

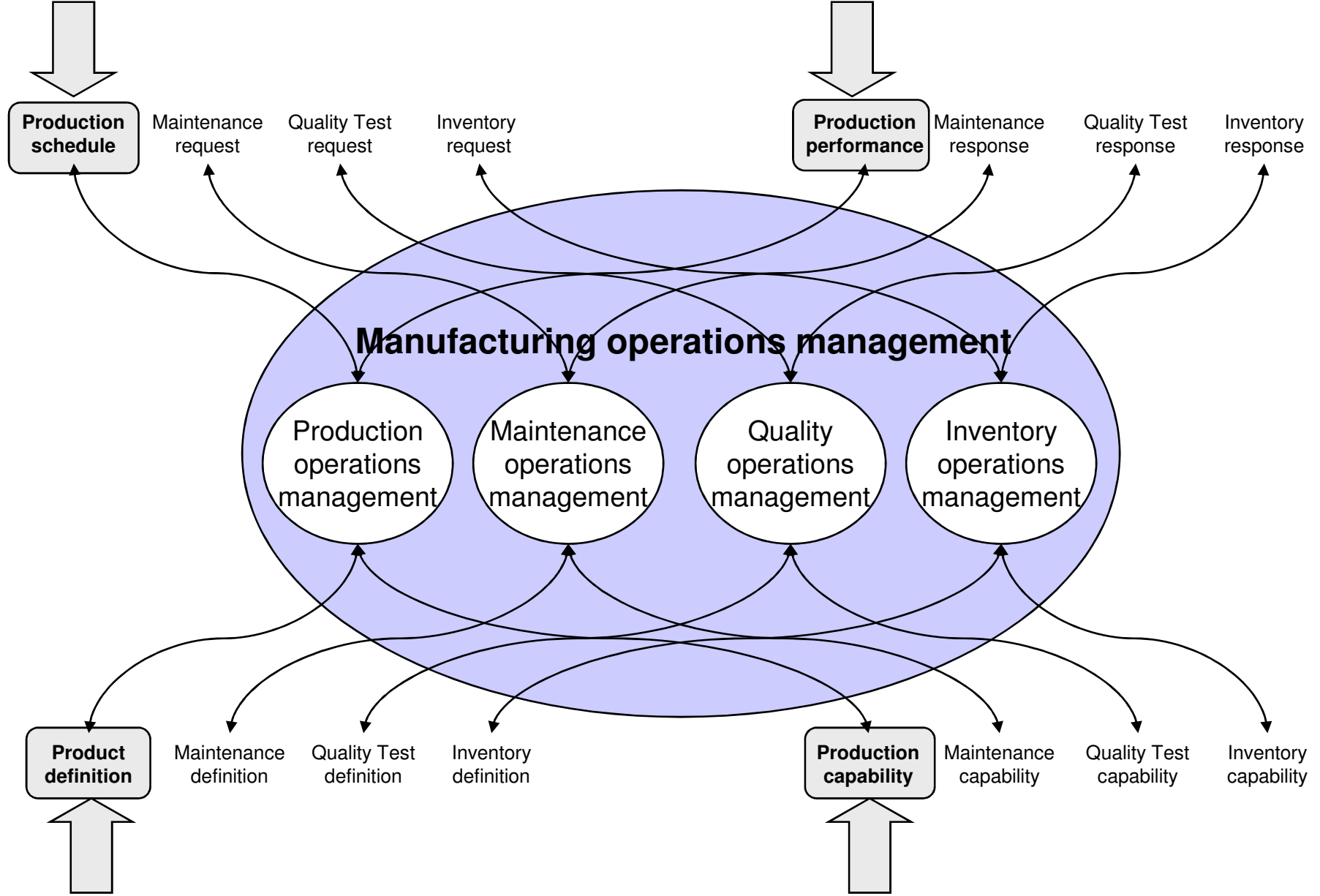
ISA 95 Part 2 Update, Working Draft 05

Enterprise/Control System Integration

- Common Object Model and Attributes

Represented in the Production Schedule model

Represented in the Production Performance model

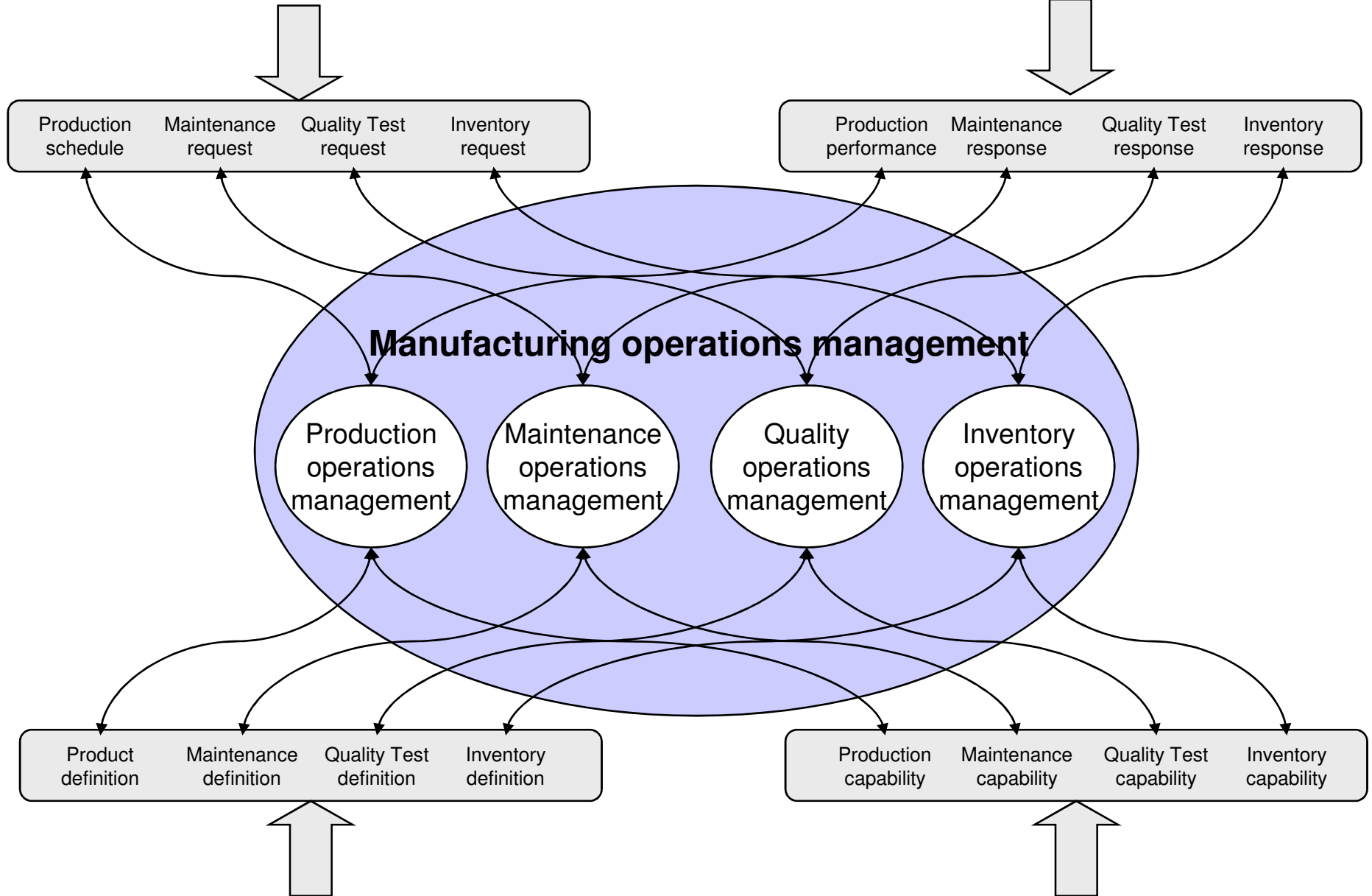


Represented in the Production Definition model

Represented in the Production Capability model

Represented in the Operations Schedule model

Represented in the Operations Performance model

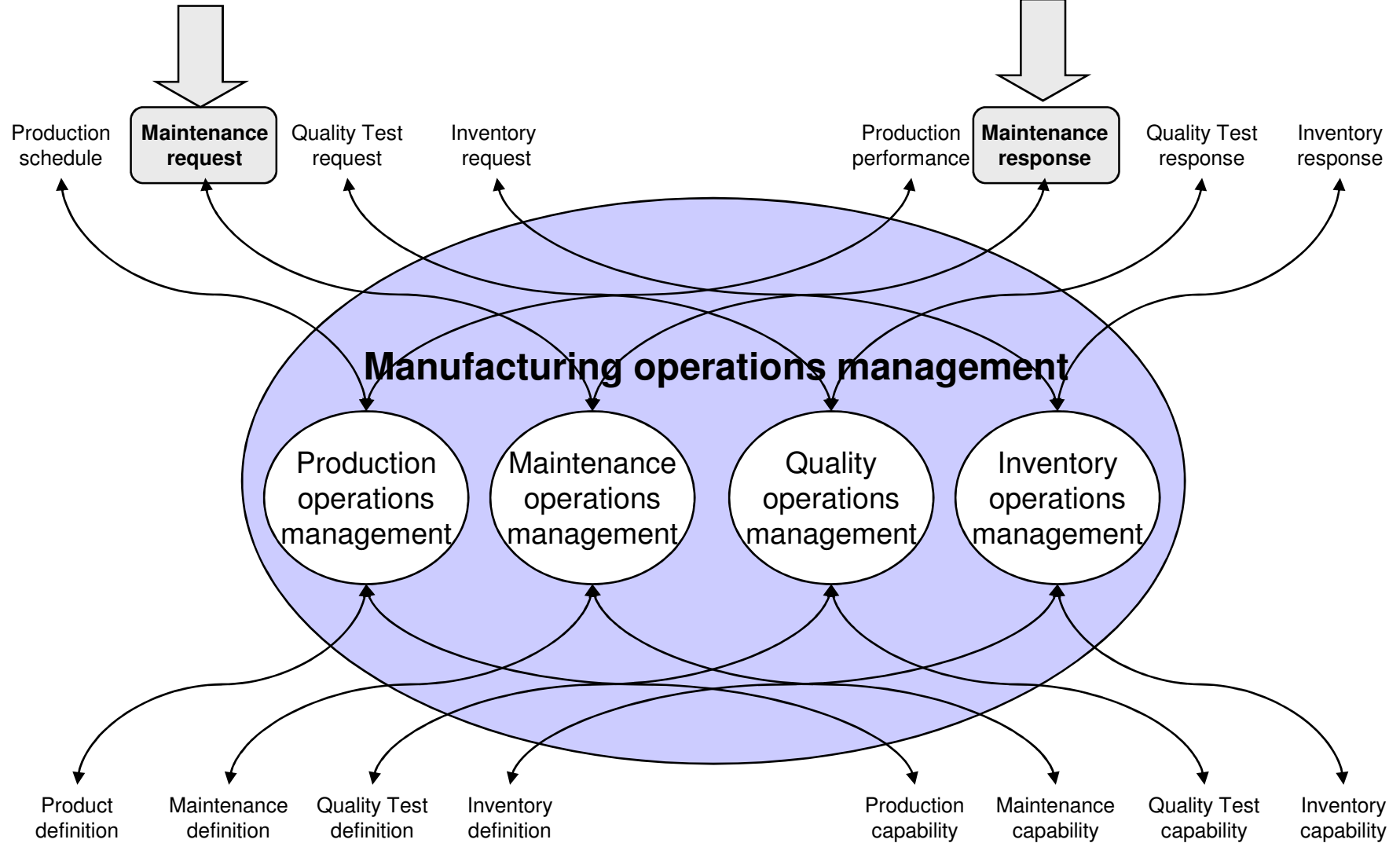


Represented in the Operations Definition model

Represented in the Operations Capability model

Represented in the
Maintenance Information model

Represented in the
Maintenance Information model



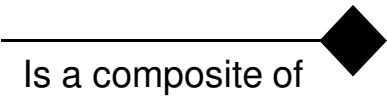
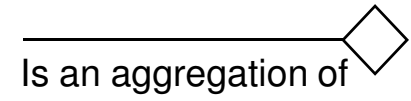
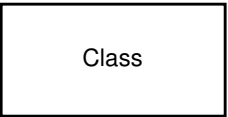
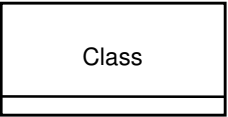
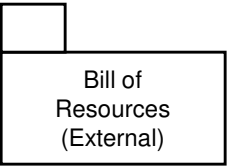
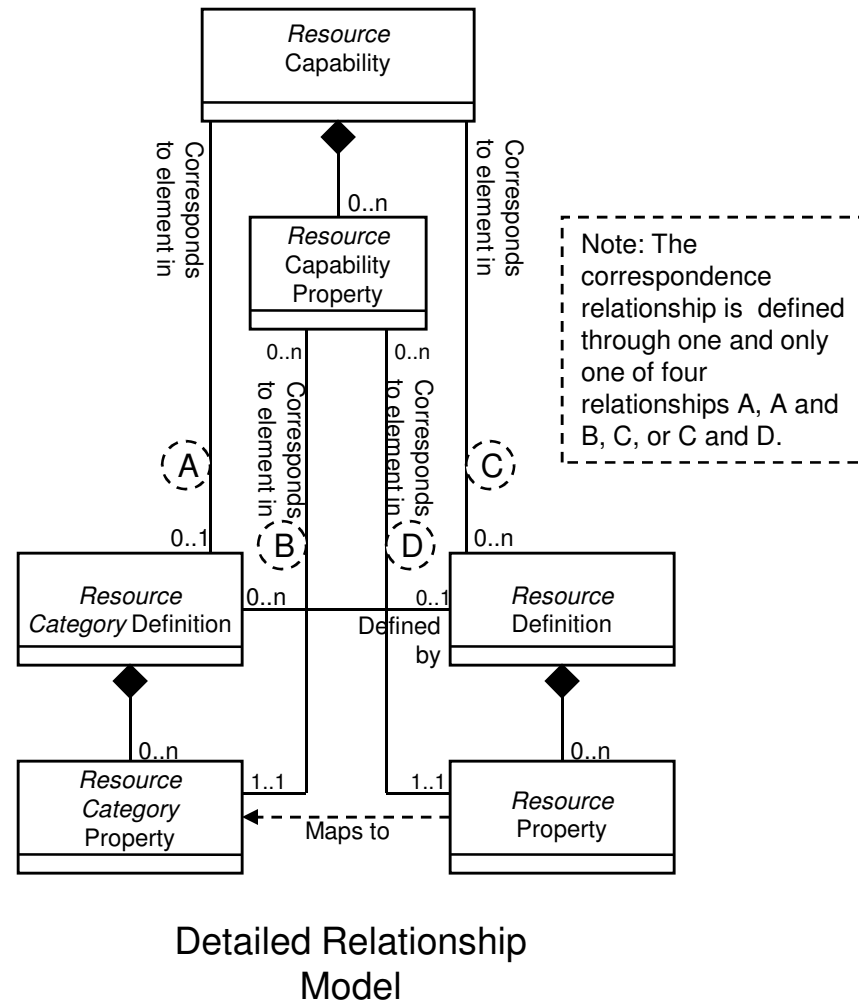
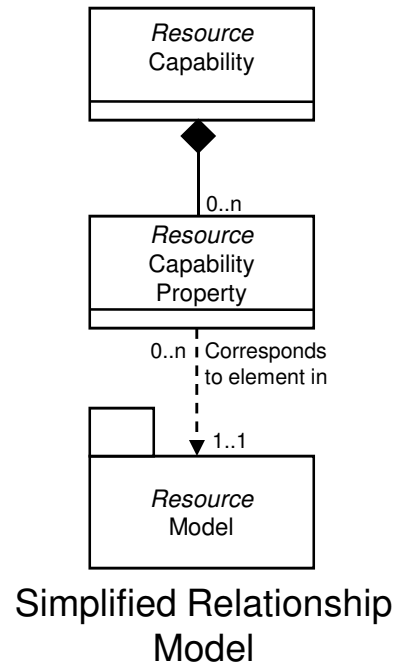


