

Milestone 1
of
Project:
Pharmaceutical Company
for
**052400-1 VU Information Management &
Systems Engineering
(SS 2022)**

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Disclaimer

For this IMSE project an existing DBS project was used which was developed by Clemens Wager in SS2021 for the course 051031 VU Database Systems (2021S).

Domain Description

Reality domain

A website representing a pharmaceutical company is developed. Users will be able to register new clients and new products and look up informative reports.

Employees have an ID, a first name, last name, gender, a salary, and a hire date. Among the employees there are team leaders, who supervise a team of employees such that each employee has one team leader. There are employees which either have the role of general manager, or marketing employee and some have another role that remains unspecified. Each general manager is responsible for exactly one region. Regions have an ID, a name, and there is a list of countries that belongs to it. Marketing employees have a specific occupation and advertise one or more products. These products are given an ID, a name, a price, and an indication. Each product is also promoted through one or more campaigns that have a start date, end date and a name which is not always unique. A client can issue orders to buy products. Clients have an ID, a name, and live in a certain country. Those countries are also found in the country list that belongs to each region. Each order is given an ID and the order data is saved as well.

ER – Diagram

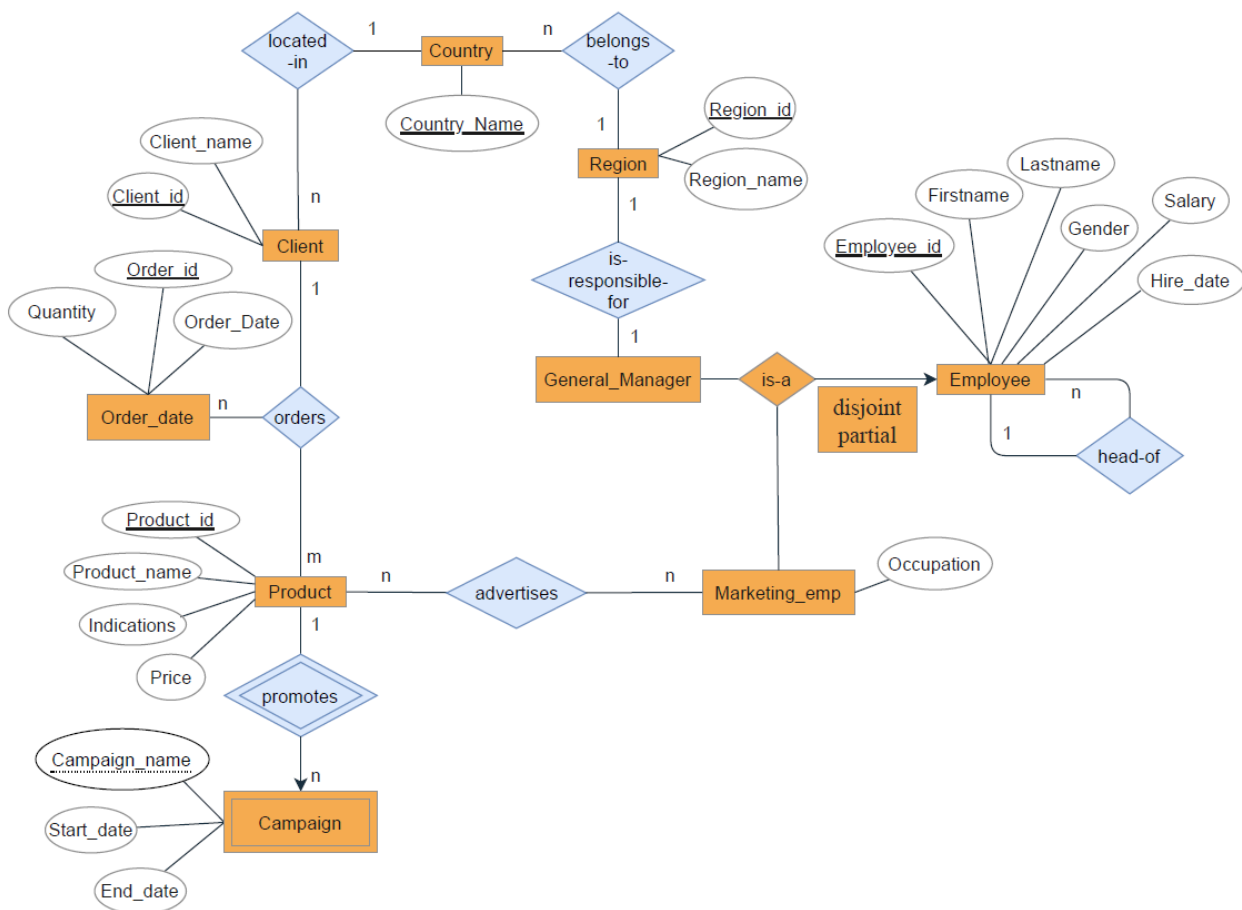


Figure 1: Entity Relationship Diagram

