Increasing Data Reliability in Business Processes

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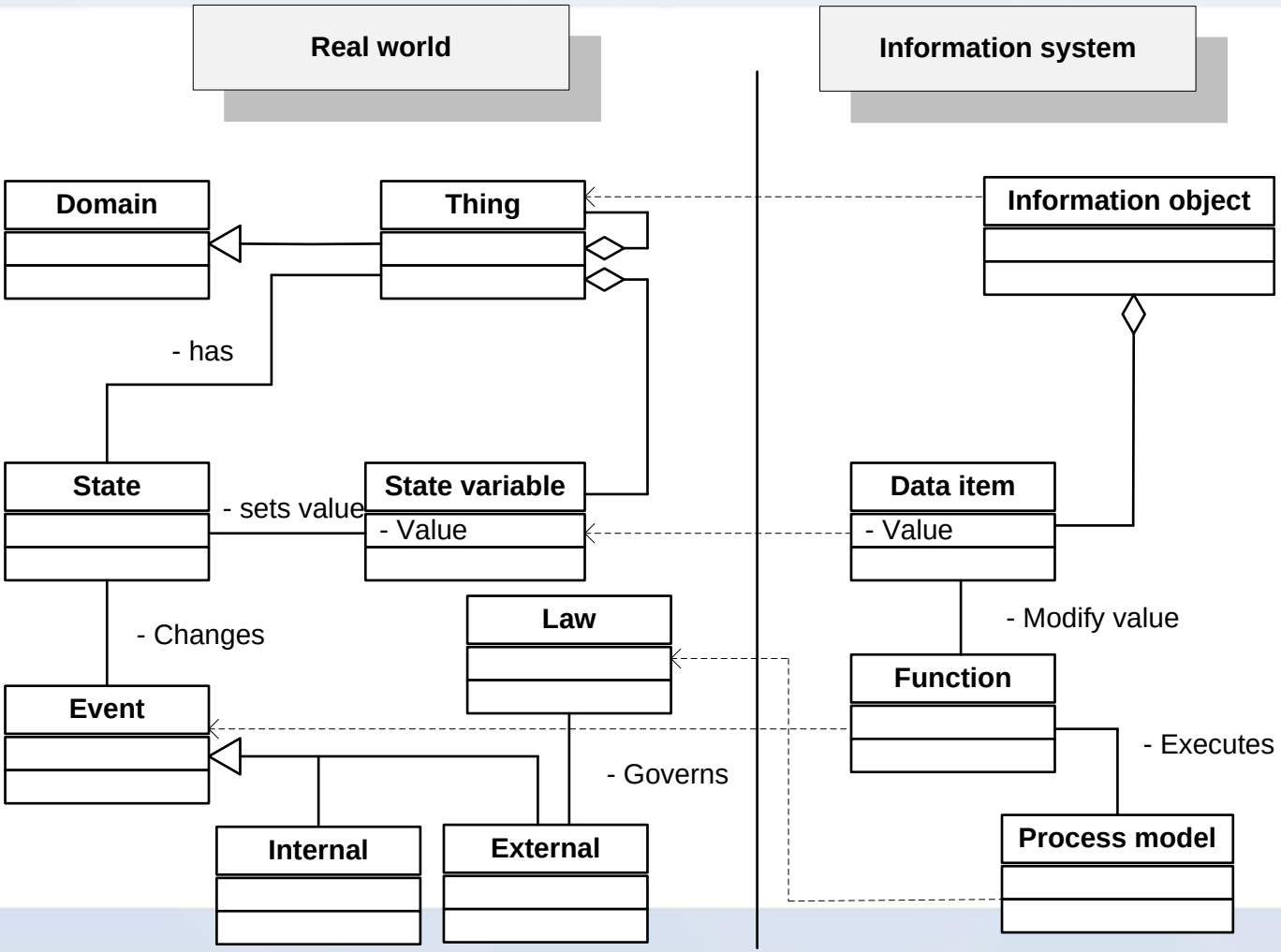
Business processes

- A **business process** is a collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers.
- It often can be visualized with a flowchart as a sequence of activities with interleaving decision points.

