SISTEMAS DE INFORMAÇÃO E BASES DE DADOS

Assignment 1

Database Modeling

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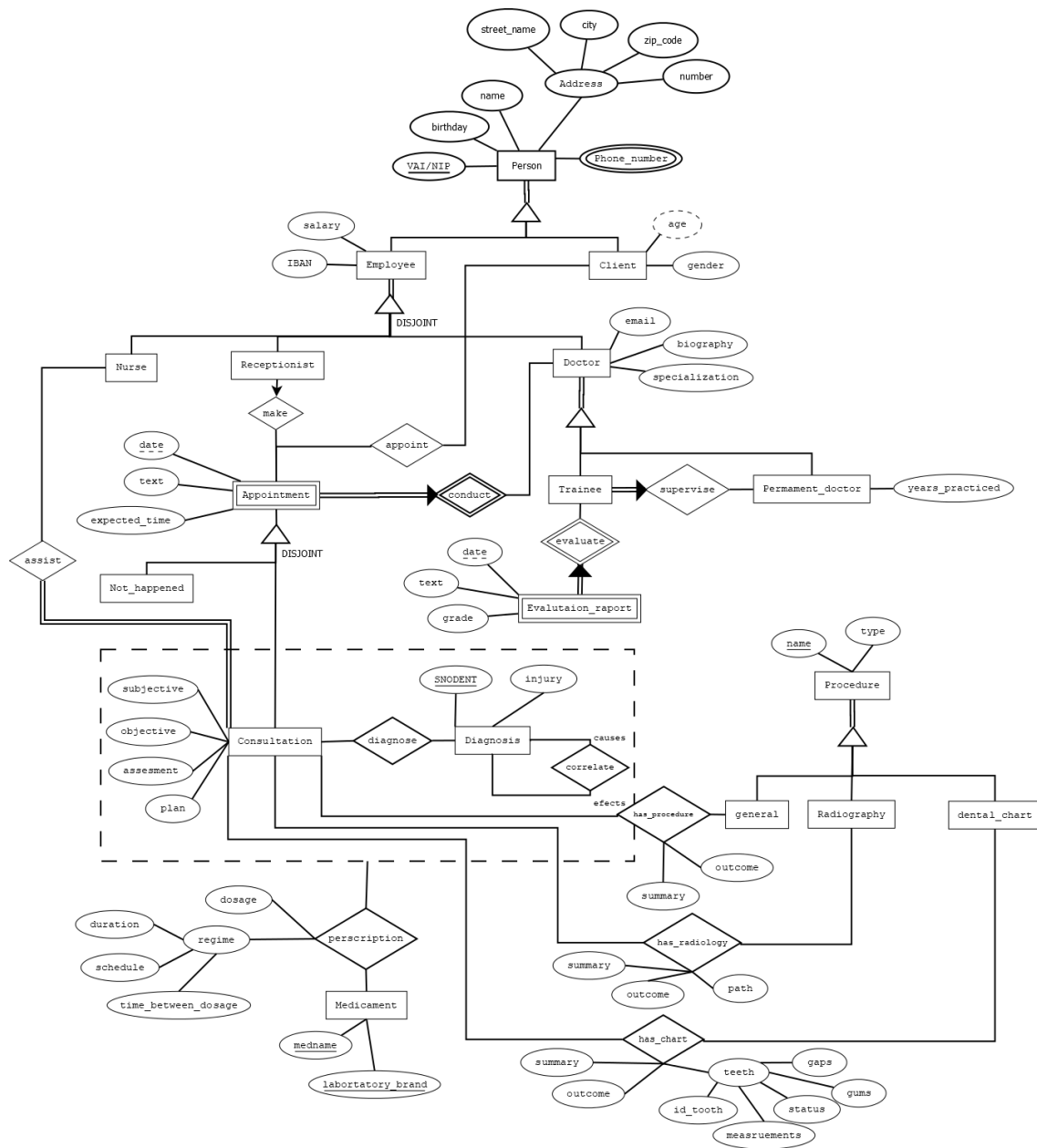
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1 ER-Model

Figure 1: ER model

2 Relational-Model

Person(*pvat*, *birthday, name, street_name, city, zip_code, number*)

IC-1: *pvat* must appear in at least one in *Employee* or in *Client.*

Phone_number(*pvat, phone_number*)
                 pvat: FK(*Person*)

Employee(*evat, salary, IBAN*)
          evat: FK(*Person*)

IC-2: *evat* has to appear only once in *Receptionists* or *Nurse* or in *Doctor.*
IC-3: *IBAN* is a unique entry for all employees.

