Data Systematics:
The Metamodel of PSOA RuleML Illustrated by Grailog Visualization

(PDF version: ruleml.org/talks/PSOAMetamodelGrailogWedding.pdf**)**

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Introduction

- [PSOA RuleML](#) builds on a novel data systematics

- Slicing and dicing the [PSOA metamodel cube](#)

- Exemplify with 18 oidless/oidful, tupled/slotted, perspeneutral/perspectival wedding atoms

- Illustrate all kinds of atoms by [Grailog](#) visualization

- Data facts complemented by interoperation rules:

http://wiki.ruleml.org/index.php/PSOA_RuleML_Bridges_Graph_and_Relational_Databases
(syntactic realization for core interoperation path pv1-pv3-pv4-pn4, abridged by PSOA rule)
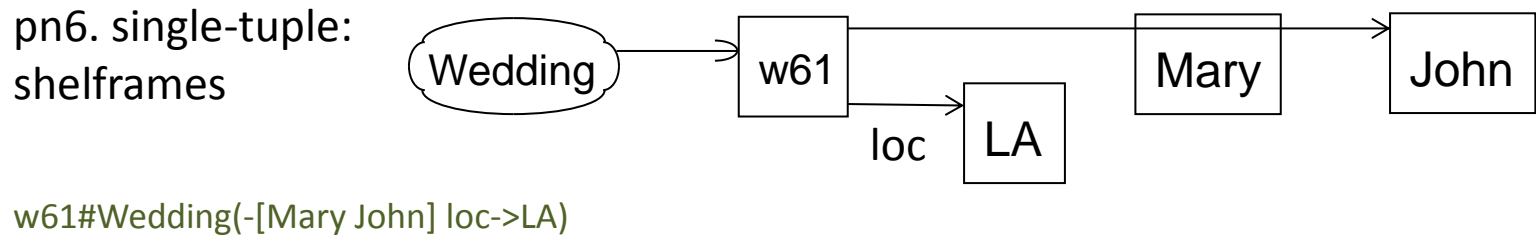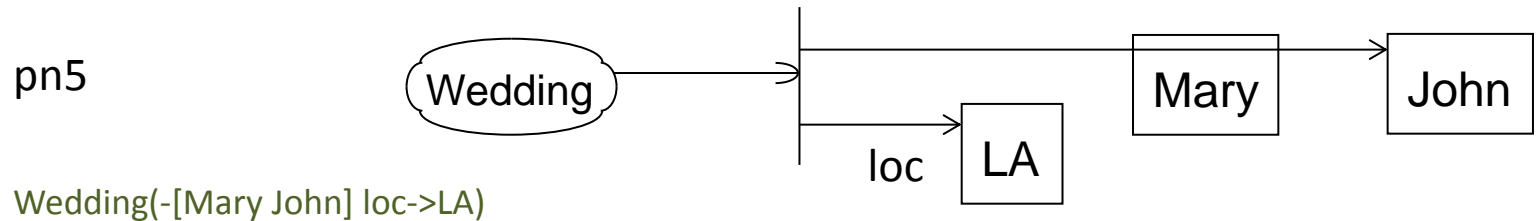
Slicing and Dicing
the PSOA Metamodel Cube