Logical Design of Relational Model

Client (ID_Client, Client_Name, Country_Name)

Candidate keys: (ID_Client)

PK: ID_Client

FK: Client.Country_Name \diamond Country.Country_Name

Orders (ID_Order, ID_Product, ID_Client, Order_Date, Quantity)

Candidate keys: (ID_Order), (ID_Product, ID_Client, Order_Date)

PK: ID_Order

FK: Orders.ID_Product \diamond Product.ID_Product

FK: Orders.ID_Client \diamond Client.ID_Client

Product (ID_Product, Product_Name, Price, Indication)

Candidate keys: (ID_Product), (Product_Name)

PK: ID_Product

Campaign (ID_Product, Campaign_Name, Start_date, End_date)

Candidate keys: (ID_Product, Campaign_Name)

PK: Campaign_Name, ID_Product

FK: Campaign.ID_Product \diamond Product.ID_Product

Employee (ID_Employee, Firstname, Lastname, Gender, Salary, Team_leader, Hire_date)

Candidate keys: (ID_Employee)

PK: ID_Employee

FK: Employee.Team_leader \diamond Employee.ID_Employee

Marketing_emp (ID_Employee, Occupation)

Candidate keys: (ID_Employee)

PK: ID_Employee

FK: Marketing_emp.ID_Employee \diamond Employee.ID_Employee

Advertises (ID_Product, ID_Employee)

Candidate keys: (ID_Product, ID_Employee)

PK: ID_Product, ID_Employee

FK: Advertise.ID_Product \diamond Product.ID_Product

FK: Advertise.ID_Employee \diamond Marketing_emp.ID_Employee

General_Manager (ID_Employee, ID_Region)

Candidate keys: (ID_Employee), (ID_Region)

PK: ID_Employee

FK: General_Manager.ID_Employee \diamond Employee.ID_Employee

FK: General_Manager.ID_Region \diamond Region.ID_Region

Region (ID_Region, Region_Name)

Candidate keys: (ID_Region), (Region_Name)

PK: ID_Region

Country (Country_Name, ID_Region)

Candidate keys: (Country_Name)

