U.PORTO
FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO

Bases de Dados

L.EIC
2023/2024

Group Project
First Submission

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October 15, 2023

Contents

1 Domain Definition

We are developing the database for the logistics of a paper bag company. The company makes sales, and from each sale an order is created. From that order, we want to save many things. We want to save the client, the items, quantities, prices, identification number, employee that produced each item, machine where each item was produced, date, status, and delivery method.

The items are paper bags,and each type of bag has a paper type, dimensions and a list of machines where it can be produced.

We need to keep track of the employee that produced the items and the machine where it was produced, so that in case a problem arises with the bags, it is possible to know who and where the mistake was made.

From employees, we only want to save their name and identification number. From clients, we want to save that, plus their phone number, e-mail address and physical address.

The company has various warehouses, and each warehouse has certain machines and paper types in stock. We can select in what warehouse a certain item can be produced based on the machines where it can be produced and on the paper type it needs.

2 Conceptual Modelling

What follows is the UML diagram we developed for the defined problem domain. We did not use AI tools to help develop this diagram.

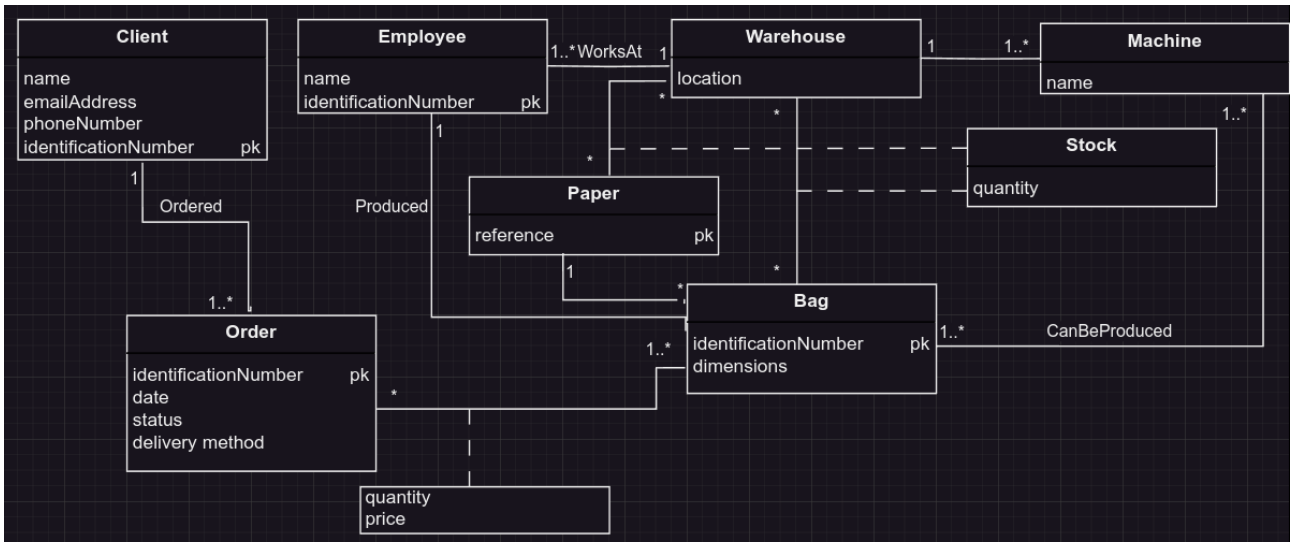


Figure 1: UML diagram, designed using draw.io

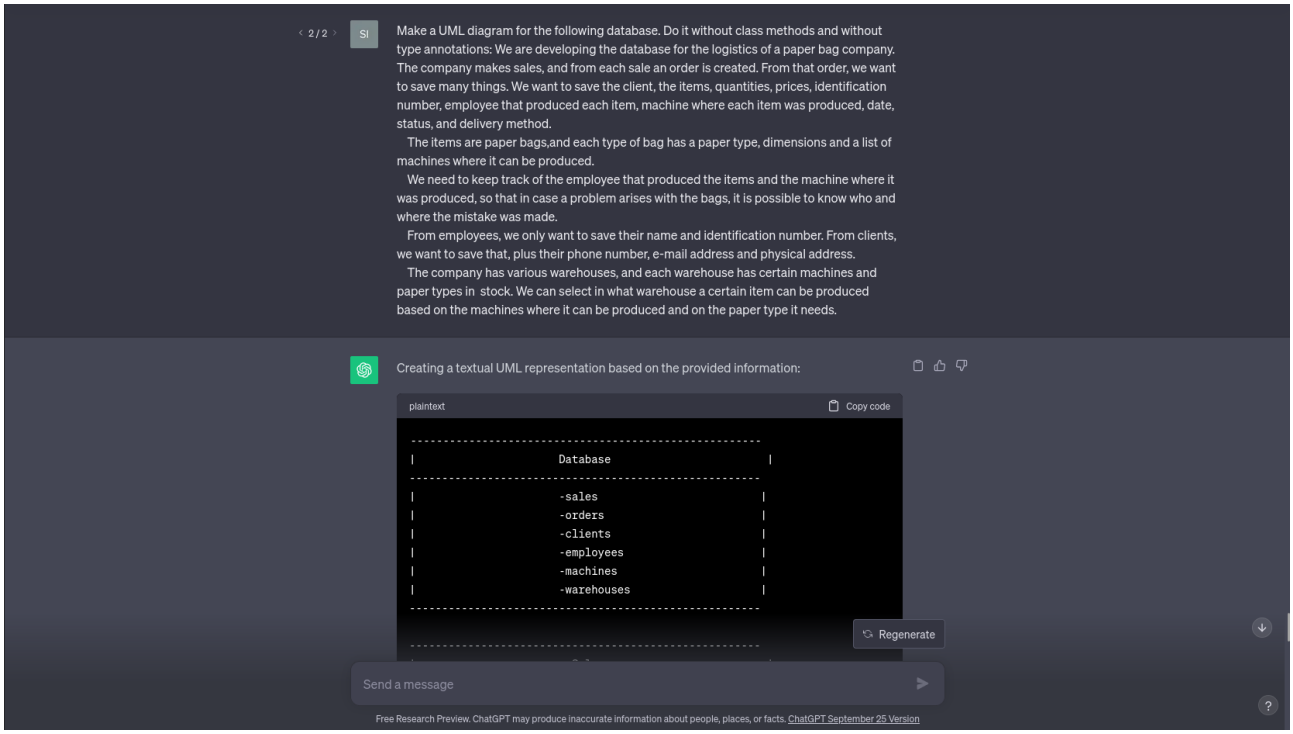
After the use of AI tools, there were no significant improvments made to this model. What the AI generateed was considered by us to be worst, as it's abilities for UML and conceptual modelling are not fully developed.

3 Generative AI Integration

3.1 AI Tool Used

For this task, we chose to use ChatGPT. Chatbot GPT-3.5, often referred to as ChatGPT, is a language generation model developed by OpenAI. GPT (Generative Pre-trained Transformer) is a type of machine learning model based on a transformer architecture, and GPT-3.5 is one of the latest and most advanced versions.

3.2 Prompts and Answer



SI You forgot to represent the relationships

I apologize for the oversight. Let's include the relationships in the UML textual representation:

