

FACTS_ AND VERBALIZATIONS



PROBLEMS IN ERM

Two main problems with classic ERM:

- Semantics* not modeled
 - Semantics highly valued in practice
 - Comments on ETs and Atts often absent
 - Definitions: often only after the modeling
- No good modeling method
 - Most textbooks show WHAT to model
 - No textbook shows HOW to model

Here: attempt to solve both problems using verbalizations of concrete examples of facts

* Semantics: what something **means**

FACT-BASED VS ATTRIBUTE MODELING

ISE Student Questionnaire: **Attribute/Entity** perspective:

- **Table**: models an **entity type**: a kind of thing in the UoD
- **Columns**: model **attributes**: properties of the entity type

Attribute Dom:Semester PK, NN ↓	Attribute Dom:ResponseNo PK, NN ↓	Attribute Dom:EnjoysDB NN ↓	Attribute Dom:EnjoysSAQ NN ↓
Semester	ResponseNo	EnjoysDB	EnjoysSAQ
1819s1	1	2	2
1819s1	2	4	2
1819s2	2	3	1
...

Focus: the **atoms** of information, not the molecules

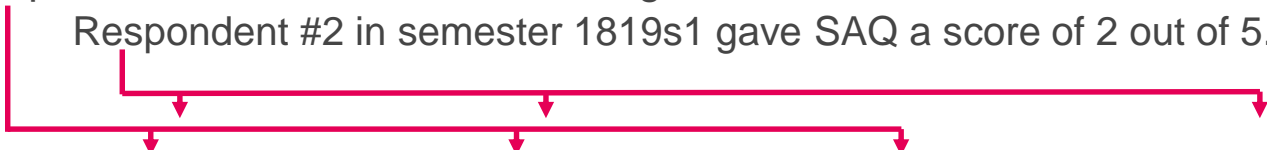
FACT-BASED VS ATTRIBUTE MODELING

ISE Student Questionnaire: **Elementary fact** perspective:

- **Table: contains facts:** groups of attributes that belong together

Respondent #2 in semester 1819s1 gave DB a score of 4 out of 5.

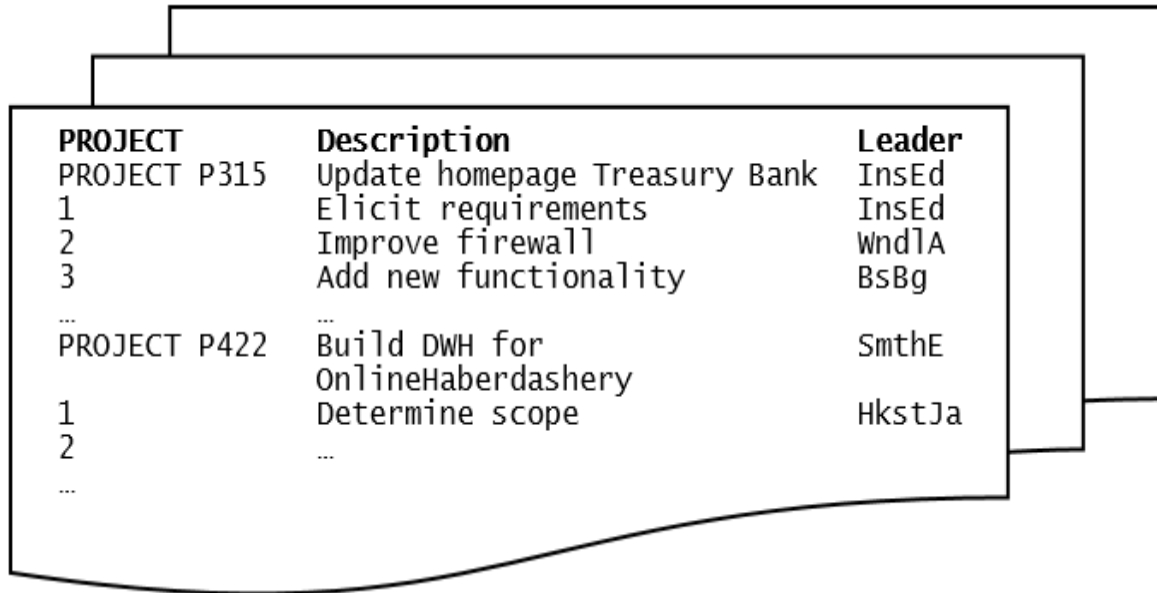
Respondent #2 in semester 1819s1 gave SAQ a score of 2 out of 5.