Figure 1



Personnel
Equipment
Physical Asset
Material
Process Segment

Figure 2

PERSONNEL

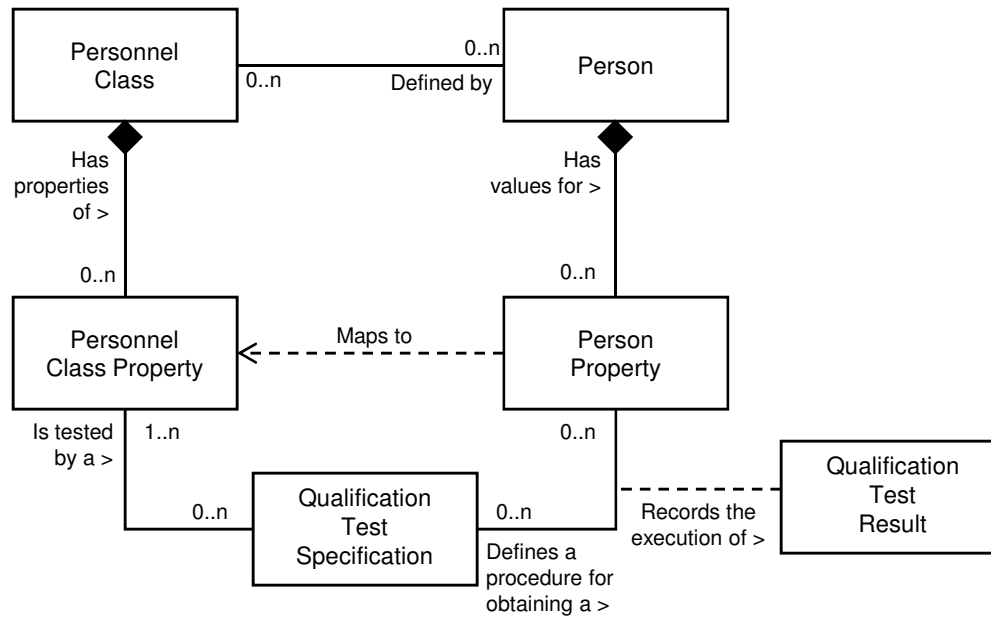


Figure 2

PERSONNEL

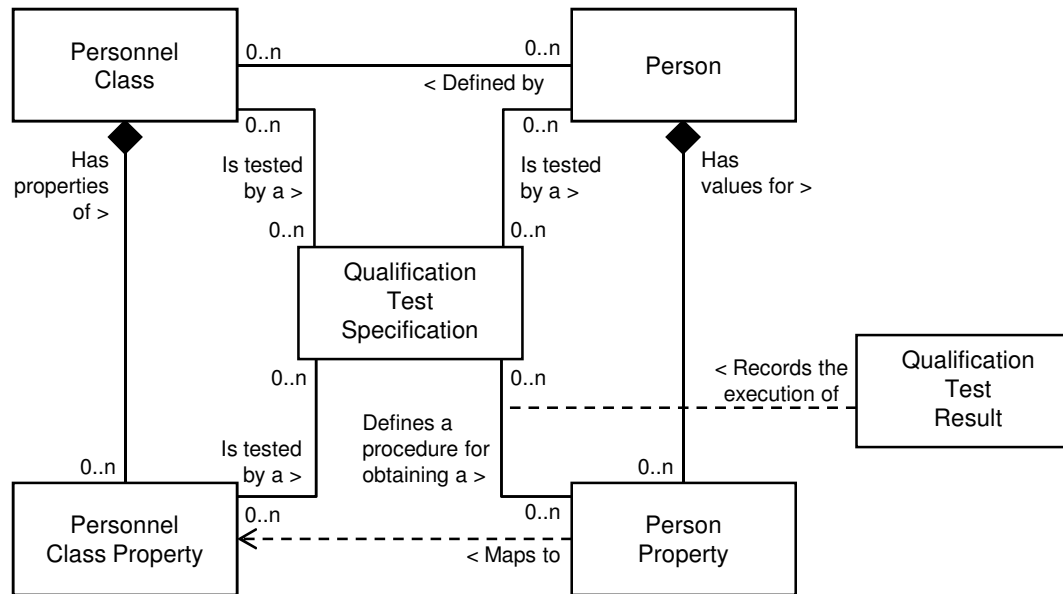


Figure 3 - New

EQUIPMENT

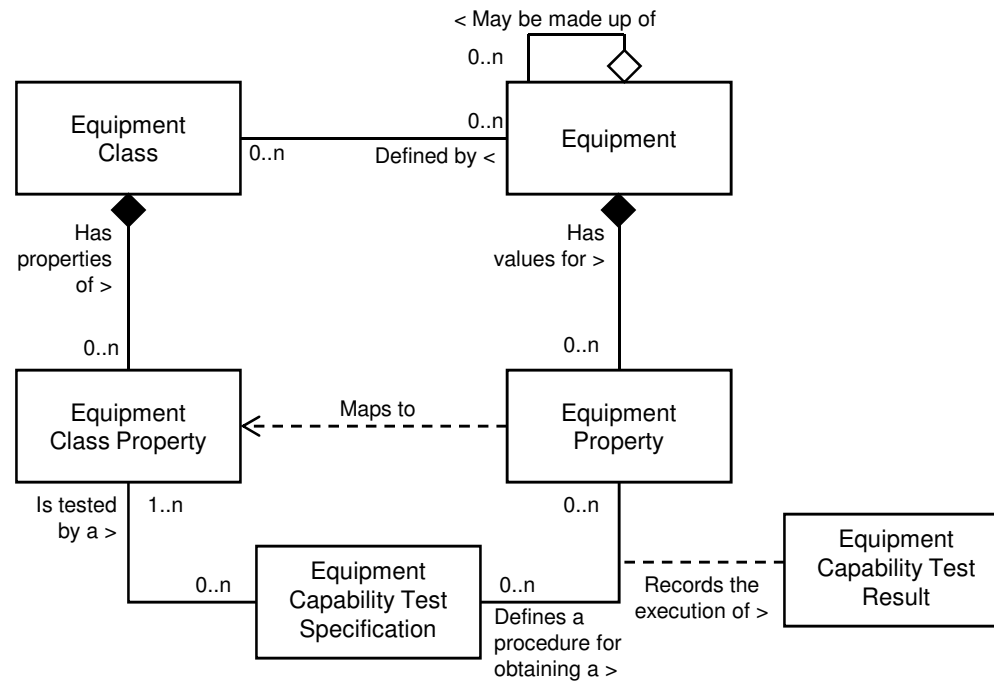


Figure 3 - Old

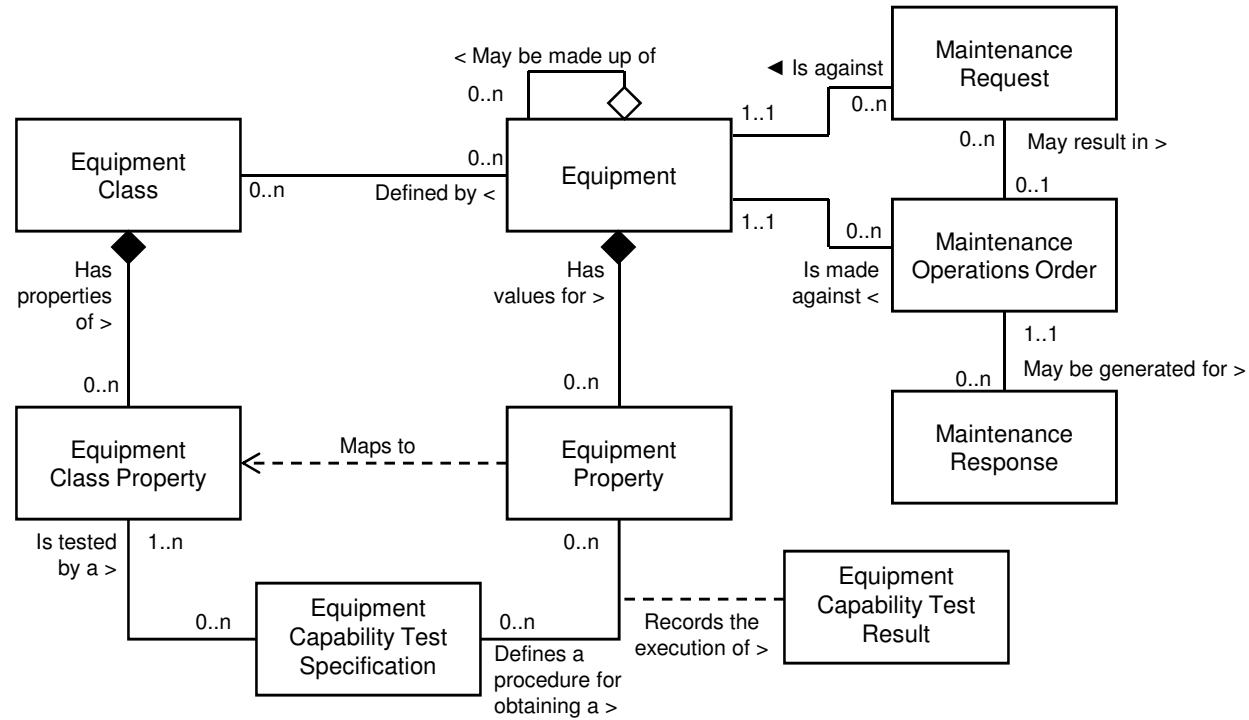


Figure 4

PHYSICAL ASSET

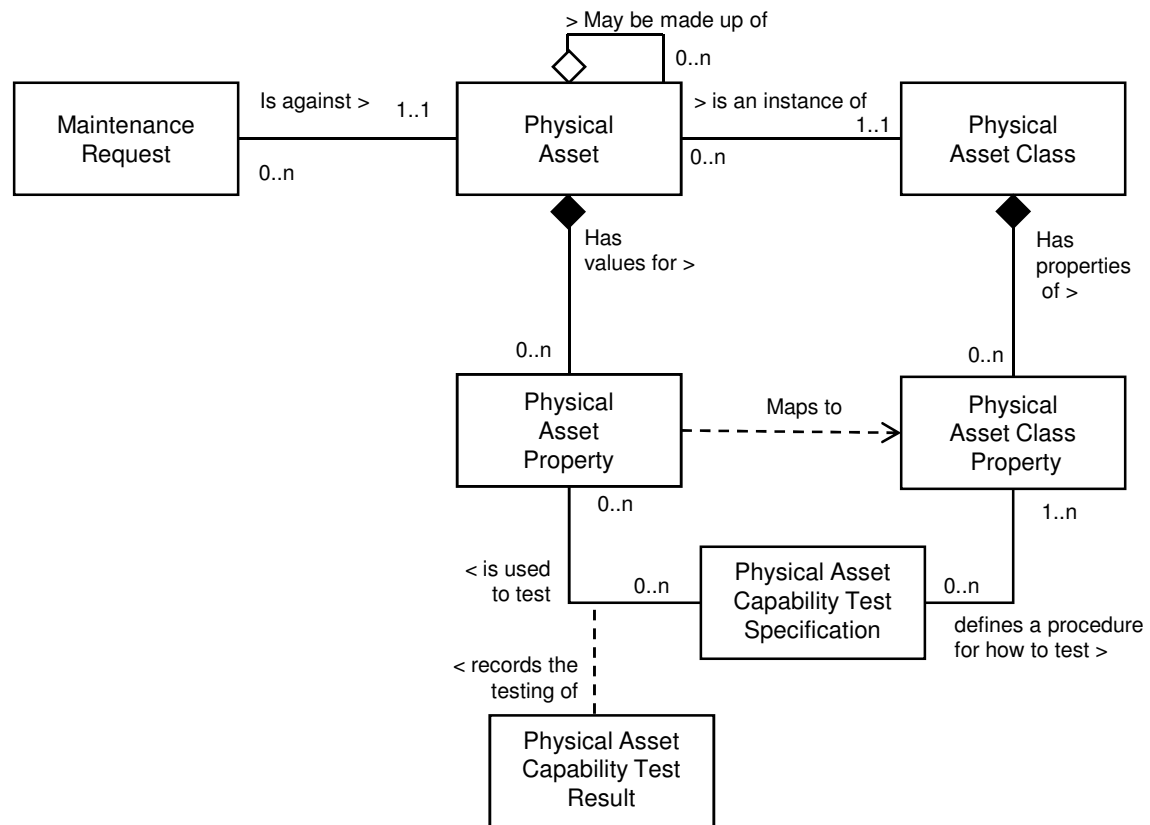
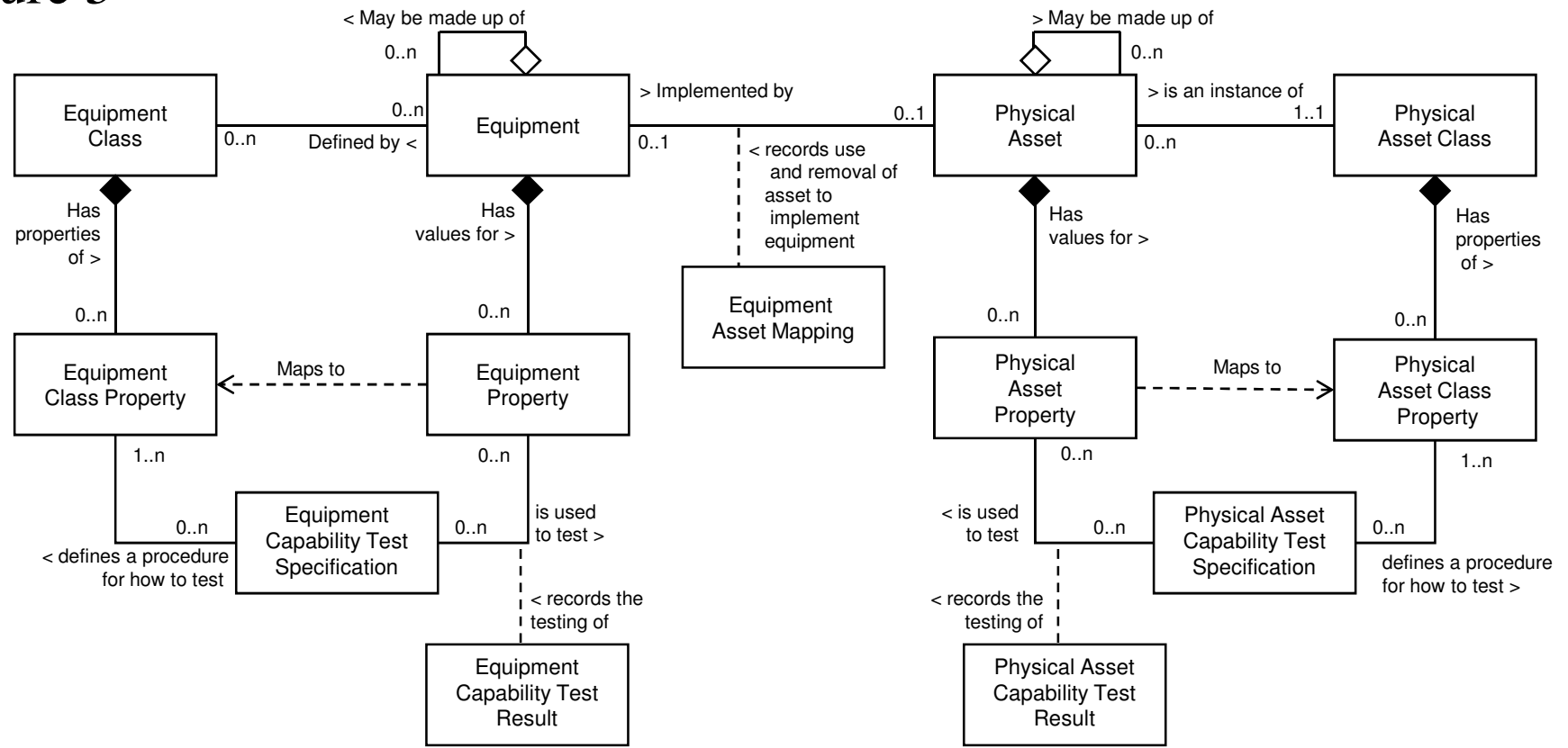


Figure 5



A MIMOSA *Asset* maps to an ISA 95 *Physical Asset* object

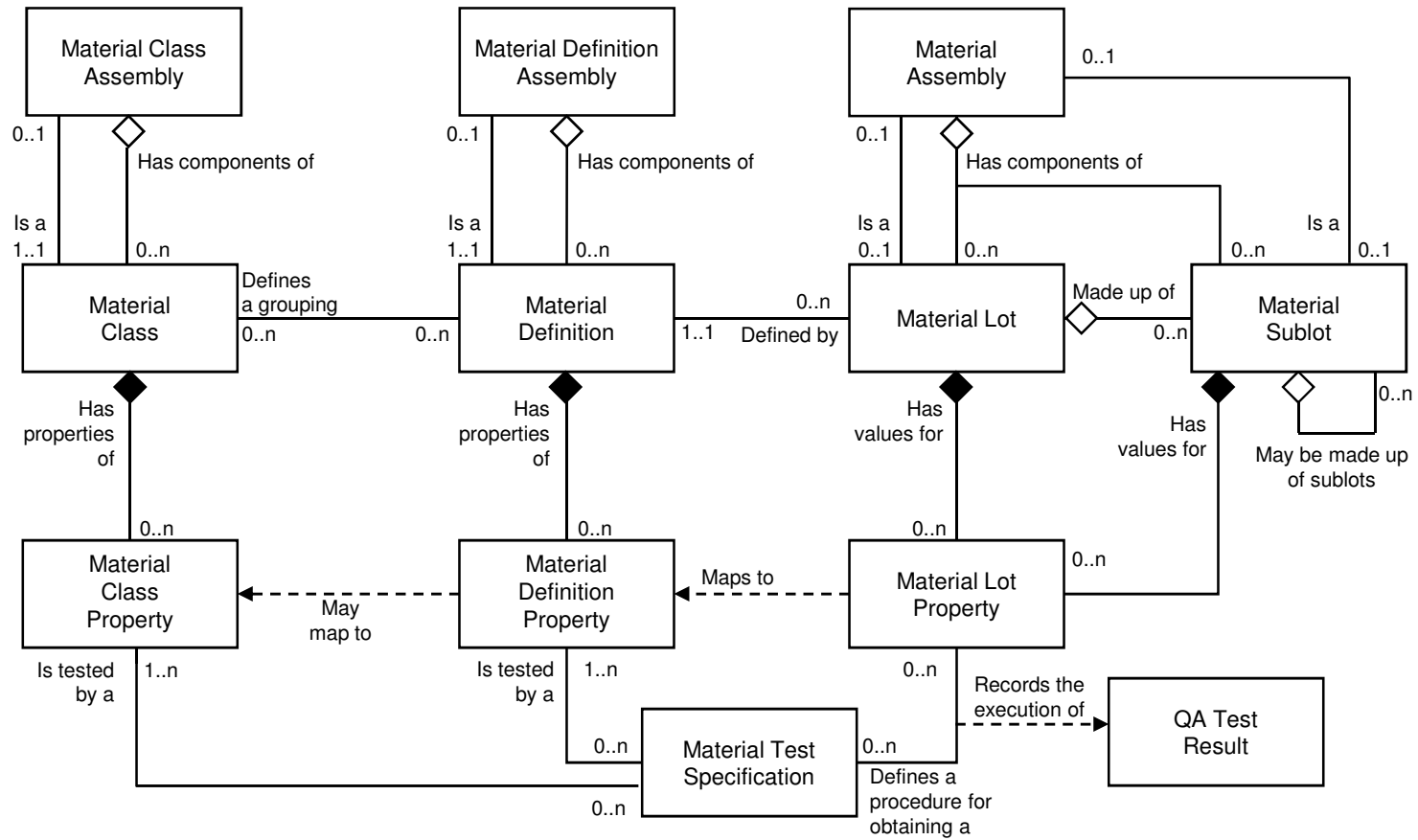
A MIMOSA *Asset Utilization History* maps to an ISA 95 **Equipment Asset Mapping** object

A MIMOSA *Functional Segment* maps to an ISA 95 *Equipment* object

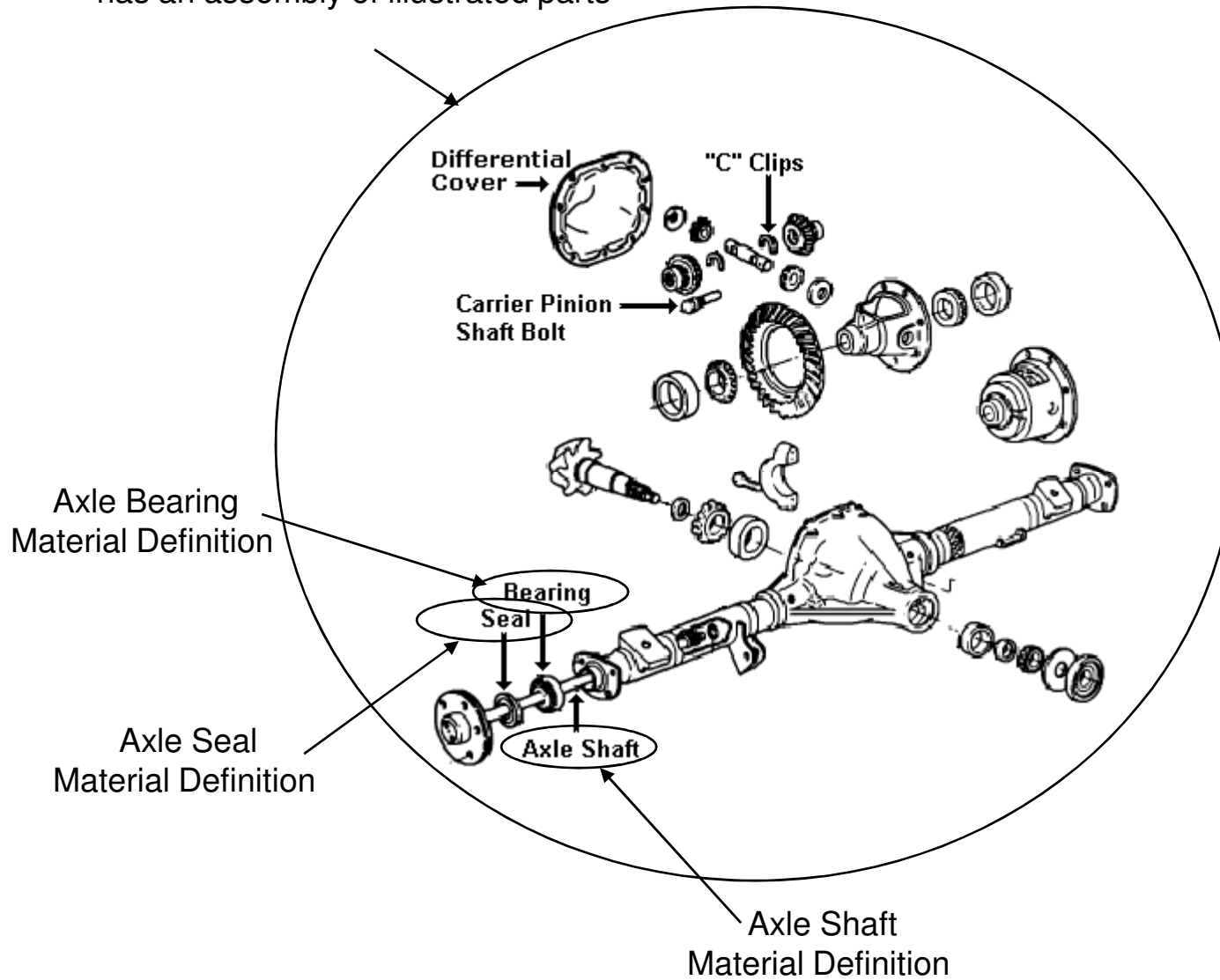
A MIMOSA *Model* maps to an ISA 95 *Physical Asset Class* object

