Case example

In the following, we use a case example of a sports center application to illustrate the use of our DSL. In this context, Figure 1 presents an extract of the database schema of this application, highlighting the main entities and their relationships. Figure 2 describes specific processing that is performed by the application.

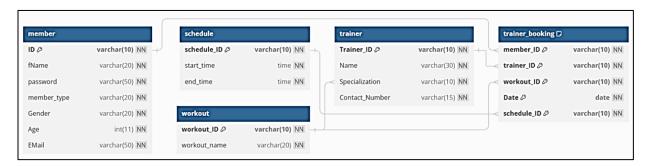


Figure 1 Except class diagram sport center

| Processing | | Purpose 1 | | |
|--------------------|--|--|--|---|
| processing Name | The transmission of data for targeted advertising purposes | description | Use data to personalize promotional offers and product recommendations according to members' preferences and training habits | |
| pt | Optional | type | Main | |
| рс | Consent/Contract | Purpose 2 | | |
| createdAt | 12/04/2022 | description Analyze member preferences to improve sales and enhance customer | | |
| modifiedAt | null | description | satisfaction. | |
| endedAt | null | type | Secondary | |
| | | | Secondary actor | Used Data |
| | | Slimming products compagny | | fname, gender, age, email, workout_name |

Figure 2 Processing description example

1.Annotation

1.1 Actors

The aim of using the DSL is to generate artifacts from the annotation (user stories, comic creation script and instantiation script) that will help the developer to integrate privacy easier.

Figure 3 illustrates an example of actor annotation. This involves specifying the contact details of the application owner, the DPO (if applicable), supervisory authority, the categories of data subjects, etc.

```
? GDPR_V1 ▼ ▶ 前 G, ■
                   ⊕ ÷ ⇔ −
   GDPR_V1 (C:\
    ✓ ■ PRIAM_LANGUAGE.sandbox
                                             name: Sport center owner email: sportcenter@aa.org phone: <no prPhone> country: France
      ✓ ■ PRIAM LANGUAGE
                                              Address
                                                street name: street1 street number: 25
                                              complement: <no complement>

    dataAnnotation
    PRIAM_GDPR

                                                postal code: 75000 city: Paris
           > ® processingAnnotation
> ® Requirements
      PRIAM LANGUAGE
                                         Representative
                                         Data Subjects categories
            ActorAnnotationAddress
                                              category Member location id ID

    AdType

S Country
DataSubject
DataSubjectCategory
DataSubjectRef
                                              category Trainer location id Trainer_ID
                                         Data consumers categories
                                             category: supervisory authority
                                             category: commercial\npartner
            S ListCountry
                                         Data consumers
            S MainActo
                                            Data consumer
            MainActorRef
                                              name: CNIL email: cnil@cnil.fr phone: <no phone> country: France
                                              type: DataConsumer safeguard type No category: supervisory authority
                                              Address
                      rActorRef

<del>*</del> <del>*</del> <del>*</del> <del>*</del> −
                                                complement: <no complement>
                                                postal code: 75334 city: Paris
+ / −

★ GDPR_V1
                                            Data consumer
                                              name: Slimming products compagny email: compagny1@comp.org phone: <no phone country: France
                                                     DataConsumer safeguard type No category: commercial\npartner
```

Figure 3 Example of actors annotation

1.2 Data

In this step, the application owner annotates all the data contained in his application. For each piece of data, he specifies its source, its retention period, its category, its status (personal/non-personal) and the data subject category to which it belongs. Figures 4 and 5 show an example of the annotation of data contained in the member, workout and trainer tables.

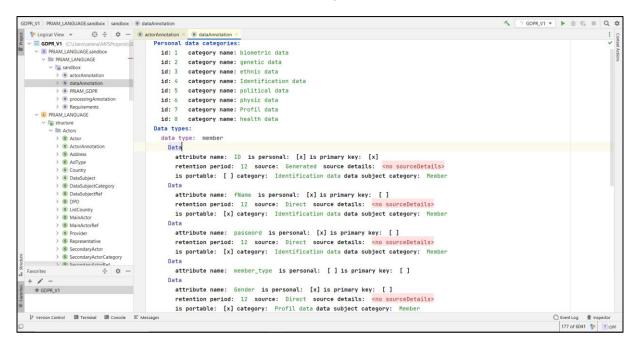


Figure 4 Example of data annotation

```
attribute name: Age is personal: [x] is primary key: [ ]
         > ® dataAnnotation
                                          retention period: 12 source: Direct source details: <no sourceDetails>
           PRIAM GDPR
                                          is portable: [x] category: Profil data data subject category: Member
                                        Data
                                          attribute name: Email is personal: [x] is primary key: [ ]
                                          retention period: <no dataConservation> source: Direct source details: <no sourceDetails>
                                          is portable: [x] category: Identification data data subject category: Member
                                       data type: workout
           S ActorAnnotation
           S Address
           AdType
                                          attribute name: workout ID is personal: [ ] is primary key: [x]

    DataSubject

                                          attribute name: workout name is personal: [ ] is primary key: [ ]
                                       data type: Trainer
                                        Data
                                         attribute name: trainer_ID is personal: [x] is primary key: [x]
                                          retention period: 12 source: Generated source details: <no sourceDetails>
                                          is portable: [ ] category: Identification data data subject category: Trainer
                                          attribute name: Name is personal: [x] is primary key: []
                                           retention period: 12 source: Direct source details: <no sourceDetails>
                                          is portable: [x] category: Identification data data subject category: Trainer
                                          attribute name: Specialization is personal: [x] is primary key: []
# GDPR_V1
                                           retention period: 12 source: Direct source details: <no sourceDetails>
                                          is portable: [x] category: Profil data data subject category: Trainer
```

Figure 5 Example of data annotation (continued)

1.3 Processings

Similarly, processings are annotated. A detailed description of each one is necessary to ensure privacy management (see example in figure 6).