Semester	ResponseNo	EnjoysDB	EnjoysSAQ
1819s1	1	2	2
1819s1	2	4	2
1819s2	2	3	1
...

Focus: the **molecules** of information, not the atoms

EXAMPLES OF VERBALIZATIONS



PROJECT	Description	Leader
PROJECT P315	Update homepage Treasury Bank	InsEd
1	Elicit requirements	InsEd
2	Improve firewall	WndlA
3	Add new functionality	BsBg
...
PROJECT P422	Build DWH for OnlineHaberdashery	SmthE
1	Determine scope	HkstJa
2
...

Employee InsEd manages project P315.

The description of subproject 2 of project P315 is: Improve firewall.

Subproject 2 of project P315 is led by employee Wndla.

WHY USE VERBALIZATIONS OF FACTS?

Verbalizations of elementary facts:

- Capture the semantics of the data
 - Main issue in practice (>60% of design time)
- Offer a valuable alternative viewpoint
 - Indivisible units of information composed of several Atts that belong together (molecule)
 - Single Att: only a part of info (atom)
- Are independent of modeling technique
 - Do not change in model transformations: ERM, UML, Rel, ...: same verbalizations
- Allow validation by the domain expert

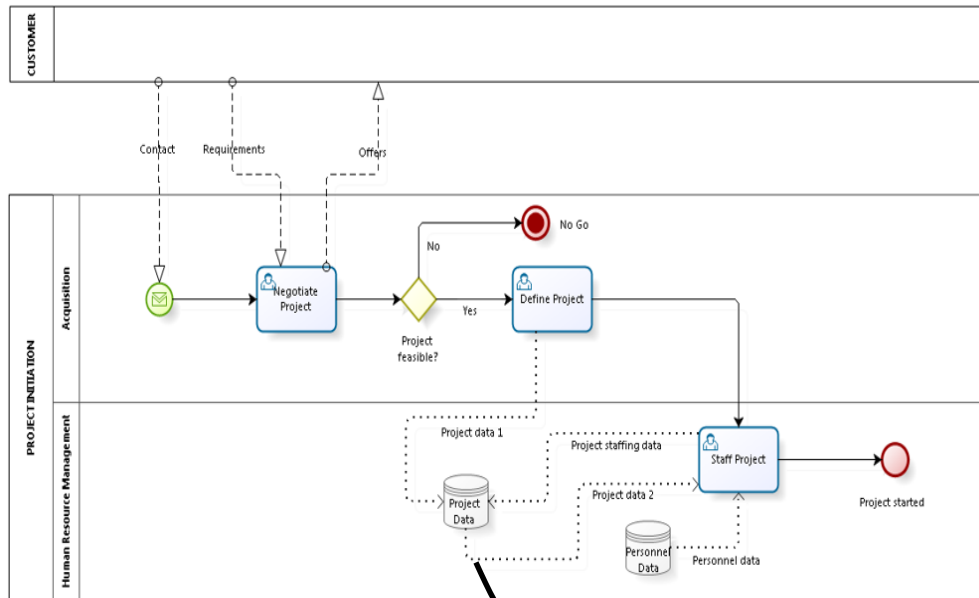
HOW DO THEY HELP A MODELER?

Verbalizing concrete examples of facts:

- Makes the modeler understand the data
- Is done in dialogues between the modeler and the domain expert:
no 'ivory tower' modeling
- Enables an arcane abstract ERM model to be built from familiar concrete facts
- Leads to a good and simple method to draw up an ERM diagram
- Enables easy validation of the model
- Enables adding semantics and examples to the diagram itself where convenient

STARTING POINT

A process model shows data stores and flows: good sources of concrete examples of facts