A MIMOSA *Agent* would map to an ISA 95 attribute or property, where needed

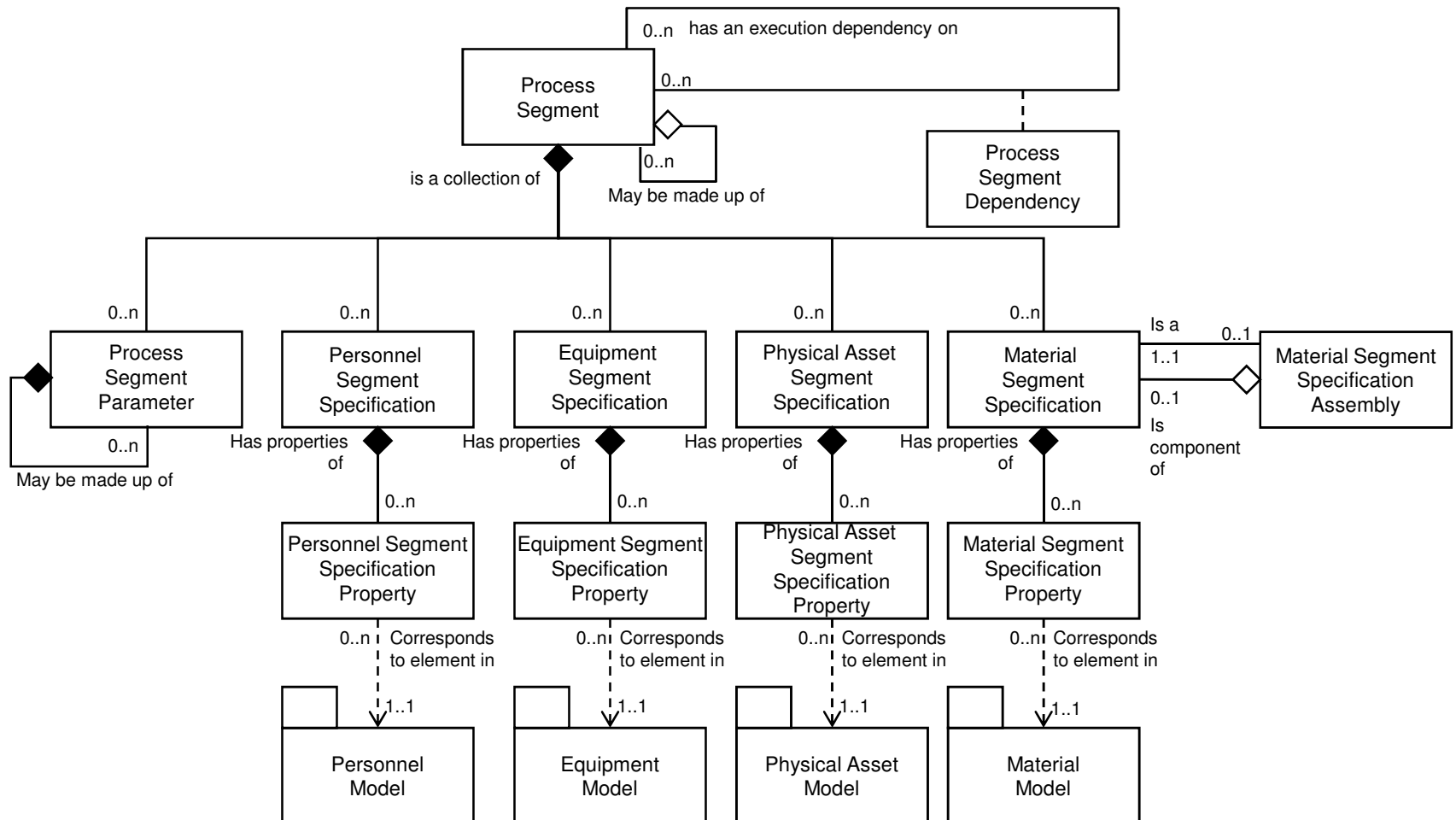
MATERIAL



Transaxle Material Definition
has an assembly of illustrated parts

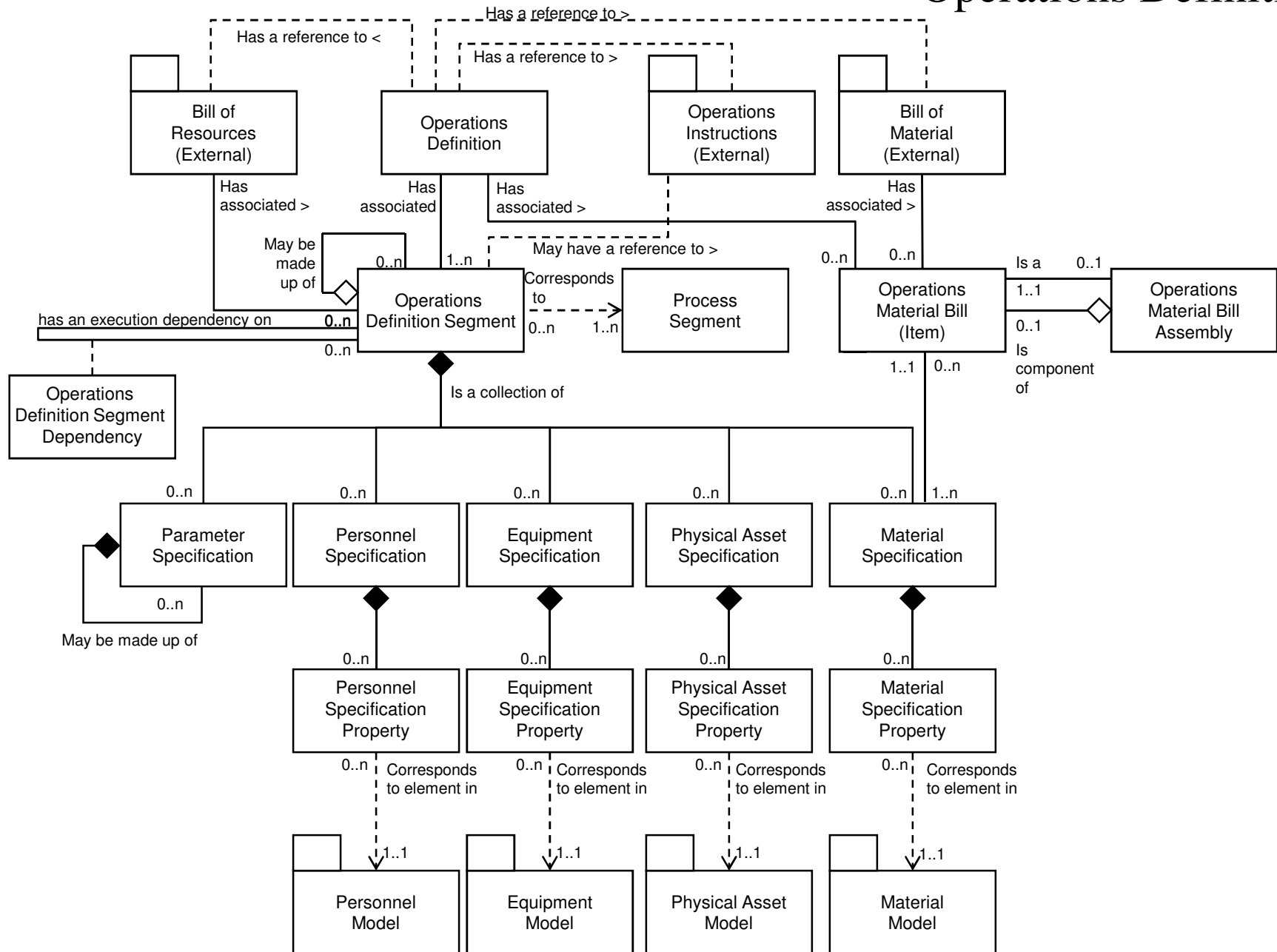


PROCESS SEGMENT

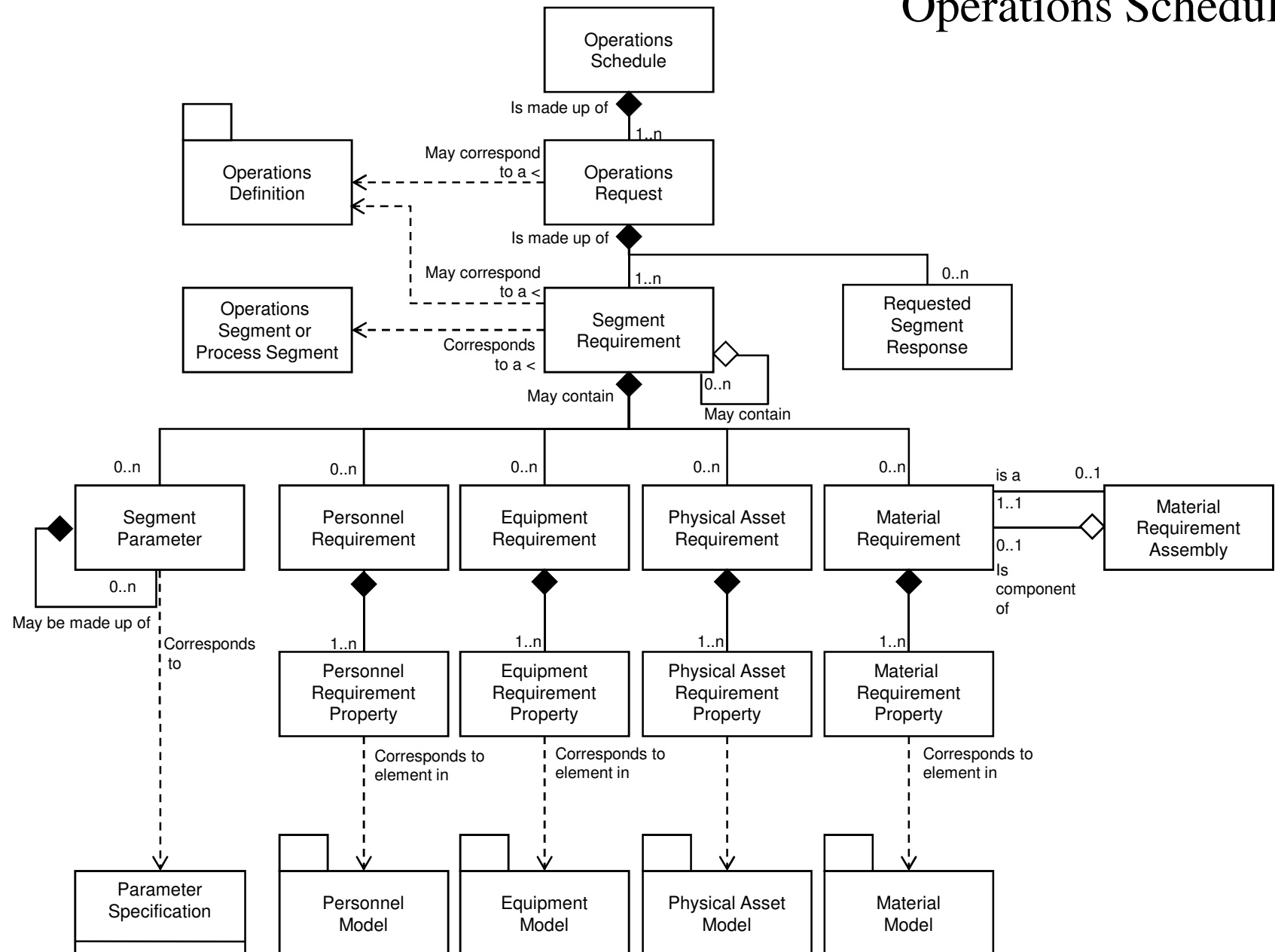


Operations Definition
Operations Schedule
Operations Performance
Operations Capability
Operations Segment Capability

