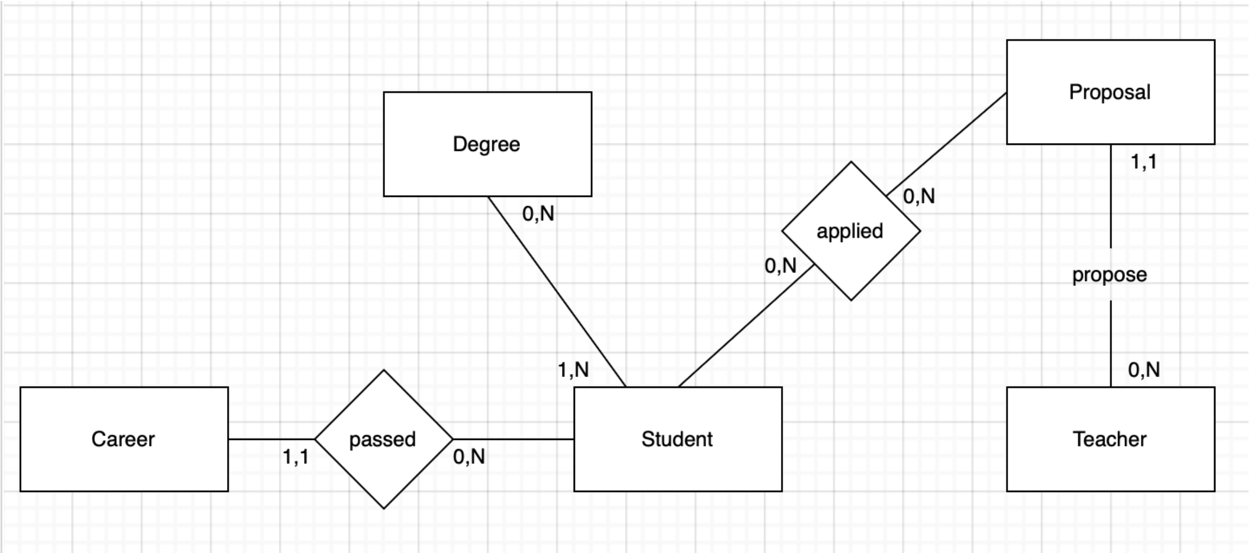
Thesis Management System

Conceptual design

The goal is to implement Thesis Management System for PoliTO. The primary entities include "Degree," representing different academic degrees they can be followed my 0 or many students. A student is always associated to one or many degrees.
"Student," contains student information with enrollment details such as the degree.
"Career," contains an exam informations (cpu, grade, date) taken by a student, one career is associated to one student but a student can have many careers (related to all exams he had). The link between student and career detail is stored in “passed” table.
The "Proposals" entity list thesis projects, proposed by teachers.
"Applications" entity tracks student applications for thesis proposals. A student can applied to as many proposal as he wants. A proposal can be applied by 0 or many students.



In this design 4 tables can NOT be modified :

- Teacher

- Student
- Degree
- Career

Logical design

Translation of entities and associations

- Degree: [**cod_degree** (PK), **title_degree**]
- Student: [**id** (PK), **surname**, **name**, **gender**, **nationality**, **email**, *cod_degree*, **enrollment_year**]
- Teacher: [**id** (PK), **surname**, **name**, **email**, cod_group, **cod_department**]
- Career: [**id** (PK), **cod_course**, **title_course**, **cfu**, **grade**, **date**]
- Passed: [**pid** (PK), *career_id*, *id*]
- Proposals: [**proposal_id** (PK), **title**, *supervisor_id*, **keywords**, **type**, **groups**, **description**, **required_knowledge**, **notes**, **expiration_date**, **level**, **cds_programmes**]
- Applications: [**application_id** (PK), *proposal_id*, *id*, **status**, **application_date**]

Tables details

Degrees

Attribute	Typology	Description
cod_degree	VARCHAR(10)	The code attributed to a degree (used in student table to specify his track)
title_degree	VARCHAR(50) NOT NULL	The title of the degree

Student

Attribute	Typology	Description
id	VARCHAR(10)	Student ID. Starts with S. ex : `S001`
surname	VARCHAR(50) NOT NULL	Student's last name
name	VARCHAR(50) NOT NULL	Student's first name
email	VARCHAR(255) NOT NULL	Student email
gender	CHAR(1)	F (female), M (male), N (undefined??)
nationality	VARCHAR(50) NOT NULL	Student's nationality.
cod_degree	VARCHAR(10)	Code of the degree the student is enrolled in. It refers to the table degrees. (FOREIGN KEY)
enrollment_year	INT	Year of enrollment.