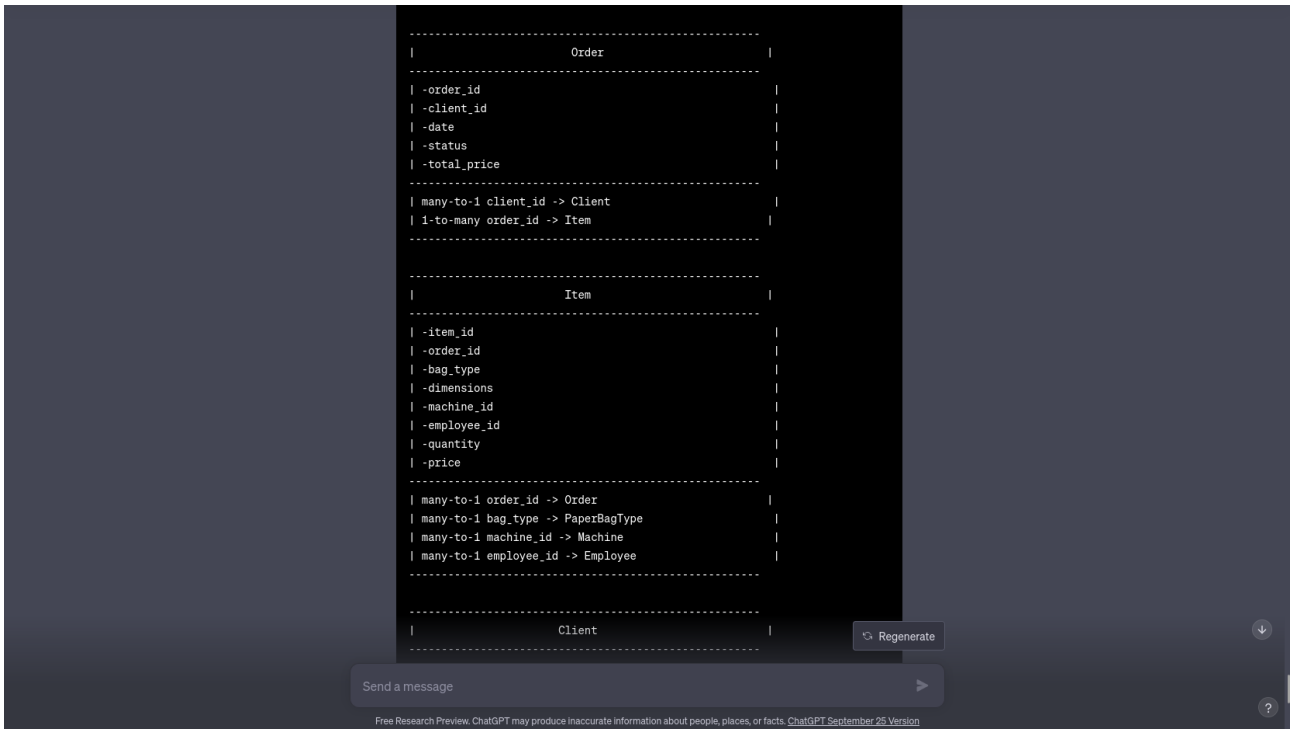
plaintext Copy code

```
-----------------------------------------------------
|                    Database                       |
-----------------------------------------------------
|                    -sales                         |
|                    -orders                        |
|                    -clients                       |
|                    -employees                     |
|                    -machines                      |
|                    -warehouses                    |
-----------------------------------------------------

-----------------------------------------------------
|                     Sale                          |
-----------------------------------------------------
| -order_id                                         |
| -sale_date                                        |
| -total_price                                      |
| -status                                           |
| -delivery_method                                  |
-----------------------------------------------------
| 1-to-many order_id -> Order                       |
-----------------------------------------------------

-----------------------------------------------------
|                     Order                         |
-----------------------------------------------------
```

Regenerate

Send a message

Free Research Preview. ChatGPT may produce inaccurate information about people, places, or facts. ChatGPT September 25 Version



```
-----------------------------------------------------
|                     Order                         |
-----------------------------------------------------
| -order_id                                         |
| -client_id                                        |
| -date                                             |
| -status                                           |
| -total_price                                      |
-----------------------------------------------------
| many-to-1 client_id -> Client                     |
| 1-to-many order_id -> Item                        |
-----------------------------------------------------

-----------------------------------------------------
|                     Item                          |
-----------------------------------------------------
| -item_id                                          |
| -order_id                                         |
| -bag_type                                         |
| -dimensions                                       |
| -machine_id                                       |
| -employee_id                                      |
| -quantity                                         |
| -price                                            |
-----------------------------------------------------
| many-to-1 order_id -> Order                       |
| many-to-1 bag_type -> PaperBagType                |
| many-to-1 machine_id -> Machine                   |
| many-to-1 employee_id -> Employee                 |
-----------------------------------------------------

-----------------------------------------------------
|                    Client                         |
-----------------------------------------------------
```

