From MODEL-BASED REQs to CONTRACTUAL REQS

2019 Acquisition Research Symposium

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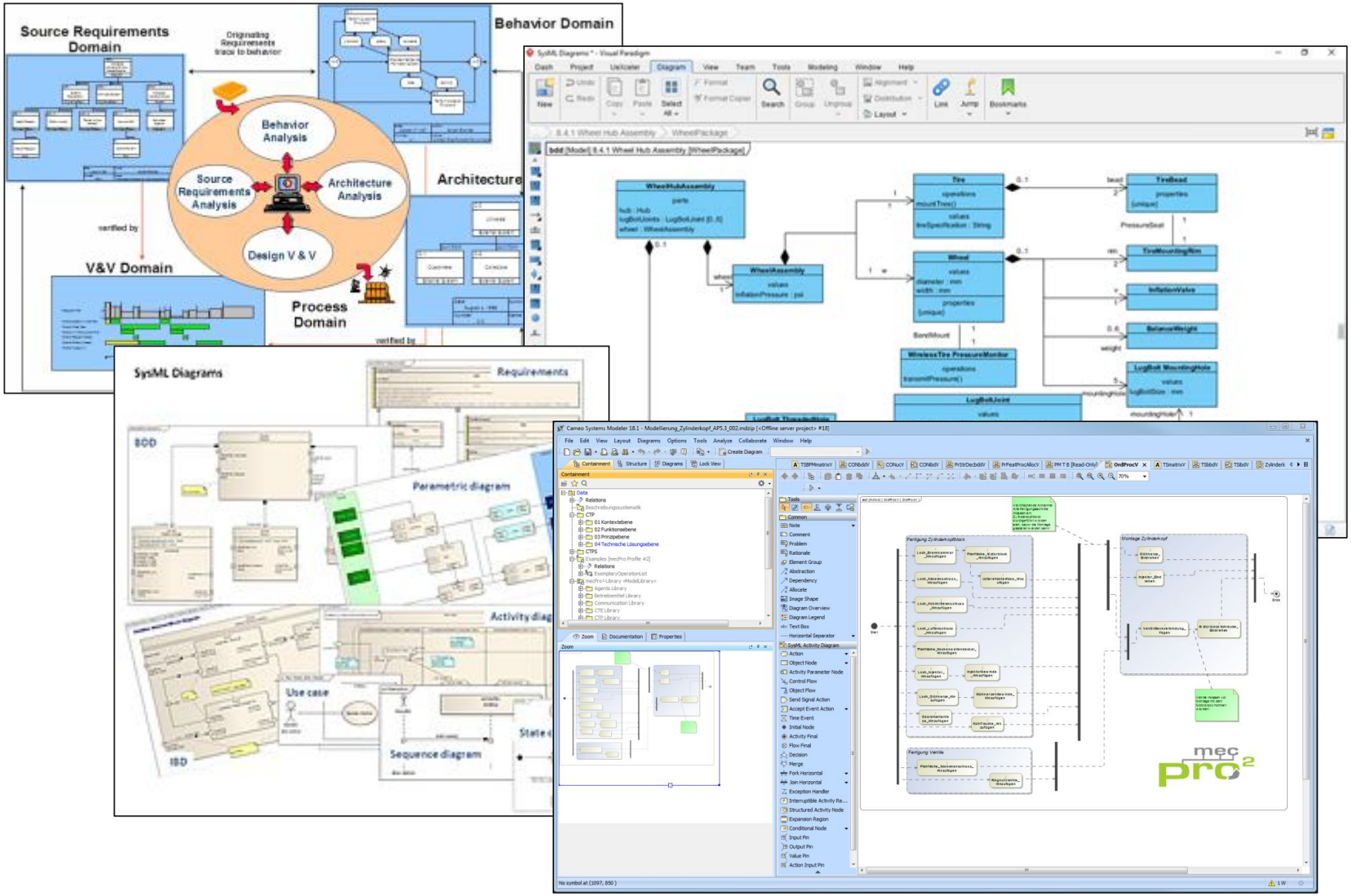
MBSE is awesome



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The system shall sdgsgsrgsregwergwerg.

The system shall aojaionsfiusduin.

The system shall aojnaradfv.

The system shall adgaergsrth.