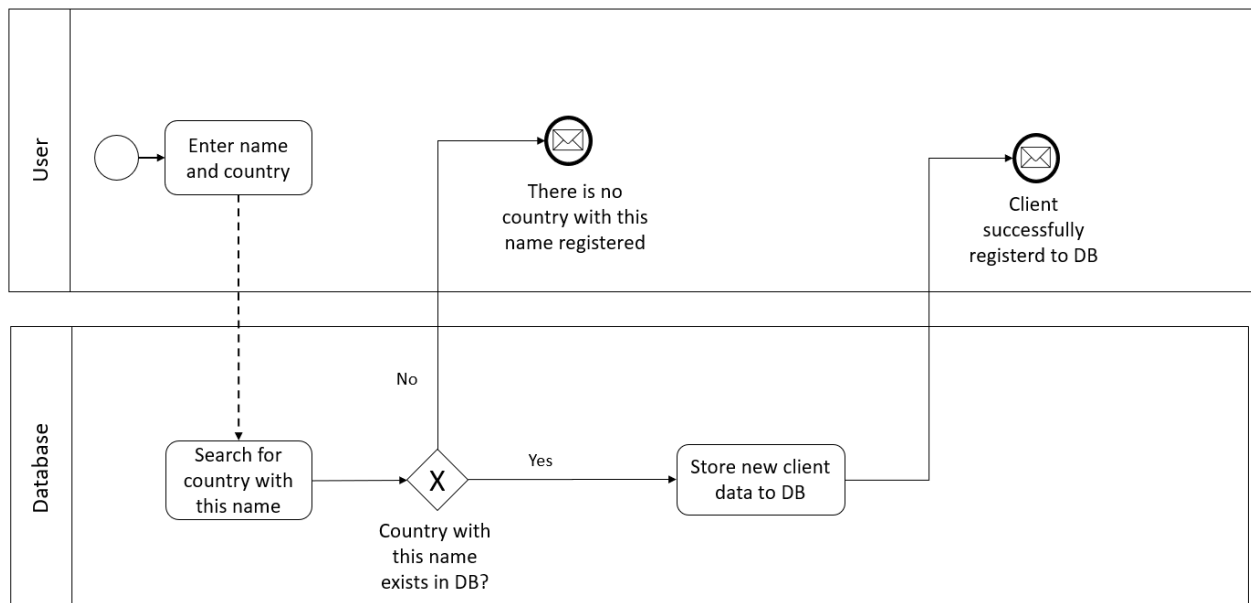
PK: Country_Name

FK: Country.ID_Region \diamond Region.ID_Region

Use cases

Main use case 1 – Register new client (by Clemens Wager)

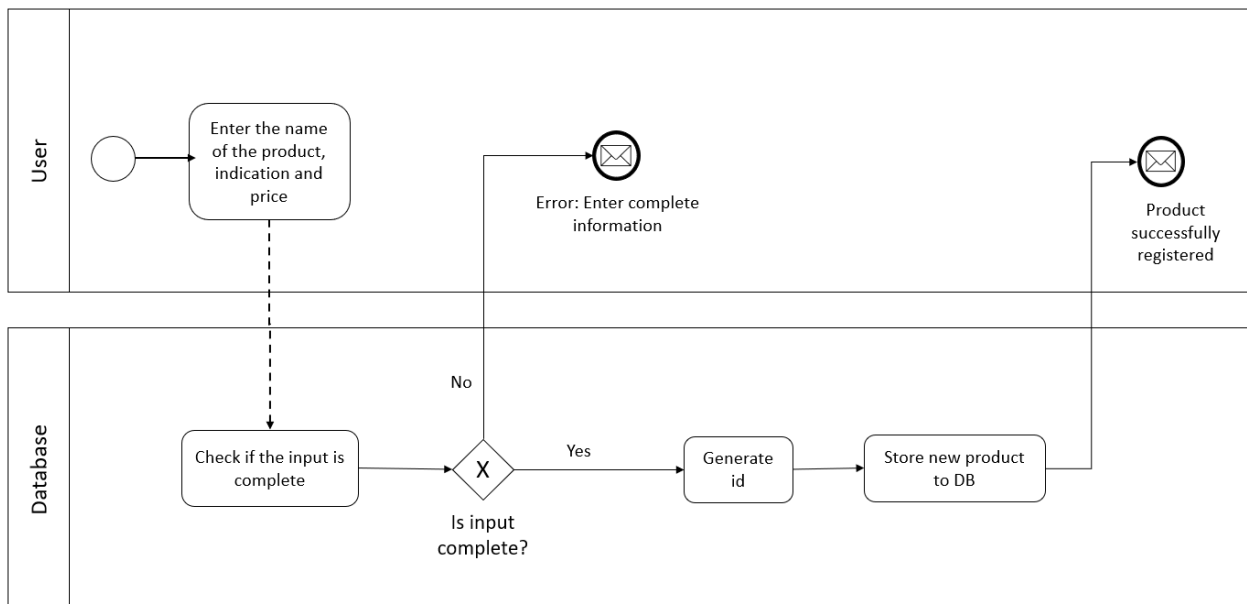
Objective	A new client is registered in the DB
Description	Clients are uniquely identified by their name. There are only Clients in countries where the company operates in. Clients can exist without orders.
Precondition(s)	<ul style="list-style-type: none"> ✓ User is connected to DB ✓ The DB has enough storage for another entry
Expected Execution	<ol style="list-style-type: none"> 1. User enters name and country of new client 2. System searches for country in DB 3. If no country with this name exists in the DB, the process is terminated 4. Client data is stored in the DB 5. Open success notification page
Postconditions(s)	<p>Success:</p> <ul style="list-style-type: none"> • The submitted client data is stored in the DB <p>Error:</p> <ul style="list-style-type: none"> ○ The client already exists in the DB ○ The country does not exist in the DB



Note: Fixed graphic.