Client(*cvat, gender*)
       cvat: FK(*Person*)

Nurse(*nvat*)
       nvat: FK(*Employee*)

Receptionist(*rvat*)
         rvat: FK(*Employee*)

Doctor(*dvat, email, biography, specialization*)
       dvat: FK(*Employee*)

IC-4: *dvat* has to appear at least once in *Permanent_doctor* or *Trainee.*

Permanent_doctor(*pdvat, years*)
           pdvat: FK(*Doctor*)

Trainee(*tdvat*)
       tdvat: FK(*Doctor*)

Evaluation_report(*tdvat, date, text, grade*)
          tdvat: FK(*Trainee*)

Appointment(*dvat, date, text, expected_time*)
        dvat: FK(*Doctor*)

IC-5: If the appointment takes place it will be found in the consultation and if the client not appears the appointment will be placed into not_happened.

Not_happend(*dvat, date*)
         dvat, date: FK(*Appointment*)

Consultation(*dvat, date, subjective, objective, assessment, plan*)
         dvat, date: FK(*Appointment*)

Diagnosis(*SNODENT, injury*)

Medicament(*name, laboratory_brand*)

General(*gpname, type*)

Dental_chart(*dcname, type*)

Radiography(*rname, type, path*)

Relations:

supervise(*tdvat, pdvat*)
        pdvat: FK(*Permanent_Doctor*)
        tdvat: FK(*Trainee*)

IC-6: *tdvat* trainee must appear at least once and only once.

appoint(*cvat, dvat, date*)
        cvat: FK(*Client*)
        dvat, date: FK(*Appointment*)

make(*rvat, dvat, date*)
        rvat: FK(*Receptionist*)
        dvat, date: FK(*Appointment*)

assist(*nvat, dvat, date*)
        nvat: FK(*Nurse*)
        dvat, date: FK(*Consultation*)

IC-7: *nvat* at least one Nurse must assist.

diagnose(*dvat, date, SNODENT*)
        dvat, date: FK(*Consultation*)
        SNODENT: FK(*Diagnosis*)

correlate(*SNODENT_1, SNODENT_2*)
        SNODENT_1: FK(*Diagnosis*)
        SNODENT_2: FK(*Diagnosis*)

has_procedure(*dvat, date, gpname, outcome, summary*)
        dvat, date: FK(*Consultation*)
        gpname: FK(*General*)

has_radiology(*dvat, date, rname, outcome, summary, path*)
        dvat, date: FK(*Consultation*)
        rname: FK(*Radiography*)

has_chart(<u>*dvat*</u>, <u>*date*</u>, <u>*dcname*</u>, *outcome, summary, id_tooth, measurements,*
        status, gums, gaps)
        dvat, date: FK(*Consultation*)
        dcname: FK(*Dental_chart*)

prescription(<u>*dvat*</u>, <u>*date*</u>, <u>*SNODENT*</u>, <u>*medname*</u>, <u>*laboratory_brand*</u>, *dosage, duration,*
        schedule, time_between_doses)
        dvat, date: FK(*Consultation*)
        SNODENT: FK(*Diagnosis*)
        medname, laboratory_brand: FK(*Medicament*)

3 Architecture decisions

Phone Numbers:
One person can have multiple phone numbers so we decided to store it within multiple attribute.

Person Identity Number:
To store information about all the people involved in the system be decided to use as PK VAT/NIP number. We additionally store IBAN number as candidate key for workers, yet identify them using VAT/NIP.

Person, employee and clients specialization:
We assume that Employees can be also Clients. There is disjoint in employee specialization, so one person cannot be responsible/hired on more than one function. There is total participation in Person specialization, it is to avoid having Person's who are not either Client or Employee.

Doctor specialization:
We did not decide for disjoint in doctors specialization, we assume that after some time trainee's can become permanent doctors. There is total participation in specialization so we avoid having doctors who are not either a trainee or permanently hired doctors.

Appointment as weak identity:
There cannot be two appointment to same doctor at the same time so each appointment is identified by date and doctor's id. Additionally we add attribute 'expected_time' to calculate finish time and by this allow to make another appointment to the same doctor after calculated finish time.

Receptionist makes an appointment:
This information seems not to be required, yet we decided to store this information in a database.

Evaluation reports:
Each evaluation report can relate to only one trainee, as trainee has only on supervisor this model is sufficient to store data correctly in a database.

Consultations:
Consultations are appointments that took place. The ones that did not happen are going to be stored separately. Each has text attributes related with SOAP model.

Prescription:
Each prescription is related to the consultation and stated diagnosis. Prescription defines medicament and dosage information.

Procedures:

To distinguish different necessary procedures we decided for total participation for different procedures and relate any of them to the consultation. Each specialized procedure has within relation with consultation summary and outcome, this is so far best solution to store those information.