BUSINESS RULES

TERMS USED IN THIS COURSE

In this course,

we will try to use the following terms consistently:

Business Rule

A rule that was found during the Requirements Analysis, usually stated informally by domain experts. A business rule does not depend on (or refer to) any data model, neither conceptual nor logical or physical.

Constraint

The result of translating a Business Rule into a conctraint that applies in the CDM (conceptual model).

Integrity Rule

The result of translating a constraint into an integrity rule that applies in the Relational Schema (PDM).

CONSTRAINTS IN A CDM

Many business rules are already visible in constraint form in a CDM:

- Primary identifiers

- Mandatory constraints

- Dependency in relationship types

- Cardinalities of relationship types

- Subtypes and their derivation rules

VALUE RULES, NUMBERS

X is a value to be entered in an attribute

- X > 1
- X >= 1
- X = 0..100 (for %)
- X = 1..31 (for day of month)
- X = 1..12 (for month of year)
- X = 10..12 (month in 3rd quarter of year)
- X = 1..366 (for day of year)

VALUE RULES, TEXT

- Preference in (first, second, third)

- Month in (jan….dec)

- Day of week in (Monday, Tuesday…etc)

- Status in (draft, opened, completed, closed)

How can you implement these?

CARDINALITY RULES

The ordinary minimum and maximum cardinalities in an ERD

Others:

- A student may give a maximum of three project preferences

- Each final project must be assessed by two teachers

- A hotel must have at least 4 points of interest

TIME RULES

- The end date must be later than the start date and vice versa

- The end time must be later than the start time and vice versa

- Date of birth must be earlier than the registration date

- The minimum age for driving lessons is 17 years

- Holiday periods must not overlap

COMPLEX RULES (1)

NBSA = negative
binding study
advisory

VNSA = tentative
(Voorlopig) negative
study advisory

- A student must get an NBSA after 1 year if he/she has less than 45 EC and had a VNSA before.

- A student may participate in an exam if he/she is registered for the present realization of the course concerned or if he/she has registered for a re-exam.

- A student may register for a re-exam if he/she has no mark for that exam or if he/she has an insufficient mark for that exam.

COMPLEX RULES (2)

Some domains have many rules:
- Banks
- Insurance
- Sports
- ...

- A train runs on time if it arrives within 5 minutes of its expected time of arrival

- A rider of class Z1 with a horse of class M1 may start in class L1 or M1

- The total package cost must be computed as the costs of traveling plus the costs of accommodation

RULE LANGUAGES

Stating business rules (a form of verbalizing!):
- Standardize as much as possible
  (many DM-tools (CaseTalk, Norma) offer such features)
- Use guidelines
- Be precise
- Are they consistent?
- Formulate them business friendly: for communication between domain and IT

RULE STANDARDIZATION

www.rulespeak.com

Object Management Group (OMG)

- SBVR: Semantics of Business Vocabulary and Rules

- Implementation of SBVR: For example: Rulespeak

- Use of template sentences
  - …. must ….
  - …. must be computed as……
  - …. must not…
  - …. may …..
  - …. must ….. if …….
  - …. must not ….. if …. and if …..

RULE STANDARDIZATION: EXAMPLE

- The minimum age for driving lessons is 17 years

Rephrase:

- Someone taking driving lessons must be at least 17 years of age

- Check the other examples in these slides

TRANSFORMATION OF BUSINESS RULES (REQUIREMENTS) TO CONSTRAINTS (IN CDM)

- No general method

- Each constraint must specify clearly
  - which attribute(s) of which ET(s) it concerns
  - which non-dependent RT(s) it concerns

TRANSFORMATION OF CONSTRAINTS (IN CDM) TO INTEGRITY RULES (IN PDM)

- No general method

- Each constraint must specify clearly
  - which columns(s) of which table(s) it concerns

- Programmers should be able to implement the IRs specified in the PDM in the RDBMS the database is built in