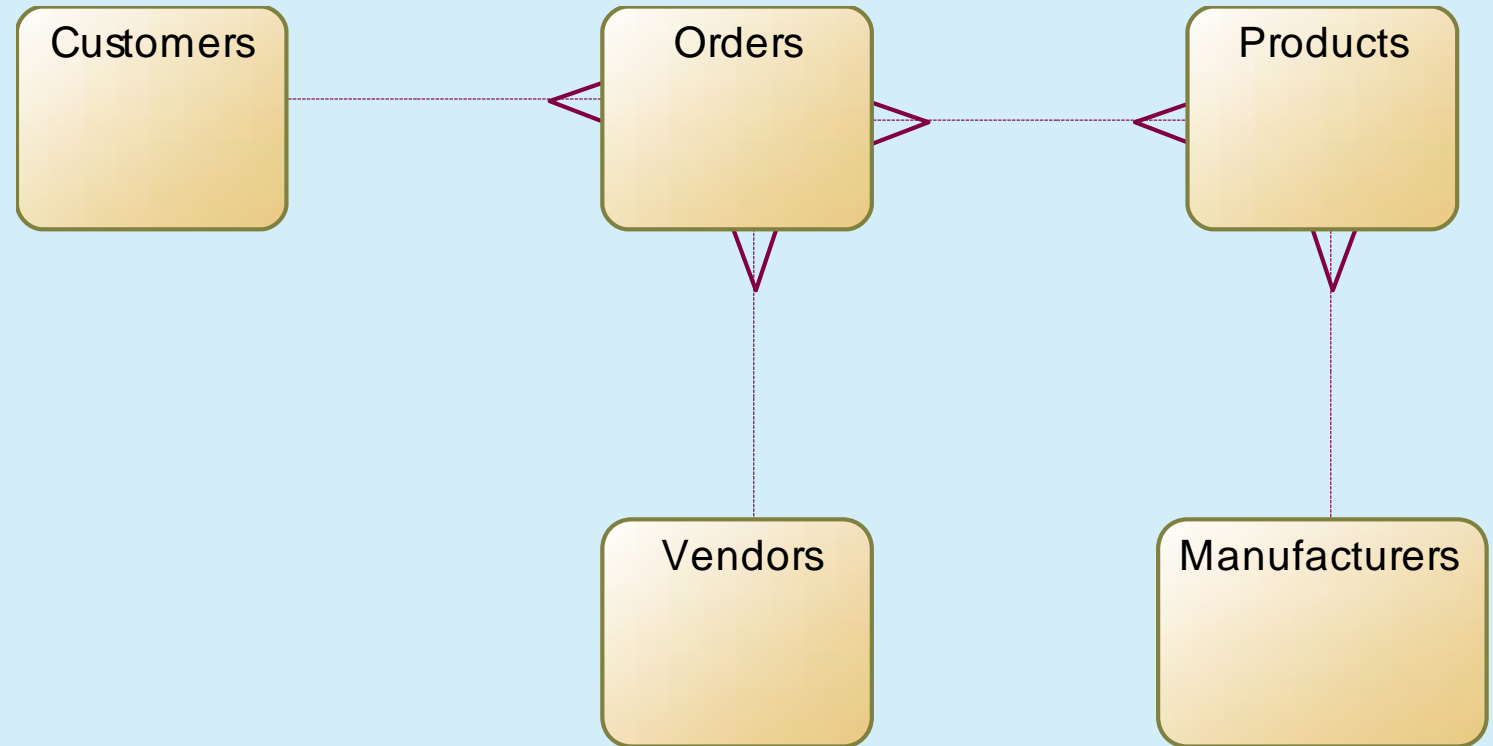
E7 - Relationships

- The relationship is the connection between the entities, just like in the real world: what does one entity do with the other, how do they relate to each other? For example, customers buy products, products are sold to customers, a sale comprises products, a sale happens in a shop [2].



