SIBD PROJECT

ASSIGNMENT 1: DATABASE MODELING

COURSE: INFORMATION SYSTEMS AND DATABASES
FACULTY: BRUNO MARTINS

MIGUEL RODRIGUES Nº76176
HENRIQUE PIEDADE Nº75546
RAFAEL VILLAREJO Nº91712
GROUP 63

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1 E-R Model

1.1 Model

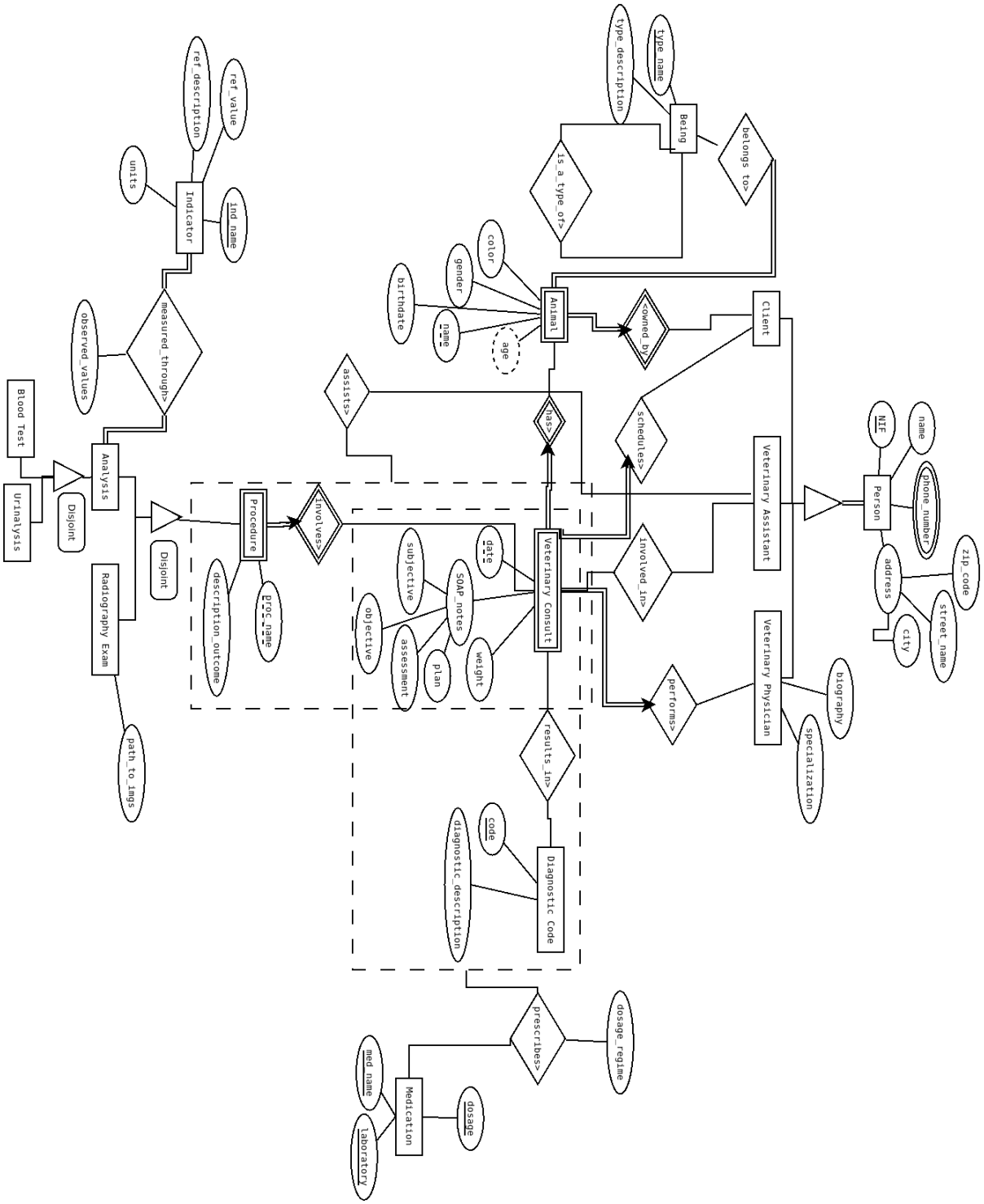

Figure 1: E-R Model

1.2 Considerations

- Total participation from Person to its specialization, as it doesn't make sense to have people registered in the clinic's database if they aren't costumers or veterinaries.
- In the Animal entity, it is added a birth date (not present on the handout), so that the animal's age is always known, as required (derived from the birth date).
- The Animal's name is a weak key because it only identifies it amongst that specific Client's animals.
- For an animal's species/breed, the name Being is adopted to have more broadness.
- Medication has name, laboratory and dosage as keys because there is medication, with the same name, from the same laboratory, in different dosages.
- It was added to Procedure a name attribute, so that we have a good enough discriminator. The same rationale was applied to the Indicator's name attribute.
- The Indicators, like diagnostic codes, were treated as something that is already established, therefore being both strong entities.
- Aggregations so that a prescription is originated by the relation between a consult and the resulting diagnostic (if any), and so that a Veterinary Assistant participates in a procedure that results from the consult.

2 Relational Model

2.1 Model

Entities:

Person(NIF, name, city, zip_code, street_name)
phone_number(phone_number, NIF)
    IC-1: every *NIF* must appear in at least one of the Clients, Veterinary Assistants or Veterinary Physicians.
Client(NIF)
    NIF: FK(Person)
Veterinary Assistant(NIF)
    NIF: FK(Person)
Veterinary Physician(NIF, specialization, biography)
    NIF: FK(Person)
Animal(NIF, name, color, birthdate, gender, age)
    NIF: FK(Client)
    IC-2: *Age* is derived from *birthdate*.
Being(type_name, type_description)
