



ULIÈGE UNIVERSITY

ACADEMIC YEAR 2022-2023

**INFO9014-1 - Knowledge representation and  
reasoning**

**Project - Zoo**

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# Milestone 0

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Group Name : Safari Squad

Chosen domain and description of information system :

Our information system allows for managing a bunch of zoos. It keeps track of the overall management of multiple institutions, at different levels. We can follow which animals are in which enclosure, which veterinarian and caretaker are associated with which zoo and animals. The database also displays the food and quantity needed (and available) for each kind of animal. For each zoo, it also keeps track of hosted events and shops present in it. Moreover, we know which visitor was in which zoo and what he bought, which allows us to compute interesting statistics for the zoo's marketing. This global system will allow the zoo to look at its turnover, the health of its animals, its popularity among visitors, and the management of different kinds of animations.

The structure of our database will be given in the figure 1.

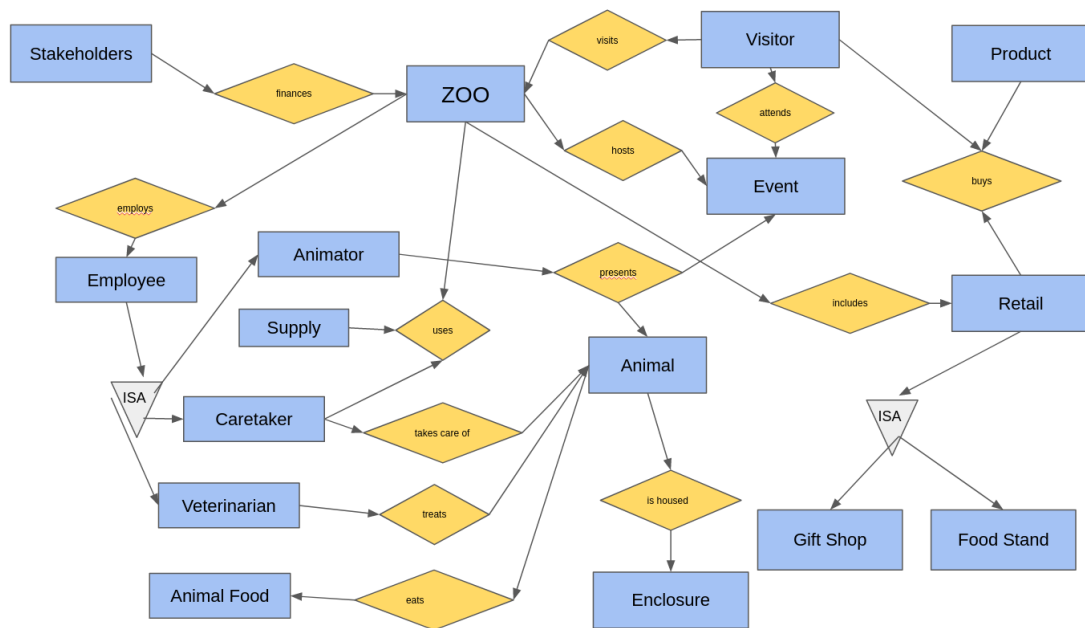


Figure 1: First idea of the structure of the database

The chosen information system is inspired by the following Kaggle dataset :  
<https://www.kaggle.com/datasets/agajorte/zoo-animals-extended-dataset>

We also saw this sample of a database of a Zoo : <https://github.com/michaelmaffia/Sample-Zoo-Database>

# Milestone 1

This section aims to clarify what is exactly contained in our database and how the different entities relate to each other. As previously explained, this database aims to model and manage an hypothetical zoo. In the following, we will describe the content of the database and its implementation.

We chose to use an ERD to model our database.

The following figure is a more advanced version of the figure 1. We have added the different attributes of the different entities and of some relations. These entities and relations are followed to create the database's tables and to populate them. See the files `create_tables.sql` and `populate_tables.sql`. Another improvement from the previous is the different cardinalities of the relations.