E7 - Relationships

- **Basic relationships:**



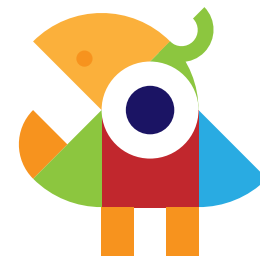
05.

Stage E8 - Attributes



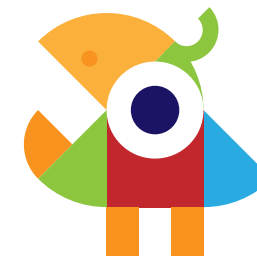
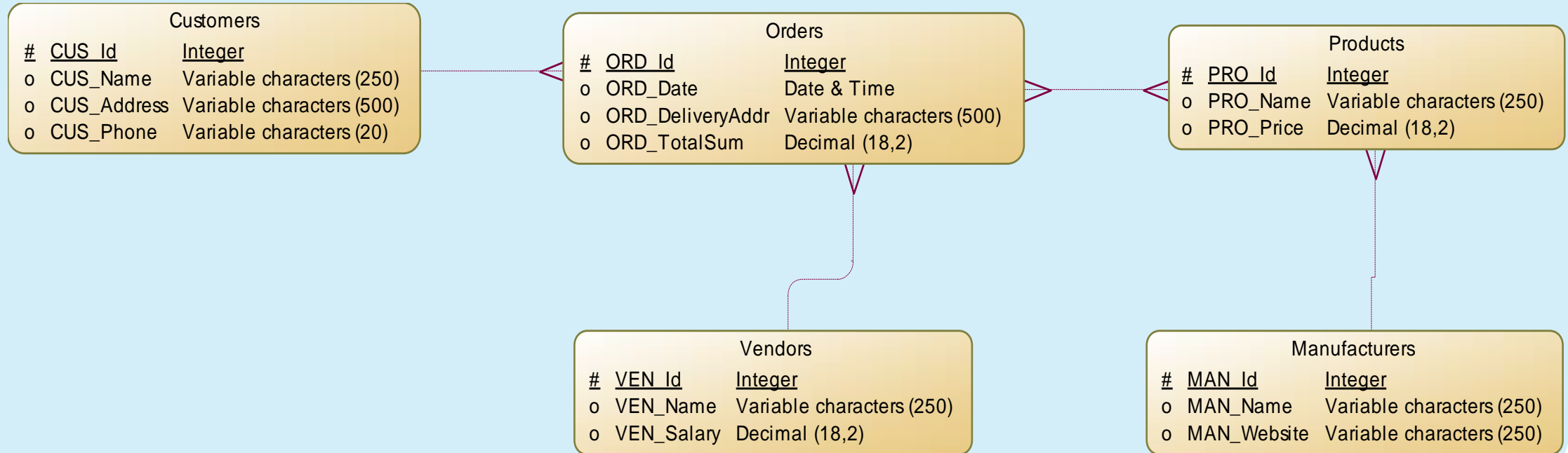
E8 - Attributes

- About the products that you sell, you want to know, for example, what the price is, what the name of the manufacturer is, and what the type number is. About the customers you know their customer number, their name, and address [2].



E8 - Attributes

- **Basic attributes:**



06.

Stage E9 - Verification



E9 - Verification

I want to buy two photo albums, the first with a dedication (label) for mom, the second with a dedication to dad.

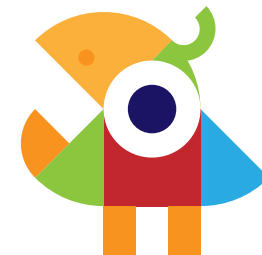


Customer

Please wait, I will check in an E-Cataloge if it is possible.