Data inaccuracy

1- Generic Process Model (GPM) :

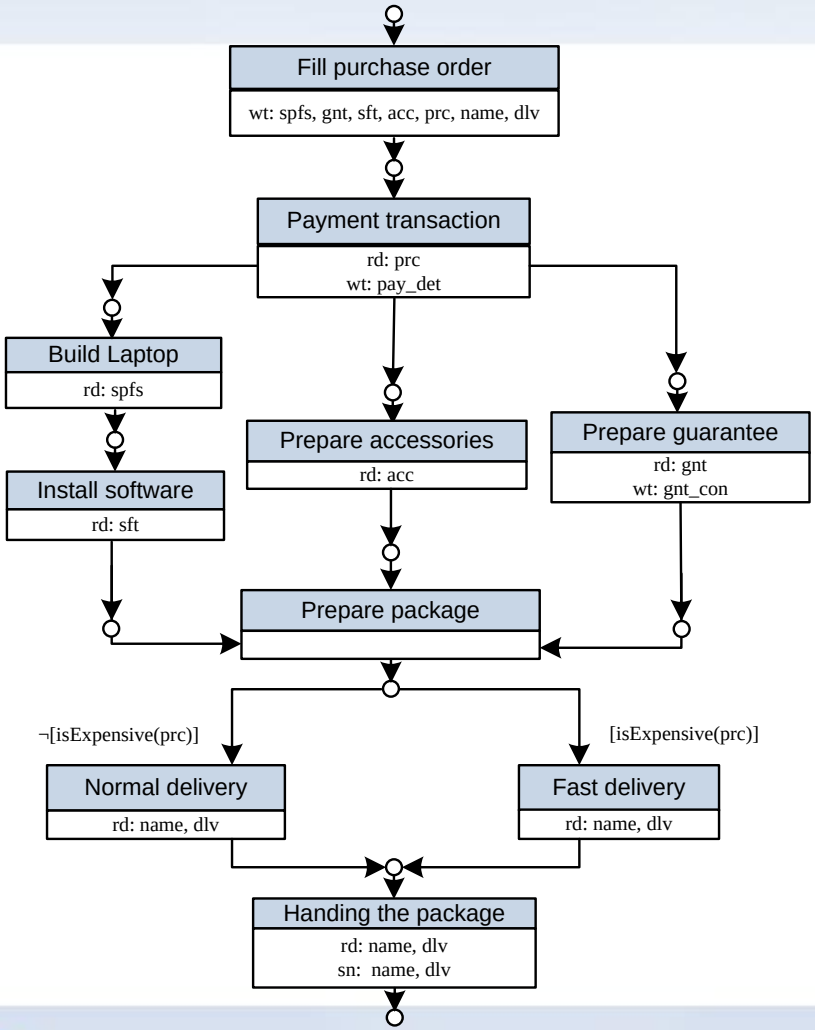


Data inaccuracy

2- Data inaccuracy formalization

- A domain state X = {x1, x2, . . . , xn}, is truly reflected by an information system R={d1, d2,. . . ,dn} **IFF** *xi = di* for all corresponding couple <xi, di>.
- **Inaccuracy** of data is a situation where, there is a corresponding couple <xi, di> such that *xi ≠di.*

Workflow net with data (WFD-net)



Workflow net with data (WFD-net) N = <P, T,F, rd, wt, del, grd, sn > consists of

a WF-net <P, T, F> :