Main use case 2 – Register new product (by Claas Fillies)

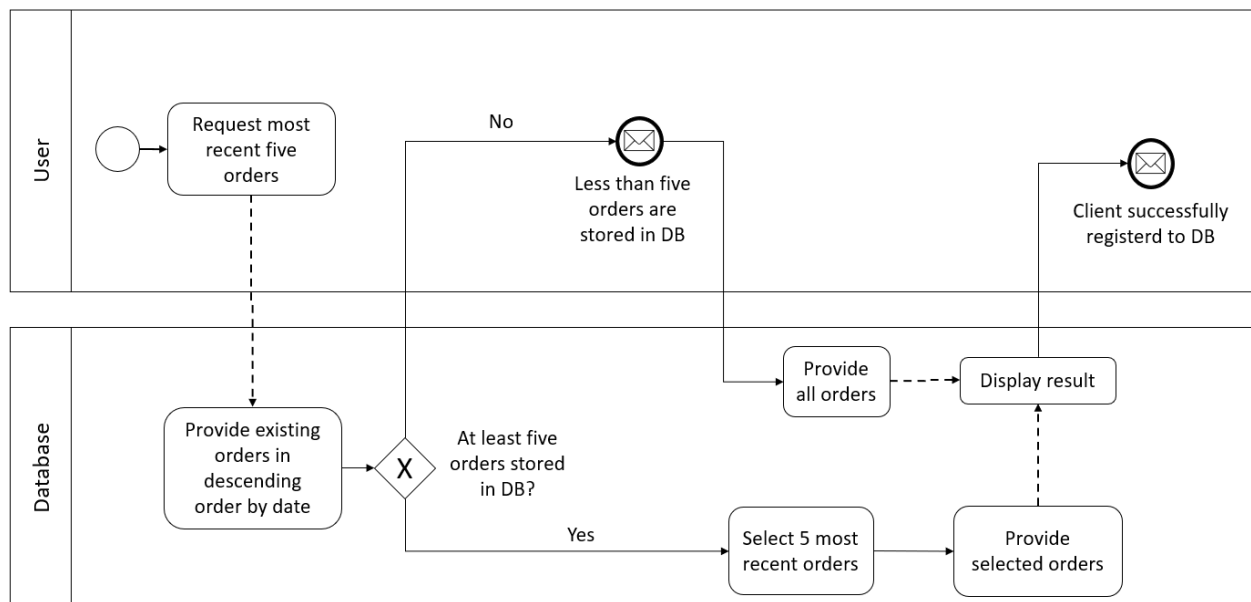
Objective	A new product is registered in the DB
Description	Products are uniquely identified by their ID. IDs are auto-generated. Each product must have an indication and a price.
Precondition(s)	<ul style="list-style-type: none"> ✓ User is connected to DB ✓ The DB has enough storage for another entry
Expected Execution	<ol style="list-style-type: none"> 1. User enters name, indication and price of new product 2. System searches for country in DB 3. If no country with this name exists in the DB, the process is terminated 4. Client data is stored in the DB 5. Open success notification page
Postconditions(s)	<p>Success:</p> <ul style="list-style-type: none"> • The General Manager of a region is displayed successfully. <p>Error:</p> <ul style="list-style-type: none"> ○ A product with name already exists in the database.



Note: Fixed graphic.