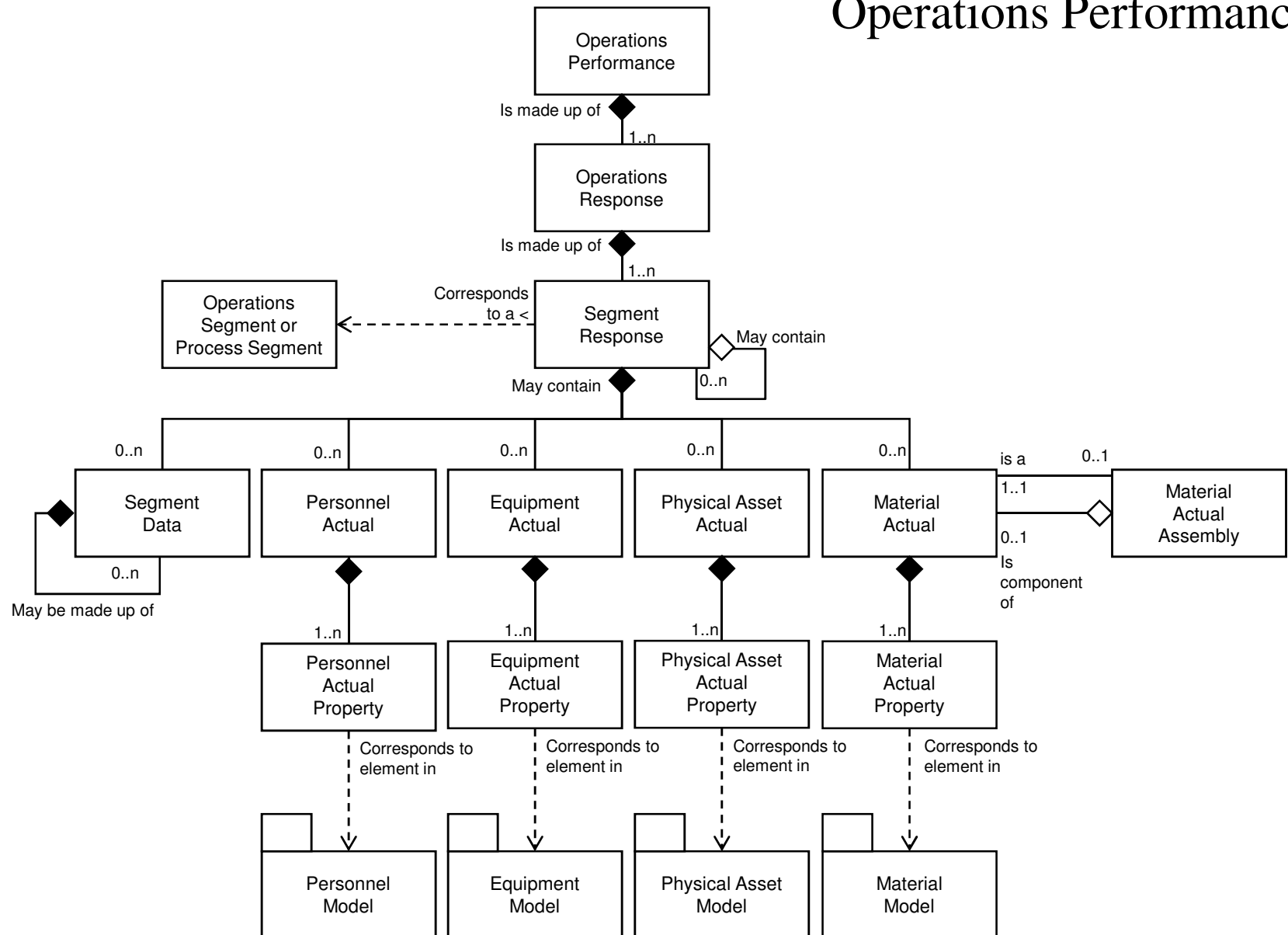
Operations Definition



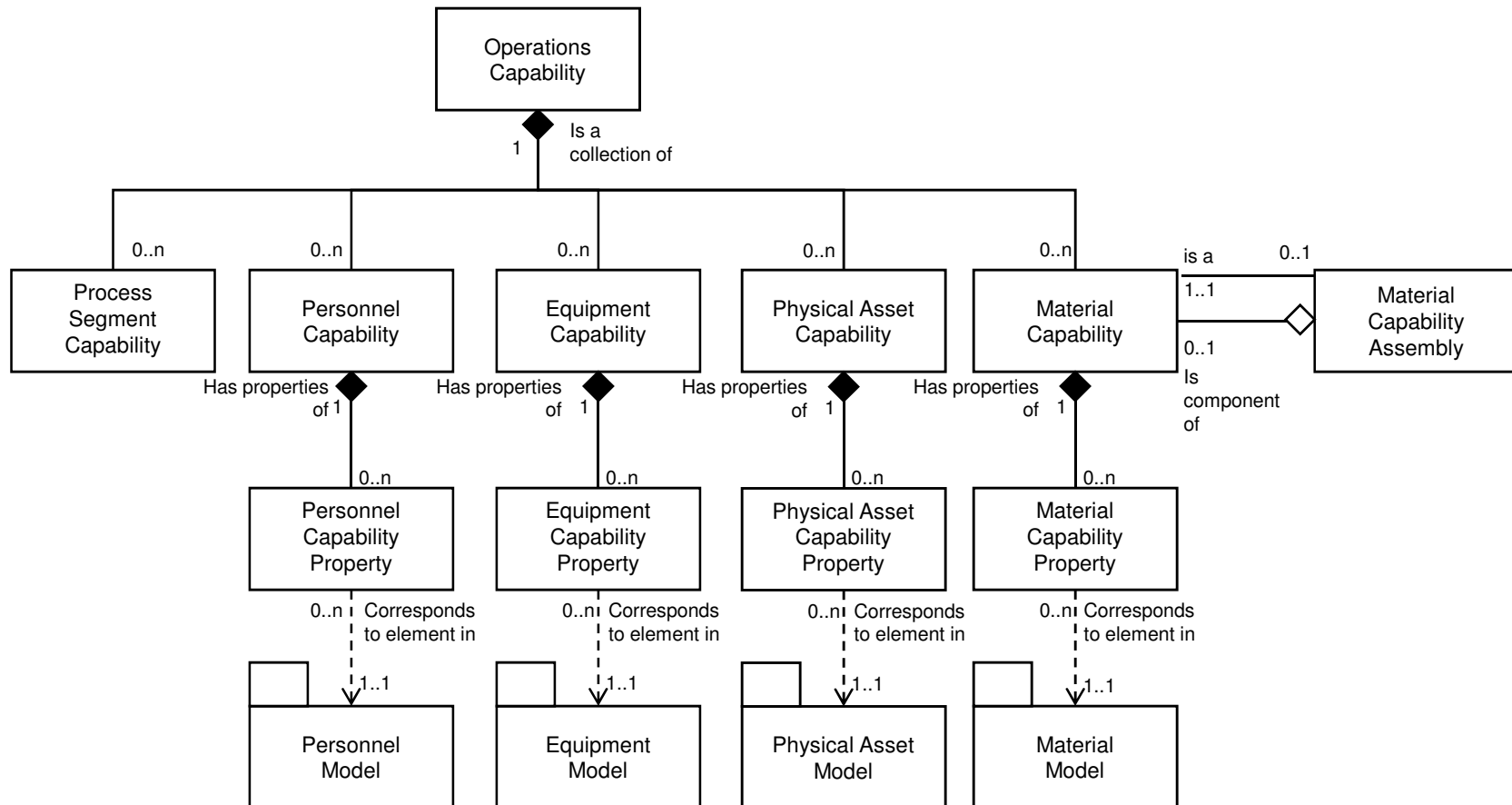
Operations Schedule



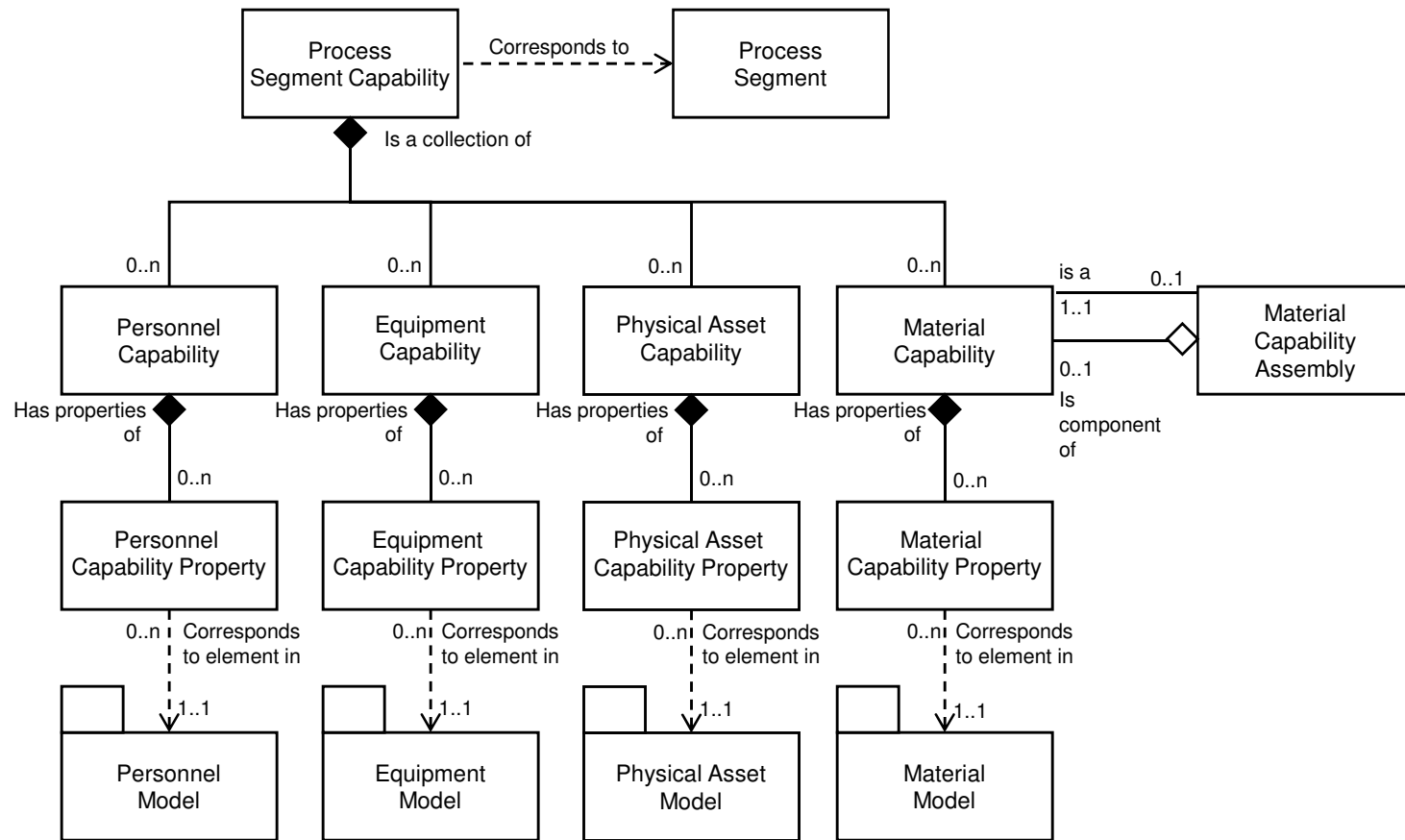
Operations Performance



Operations Capability

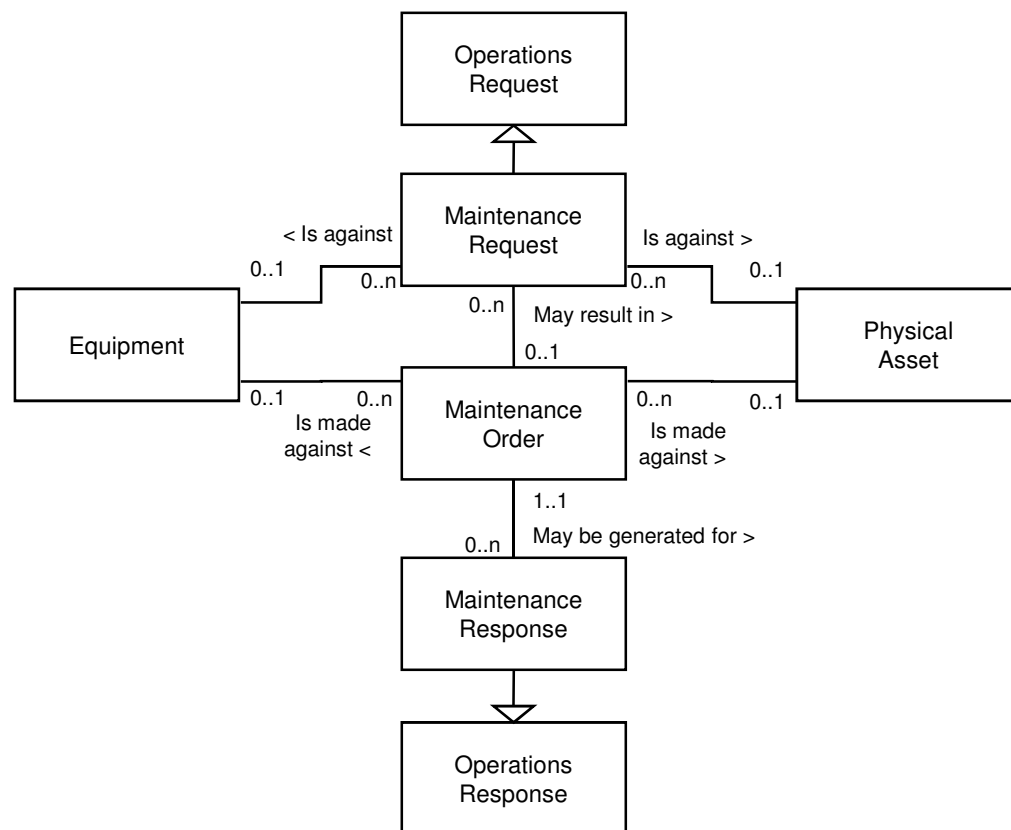


Process Segment Capability



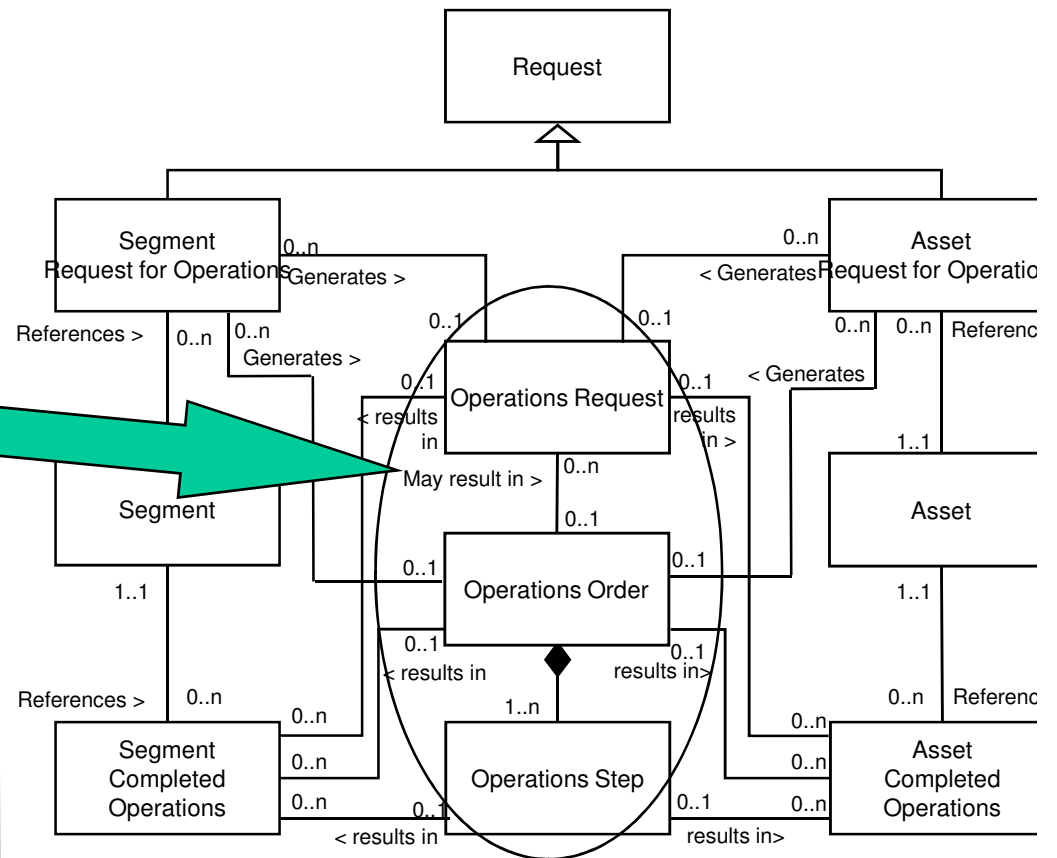
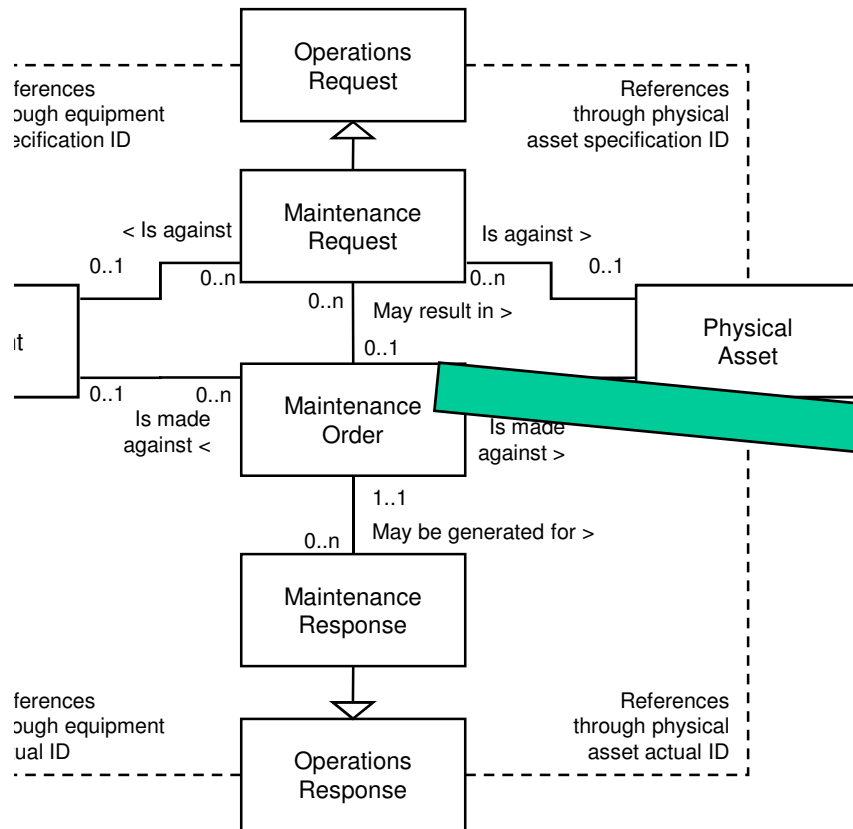
Maintenance Request

Figure 20



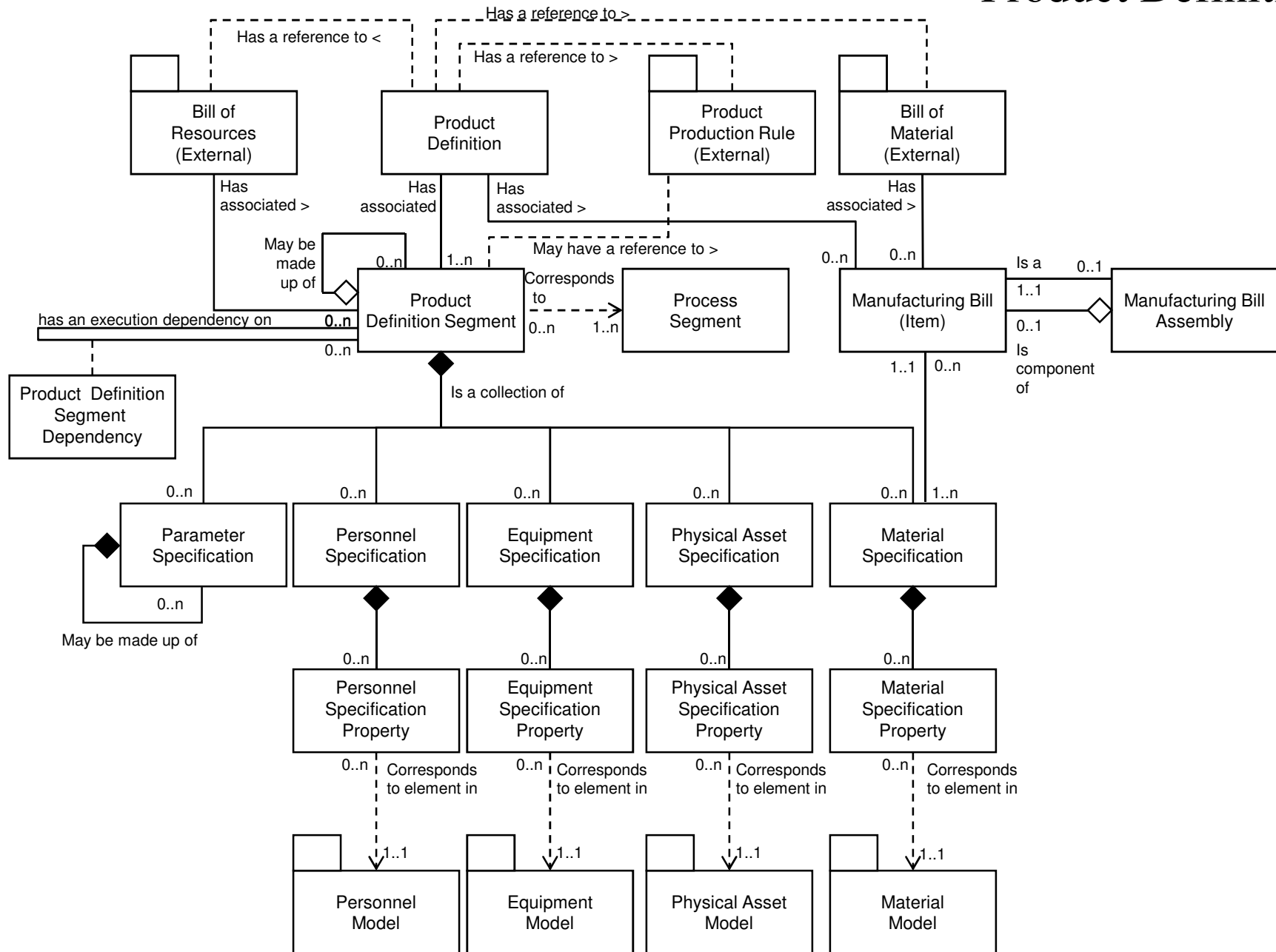
MIMOSA

OSA-EAI CCOM V3.2

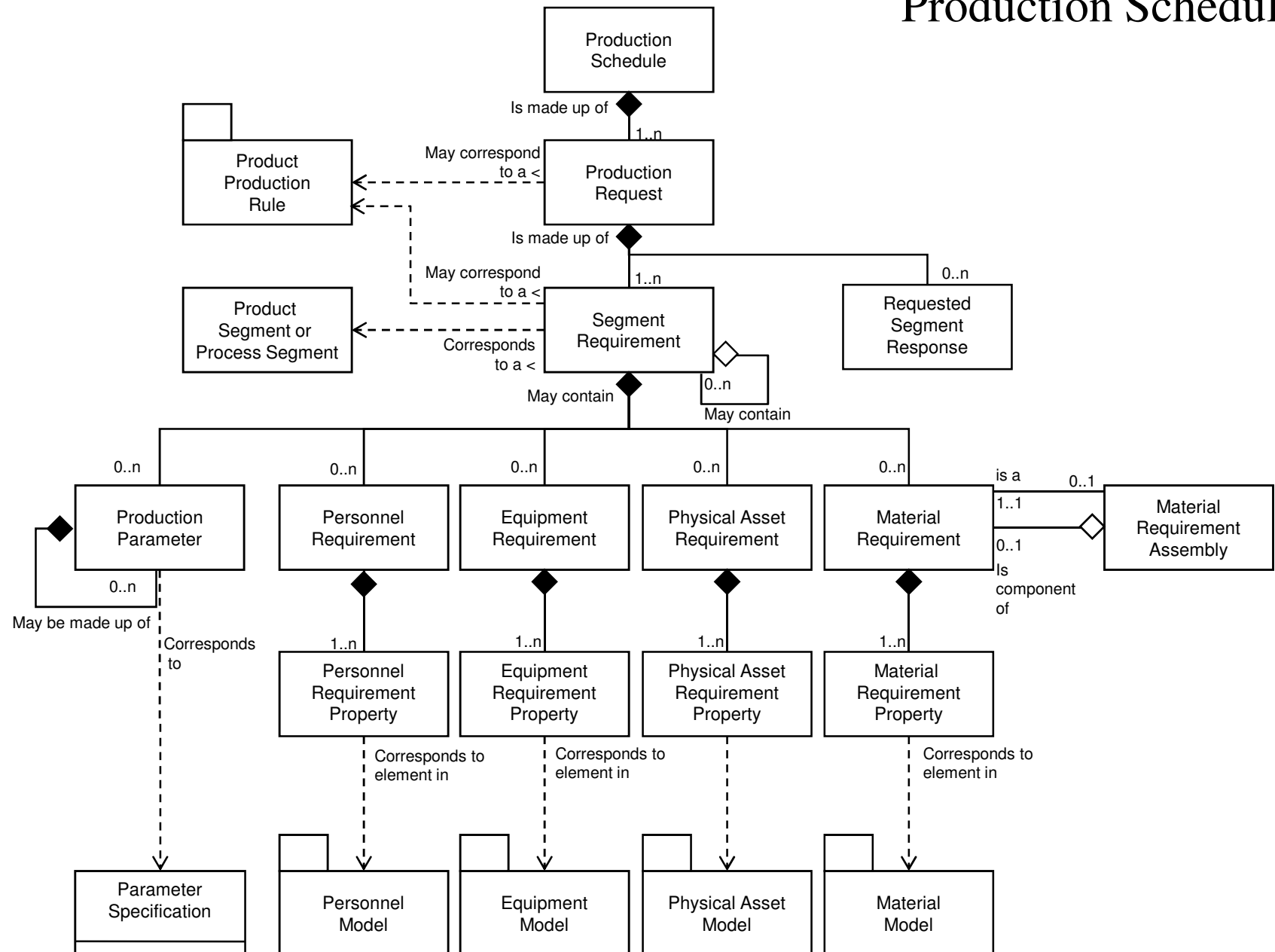


Product Definition
Production Schedule
Production Performance
Production Capability
Process Segment Capability

