

Seminar 1
Data Storage Paradigms, IV1351
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1 Introduction

The task of this seminar is to modulate a conceptual model specified by the description of *The Soundgood Music School*. I had little time left to do this assignment because of the other course, so I worked by myself, otherwise I would collaborate with some others. The ER diagram is made in the tool Astah and the requirements for the task is to have the diagram contained with all the different kinds of data needed for the business and to follow the guidelines of creating a conceptual model.

2 Literature Study

Before beginning with the assignment I went through the video material provided by the course and listed up all the important requirements for how a conceptual model should be modulated. I also read the article snippet “tips-and-tricks-task1” to prepare for this. Some important concepts described in those sources are to follow data integrity, i.e. no duplicated data, nor derived data. Also concepts like there are no entities without attributes and that the purpose of the model is to illustrate the reality of how different kinds of data are related to each other.

3 Method

Since the task is to make a conceptual model which is supposed to “describe the reality” by a data specific approach, I listed all the data specific contents of the description in The Soundgood music school and started from there. Since it is clear that the entities in the model are a grouping of attributes, I continuously reasoned how specific attributes were needed for that specific entity and the corresponding values of the attributes, which are not supposed to be included in the model, but are to be considered to be able to distinguish what is what. The description of the business also specifies that we are not designing a database nor has a financial purpose like bookkeeping, taxes etc. However, that the model will cover all the data that is covered by the description of the Soundgood Music School.

4 Result

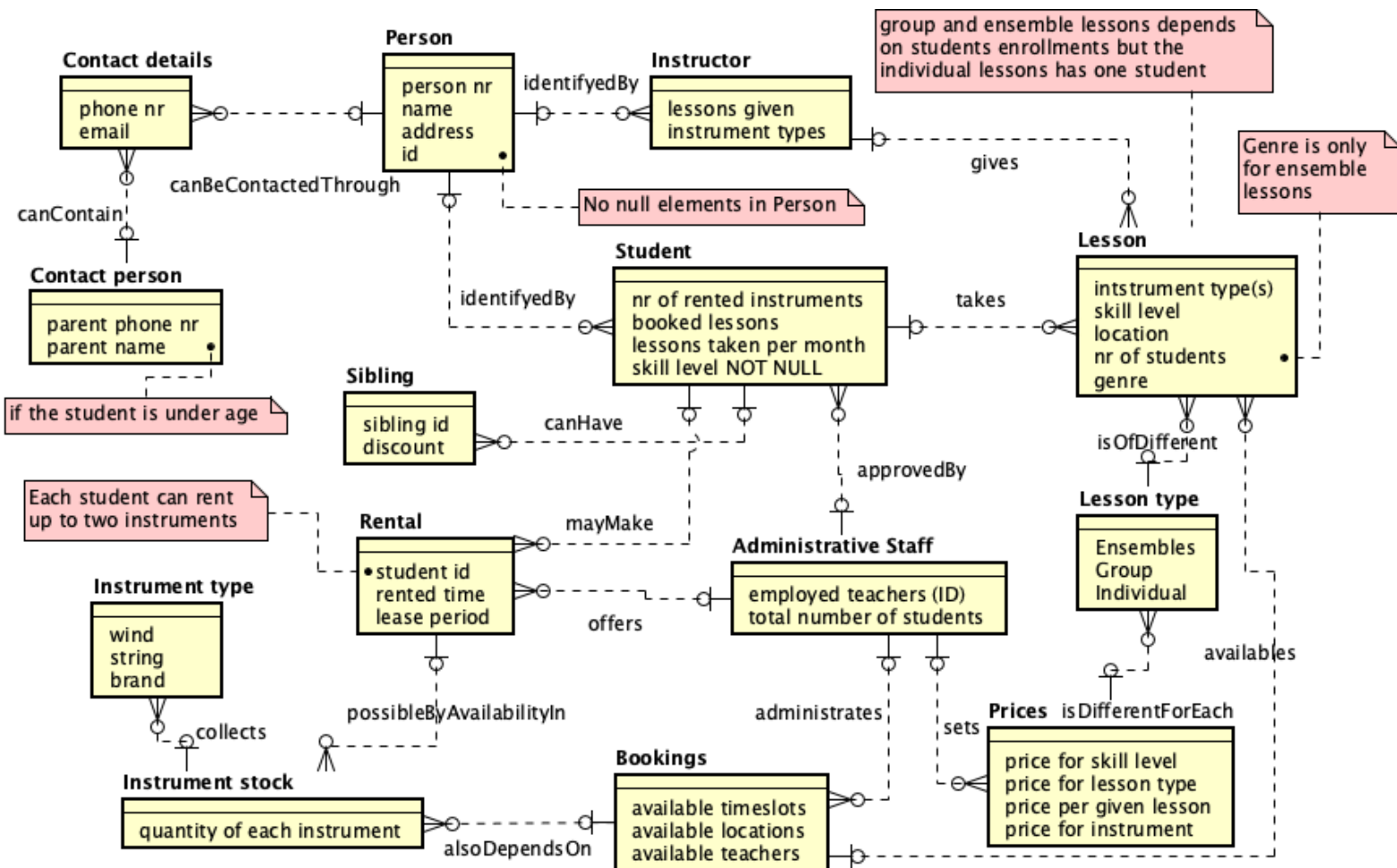


Figure 4.1.1 ER diagram of conceptual model, the description below is describing the central entities for each section of the diagram

Person, Student, Instructor

Both the entities Student and Instructor have common attributes like person number, name, id etc which would rather result in a inheritance association of the Person entity. However, both the child entities have a direct relation to the Person entity which identifies each student and teacher. Furthermore, each type of person can have contact details like phone number and email depending on the purpose of getting contacted. These attributes are therefore placed in the entity contact details. These details could further have attributes for a contact person that has attributes like phone nr for example but is however a guess of how the contact person would be contacted. The contact person is also only for students under age as noted in the diagram.