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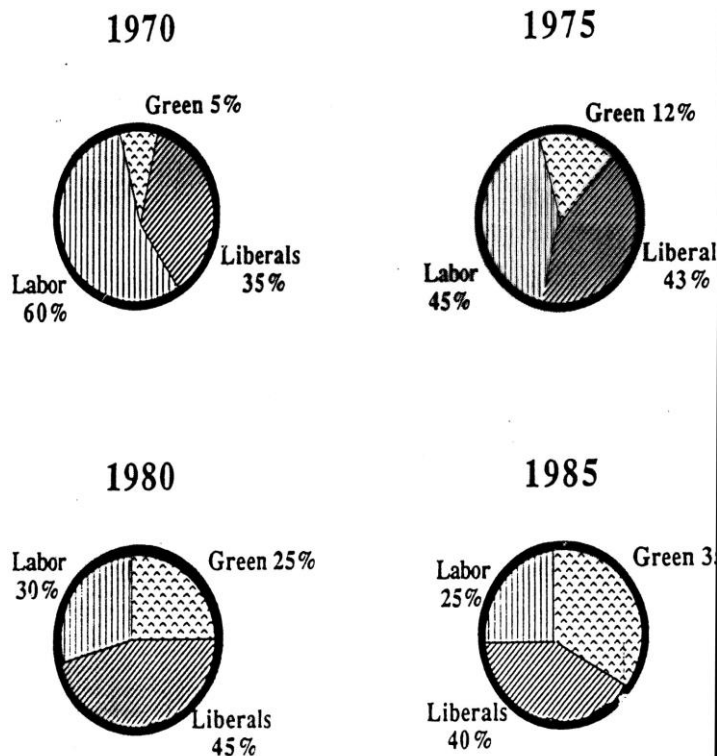
RULES FOR VERBALIZING

- Express exactly one fact per sentence
 - No clusters of facts in one sentence
 - No incomplete facts in a sentence
- Express only what you can highlight
 - Do not count, compare or derive facts
- Do not refer to other expressions
 - Each sentence: stand-alone complete
- Express the meaning very clearly
 - Don't use 'has' all the time

RULES FOR VERBALIZING

- Express exactly one fact per sentence
 - No clusters of facts in one sentence
 - No incomplete facts in a sentence
- **Wrong** (Why? Give correct verbalizations instead):
 - Student S543 has the surname Jones and was born on 3/11/1994.
 - Articles A12, A13 and A14 cost € 3.50 per piece.
 - Subproject 3 has a budget of € 2,500.
(Subprojects are numbered sequentially from 1 in each project)
 - Patient P7788 is on the waiting list.
(Each ward in this hospital has its own waiting list)

RULES FOR VERBALIZING



PERCENTAGE OF THE ELECTORAL VOTE

- Express only what you can highlight
Do not count, compare or derive facts
- **Wrong** (Why? Improve):
 - Three political parties participated in the elections of 1985
 - Green grew mostly at the cost of Labor between 1980 and 1985.
 - Green got the smallest percentage of votes in 1980.

RULES FOR VERBALIZING

- Do not refer to other expressions
Each sentence: stand-alone complete

Wrong (Why? Improve):

- Employee E34 has the surname Jones.
This employee has the first name John.
- The Chevvy that was brought in for repair yesterday needs a new set of tires.
- My sister was born on 23/1/1957.

RULES FOR VERBALIZING

- Express the meaning very clearly
Don't use 'has' all the time

Wrong (Why? Improve):

- Employee E34 has room 25.
- Product P678 has price € 45.00.
- Declaration 45 of employee E34 has date 14/2/2016.
- Project P315 has HRscope 0.4.

VERBALIZE:

If the example is not self-explanatory, ask the domain expert (your teacher)