The system shall wergwergwergw.

The system shall sadfasdcasdc.

The system shall wergwergwerg.

The system shall wefvwefv.

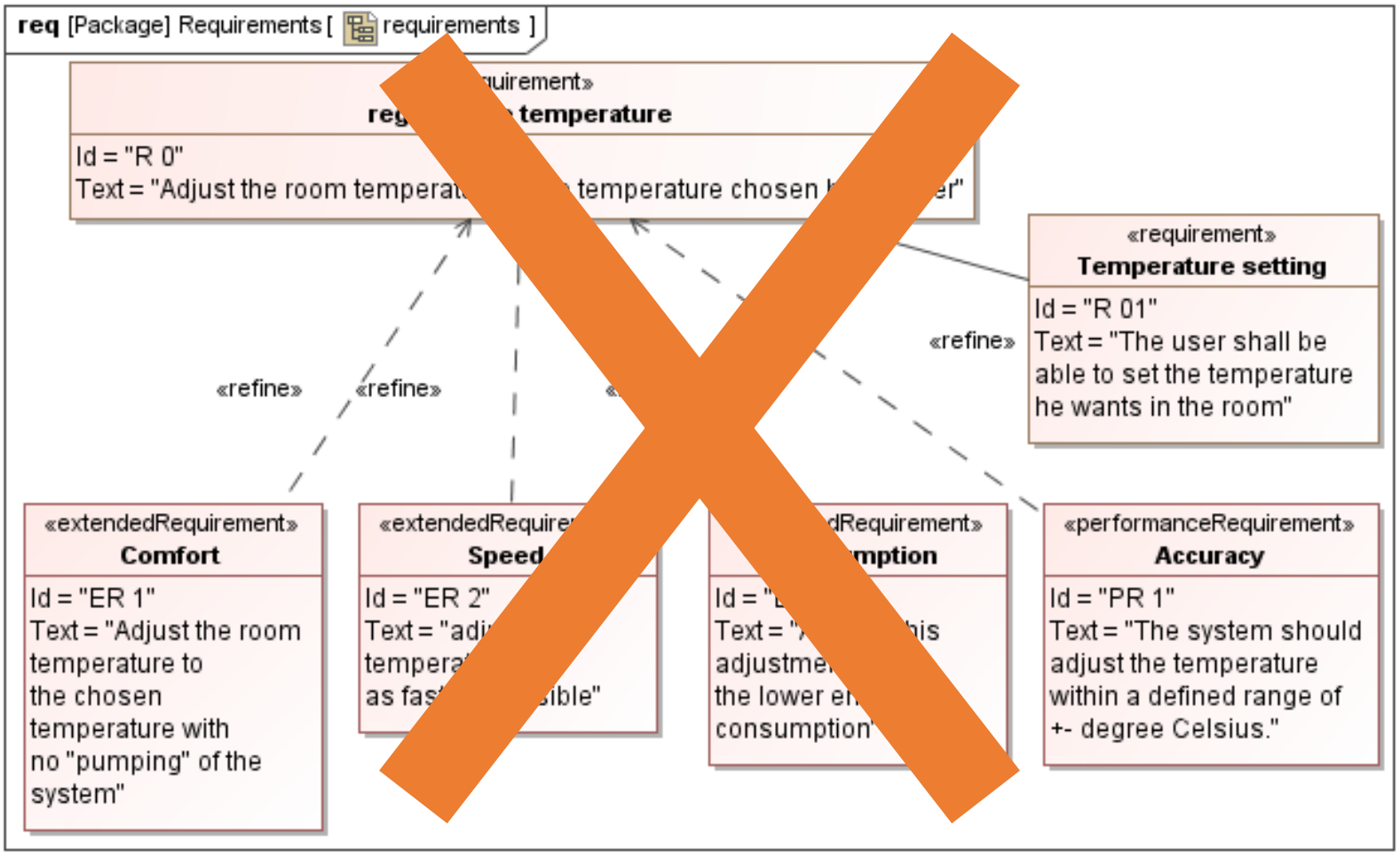
The system shall sdfgsdg.

The system shall kuiyklyu.

The system shall sdfvsrgrtg.

The system shall bfgnfghmy.

The system shall asdasdgaergwer.



