

# Data and Process Modelling

## Lab3. Modelling a Complex Domain in NORMA

Marco Montali

KRDB Research Centre for Knowledge and Data  
Faculty of Computer Science  
Free University of Bozen-Bolzano

A.Y. 2014/2015



# Frodo's Information System 1/2

Frodo Baggins (from “The Lord of the Rings”) wants to build an information system to keep track of important events happened in the Middle-earth, in particular where and when did they happen, and which characters were involved. The Middle-earth contains regions, univocally identified by their names. Each place is located in a region, and primarily identified by its (local) name *in the context of* the region (i.e., two places could have the same name if they are located in different regions). On the other hand, each region has exactly one capital, which must be a place located in that region.

In the Middle-earth, time is measured in different ways. For simplicity, we assume that Frodo uses a unique calendar, where each timestamp is identified by two value types “date” and “time”.

Places host events at specific timestamps. Each event is mandatorily described by a title, and optionally by a textual chronicle describing what happened. Among the events, two specific events are of interest: personal events and collective events. A collective event cannot be a personal event, and vice-versa.

## Frodo's Information System 2/2

A personal event involves a single character. Each character is identified by a name, also tracking his/her people type (Hobbit, Human, Dwarf, . . .), and whether (s)he has ever been involved in the fellowship of the ring or not.

A collective event involves in general many characters. More specifically, the participation of a character in a collective event is either because (s)he was against that event, or because (s)he was in favour of that event. A character cannot be against and in favour of the same event.

A character is stored in the information system only if (s)he takes part to at least one personal or collective event, that is, if (s)he was involved in at least a personal event or was against/in favour of a collective event.

Among collective events, Frodo wants to better specify battles. Each battle sees the participation of at least two teams, and is won by at least one of the teams that took part in it. Multiple teams can, in principle, win the same battle. Teams are constituted by characters, keeping also track from which date to which date each character has been part of a certain team.

### Exercise

Elicit object types, fact types, and constraints.

Draw a corresponding ORM conceptual schema.