Use case 1 – List most recent orders (by Clemens Wager)

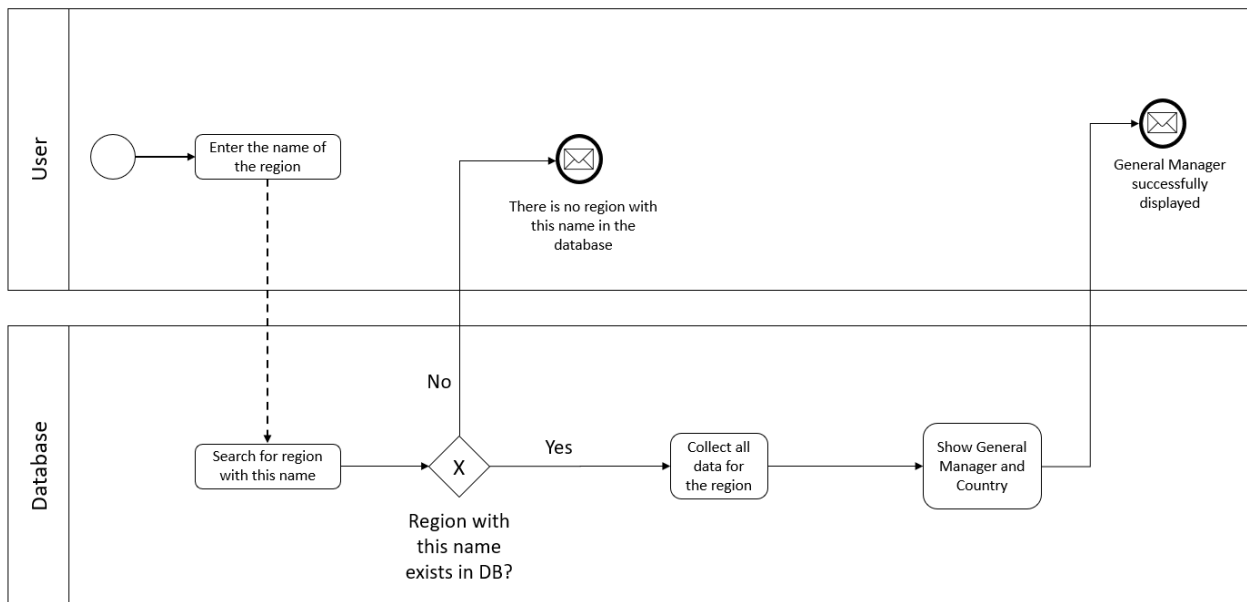
Objective	Most recent orders are listed
Description	The last five orders that were registered are listed in chronological order.
Precondition(s)	✓ User is connected to DB
Expected Execution	<ol style="list-style-type: none"> 1. User requests to see most recent orders 2. System provides existing orders in descending order by date 3. Check if at least five orders are stored in the DB, otherwise all orders are provided 4. Select the top five orders 5. Provide selected orders 6. Display result 7. Open success notification page
Postconditions(s)	Success: <ul style="list-style-type: none"> • The desired data is provided to the user Error: <ul style="list-style-type: none"> ○ No orders are stored in the DB



Note: Fixed graphic.

Use case 2 – Who is GM of my region? (by Claas Fillies)

Objective	Show General Manager of my region
Description	General Manager of a region is searched in DB and displayed.
Precondition(s)	<ul style="list-style-type: none"> ✓ User is connected to DB ✓ The DB has regions and General manager saved
Expected Execution	<ol style="list-style-type: none"> 1. Search for a region by name 2. Check if region exists 3. Collect all data for the region 4. Show General Manager and success notification
Postconditions(s)	<p>Success:</p> <ul style="list-style-type: none"> • The General Manager of a region is displayed successfully. <p>Error:</p> <ul style="list-style-type: none"> ○ There is no region configured in the DB.



Note: Fixed graphic.

Reports

Product report: What are the most expensive products under the given price limit? (by Claas Fillies)

A report on the five most expensive products, which cost less than the given price limit. Users can filter by setting the price limit.

Use entities	Product
Filtered by	Max price limit
Sorted by	Price
Columns	"ID_product", "Product name", "Indication", "Price"

Note: Adapted to reliably show changes in the data after execution of main use case.

Client report: Report on the clients in alphabetical order filtered by country (by Clemens Wager)

Report of clients that reside in a given country. Users can filter clients by the country they are located in.

Use entities	Client
Filtered by	Country name
Sorted by	Alphabetically by name
Columns	"ID_client", "Client name", "Country"

Note: Adapted to reliably show changes in the data after execution of main use case.