Source: https://docs.nomagic.com/display/SYSMLP182/Requirement+Diagram

TOWARDS TRUE REQUIREMENT MODELS

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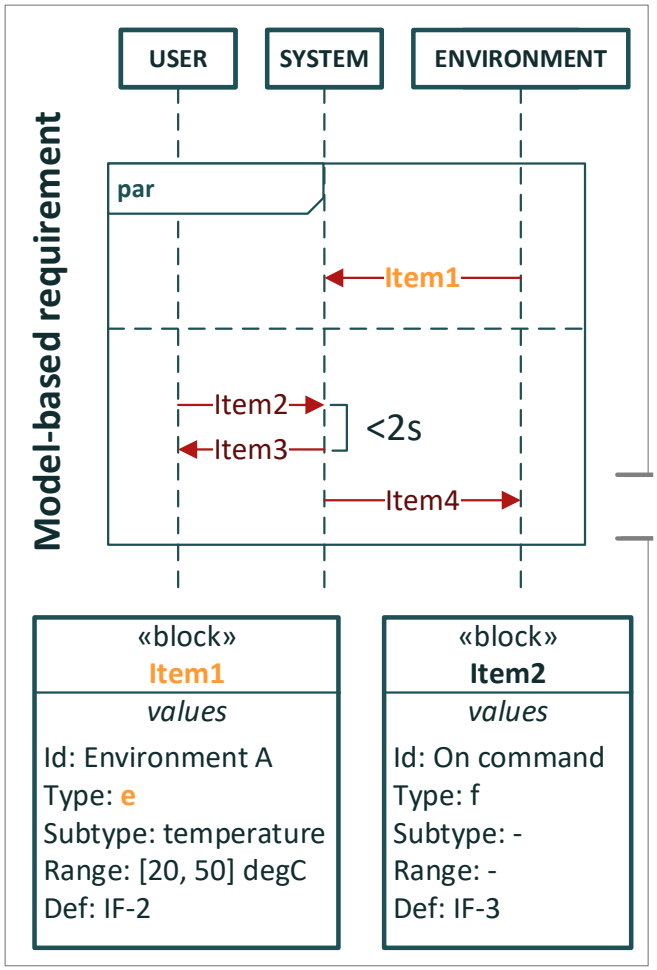