- Via 3 (orthogonal) dimensions, the **full metamodel** cube systematizes 18 kinds of atoms that are contained in (3*3*2 =) 18 unit cubes (units) named pxi (x=n,v,p; i=1,…,6)
- By choosing one of the reductions PDO, DPO, or ODP, users can variously slice and dice the cube, in a kind of (meta)OLAP, initially reducing its 3 dimensions to slices of 2 dimensions:
- PDO reduction, via Perspectivity dimension, to 3 slices, each with 6 units structured by Descriptor-row and OID-column dimensions:
  - 6 perspeneutral units (x=n; i=1,…,6) vs. 6 perspectival units (x=v; i=1,…,6) vs. 6 perspeneutral+perspectival units (x=p; i=1,…,6)
- The **core metamodel** is an 8-unit subcube of the full metamodel cube, which can be reduced, PDO-style, to 2 Perspectivity slices: pn1-pn4 and pv1-pv4
  - Each includes a prominent unit: *frame* atoms (pn4) and *relationship* atoms (pv1)
- DPO reduction (e.g., for full metamodel), via Descriptor dimension, to 3 slices, each with 6 units structured by Perspectivity-row and OID-column dimensions:
  - 6 tupled units (x=n,v,p; i=1,2) vs. 6 slotted units (x=n,v,p; i=3,4) vs. 6 tupled+slotted units (x=n,v,p; i=5,6)
- ODP reduction (e.g., for full metamodel), via OID dimension, to 2 slices, each with 9 units structured by Descriptor-row and Perspectivity-column dimensions:
  - 9 oidless units (x=n,v,p; i=1,3,5) vs. 9 oidful units (x=n,v,p; i=2,4,6)

Exemplifying the Perspectivity Slices

Core oidless/oidful, tupled/slotted atoms that are **p**erspe**n**eutral:
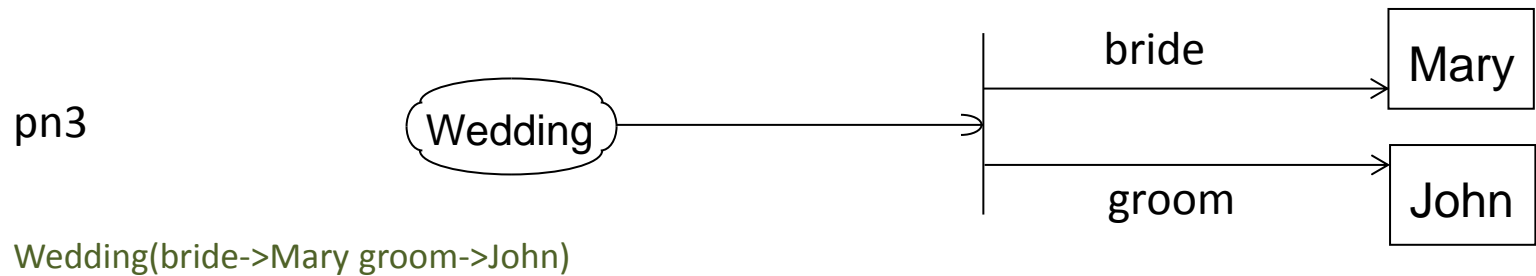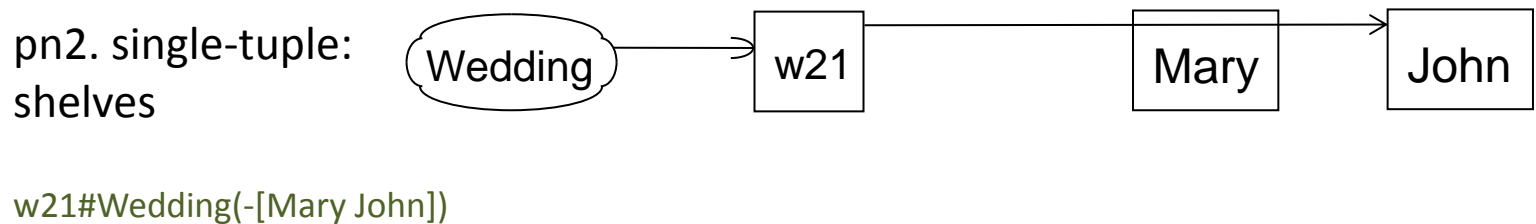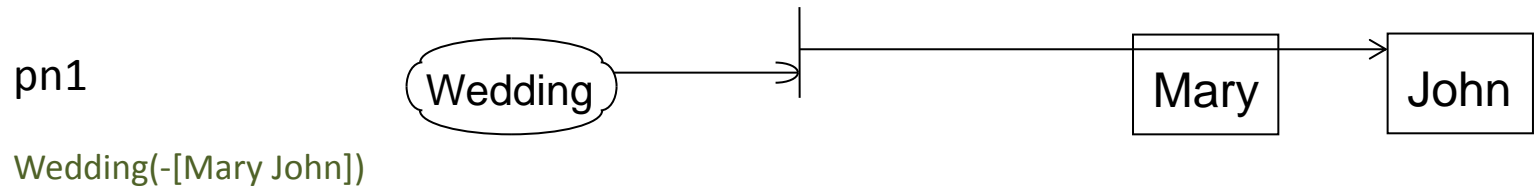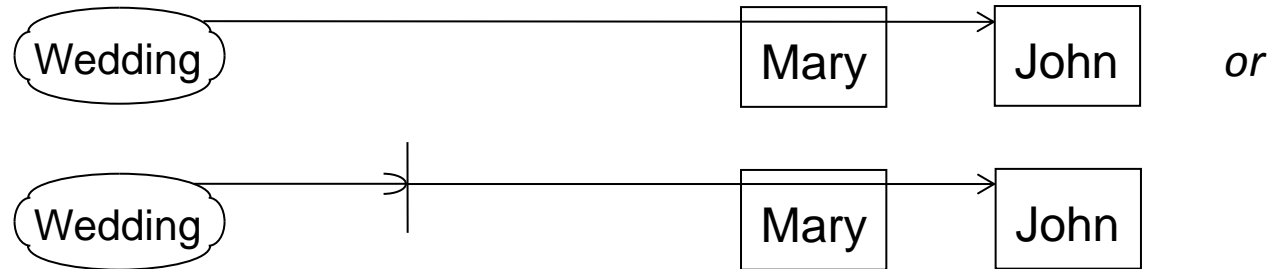