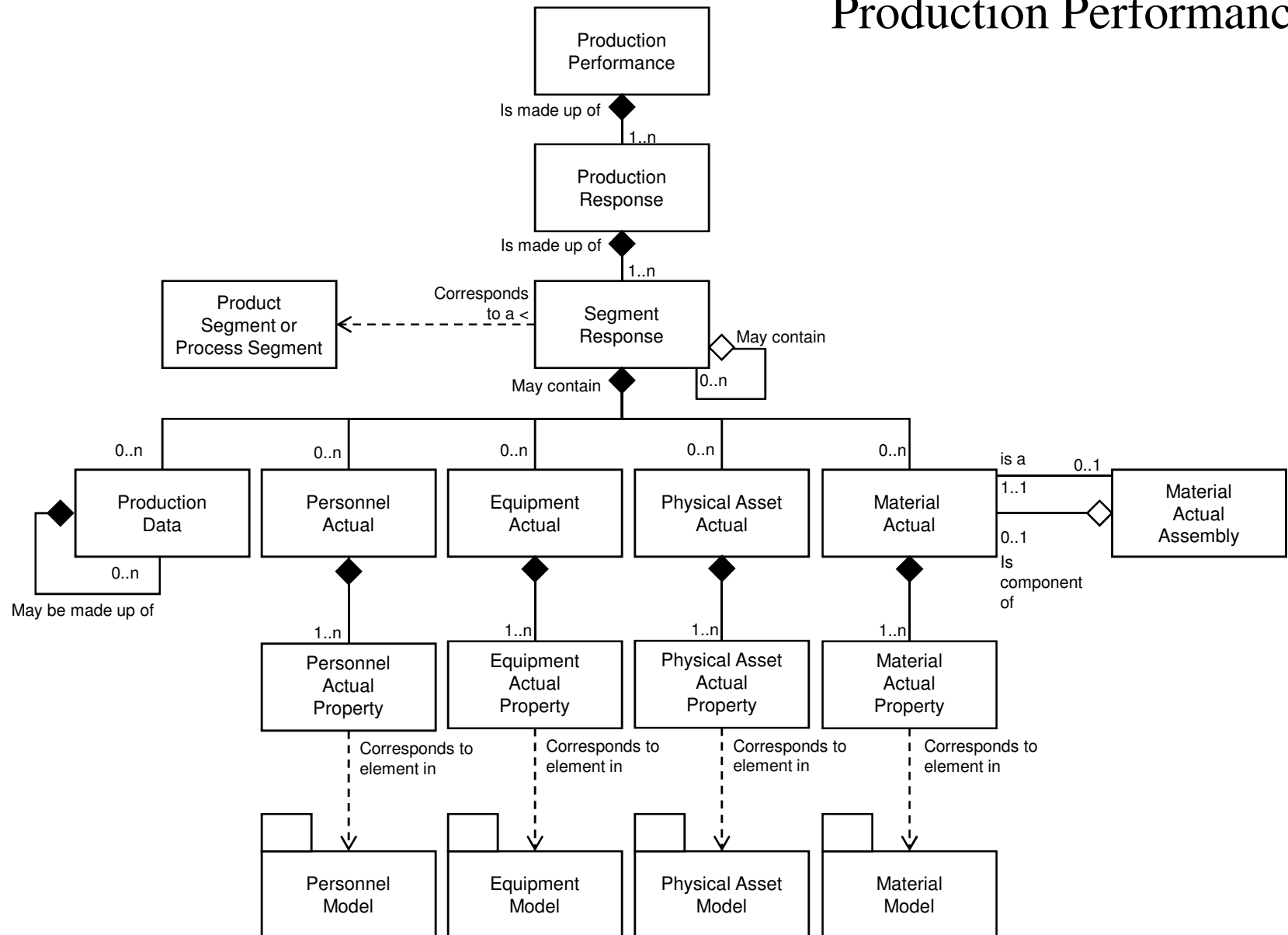
Product Definition



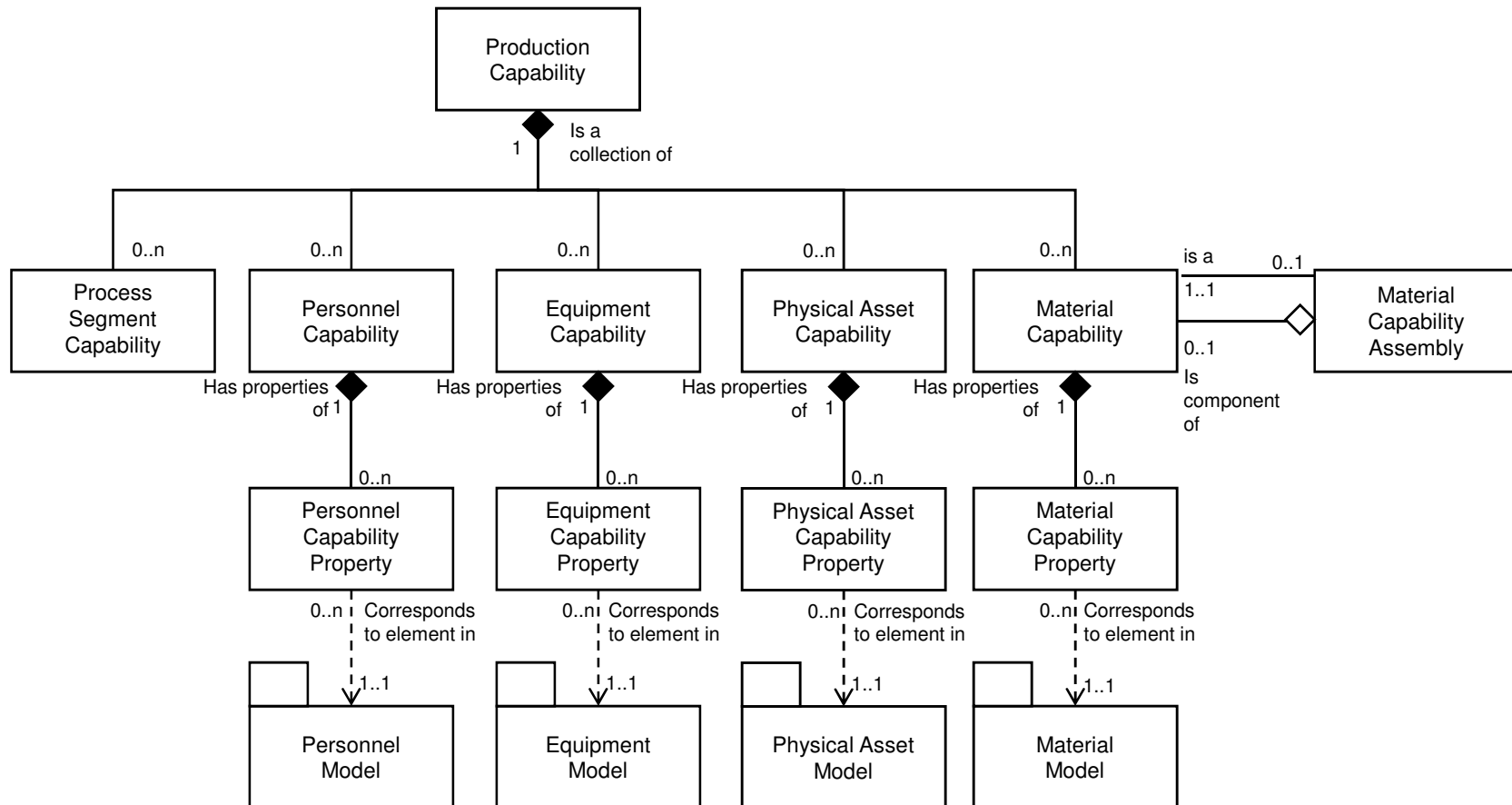
Production Schedule



Production Performance



Production Capability



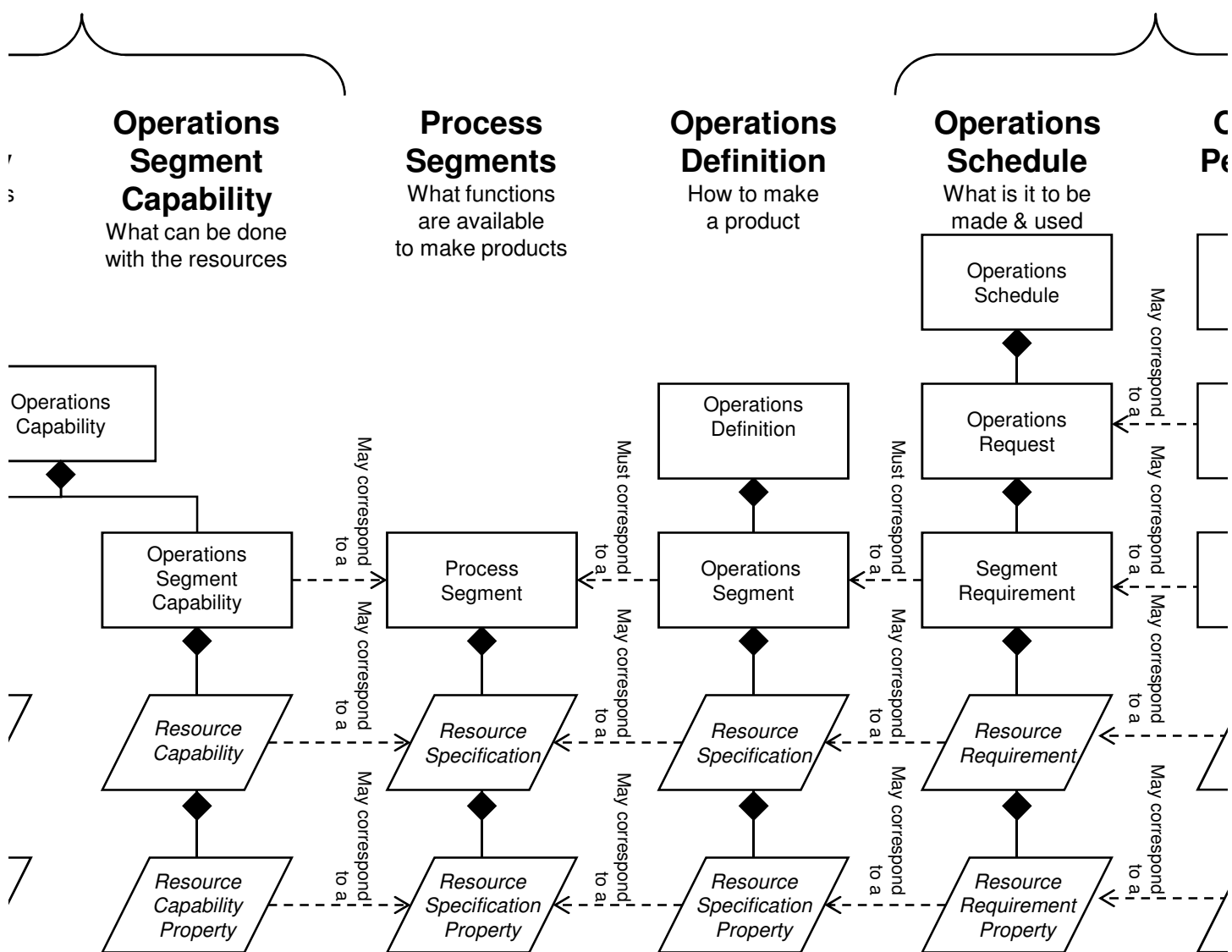
Other Slides

Operations Capability Information

What is available

Operations Information

What to make and how



Resource $\rightarrow$ Personnel, Equipment, Physical Asset, or Material

Production Capability Information

What is available

Resource Capability

What resources are available

Process Segment Capability

What can be done with the resources

Production Information

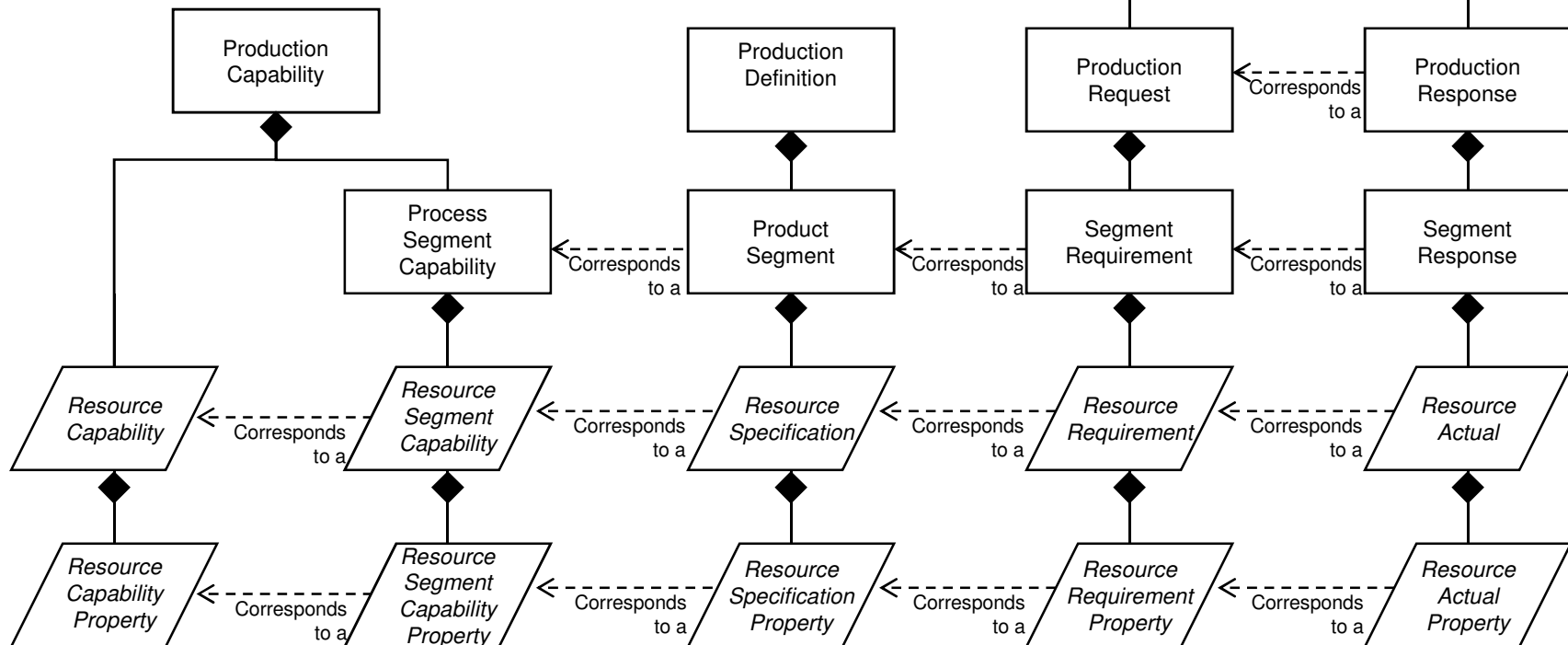
What to make and results

Production Schedule

What is it to be made & used

Production Performance

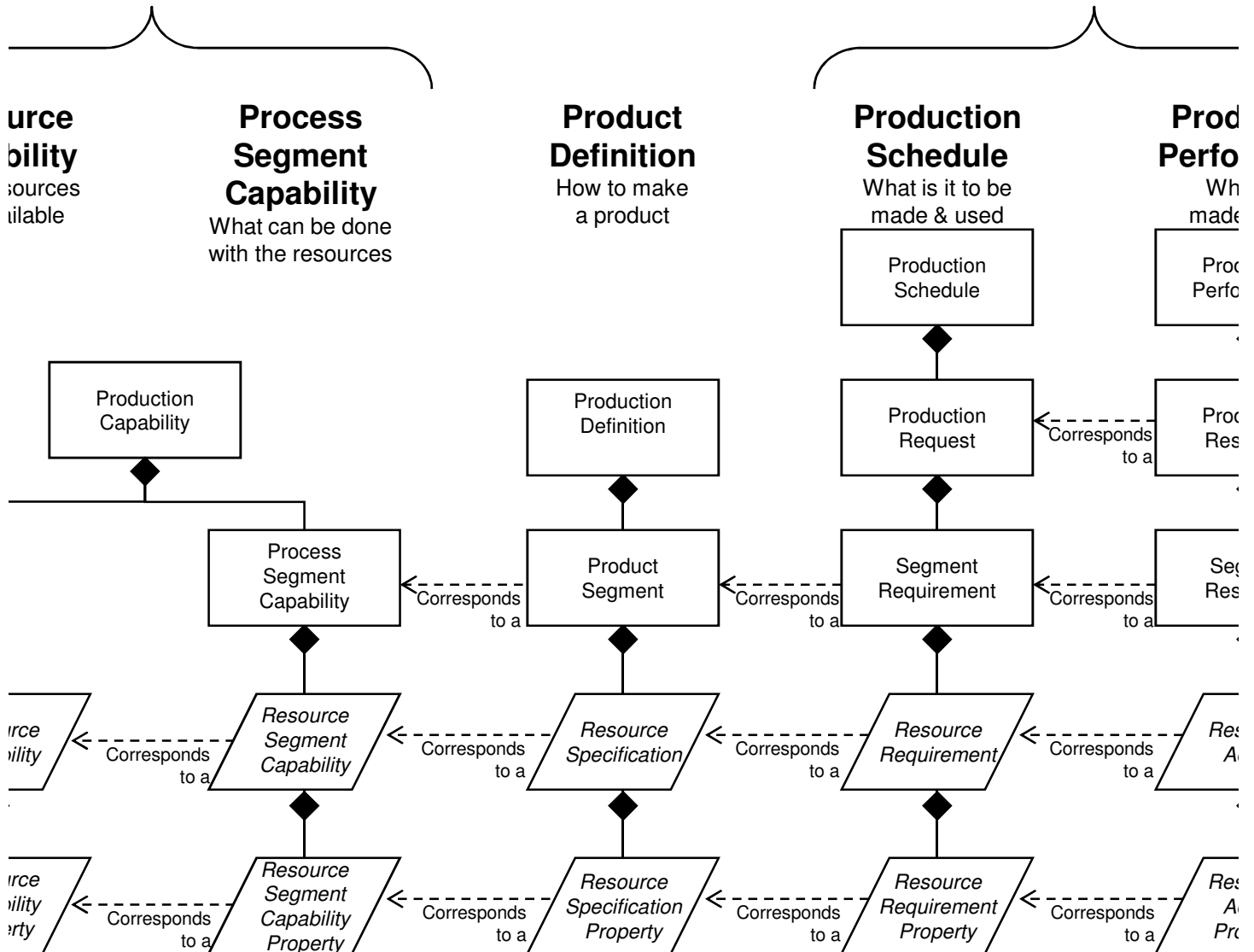
What was made & used



Resource → Personnel, Equipment, or Material

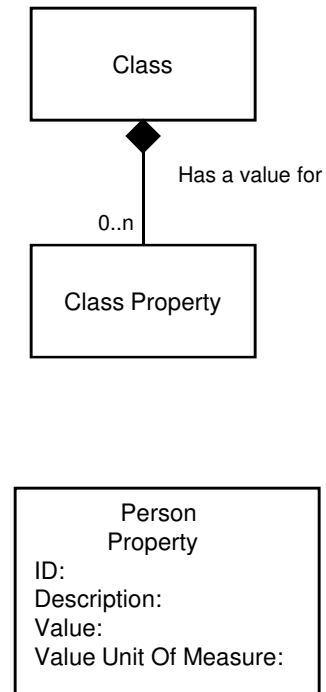
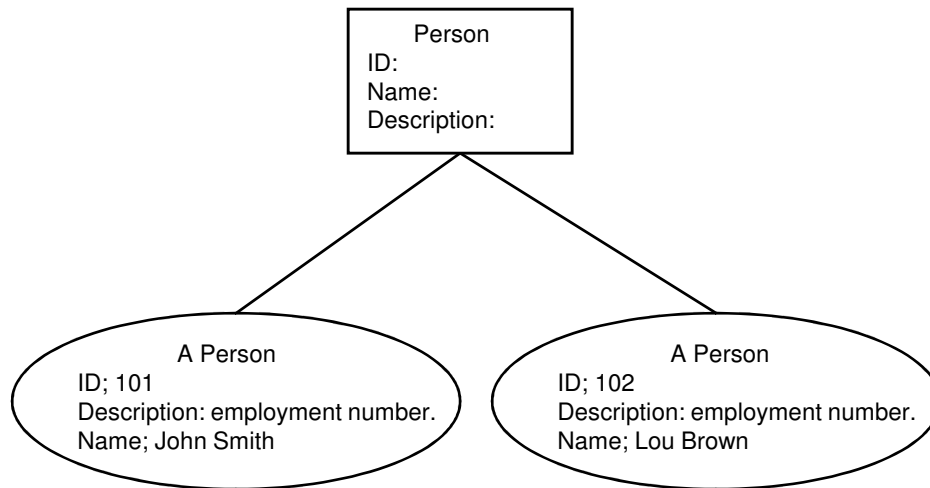
What is available