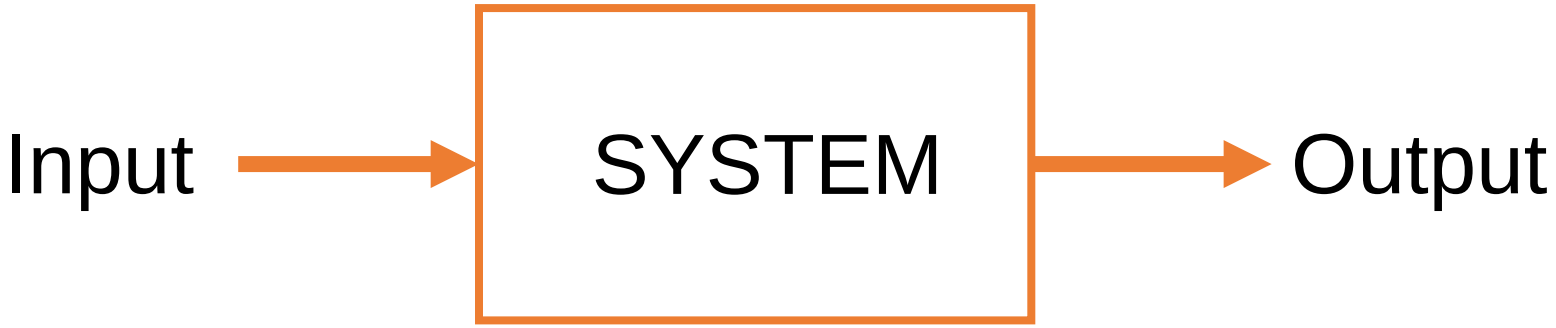
4 FOUNDATIONS

MATHEMATICAL CONSTRUCT Wymore, 1993

INTERFACE TYPOLOGY Various authors

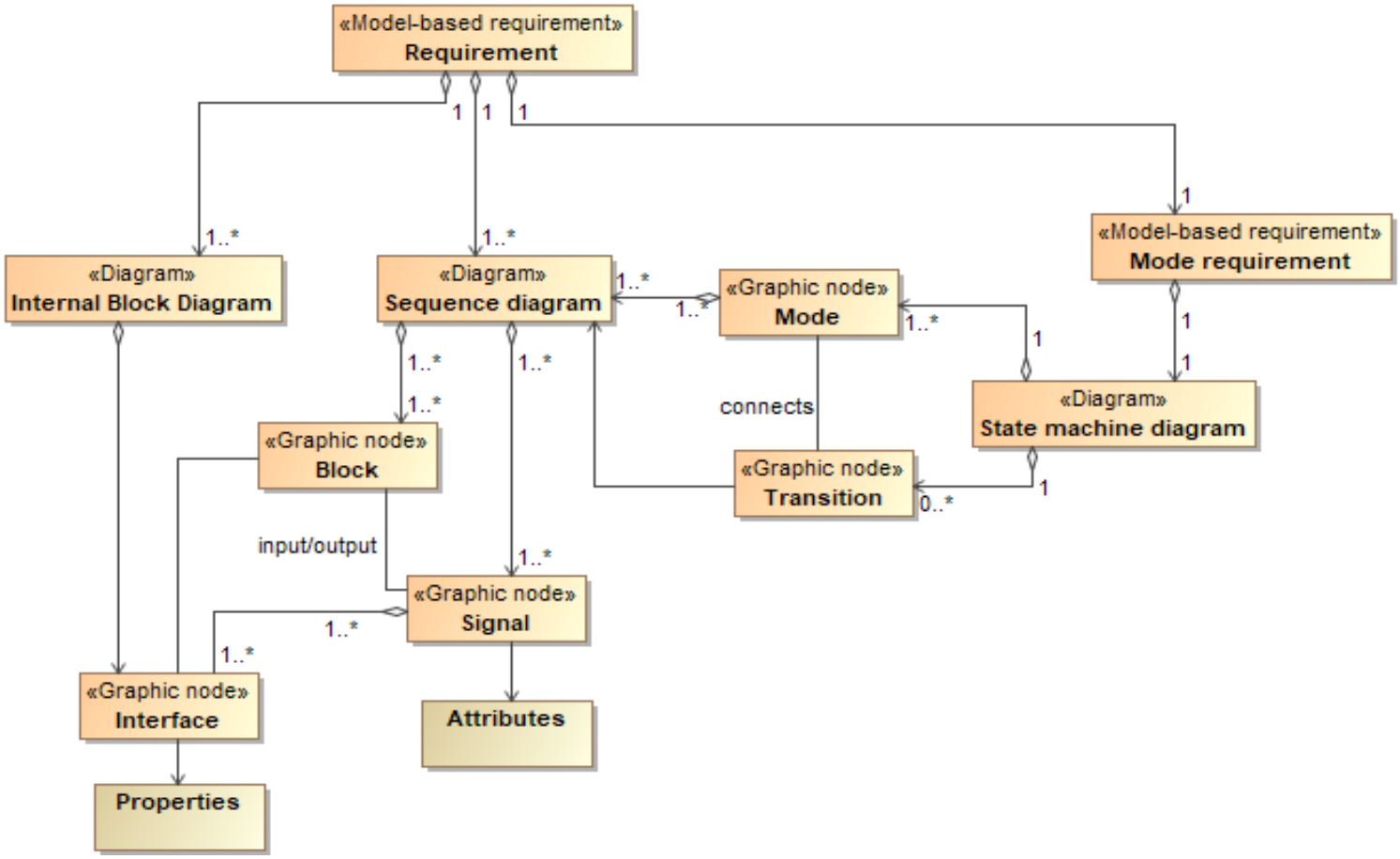
TEXTUAL CONSTRUCT INCOSE, 2012

REQUIREMENT TYPOLOGY Salado & Nilchiani, 2014



A system transforms inputs into outputs

A set of requirements defines a minimal transformation set of inputs into outputs



The system shall provide a signal through a physical interface.