pn1

Wedding(-[Mary John])

pn2. single-tuple: shelves

w21#Wedding(-[Mary John])

pn3

Wedding(bride->Mary groom->John)

pn4: **frames**

w41#Wedding(bride->Mary groom->John)

Extra oidless/oidful, combined tupled+slotted atoms that are **p**erspe**n**eutral:

pn5

Wedding(-[Mary John] loc->LA)

pn6. single-tuple:
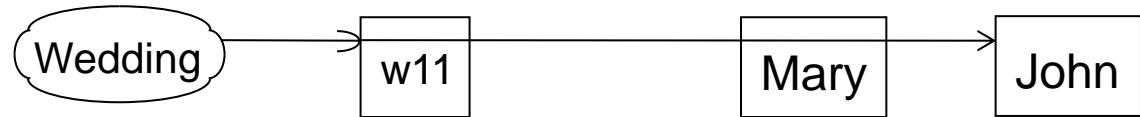shelframes

w61#Wedding(-[Mary John] loc->LA)

Core oidless/oidful, tupled/slotted atoms that are **p**erspecti**v**al:

pv1. single-tuple:
relationships

Wedding — Mary → John *or*

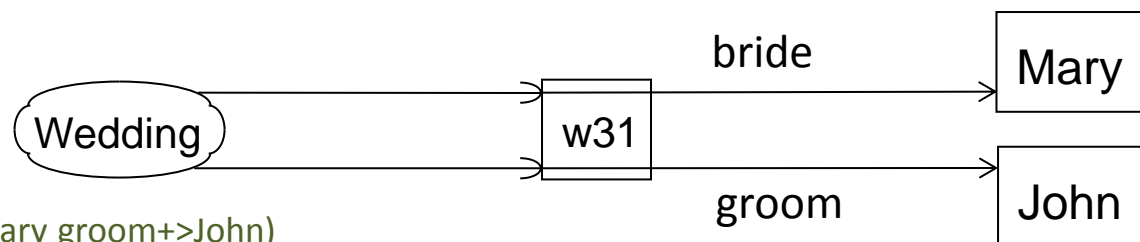Wedding — ⊢ — Mary → John

Wedding(Mary John) *or* Wedding(+[Mary John])