Seller



E9 - Verification

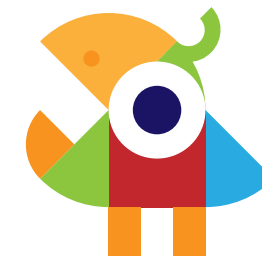
| CUS_Id | CUS_Name | CUS_Address | CUS_Phone |
|--------|---------------|-------------|------------|
| 1 | John Smith | Address 1 | +111222333 |
| 2 | Steven Walker | Address n | +221122339 |

| ORD_Id | CUS_Id | ORD_Date | ORD_DeliveryAddr | ORD_TotalSum |
|--------|--------|------------|------------------|--------------|
| 1 | 1 | 2021-11-11 | Address 1 | 100e |
| 2 | 2 | 2021-11-12 | Address n | 150e |

| PRO_Id | PRO_Name | PRO_Price |
|--------|-------------|-----------|
| 1 | Photo album | 50e |
| 2 | Cup | 15e |

| ORD_Id (FK) | PRO_Id (FK) |
|-------------|-------------|
| 1 | 1 |
| 1 | 1 |
| 2 | 2 |

An annotation about the subtitles/labels on the albums (for mom, for dad) should be entered.



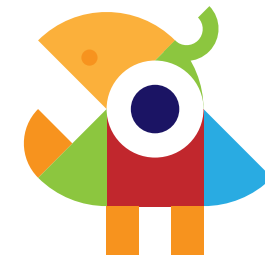
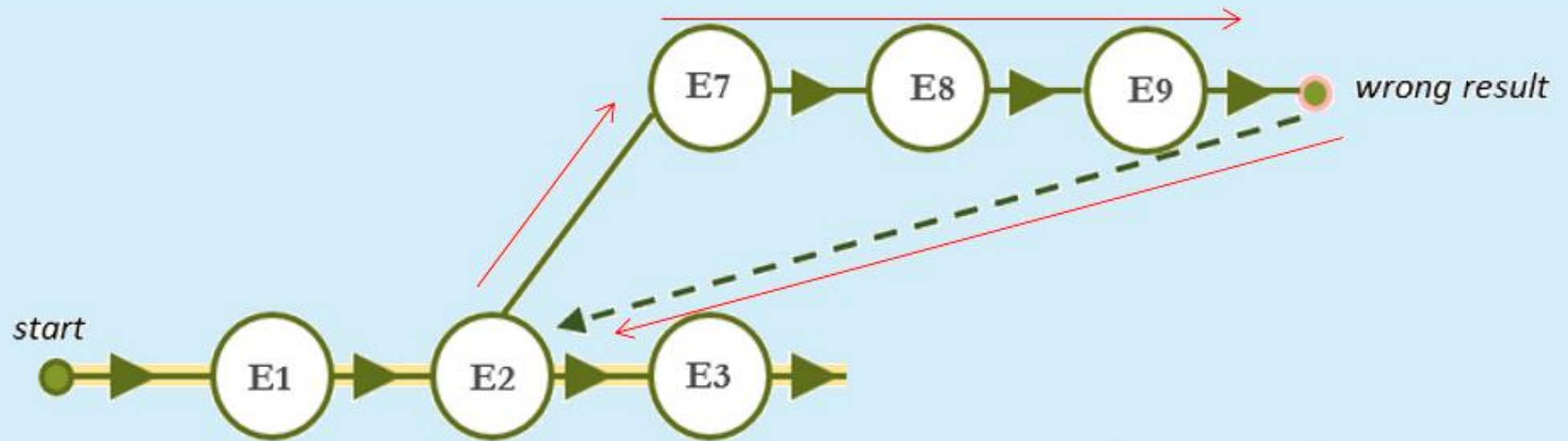
07.

Return in storyline



Return in storyline

- The built database does not meet the requirements of the store. In stage E2 - entities, an additional entity had to be added.