Regenerate

Send a message

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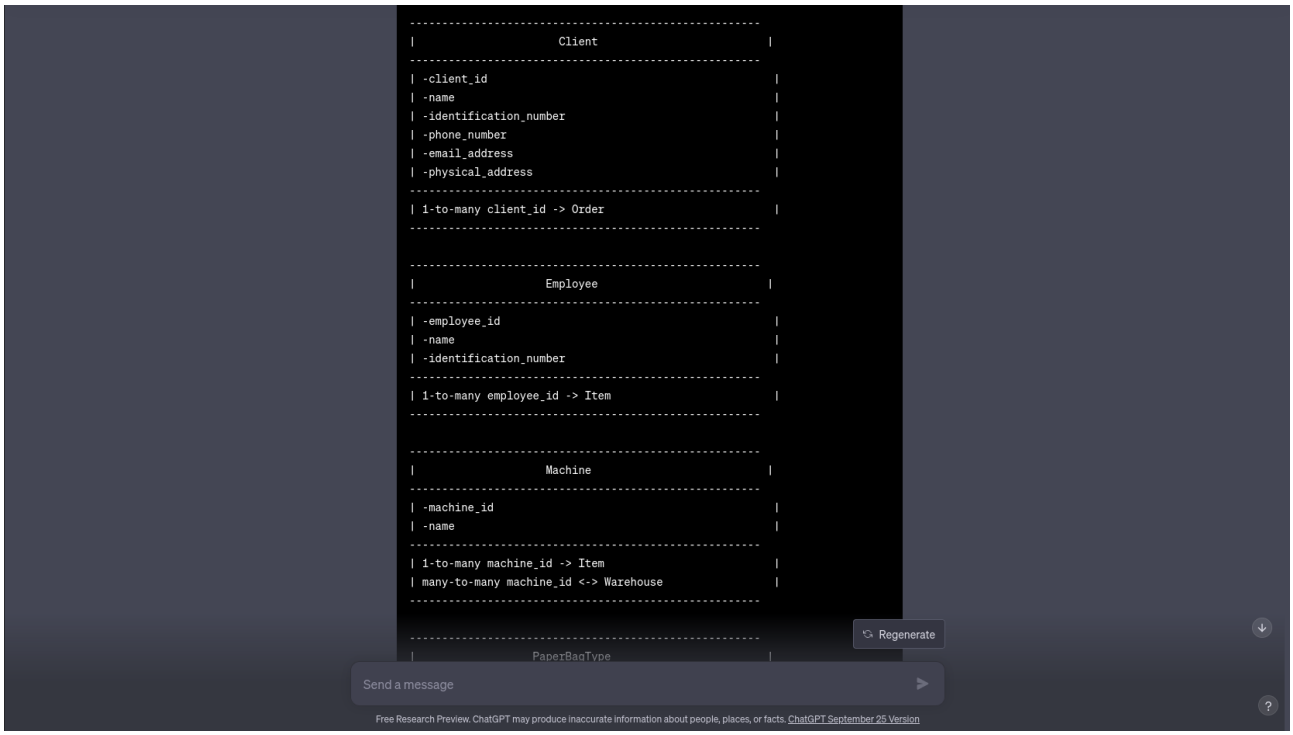