pv2

Wedding → w11 — Mary → John

w11#Wedding(+[Mary John])

pv3: pairships

Wedding — bride → Mary

Wedding — groom → John

Wedding(bride+>Mary groom+>John)

pv4
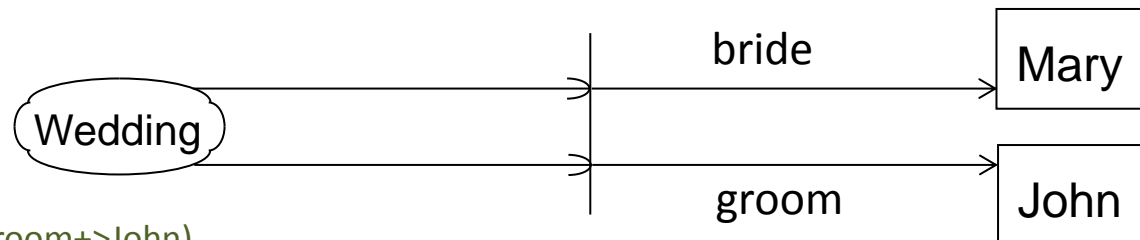
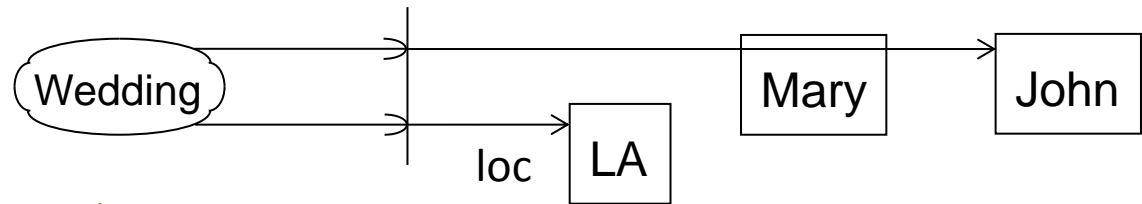Wedding → w31 — bride → Mary

w31 — groom → John

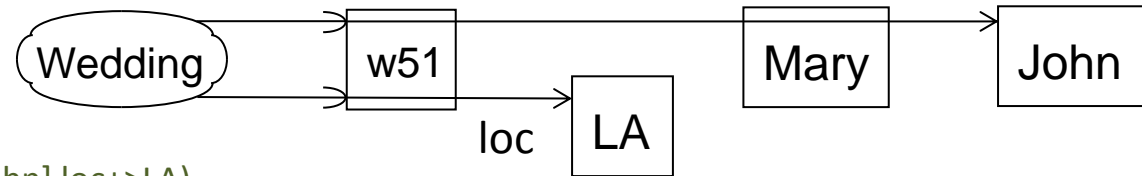w31#Wedding(bride+>Mary groom+>John)