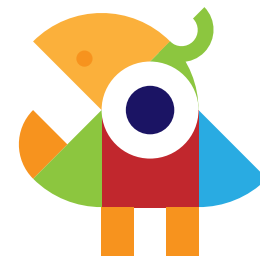
08.

Stage E3 - Association Entities



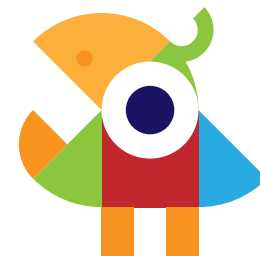
E3 - Association Entities

- Many-to-many relationships (M:N) are not directly possible in a database. What a M:N relationship says is that a number of records from one table belongs to a number of records from another table. Somewhere you need to save which records these are and the solution is to split the relationship up in two one-to-many relationships [2].

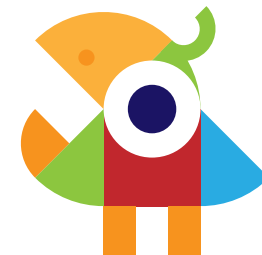
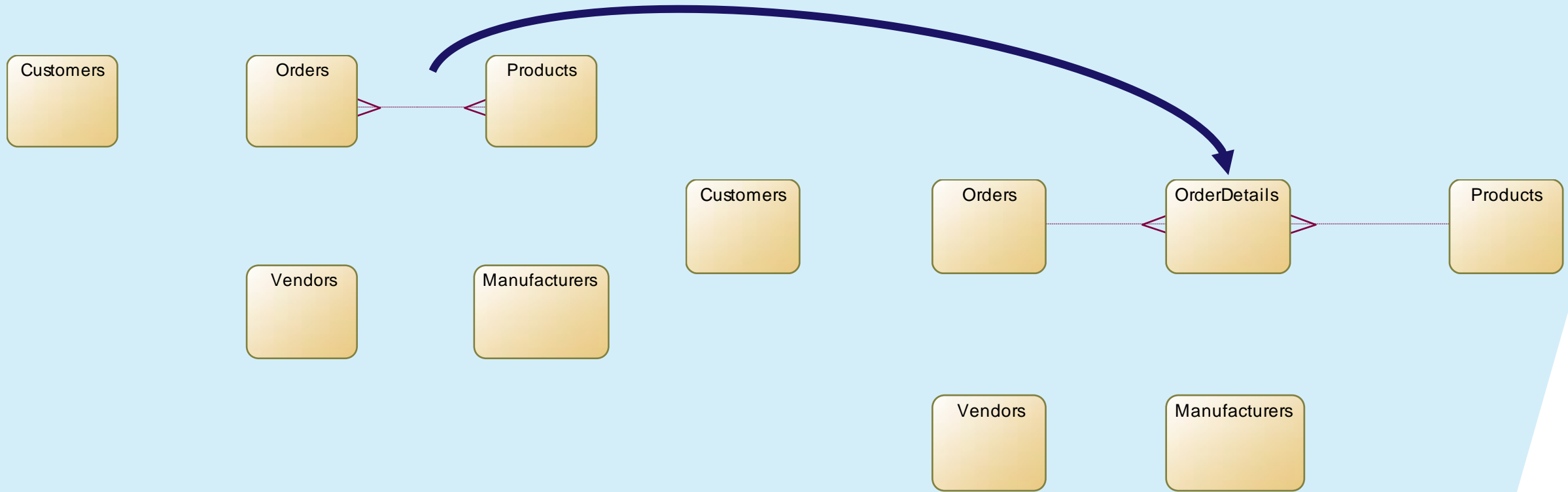


E3 - Association Entities

- This can be done by creating a new entity that is in between the related entities. In our example, there is a many-to-many relationship between sales and products. This can be solved by creating a new entity: sales-products. This entity has a many-to-one relationship with Sales, and a many-to-one relationship with Products. In logical models this is called an associative entity [2].