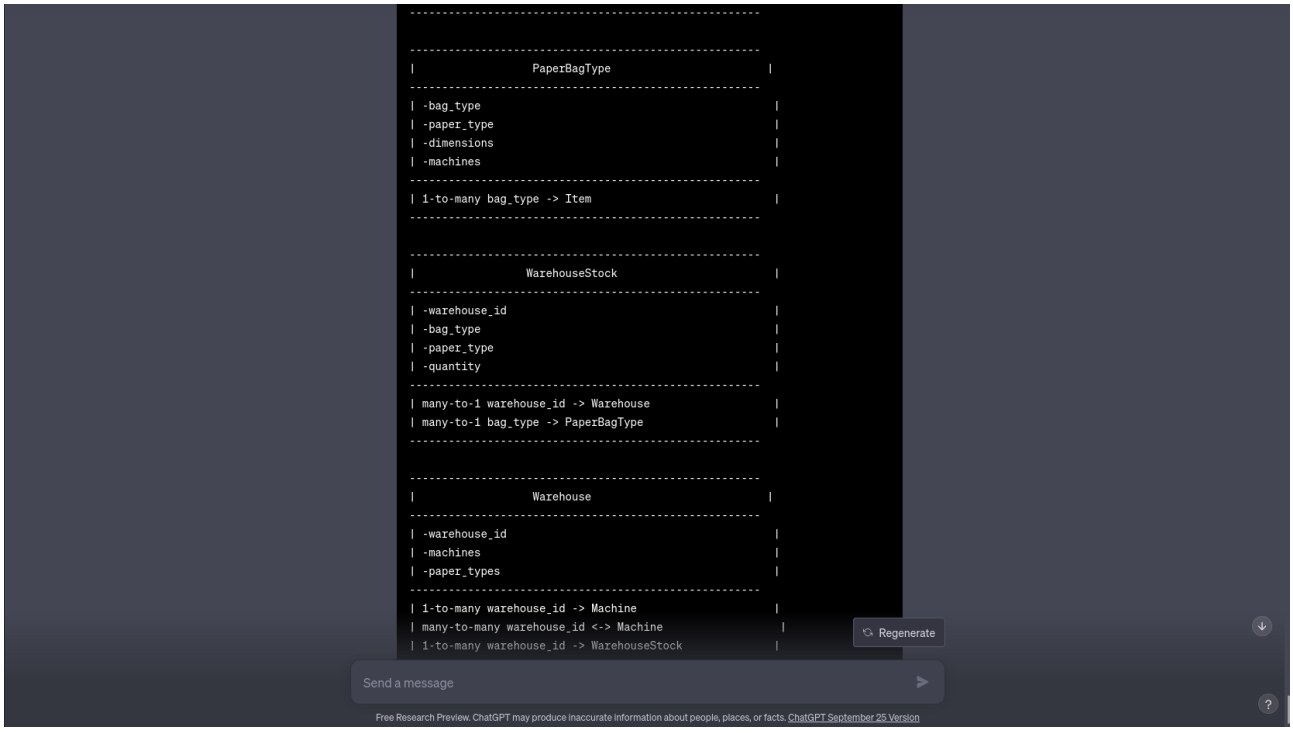
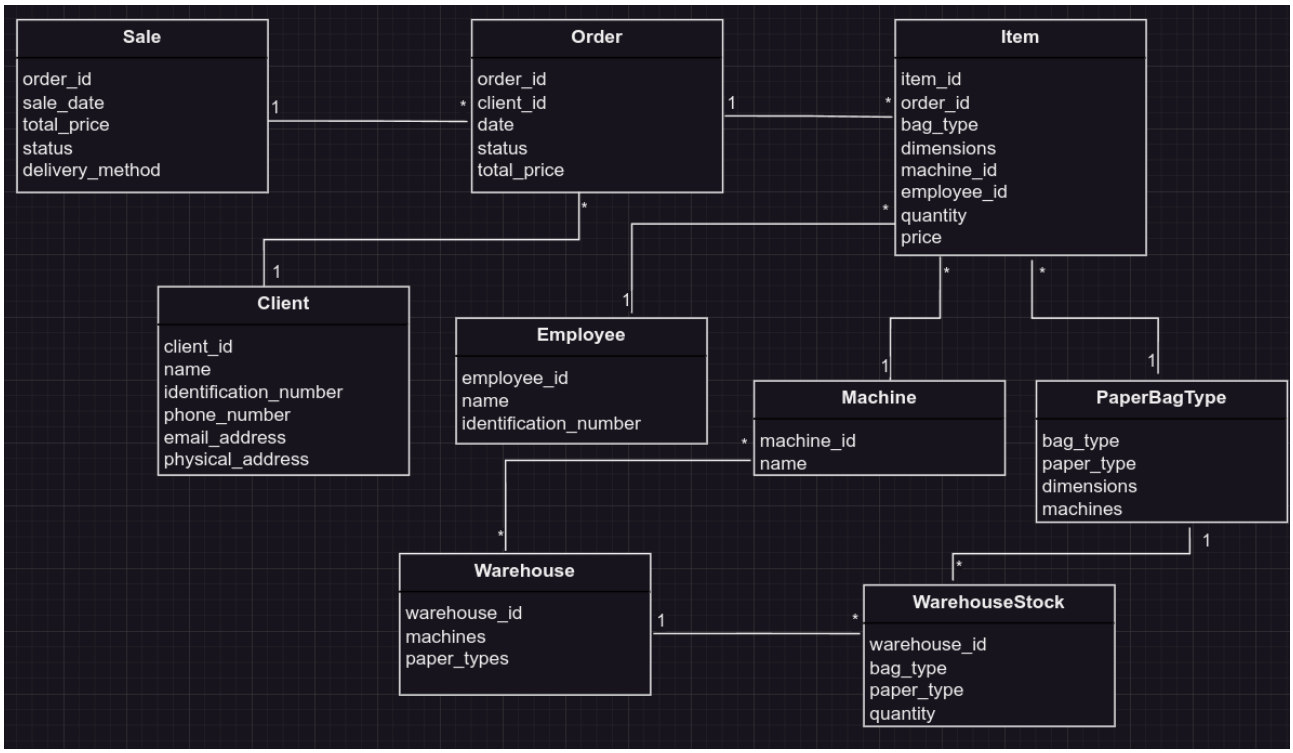