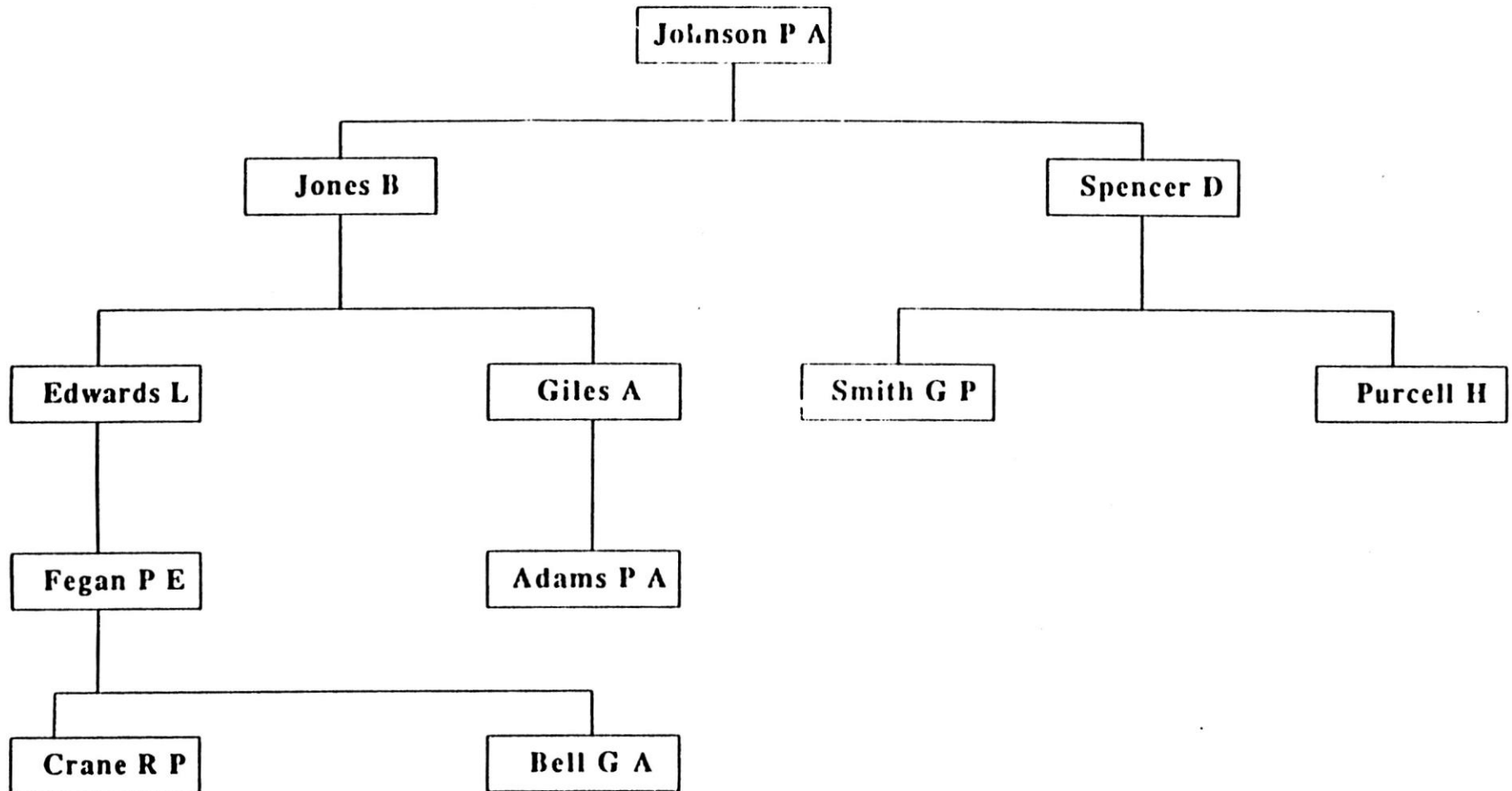
YEAR	MELBOURNE		SYDNEY		BRISBANE	
	M	F	M	F	M	F
1977	2000	2050	1900	1950	1000	1010
1978	1990	2040	1870	1860	1050	1100
1979	1940	2010	1850	1810	1100	1150
etc	etc	etc	etc	etc	etc	etc

VERBALIZE:

If the example is not self-explanatory, ask the domain expert (your teacher)

Patient Nr P1		
Sex <i>F</i>	Birthyear <i>1950</i>	
Date	Diastolic	Systolic
<i>120689</i>	<i>140</i>	<i>185</i>
<i>130689</i>	<i>140</i>	<i>180</i>

VERBALIZE:



VERBALIZE:



VERBALIZE

An elevator operating system needs facts (from sensors) to direct the elevators in an economical way.

Verbalize a few necessary facts.

The image shows a schematic snapshot.