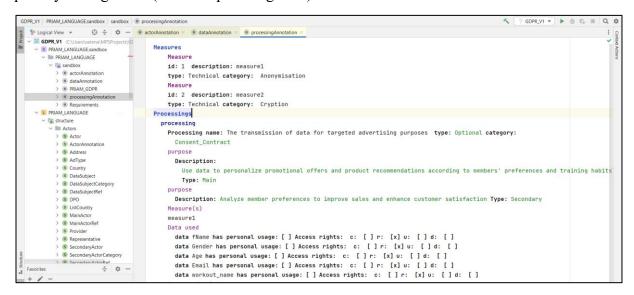


Figure 6 Example of processing annotation

2. Automatic generation of artifacts

Once the annotation has been made, the DSL generate:

- 1. creation script for the PRIAM DB.Script d'instanciation,
- 2. the instantiation script which allows populate PRIAM database with application-specific privacy enforcement data such as the list of processings (see figure 7),
- 3. set of specific user stories (see figure 8).

```
® dataAnnotation × 🔼 Data Annotation.sql
 GDPR_V1 (C:
                                       /* insert data types and data */
   ■ PRIAM_LANGUAGE.sandbox

> ■ PRIAM_LANGUAGE
                                       insert into DataType(data_type_id, data_type_name) values (1, 'member');

√ Image sandbox
> ® actorAnnotation

                                      insert into Data(data_id, data_name, source, source_details, data_conservation_duration, is_personal,
      > ® dataAnnotation 5
                                                    is_portable, is_primary_key, data_type_id, personal_data_category_id, data_subject_category_id)
                                         values (2, 'ID', 'Generated', '',12,true,false,true,1,4,1);
          B PRIAM_GDPR

    processingAnnotation
    Requirements

                                       insert into Data(data_id, data_name, source, source_details, data_conservation_duration, is_personal,
      PRIAM LANGUAGE
                                         is_portable, is_primary_key, data_type_id, personal_data_category_id, data_subject_category_id)
values (4, 'fName', 'Direct', '',12,true,true,false,1,4,1);
        > ® Actor
                                      insert into Data(data_id, data_name, source, source_details, data_conservation_duration, is_personal,
                                         is_portable, is_primary_key, data_type_id, personal_data_category_id, data_subject_category_id)
values (3, 'passmord', 'Direct', '',12,true,true,false,1,4,1);
          AdType

    Country
    DataSubject

                                       S DataSubjectCat
          ® DPO
                                      insert into Data(data_id, data_name, source, source_details, data_conservation_duration, is_personal,
                                         is_portable, is_primary_key, data_type_id, personal_data_category_id, data_subject_category_id)
values (6, 'Gender', 'Direct', '',12,true,true,false,1,7,1);
                                       insert into Data(data_id, data_name, source, source_details, data_conservation_duration, is_personal,
                                          is_portable, is_primary_key, data_type_id, personal_data_category_id, data_subject_category_id) values (7, 'Age', 'Direct', '',12,true,true,false,1,7,1);
★ GDPR_V1
```

Figure 7 Preview of the generated instantiation script

```
👺 🖈 🕃 😩 🍅 🔳 actorAnnotation 🕲 👸 Actor_annotation.sql × 🔞 dataA
                                                                 tation × 🐔 Data Annotation.sql × 🌘 Requirements × 💰 Backlog_User stories.txt
                          As a data subject, I want to have access to the contact details of the DPO (Data Protection Officer)
                         As a data subject, I want to have access to the contact details of the data controller / representative As a data subject, I want a legal guardian to be appointed, so that I can be sure that my rights
                          As a data subject, I want to be informed of the data consumers/categories of data consumers.
                          As a data controller, I want to be able to document my contact details / those of the representative
                         As a data controller, I want to be able to document the DPO's contact details
As data controller, I want to document the contact details of the data consumers (recipient, third party and data processor)
                          As a data controller, i want to list the categories of data subject
                            ----- Data part -----
                          Data subject Member :
                         As a Member , I want to be informed about which personal data is collected, processed and shared. As a Member, I want to be informed about the categories of my personal data.
                          As a Member . I want to be informed of the source of my personal data: ID. fName. password. Gender. Age. Email
                          As a Member, I want to be informed about how long my personal data: [ID, fName, password, Gender, Age, Email] will be kept.(retention period).
                          Data subject Trainer :
       ÷ $ -
                          As a Trainer, I want to be informed about the categories of my personal data.
★ GDPR_V1
                          As a Trainer , I want to be informed of the source of my personal data: trainer_ID, Name, Specialization
                          As a Trainer, I want to be informed about how long my personal data: [trainer_ID, Name, Specialization ] will be kept.(retention period).
```

Figure 8 Preview of the generated user stories (except)

Note: As shown in Figure 9, scripts and user stories are generated as files with .sql and .text extensions, respectively.

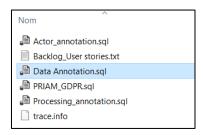


Figure 9 Generated files by the DSL