Client
-client_id
-name
-identification_number
-phone_number
-email_address
-physical_address
1-to-many client_id -> Order
Employee
-employee_id
-name
-identification_number
1-to-many employee_id -> Item
Machine
-machine_id
-name
1-to-many machine_id -> Item
many-to-many machine_id <-> Warehouse
PaperBagType
Regenerate
Send a message
Free Research Preview. ChatGPT may produce inaccurate information about people, places, or facts. ChatGPT September 25 Version


PaperBagType
-bag_type
-paper_type
-dimensions
-machines
1-to-many bag_type -> Item
WarehouseStock
-warehouse_id
-bag_type
-paper_type
-quantity
many-to-1 warehouse_id -> Warehouse
many-to-1 bag_type -> PaperBagType
Warehouse
-warehouse_id
-machines
-paper_types
1-to-many warehouse_id -> Machine
many-to-many warehouse_id <-> Machine
1-to-many warehouse_id -> WarehouseStock
Regenerate
Send a message
Free Research Preview. ChatGPT may produce inaccurate information about people, places, or facts. ChatGPT September 25 Version

With this, we were able to create a UML diagram also using draw.io for this AI generated model.



3.3 Critical Assessment

With the prompts that were given to ChatGPT, it produced a diagram in many ways different to our own.

One of the most notable problems with GPT's model is the different naming conventions for class names and attribute names. If camelCase is used in one, it should also be used in the other.

Some classes that it created would make more sense as association classes instead of normal classes, ike WarehouseStock.

At last, there were some attributes that could be ommited because of the relations between classes, such as Item having an order_id attribute. This does not make much sense, as the relation between Order and Item already exists.