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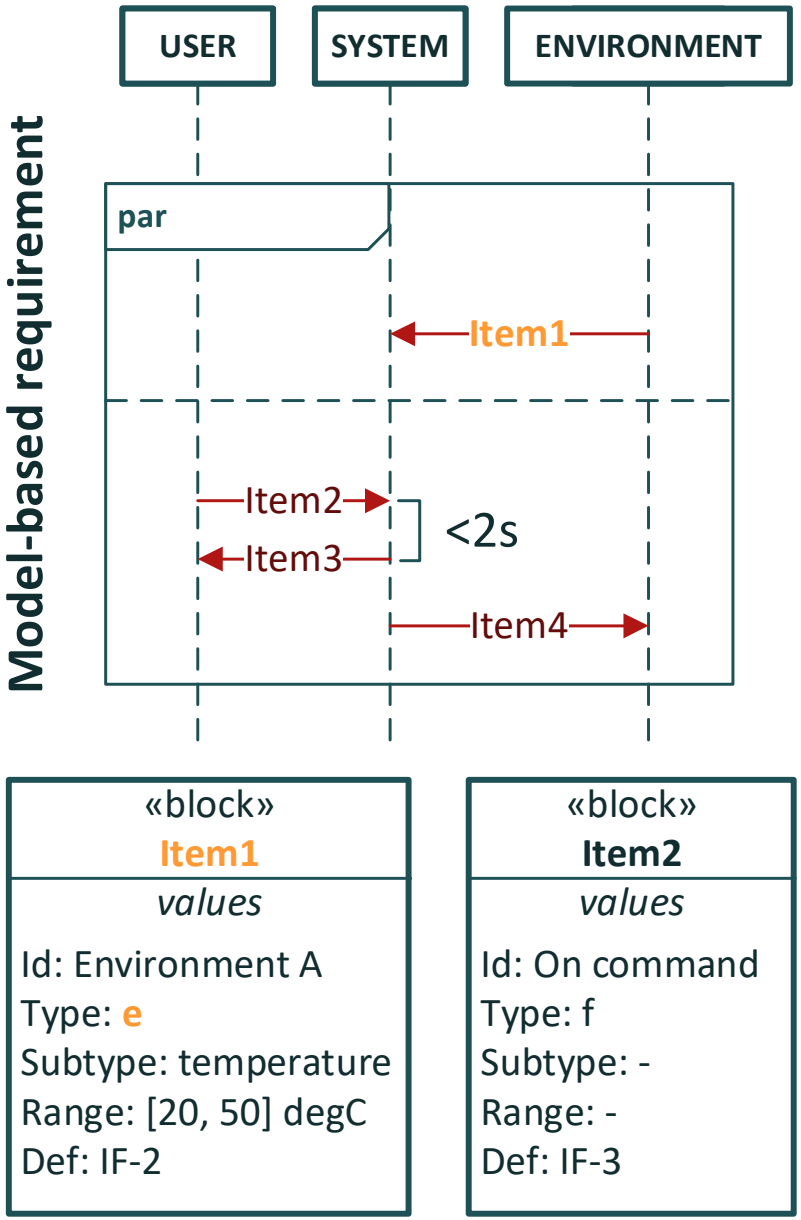


2 classes of seq diagrams

TYPESof interfaces

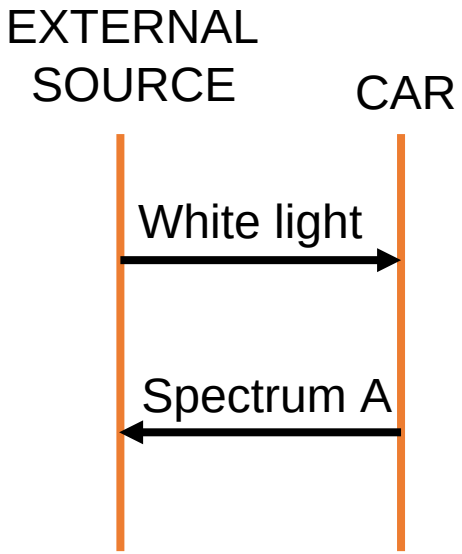
- Physical connection
- Energy flow
- Mass flow
- Information flow

Which ones are usually captured with sequence or state diagrams?

Can Wymore capture them all?