Veterinary Consult(date, name, NIFC, NIFV, plan, assessment, objective, subjective, weight)
    name: FK(Animal)
    NIFC: FK(Client)
    NIFV: FK(Veterinary Physician
Diagnostic Code(code, diagnostic_description)
Medication(med_name, laboratory, dosage)
Procedure(proc_name,date, description_outcome)
    date: FK(Veterinary Consult)
    IC-3: *proc_name* must appear in Analysis or Radiography Exam, but not in both.
Radiography Exam(proc_name, path_to_imgs)
    proc_name: FK(Procedure)
Analyses(proc_name)
    proc_name: FK(Procedure)
    IC-4: *proc_name* must appear in Blood Test or Urinalysis, but not in both.
Indicator(ind_name, ref_value, ref_description, units)
Blood Test(proc_name)
    proc_name: FK(Analysis)
Urinalysis(proc_name)
    proc_name: FK(Analysis)

Relations:

belongs_to(name, type_name)
    name: FK(Animal)
    type_name: FK (Being)
    IC-5: Every *name* in Animal must be present in *belongs_to*.
is_a_type_of(type_name1, type_name2)
    type_name1: FK(Being)
    type_name2: FK(Being)
involved_in(NIF, date)
    NIF: FK(Veterinary Assistent)
    date: FK(Veterinary Consult)

assists(NIF, date, proc_name)
    NIF: FK(Veterinary Assistant)
    date: FK(Veterinary Consult)
    proc_name: FK(Procedure)
results_in(code, date)
    code: FK(Diagnostic Code)
    date: FK(Veterinary Consult
prescribes(date, code, dosage, med_name, laboratory, dosage_regime)
    code: FK(Diagnostic Code)
    date: FK(Veterinary Consult)
    dosage, med_name, laboratory: FK(Medication)
measured_through(proc_name, id_name, observed_values)
    proc_name: FK(Analysis)
    id_name: FK(Indicator)

2.2 Considerations

- Relations *has*, *performs*, and *schedules* can be omitted, by inserting the keys of the Animal, Veterinary Physician, and Client, respectively, into Veterinary Consult, since one of each is required for every consult.
- The same rationale can be applied to omit the *involves* relation, inserting the consult key into Procedure. Also, it is applied to *owned_by*, since every Animal must be owned by one single Client.