Extra oidless/oidful, combined tupled+slotted atoms that are **p**erspecti**v**al:
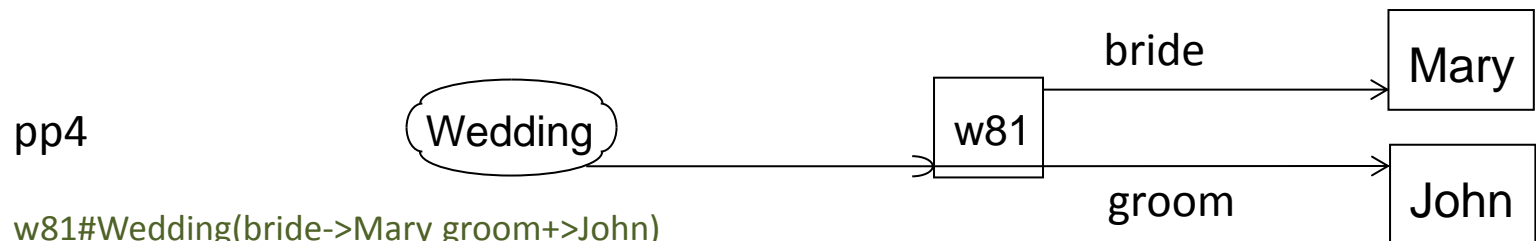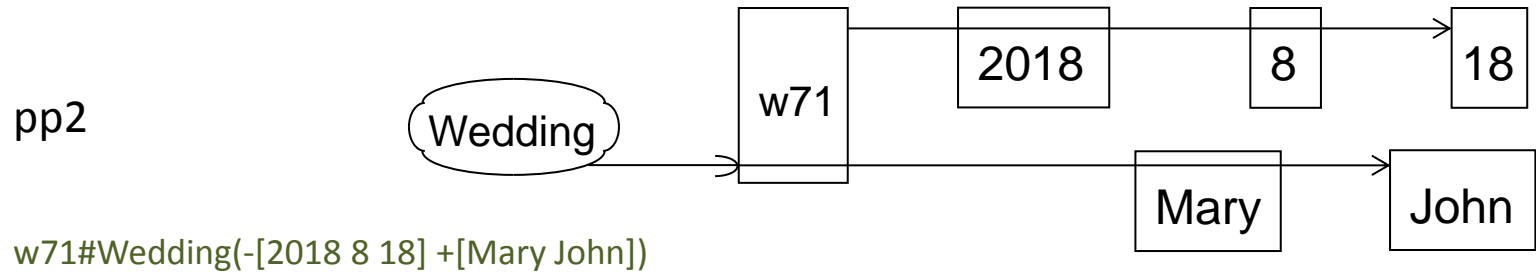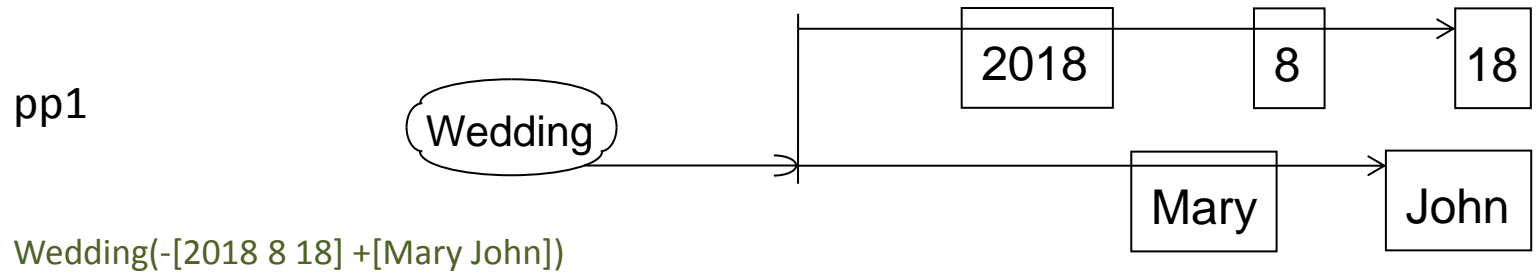
pv5. single-tuple:
relpairships


Wedding(+[Mary John] loc+>LA)

pv6

w51#Wedding(+[Mary John] loc+>LA)