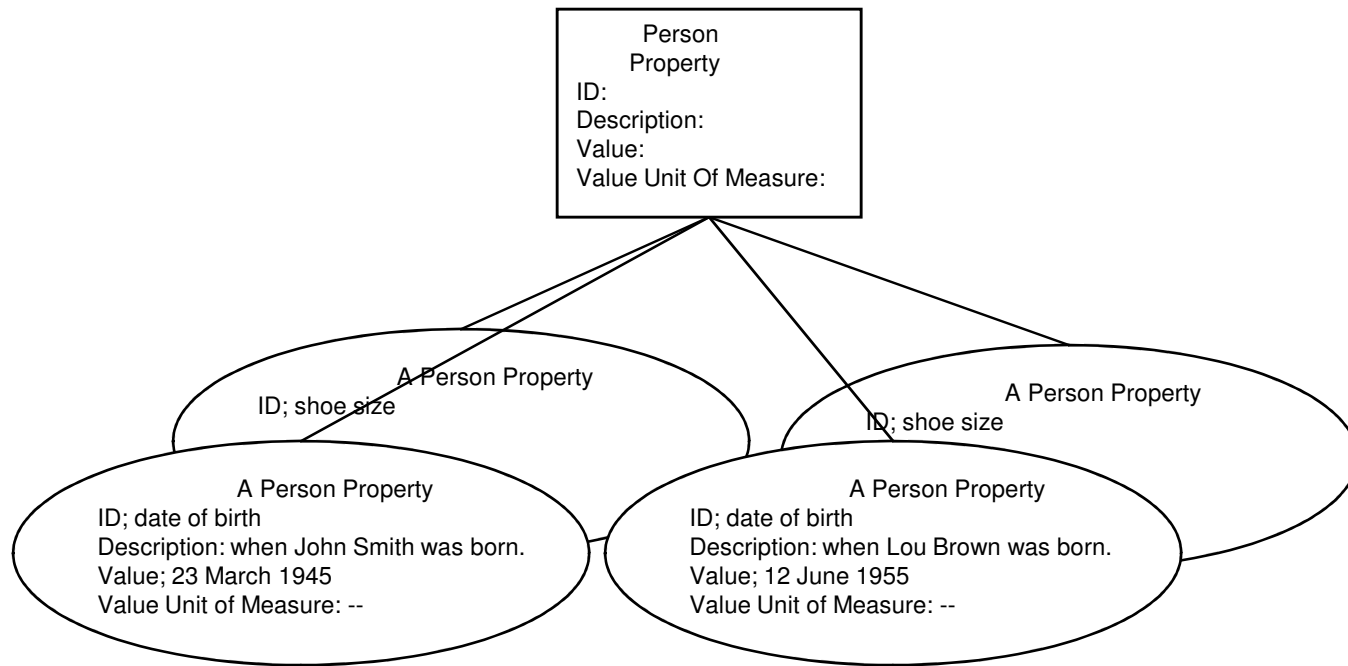
What to make and results

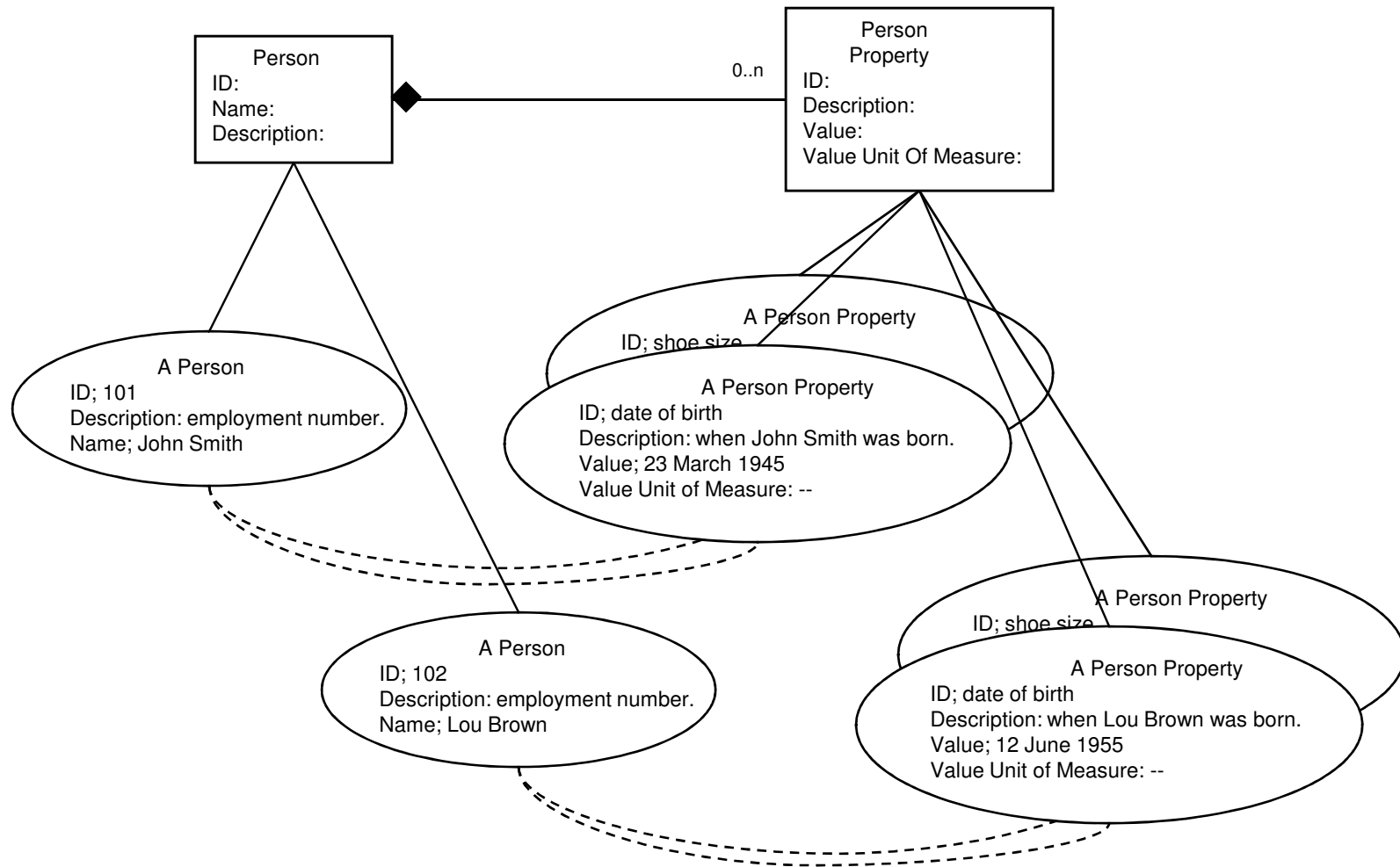


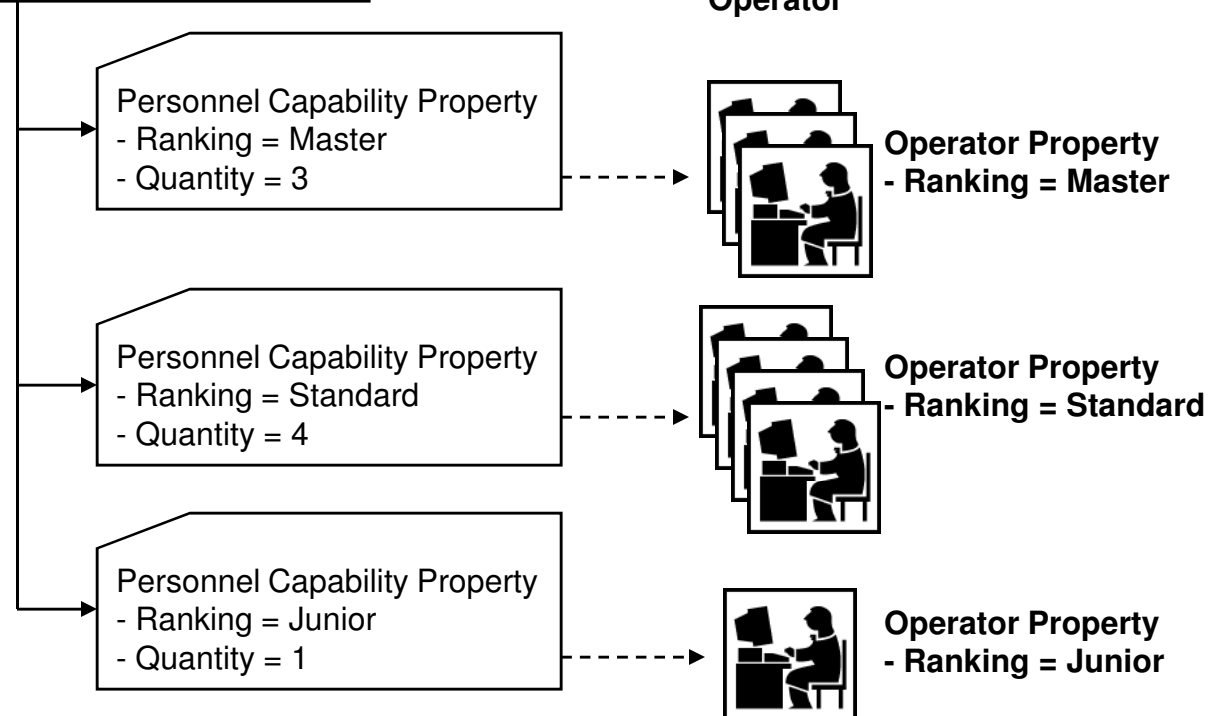
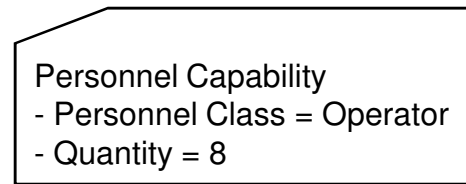
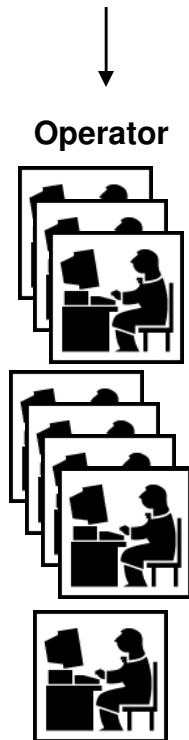
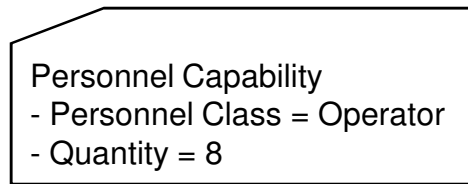
Resource → Personnel, Equipment, or Material

Annex Slides

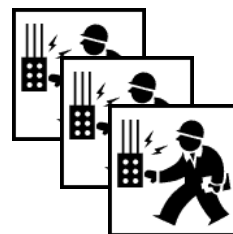




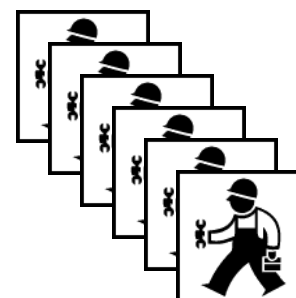


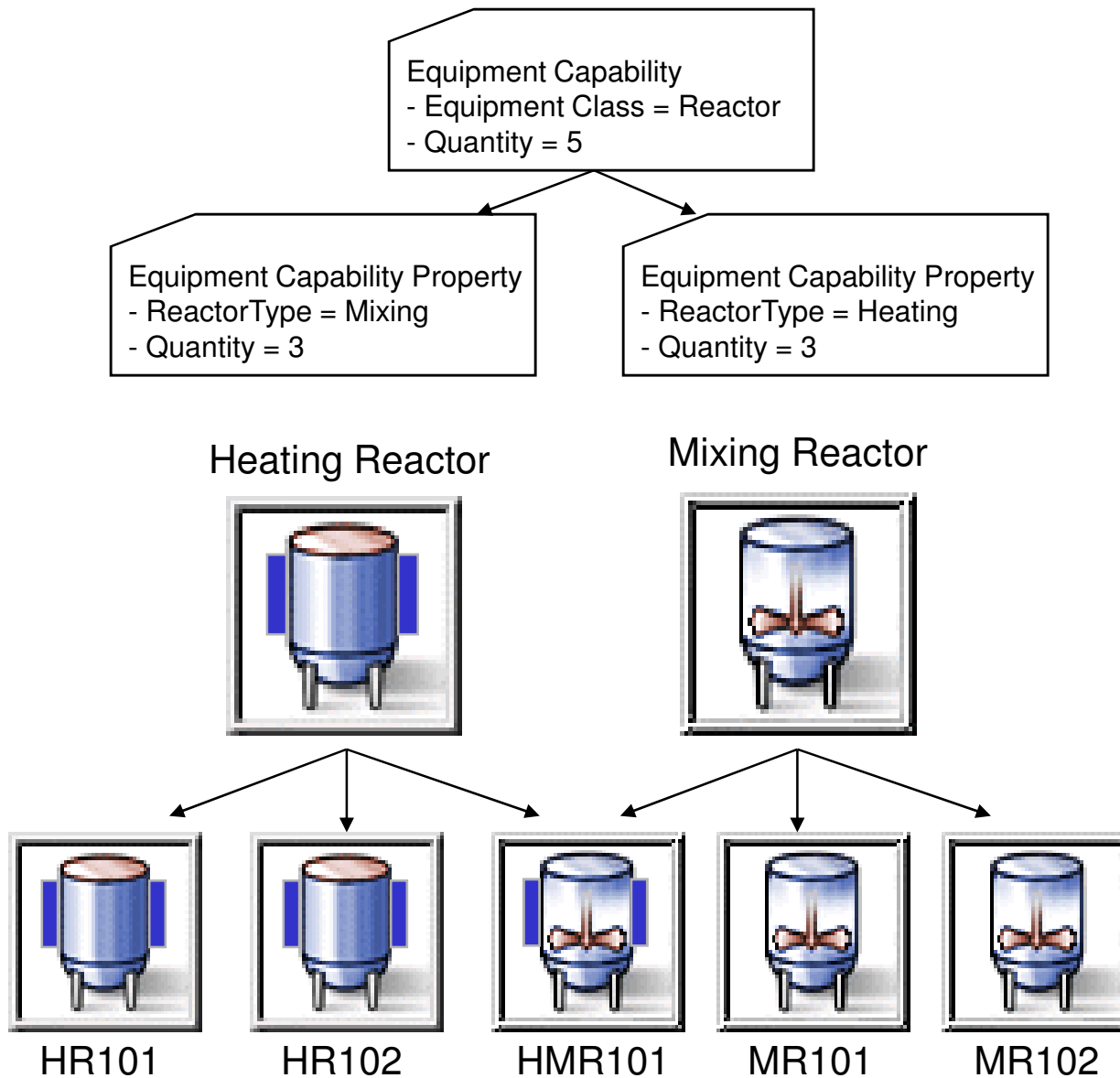


Supervisor

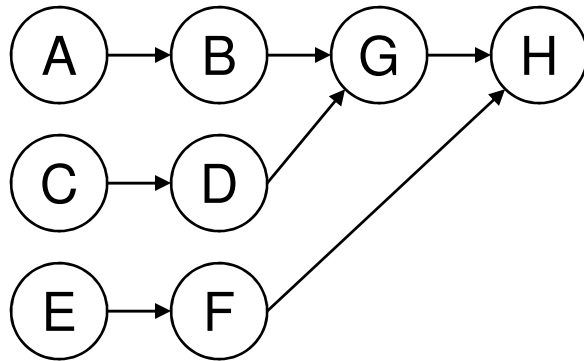


Mechanic





Product Routing for Product X



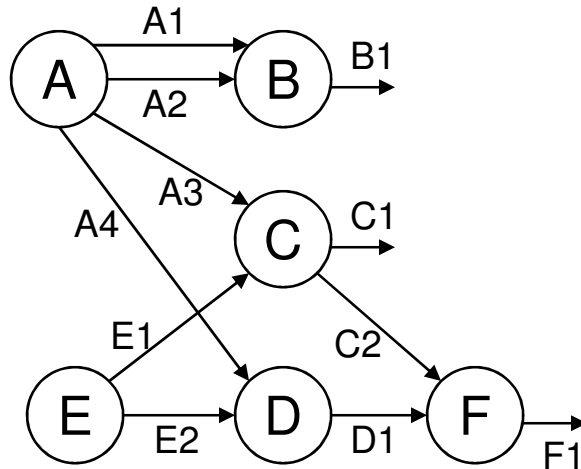
Product X Segment Dependencies

B must follow A
D must follow C
F must follow E
G must follow B
G must follow D
H must follow G
H must follow F

Process Segment Capabilities

500 boards/hour of Product X on Process
450 boards/hour of Product X on Process
300 front-panels/hour of Product X on Proc
300 front-panels/hour of Product X on Proc
500 power-supplies/hour of Product X on
500 power-supplies/hour of Product X on
350 boxes/hour of Product X on Process
450 boxes/hour of Product X on Process

Routings and Material Dependencies



Process Segment

Process Segment A

produces material A1
 produces material A2
 produces material A3
 produces material A4

Process Segment B

consumes material A1
 consumes material A2
 produces product B1

Process Segment C

consumes material A3
 consumes material E1
 produces product C1
 produces material C2

Process Segment D

consumes material A4
 consumes material E2
 produces material D1

Process Segment E

produces material E1
 produces material E2

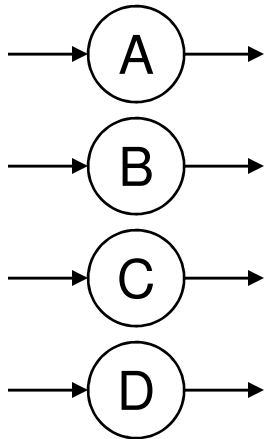
Process Segment F

consumes material C2
 consumes material D1
 produced product F1

Process Segment Dependencies

B must follow A
 C must follow A
 C must follow E
 D must follow A
 D must follow E
 F must follow C
 F must follow D

Process Segments

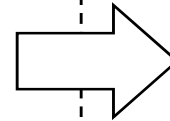


Product Segments

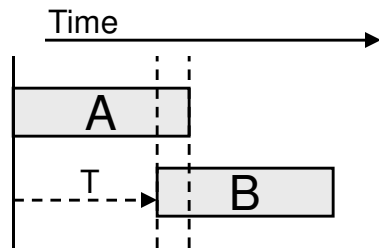
Product Class X can be manufactured by segment A,B,C, or D
 Product Class Y can only be manufactured by segment B
 Product Class Z can only be manufactured by Segment B or C
 Product Class W can only be manufactured by Segment D

Process Segment Capabilities

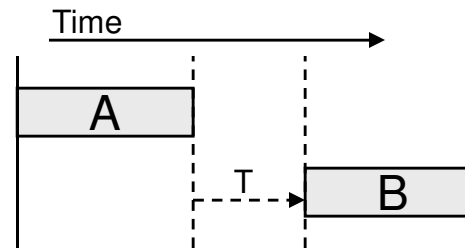
500 Kg of Product Class X on Process Segment A
 450 Kg of Product Class X on Process Segment B
 325 Kg of Product Class X on Process Segment C
 600 Kg of Product Class X on Process Segment D
 467 Kg of Product Class Y on Process Segment B
 330 Kg of Product Class Z on Process Segment B
 521 Kg of Product Class Z on Process Segment C
 489 Kg of Product Class W on Process Segment D



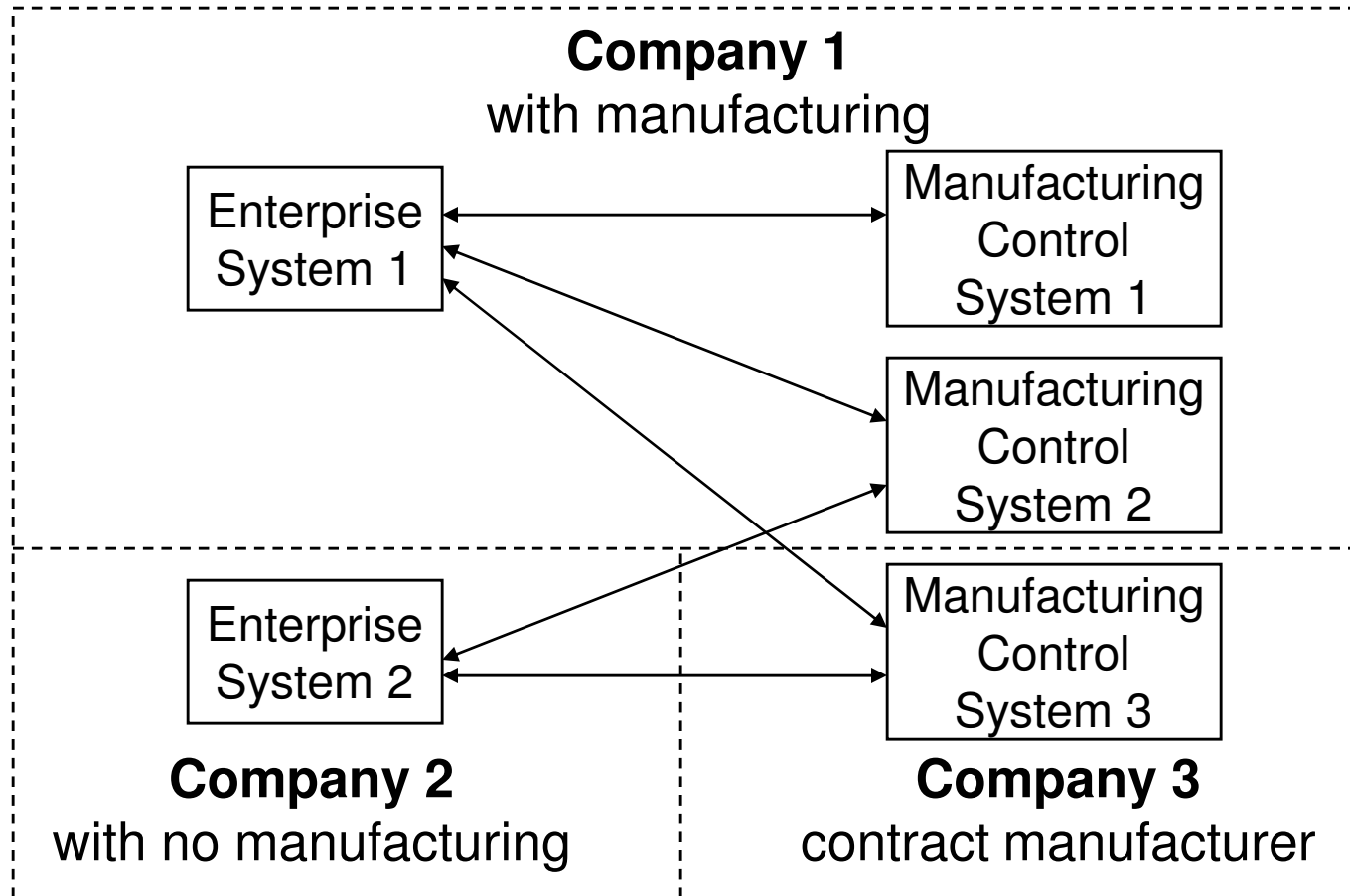
	A	B	C	D
X	$\$_{XA}$ 500	$\$_{XB}$ 450	$\$_{XC}$ 325	$\$_{XD}$ 600
Y	$\$_{YA}$ 0	$\$_{YB}$ 467	$\$_{YC}$ 0	$\$_{YD}$ 0
Z	$\$_{ZA}$ 0	$\$_{ZB}$ 330	$\$_{ZC}$ 521	$\$_{ZD}$ 0
W	$\$_{WA}$ 0	$\$_{WB}$ 0	$\$_{WC}$ 0	$\$_{WD}$ 489