P is a non-empty and finite set of places,

T is a non-empty and finite set of transitions,

F is a flow relation,

And

a reading data labeling function rd : $T \rightarrow 2^D$,

a writing data labeling function wt : $T \rightarrow 2^D$,

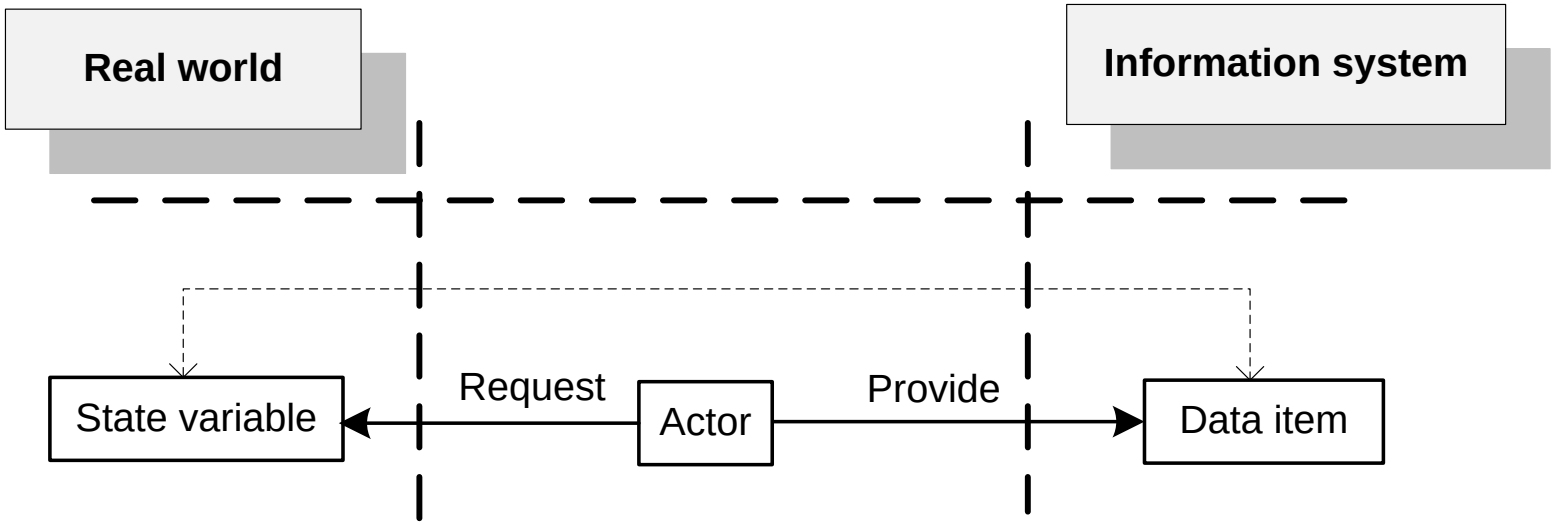
a deleting data labeling function del : $T \rightarrow 2^D$,

a data synch labeling function sn : $T \rightarrow 2^D$,

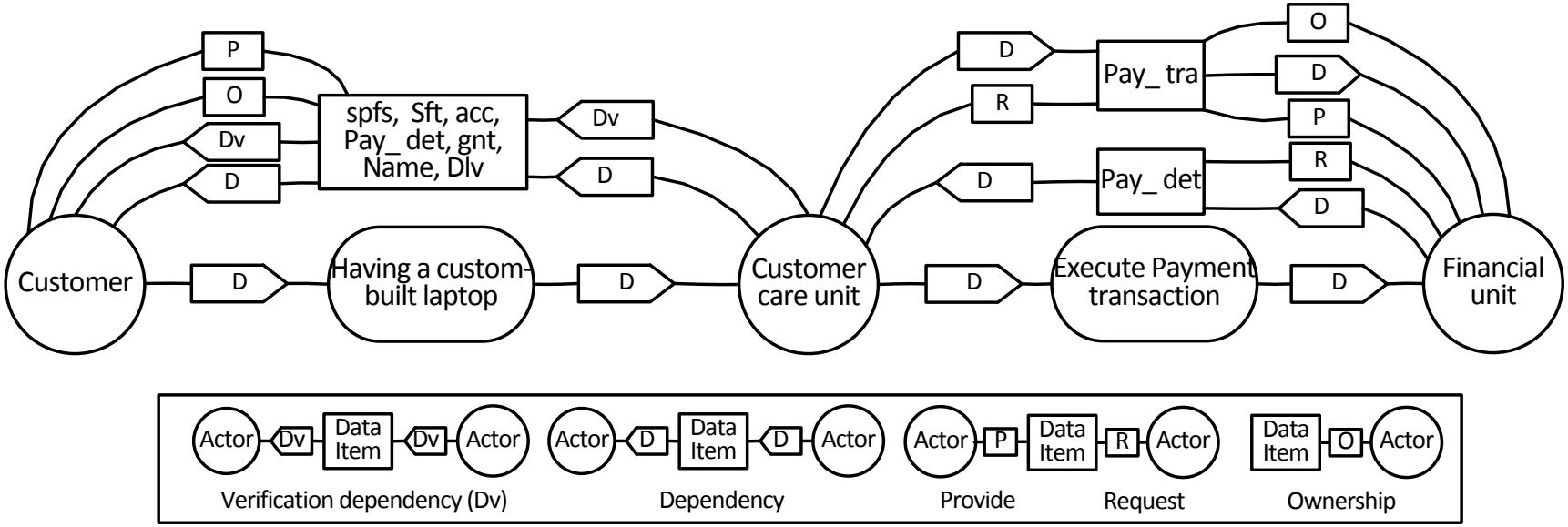
a guard function grd : $T \rightarrow G^D$ assigning guards to transitions.