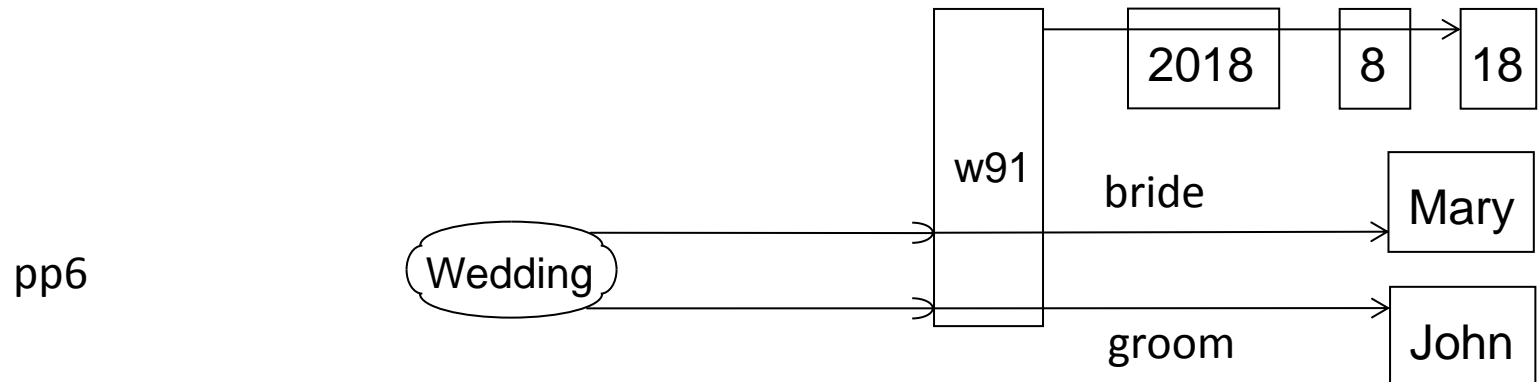Adding oidless/oidful, tupled/slotted, combined **p**erspeneutral+**p**erspectival atoms:

pp1

Wedding(-[2018 8 18] +[Mary John])

pp2

w71#Wedding(-[2018 8 18] +[Mary John])

pp3

Wedding(bride->Mary groom+>John)

pp4

w81#Wedding(bride->Mary groom+>John)

8

Also oidless/oidful, combined tupled+slotted, combined **p**erspeneutral+**p**erspectival:

pp5

2018   8   18

bride   Mary

Wedding

groom   John

Wedding(-[2018 8 18] bride+>Mary groom+>John)

pp6

w91
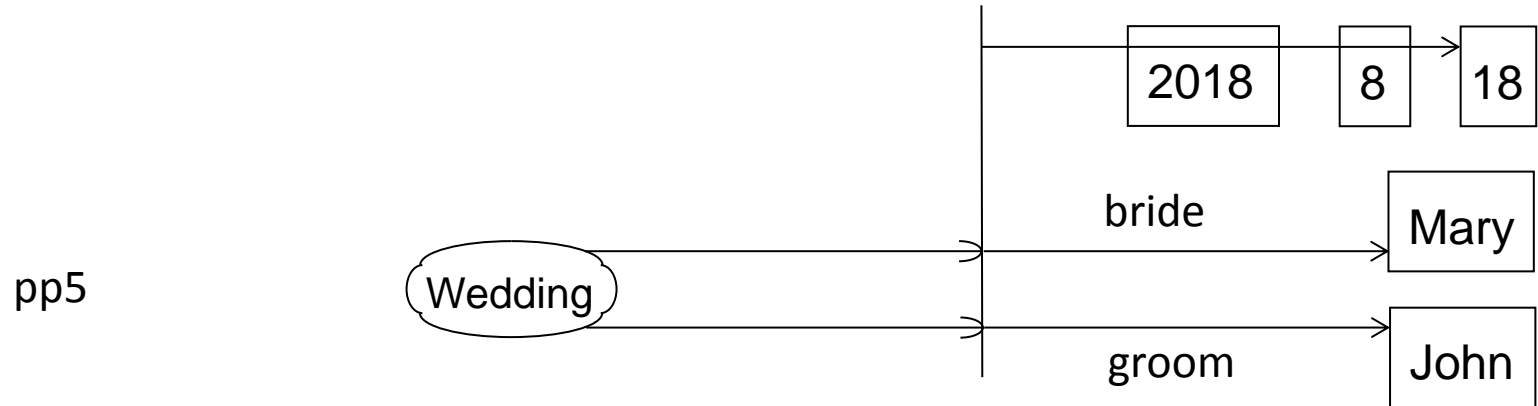
2018   8   18

bride   Mary

Wedding

groom   John

w91#Wedding(-[2018 8 18] bride+>Mary groom+>John)