Lessons and Administrative staff

In order for the student to take lessons, the student must be approved by the administrative staff entity, either if it is approving of bookings or to be accepted at the school. This depends on the availability of places in the school which can be calculated by the total number of students but also the number of employed teachers. To arrange lessons, the administrative staff have to look up data related to the availability of which teacher that can participate, available time slots and locations respectively but also the availability of instruments collected by the instrument stock entity. The reason the Bookings entity has a relationship to the Instrument stock entity is because the student can *rent up to* two instruments, which means the student can decide to not rent instruments at all which means the student has to borrow the available instruments in the school. However this can be interpreted differently by others as well.

Payment is not made as entity

Since the fees for the student and instructor wage is dependent on attributes that are placed in the central entities, for example Student and Instructor, which resulted in payment not being made as a separate entity. The fees for each student can be calculated by the attributes number of lessons taken and the skill level that belongs to the student entity. Furthermore the fee is also impacted if the student has siblings which makes the student eligible for discounts. The number of siblings and their attendings at the school as other students can be looked up by the sibling id. The rental fees can also be calculated by the attribute number of rented instruments which is an attribute in the Student entity and the rented time for each instrument can be seen by the attribute rented time which belongs to specific student id:s. The instructor is paid by the number of lessons given and the skill level of each lesson which can be looked up by the attribute in Instructor. The prices of the different lesson types are specified in the description to be flexible and are managed by the Administrative staff which makes all the attributes needed for calculating financial transactions possible. If the payment would be made as a separate entity, the attributes from the central entities would be rearranged and would otherwise result in derived data.

5 Discussion

Weaknesses in the model:

- the sibling could have an association to the person directly since the sibling has to be an active student identified by a person to make a student eligible for discounts. However, the associations are factual relationships and has no directed links, which makes the associations go both ways even if the relation is not descriptive in the diagram.
- There could be a direct association to Instrument types from the Instructor and Student which would describe which instructor is able to teach which instruments and also which instruments the student either rents or is learning, since the description of the Soundgood Music school explains the student can learn any number of instruments.

- **Does the CM contain all information needed by Soundgood?**

The fundamental operations like bookings for lessons, registering students and instructors and payment can be calculated by the attributes in the entities as described in the Result section.

- **Is it easy, that is a reasonable number of hops, to collect information related to all of the major entities (student, lesson, instructor, etc)?**

To calculate the fees for each student, the attributes of siblings, number of instruments and lessons taken is needed which can be looked up from two entities. This is also why payment is not made as a separate entity, payment is of different kinds for each student because of both the number of siblings and also the students skill level for particular instruments. This resulted in attributes like, the number of instruments rented by the student and the number of lessons taken, are placed in the student entity. The wage for each instructor is dependent on the number of lessons each teacher has given but also the skill level of the lesson. The attribute lessons given would have values of number of lessons and its skill level but could otherwise be improved to add the skill level of lessons as a separate attribute in Instructor. Since the prices are specified to be flexible and managed by the Administrative staff, the entity Prices has a direct association to the Administrative staff entity.

- **Does the CM have a reasonable number of entities? Are important entities missing?**

In order to be able to achieve the fundamental operations in the business description like arranging lessons, renting instruments and handling the financial things I think the diagram has covered enough data in the entities.

- **Are there irrelevant entities, for example entities without attributes? Are there attributes for all data that shall be stored? Do all attributes have cardinality? Is the cardinality correct? Are the correct attributes marked as NOT NULL and/or UNIQUE?**

Instrument stock might be irrelevant since the quantity could be an attribute in Instrument Type. Each attribute in Lesson Type was first made to be separate entities in the diagram at first and inherit the Lesson entity but since the number of students and skill level were attributes in the Lesson entity, the individual Lesson type would not have any attributes which is forbidden in the conceptual model. This resulted in making the Lesson entity have a direct relation to the Lesson type and have the necessary attributes for each type of lesson as attributes in that entity. The group lessons do not have any genre nor the individual lessons but that is made as a note in the diagram. In order to register students and instructors the attributes in Person entity cannot be null nor the instrument type or skill level.

- **Does the CM have a reasonable number of relations? Are important relations missing? Are there irrelevant relations? Do all relations have cardinality at both ends and name at least at one end?**

The relation between Rental and Administrative staff might be irrelevant since it does not help the model to illustrate the relationships between data. All the relations have cardinality with the UML specified associations.

- **Are naming conventions followed? Are all names sufficiently explained?**

The naming conventions of making the first letter in entities in capital, and describing the relations in camel case is followed. The attributes are also in lower case.

- **Is the notation (UML or crow foot) correctly followed?**

As followed in the video "IE Notation" yes.

- **Are all business rules and constraints that are not visible in the diagram explained in plain text?**

The fact that the student cannot rent more than two instruments are noted. Since the Lesson entity contains the information needed for each Lesson type the genre is only relevant for the ensembles. Since the grouping of lessons and ensembles depends on the number of student enrollments and is an exception for the individual lessons, these are noted in the diagram as well.

- **Is the method and result explained in the report? Is there a discussion? Is the discussion relevant?**

I tried to follow the instructions and make the report content as relevant as possible and answer the questions descriptively.