D = <d1, … , dm> is a finite set of data elements, and a set of all guards is denoted by GD .

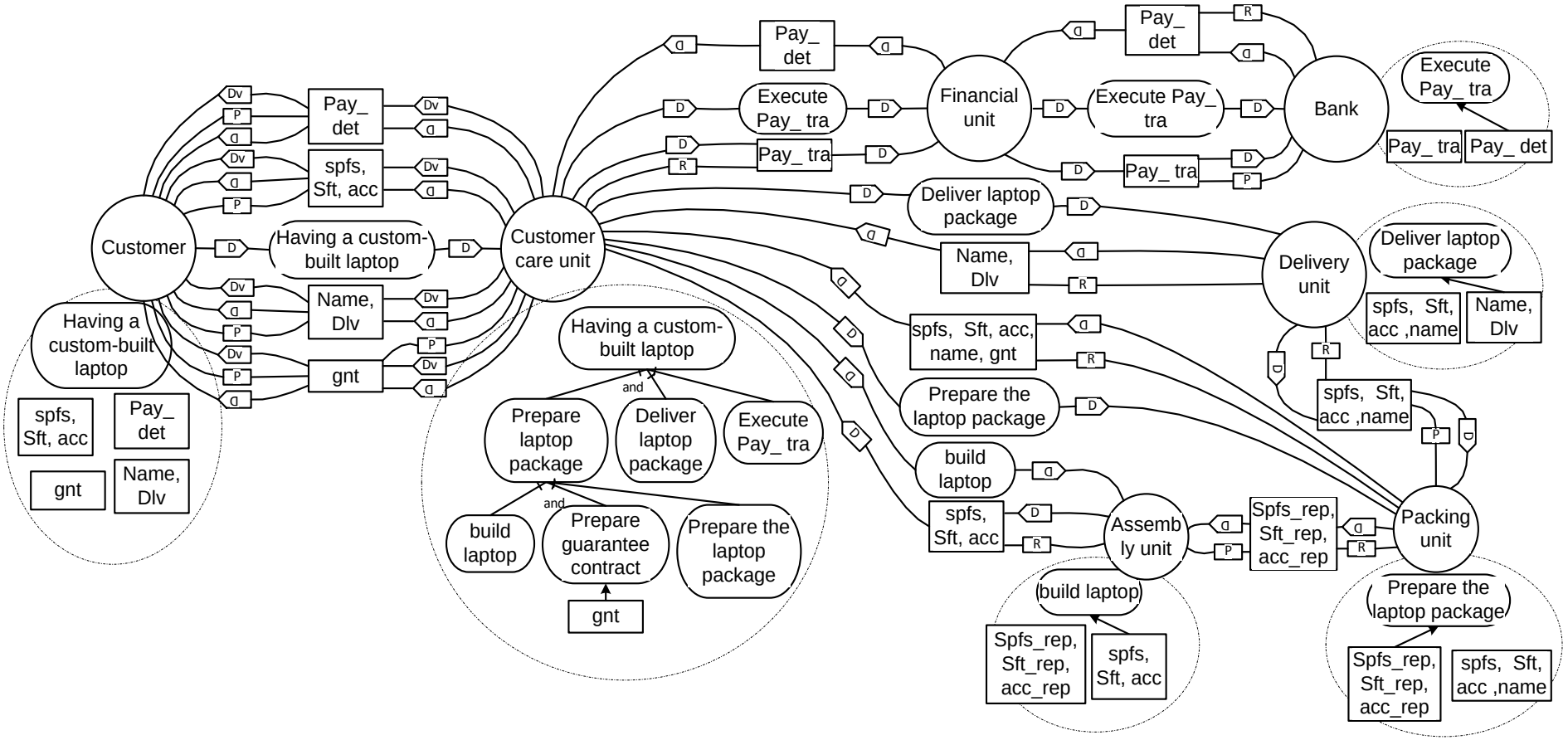
Actors and data verification



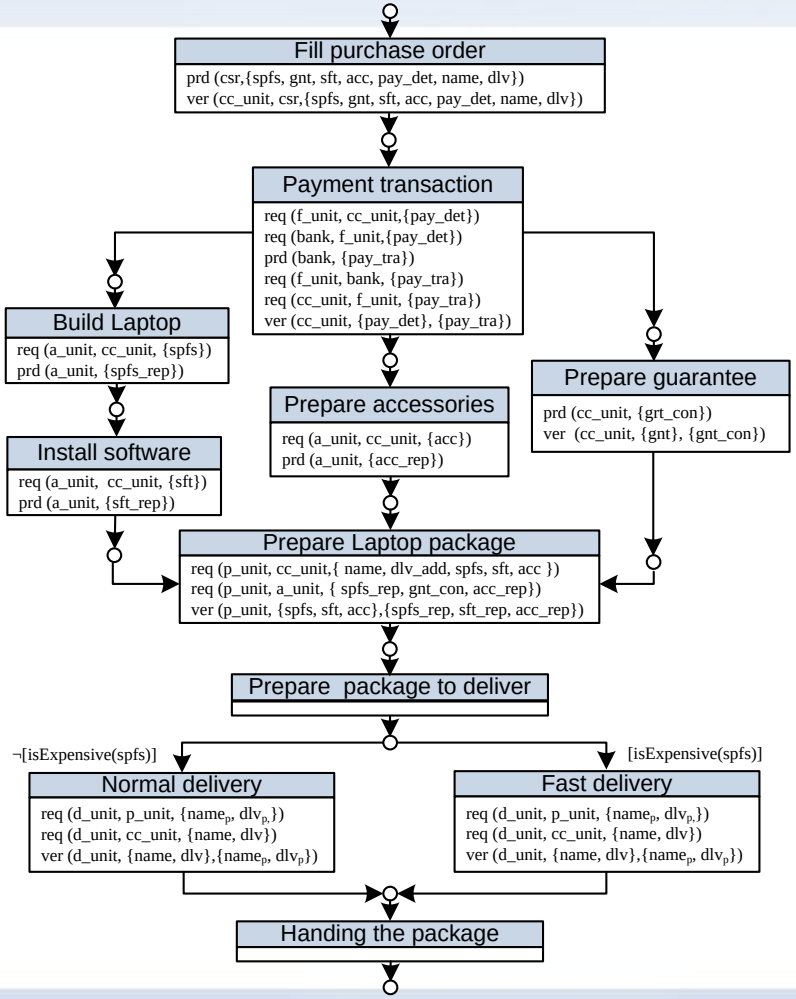
i*/Tropos


P
O
Dv
D
spfs, Sft, acc, Pay_ det, gnt, Name, Dlv
Dv
D
Customer
D
Having a custom-built laptop
D
Customer care unit
D
R
Pay_ tra
D
Pay_ det
O
D
P
R
D
D
Execute Payment transaction
D
Financial unit
Actor
Dv
Data Item
Dv
Actor
Verification dependency (Dv)
Actor
D
Data Item
D
Actor
Dependency
Actor
P
Data Item
R
Actor
Provide
Request
Data Item
O
Actor
Ownership

i*/Tropos


Customer
Having a custom-built laptop
spfs, Sft, acc
Pay_ det
gnt
Name, Dlv
Pay_ det
spfs, Sft, acc
Name, Dlv
gnt
Having a custom-built laptop
Customer care unit
Pay_ det
Execute Pay_ tra
Pay_ tra
Financial unit
Pay_ det
Execute Pay_ tra
Pay_ tra
Bank
Execute Pay_ tra
Pay_ tra
Pay_ det
Deliver laptop package
Name, Dlv
spfs, Sft, acc, name, gnt
Prepare the laptop package
build laptop
spfs, Sft, acc
Assembly unit
Spfs_rep, Sft_rep, acc_rep
Packing unit
Delivery unit
Deliver laptop package
spfs, Sft, acc ,name
Name, Dlv
spfs, Sft, acc ,name
Having a custom-built laptop
and
Prepare laptop package
Deliver laptop package
Execute Pay_ tra
and
build laptop
Prepare guarantee contract
Prepare the laptop package
gnt
(build laptop)
Spfs_rep, Sft_rep, acc_rep
spfs, Sft, acc
Prepare the laptop package
Spfs_rep, Sft_rep, acc_rep
spfs, Sft, acc ,name