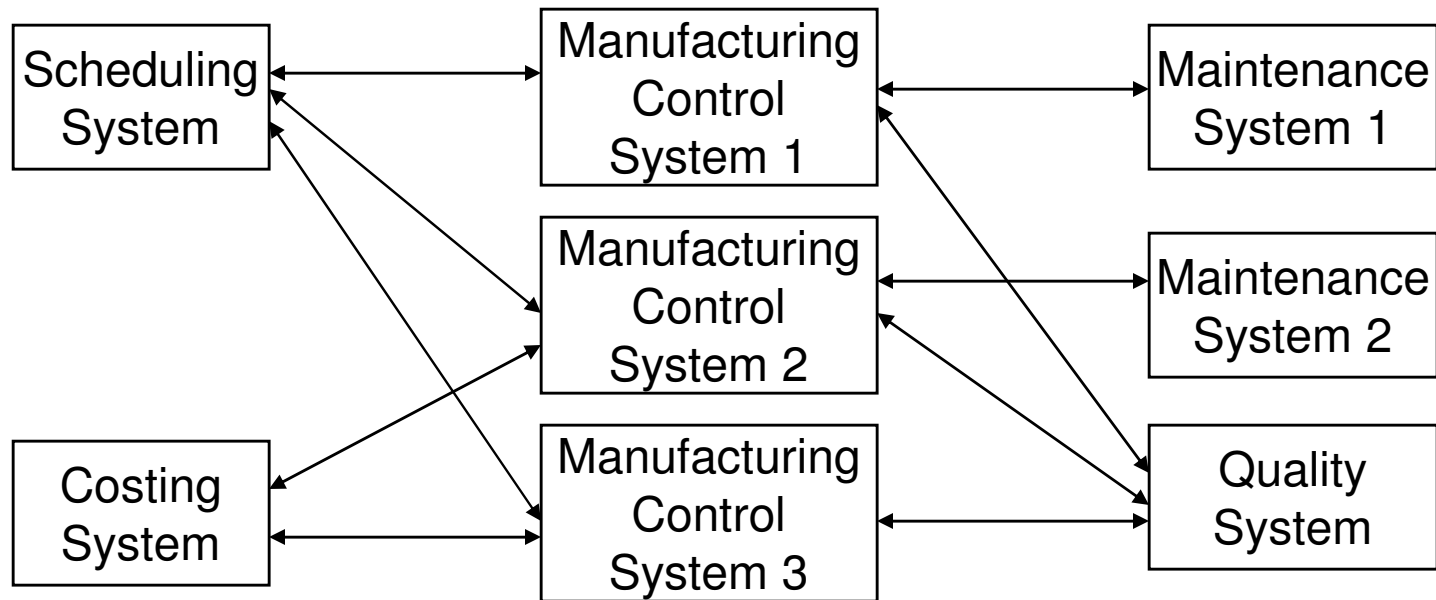
B may run in parallel to A
 Start B at A start
 Start B after A start
 Start B no later than T time after A start
 Start B no earlier than T time after A start



B may not run in parallel to A
 Start B at A end
 Start B after A end
 Start B no later than T time after A end
 Start B no earlier than T time after A end



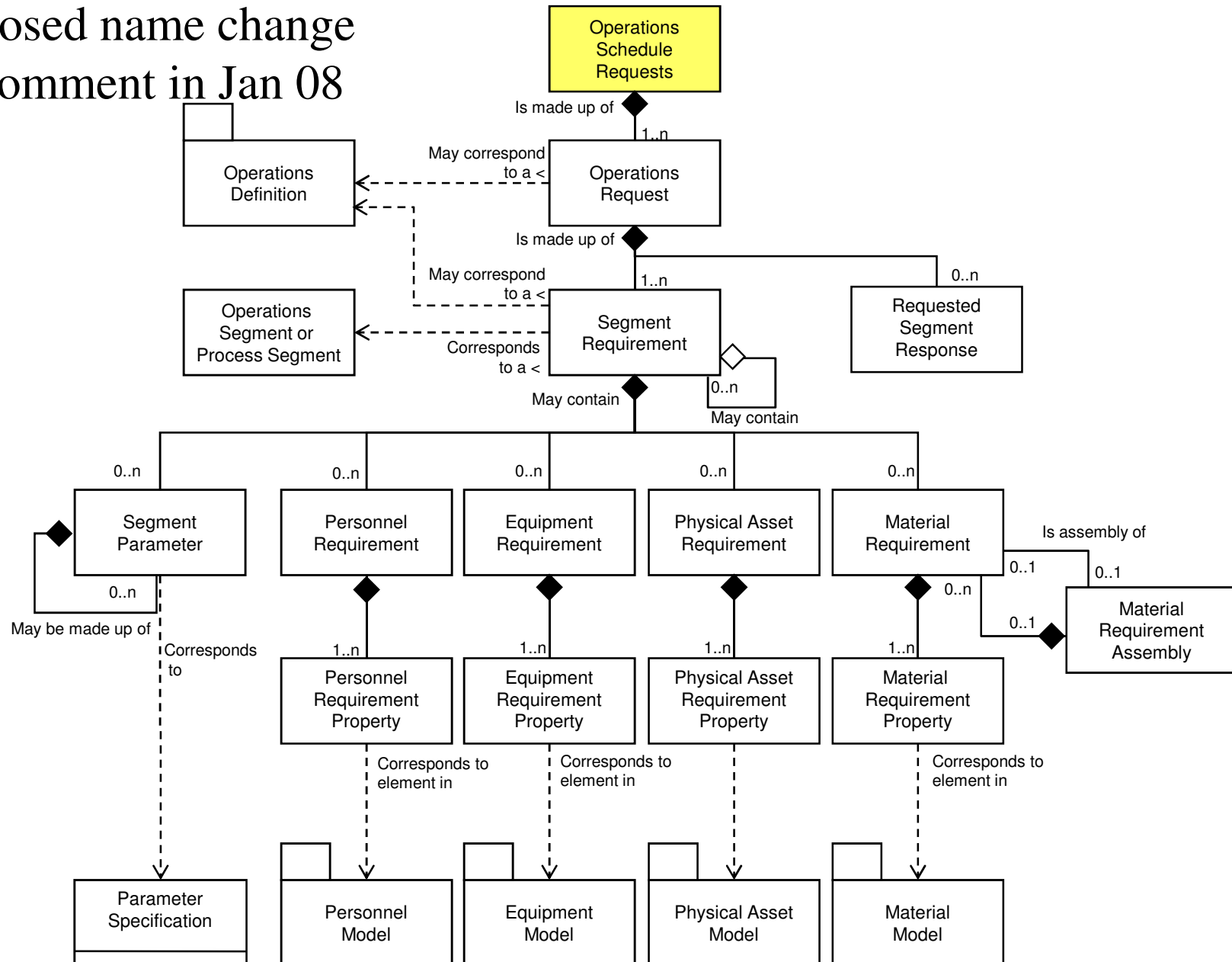
Check with PDF from original Part 2



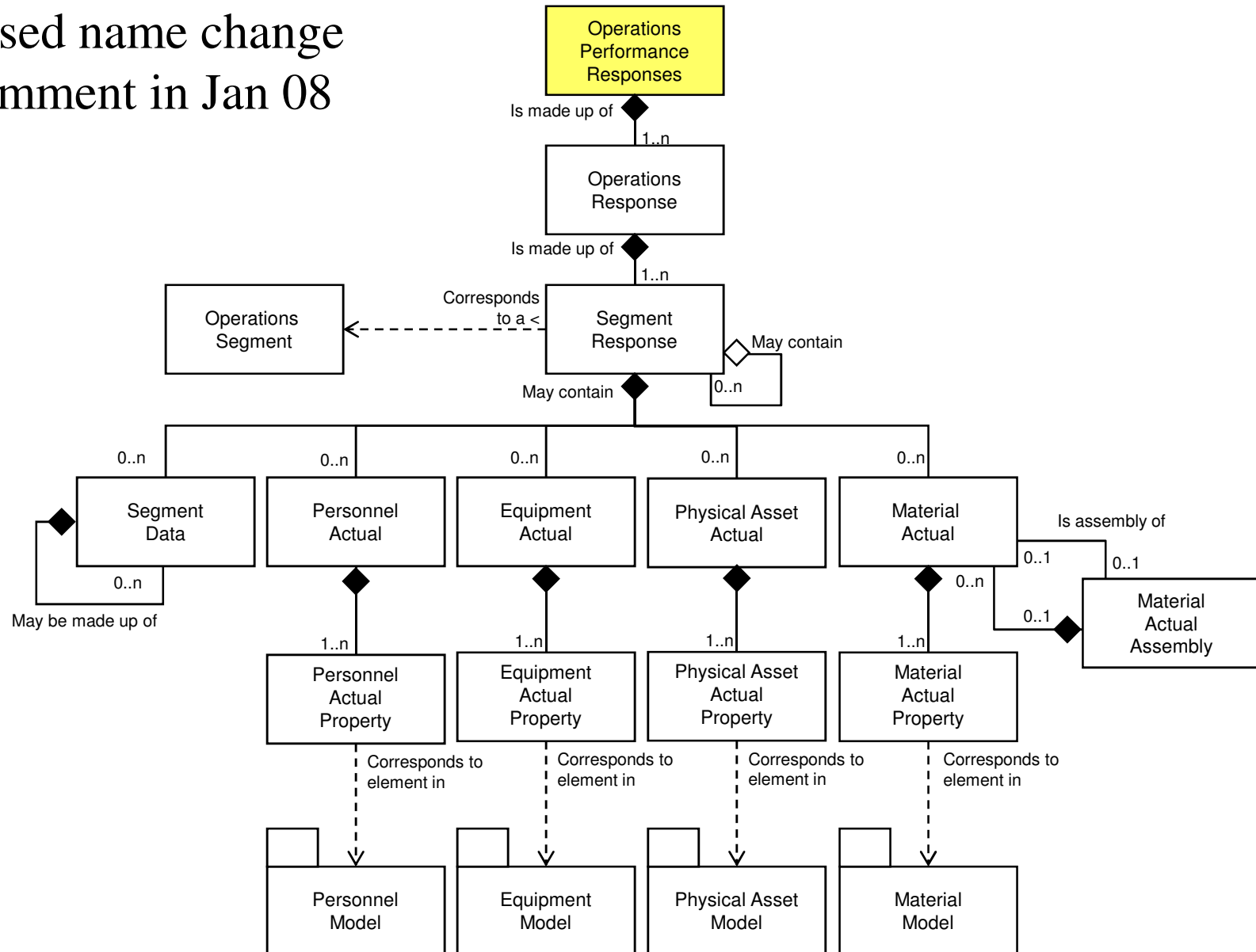
Check with PDF from original Part 2

Extra Slides

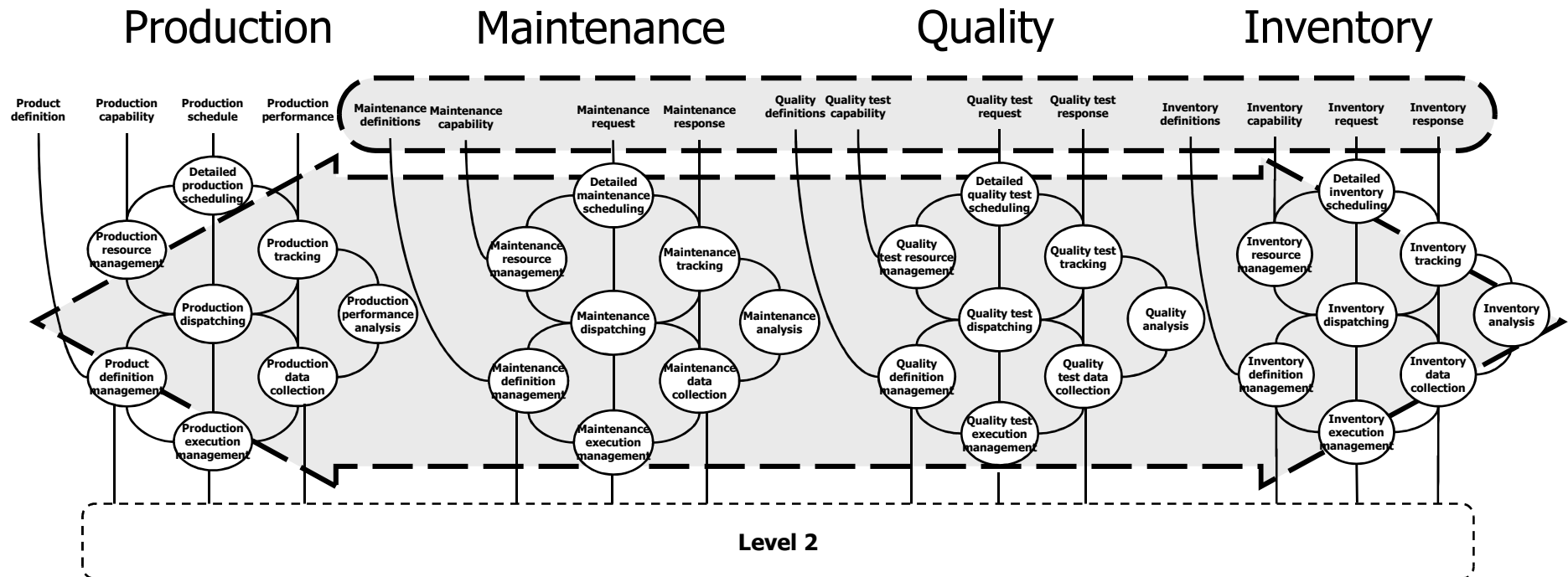
Proposed name change for comment in Jan 08



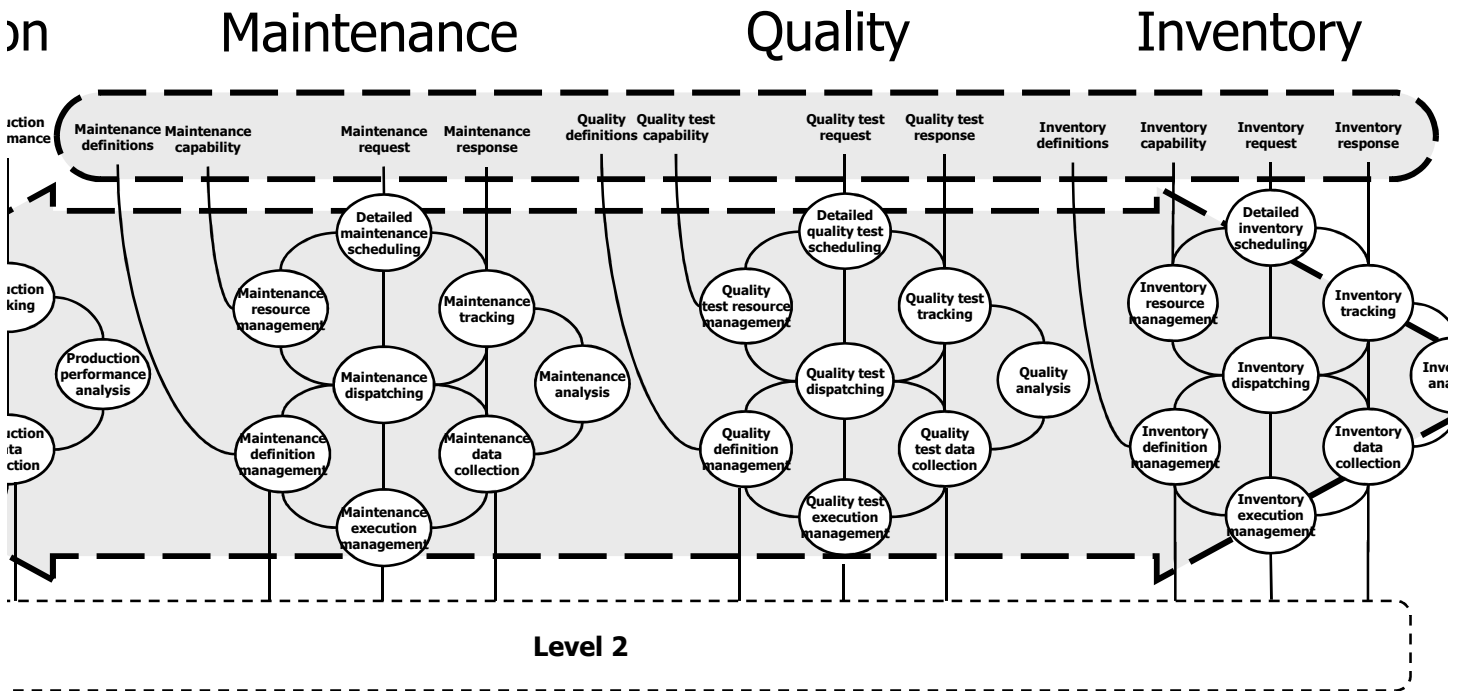
Proposed name change for comment in Jan 08



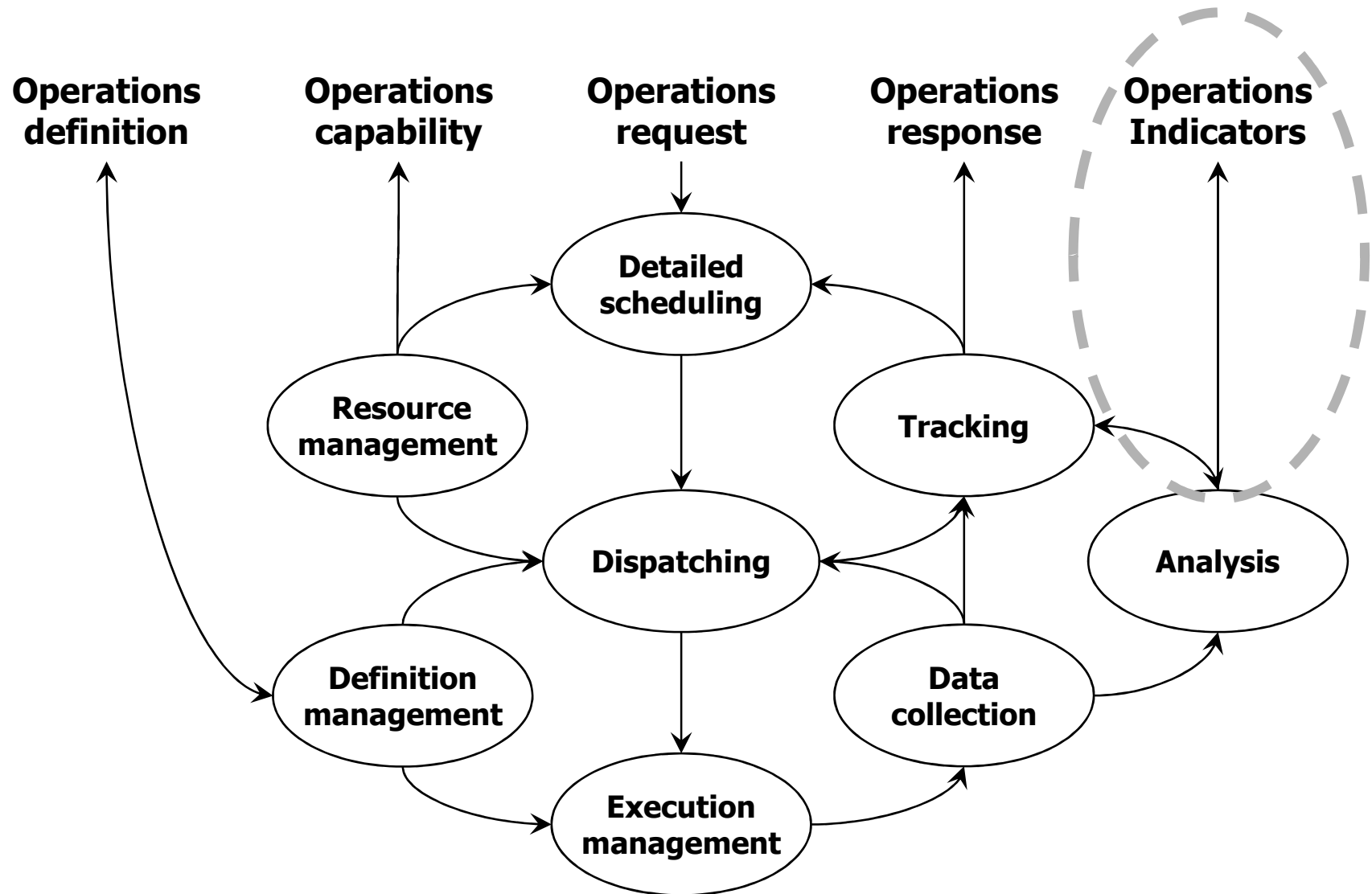
Part 4 ? Figure ?