WHAT	Functional transformation
HOW WELL	Performance of the transformation
WITH WHAT	Resources employed
WHERE	Environment where transformation occurs

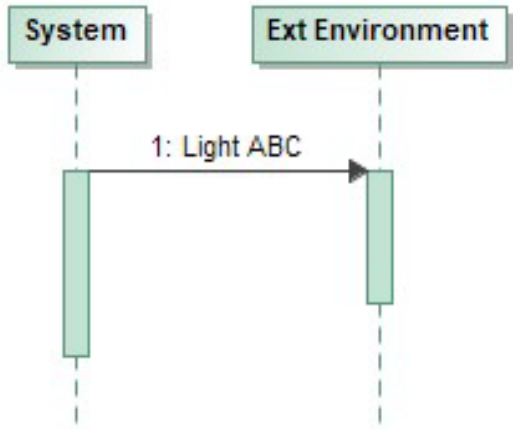
What about color?

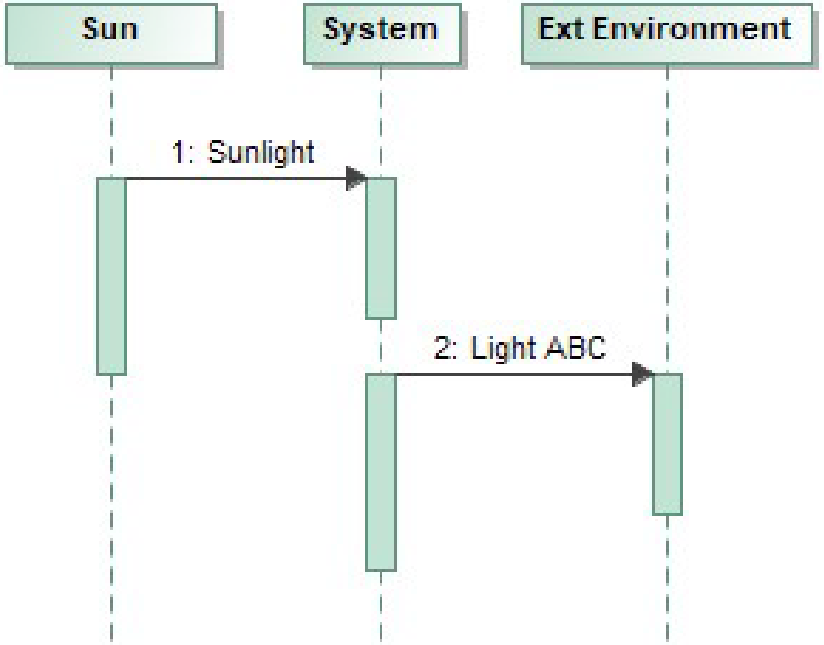


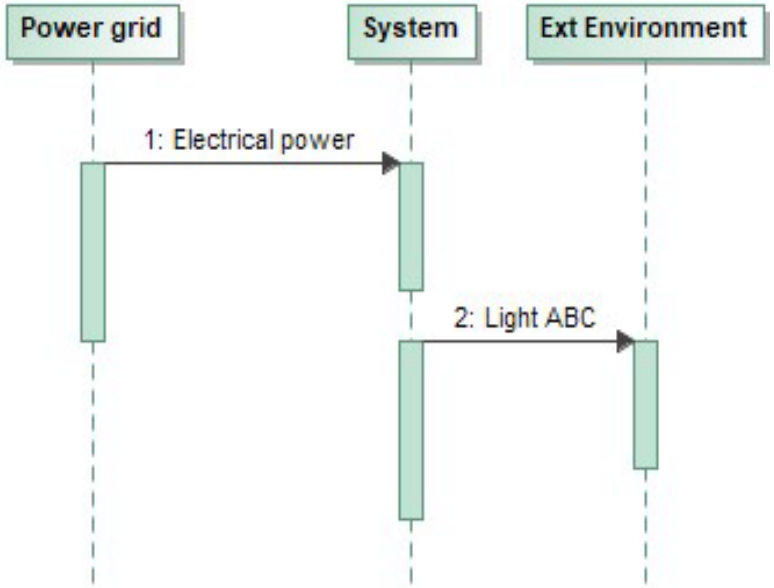
The system shall exhibit color ABC.

The system shall accept input light XYZ.

The system shall reflect light ABC when receiving input light XYZ.