Workflow net with data (WFDA-net)

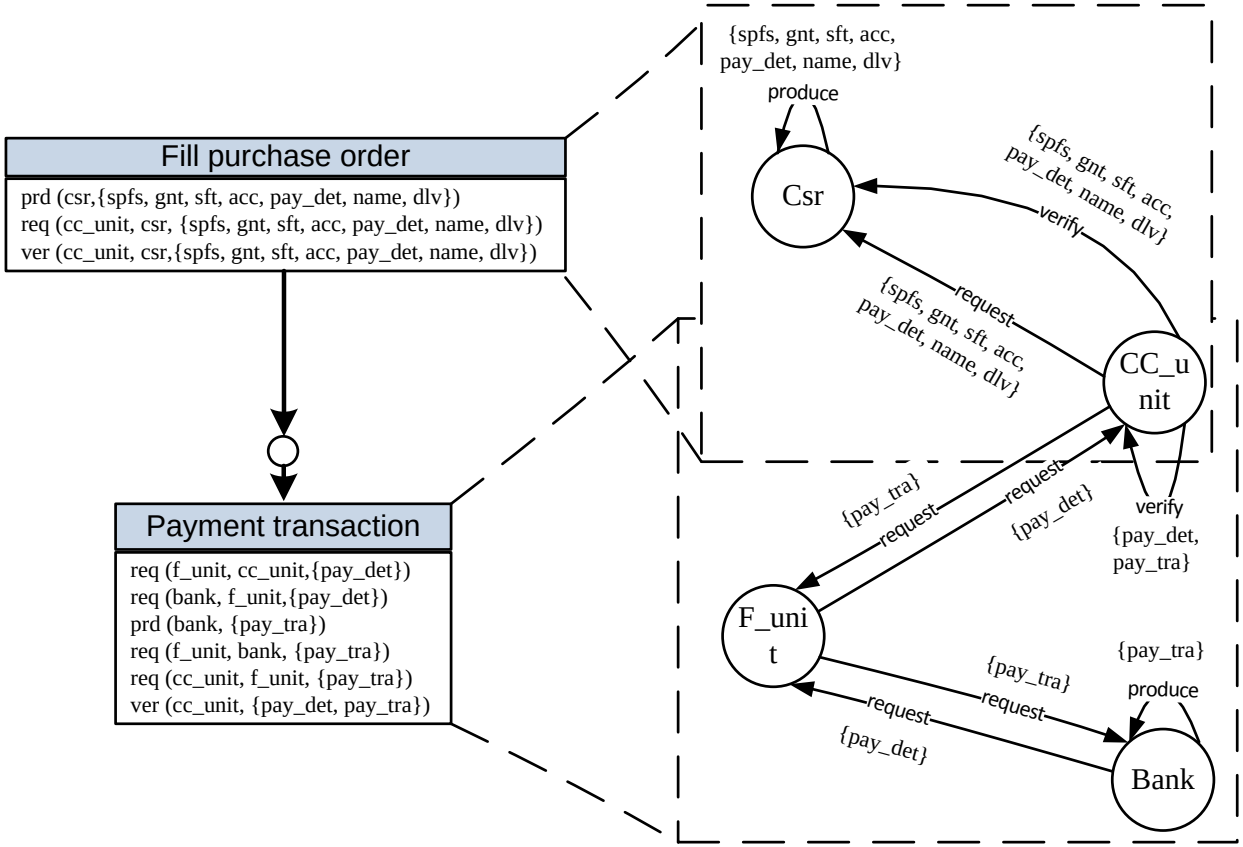


Workflow net with data (WFDA-net) N = <P, T, F, prd, req, ver, grd > consists of

a WF-net <P, T, F> :
P is a non-empty and finite set of places,
T is a non-empty and finite set of transitions,
F is a flow relation,
And
a prd(a, {d1, d2, . . . , dn}),
a req(a, b, {d1, d2, . . . , dn}),
a ver(a, b, {d1, d2, . . . , dn}),
a ver(a, {d1, d2, . . . , dn}, {d1', d2', . . . , dn'})
a guard function grd : $T \rightarrow G^D$ assigning guards to transitions.

D = <d1, … , dn,d1',…dn' > is a finite set of data elements, A= <a1,…,an> is a finite set of actors, and a set of all guards is denoted by GD .

Adding actors to WFD-nets



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Questions ?