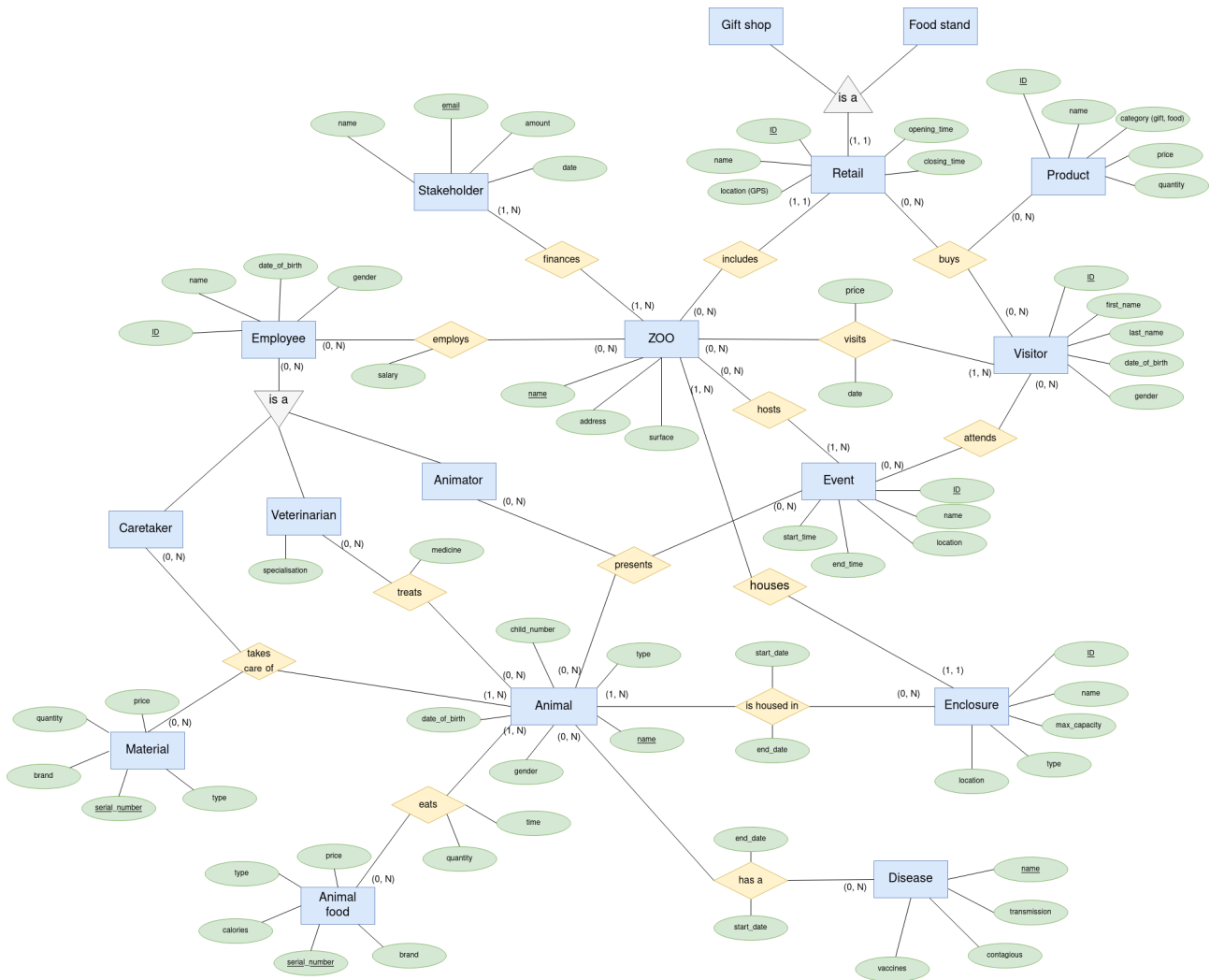


Figure 2: More complete ERD of the structure of the database

The entities and relations have been carefully chosen so that they could all be used in a way to manage the zoo and analyze its way-of-working. For instance, it is a useful feature to check about the health of the animals, and track potential epidemics among them, which could be done by querying which animals have been in contact recently (through the `is_housed_in` entity), and which are with a contagious disease.

Also, another quite useful use case could be to manage the stocks of the different retails present in the zoo, and to compute the income that these generate, or track the purchase habits of the

visitors.

The **Employee** entity can be used by managers of the zoo to better understand their work forces, and ensure that each employee does the appropriate job, regarding his abilities.

In the representation of the database, some integrity constraints were not possible to model. Here is a list of those :

1. A **Caretaker** has to be employed by a **Zoo** to be able to takes care of a **Animal** of the same **Zoo**. Similarly, a **Veterinarian** has to be employed by a **Zoo** to treats an animal of the **Zoo**.
2. An **Event** has to be presented by an **Animator** employed by the same **Zoo** and with animals of the same **Zoo** also.
3. A **Visitor** that attends an **Event** has to be visiting the hosting **Zoo** at the same time/day.
4. Every **start\_date** has to be before **end\_date**. Same for **opening\_time** and **closing\_time**.
5. Most of the attribute must follow a special format (Date, DateTime, GPS, email, serial\_number, etc.)
6. A **Stakeholder** cannot contribute with a negative amount of money.
7. A **Zoo** cannot have a negative surface.
8. The GPS coordinates denoting the location of a **Retail** must be within the **Zoo** area to which they are associated. The same holds for **Enclosure**.
9. A **Product** cannot be sold at a negative price.
10. An **Event** location must be a valid and existing location (understandable by visitors, e.g. : rabbits hole, lions' pit, aviary...) of the associated **Zoo**.
11. ...