Teacher

Attribute	Typology	Description
id	VARCHAR(10)	Teacher ID. Starts with T. ex : `T001`
surname	VARCHAR(50) NOT NULL	Teacher last name
name	VARCHAR(50) NOT NULL	Teacher first name
email	VARCHAR(255) NOT NULL	Teachers email
cod_group	VARCHAR(10)	Code of the group associated with the teacher. ex : `GR-09 - GRAphics and`

Attribute	Typology	Description
		`INtelligent Systems` . This data will be used in thesis proposals.
cod_department	VARCHAR(10)	Code of the department associated with the teacher

Career

This tables tracks the credits, grade, and date or a specific course, passed by a student. A student can have many “career” (he passes many exams) but a “career” is associated to a **unique student**.

Attribute	Typology	Description
id	VARCHAR(10)	Career ID.
cod_course	VARCHAR(10)	Code of a specific course.
title_course	VARCHAR(50) NOT NULL	Code of the course associated with the career.
cfu	INT NOT NULL	Credit units for the course.
grade	INT NOT NULL	Grade achieved in the course.
date	DATE NOT NULL	Date of completion of the exam

Passed

This particular table is the “link” between a student and the “career” (exam) he attended.

Attribute	Typology	Description
pid	SERIAL	ID, auto increment.
career_id	VARCHAR(10) NOT NULL	ID of the career link to this student (FOREIGN KEY)

Attribute	Typology	Description
id	VARCHAR(10) NOT NULL	Student ID. (FOREIGN KEY)

Proposals

Table for all thesis proposals.

Attribute	Typology	Description
proposal_id	VARCHAR(10)	Proposal ID.
title	VARCHAR(255) NOT NULL	Title of the proposal.
supervisor_id	VARCHAR(10)	Supervisor's ID.
keywords	TEXT[]	List of Keywords associated with the proposal.
type	VARCHAR(255)	Type of the proposal. Ex: `THEORETICAL/EXPERIMENTAL` or `MODELING AND DATA ANALYSIS, MODELING`
groups	TEXT[]	Groups associated with the proposal.
description	TEXT	Description of the proposal.
required_knowledge	TEXT	Required knowledge for the proposal.
notes	TEXT	Additional notes for the proposal.
expiration_date	DATE	Expiration date of the proposal.
level	VARCHAR(30)	Level of the proposal. `Graduate/Undergraduate`
programmes	TEXT[]	All degrees concerned: **list of cod_degree**

Applications

This table contains all the application associated to a student to a thesis proposal.

The status of an application can be : `Pending, Accepted, Refused`

Attribute	Typology	Description
application_id	SERIAL	ID, auto increment
proposal_id	VARCHAR(10) NOT NULL	Proposal ID. (FOREIGN KEY)
id	VARCHAR(10) NOT NULL	Student ID (FOREIGN KEY)
status	VARCHAR(255) NOT NULL	Status of the application. `Pending, Accepted, Refused`
application_date	DATE NOT NULL	Date of the application.

How to install ?

Refers to Elio documentation for DBEaver or to Docker compose documentation. 😃

If you experienced error using DBEaver, try to drop the database from your terminal : `dropdb Thesis-Management-System`

Database Access via Terminal

To access the database via the command line, we use the

`psql -U postgres -W` command, and it will prompt us to enter the password.

Once we are granted access, we can type the command `\l` to view the list of all databases in the system, including “Thesis-Management-System”.

Using the command `\c Thesis-Management-System`, we can select the desired database (this may prompt us to enter the password again). With the command `\d`, we can retrieve a list of all available tables.

Alternatively, we can log out using `\q` and then enter the command `psql -d Thesis-Management-System -U postgres -W`, where, after entering the correct password, we will be directly logged into the specified database.