E3 - Association Entities



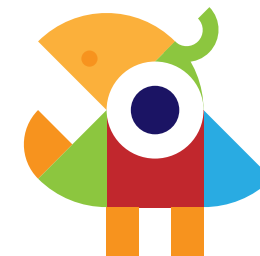
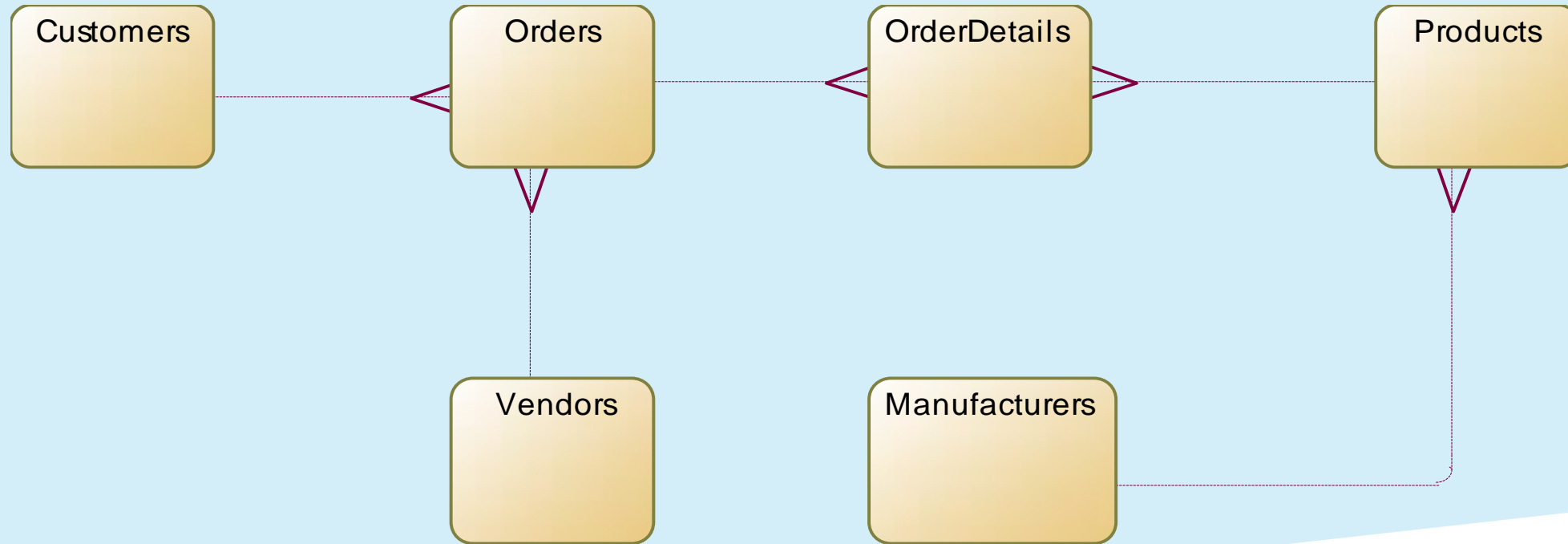
09.

Stage E4 - Relationships



E4- Relationships

- Follow stage E3 and E7 to add relationships:



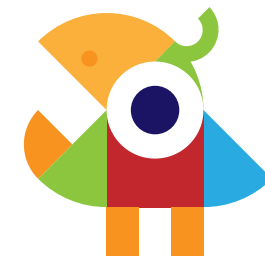
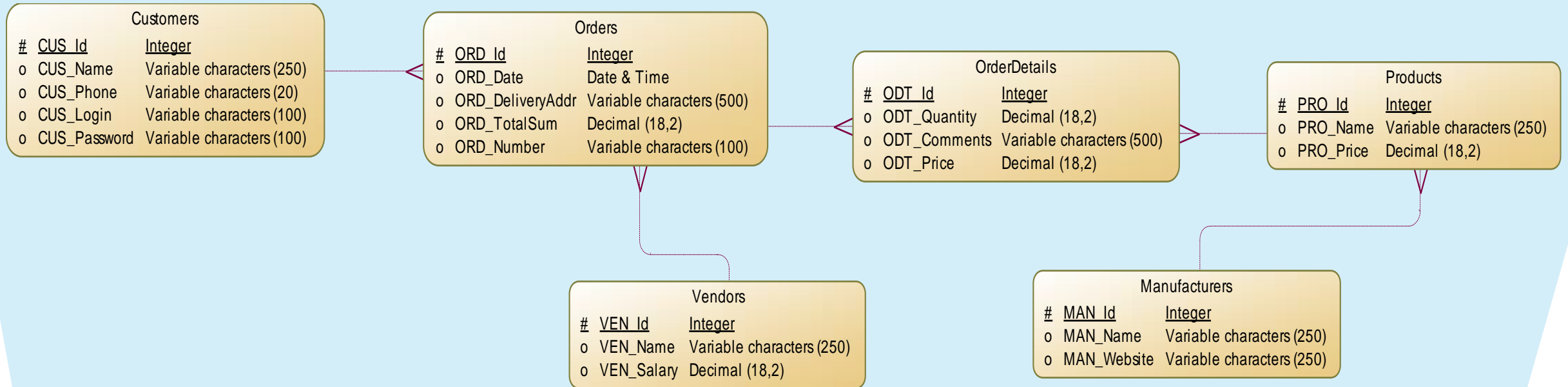
10.

Stage E5 - Attributes



E5 - Attributes

- Follow stage E8 to add attributes:



11.

Stage E6 - Verification



E6 - Verification

I want to buy two photo albums, the first with a dedication (label) for mom, the second with a dedication to dad.

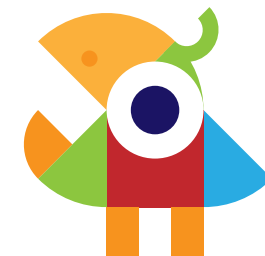


Customer

Yes, of course, You can order two different dedications.



Seller



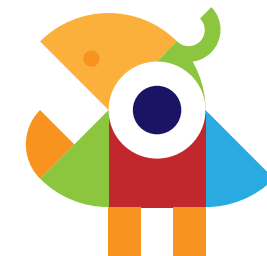
E6 - Verification

| CUS_Id | CUS_Name | CUS_Address | CUS_Phone |
|--------|---------------|-------------|------------|
| 1 | John Smith | Address 1 | +111222333 |
| 2 | Steven Walker | Address n | +221122339 |

| ORD_Id | CUS_Id | ORD_Date | ORD_DeliveryAddr | ORD_TotalSum |
|--------|--------|------------|------------------|--------------|
| 1 | 1 | 2021-11-11 | Address 1 | 100e |
| 2 | 2 | 2021-11-12 | Address n | 150e |

| PRO_Id | PRO_Name | PRO_Price |
|--------|-------------|-----------|
| 1 | Photo album | 50e |
| 2 | Cup | 15e |

| ORD_Id (FK) | PRO_Id (FK) | ODT_Comment |
|-------------|-------------|-------------|
| 1 | 1 | For Mom |
| 1 | 1 | For Dad |
| 2 | 2 | Suprise! |



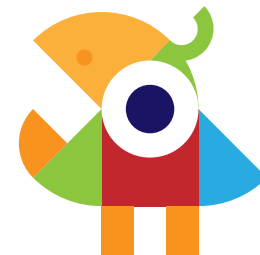
12.

References



References

1. [The Most Popular Databases in 2020 | LearnSQL.com](#)
2. [Introduction to Database Design | Tutorial | Datanamic](#)





UNIVERSITÀ DI PISA

université
de **BORDEAUX**



University
of Bremen

ERREQUADRO

Research over Research



1542

Universidad
Zaragoza