The system shall <action> <object> <modifier 1> <modifier 2> <modifier 3> … <modifier n>.

Algorithm (sample)

for each element in Diagram 1

  createreq(element)

end

Algorithm (sample)

```
for each element in Diagram 1
  createreq(element)
end
```

```
createreq(Item1):
  if item1.type=e &syst.direction(item1)=in
    <req1.action>=”operate”
    <req1.object>=”in”&item1.subtype &
     “range”&item1.range
    <req1.modifier1>=”when fulfilling
     requirements”
    <req1.modifier2>=reqs(Diagram1)
    <req1.modifier 3>=”Note: Interface defined
     in”&item1.Def
  if item1.type=f &syst.direction(item1)=in
    <req1.action>=”accept”
    <req1.object>=item1.Id
    <req1.modifier>=”according to IF defined
     in”&item1.Def
  if item1.type=f &syst.direction(item1)=out
    <req1.action>=”provide”
    ...
```

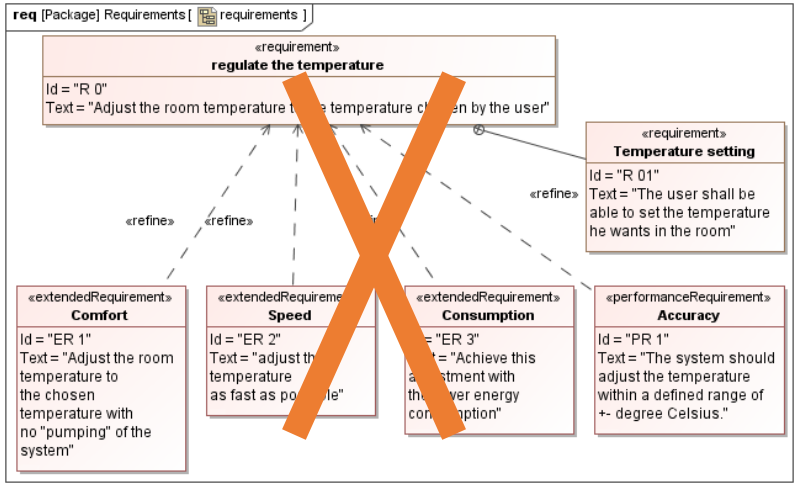
BENEFITS

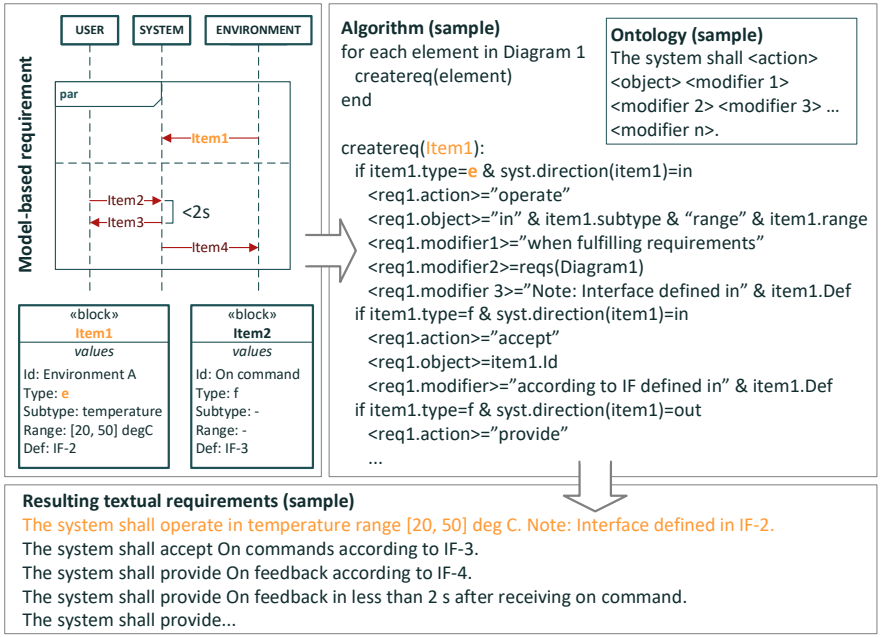
Consistent grammar

Requirement coverage

Requirement inconsistency

WRAPPINGUP





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THANK YOU

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