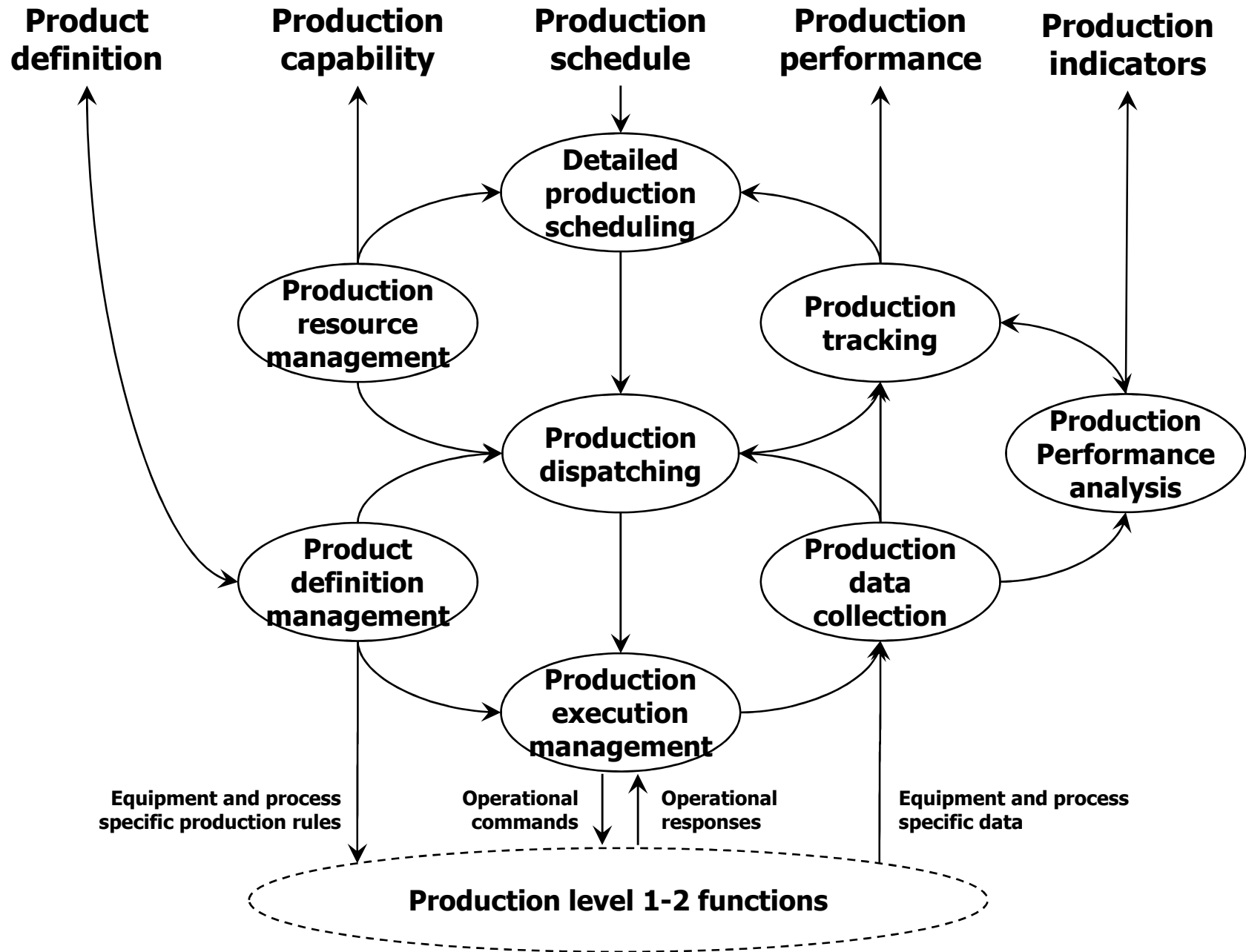
Part 4 ? Figure ?



Part 4 ? Figure ?

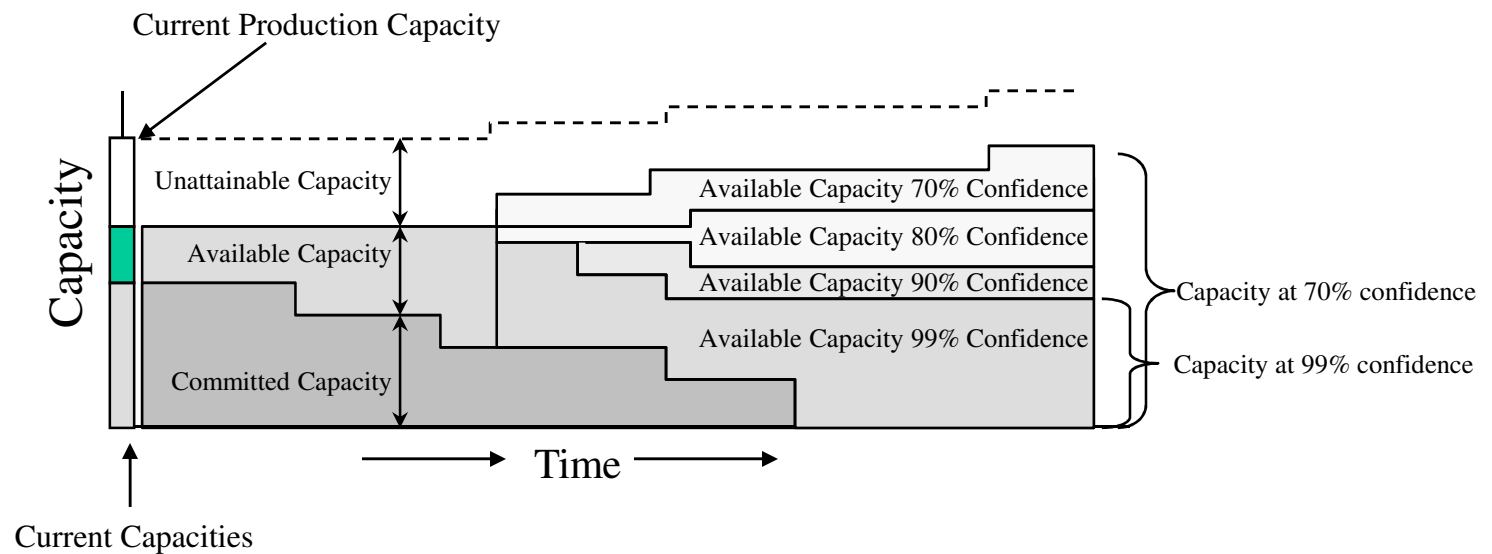


Part 4 ? Figure ?

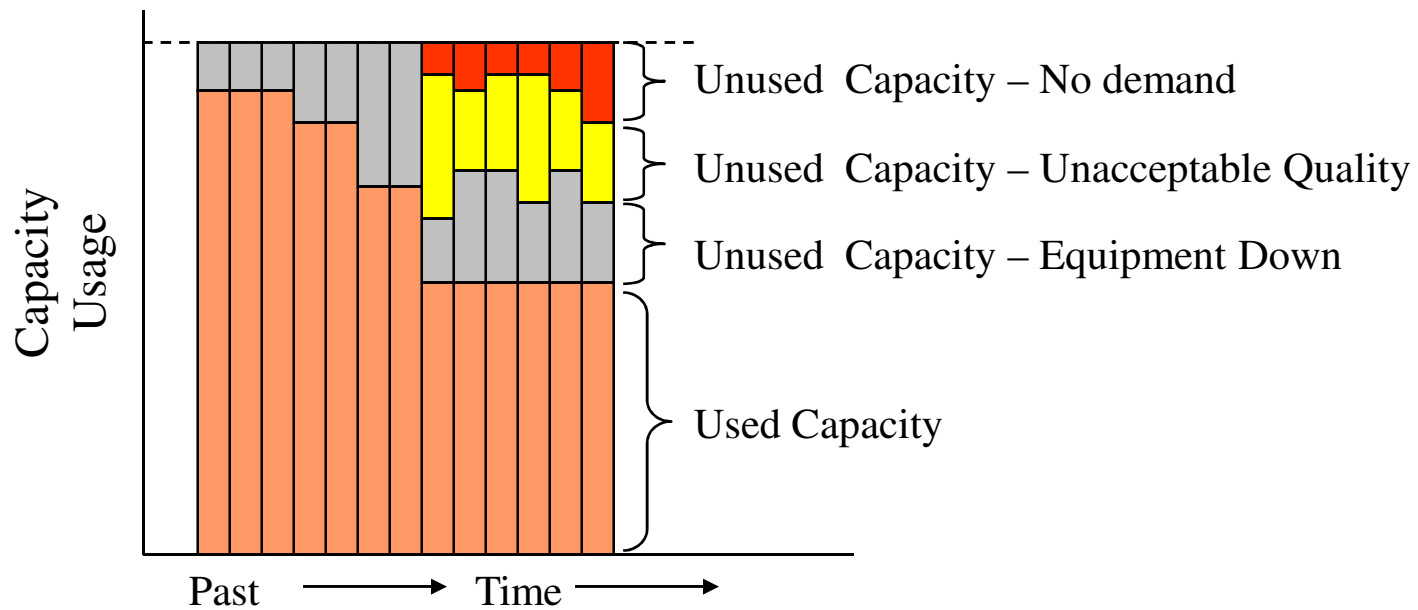
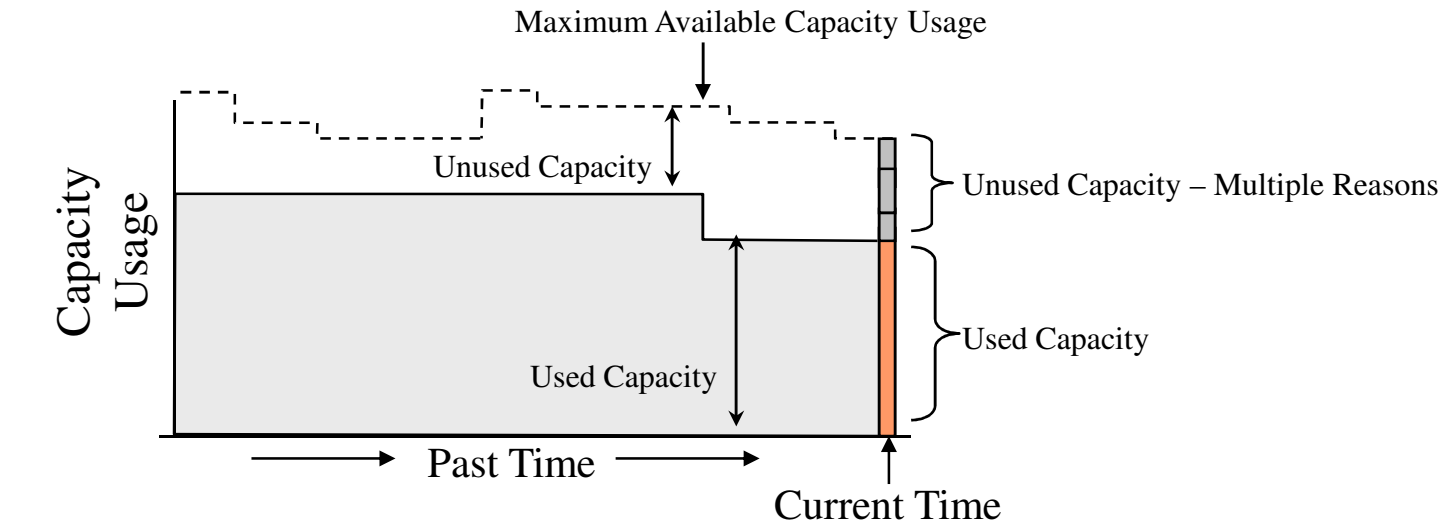


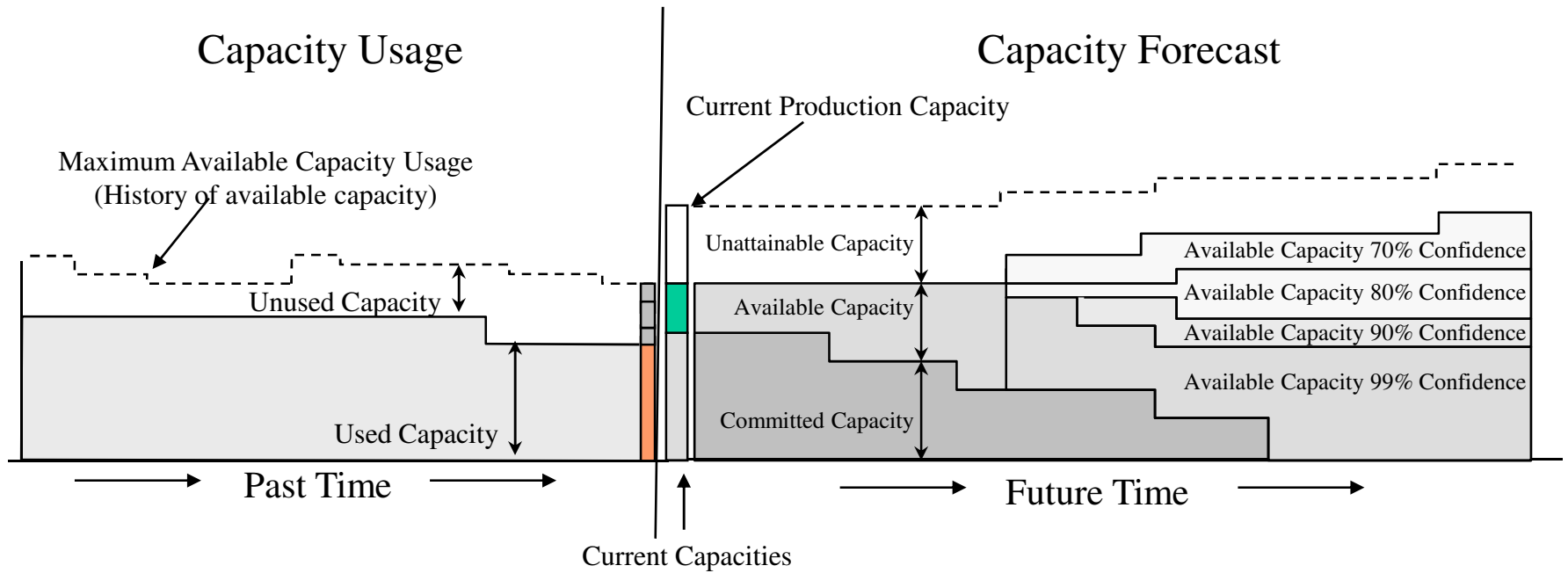
Part 4 ? Figure ?

Capability Confidence

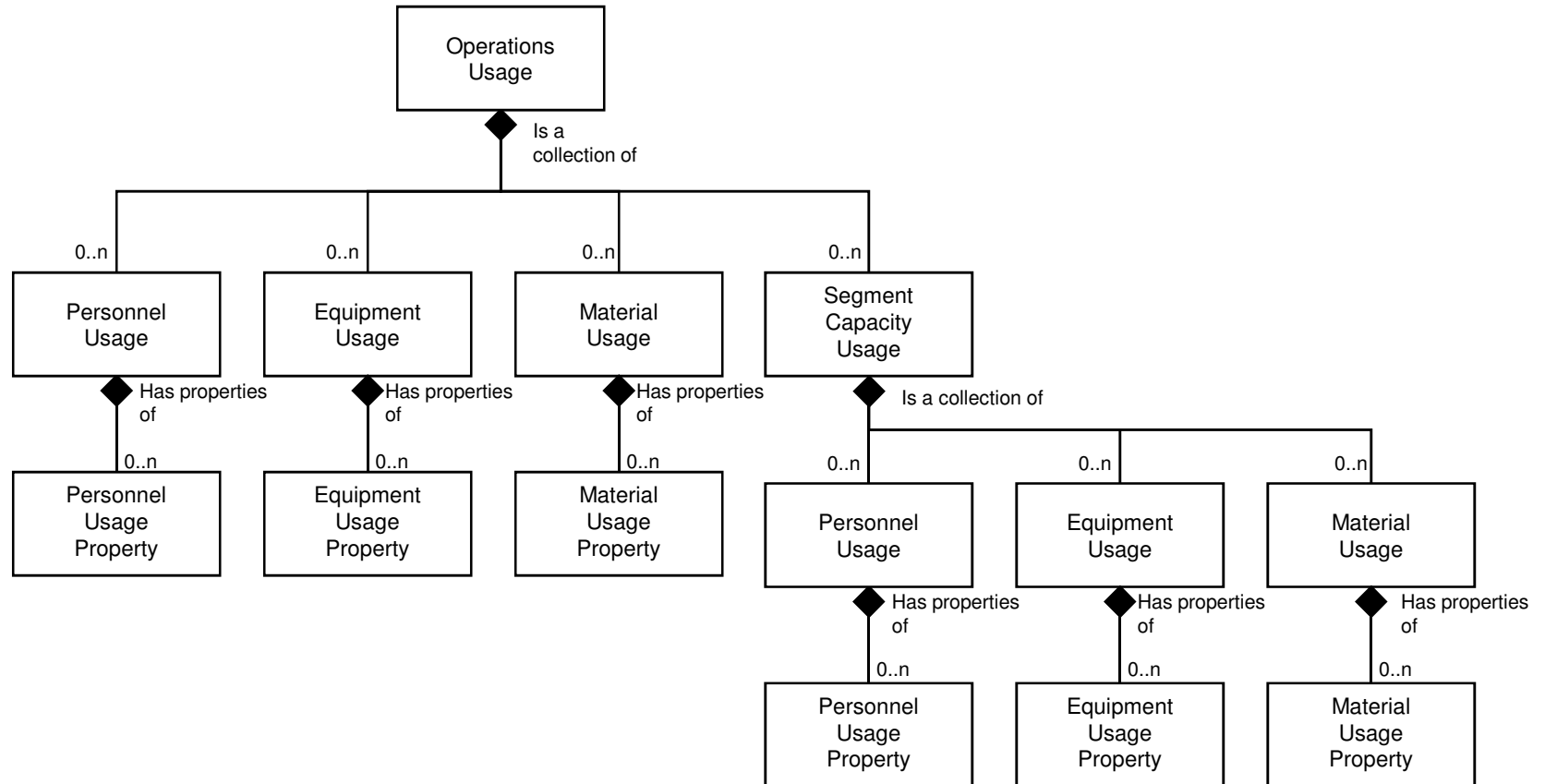


Part 4 ? Figure ?

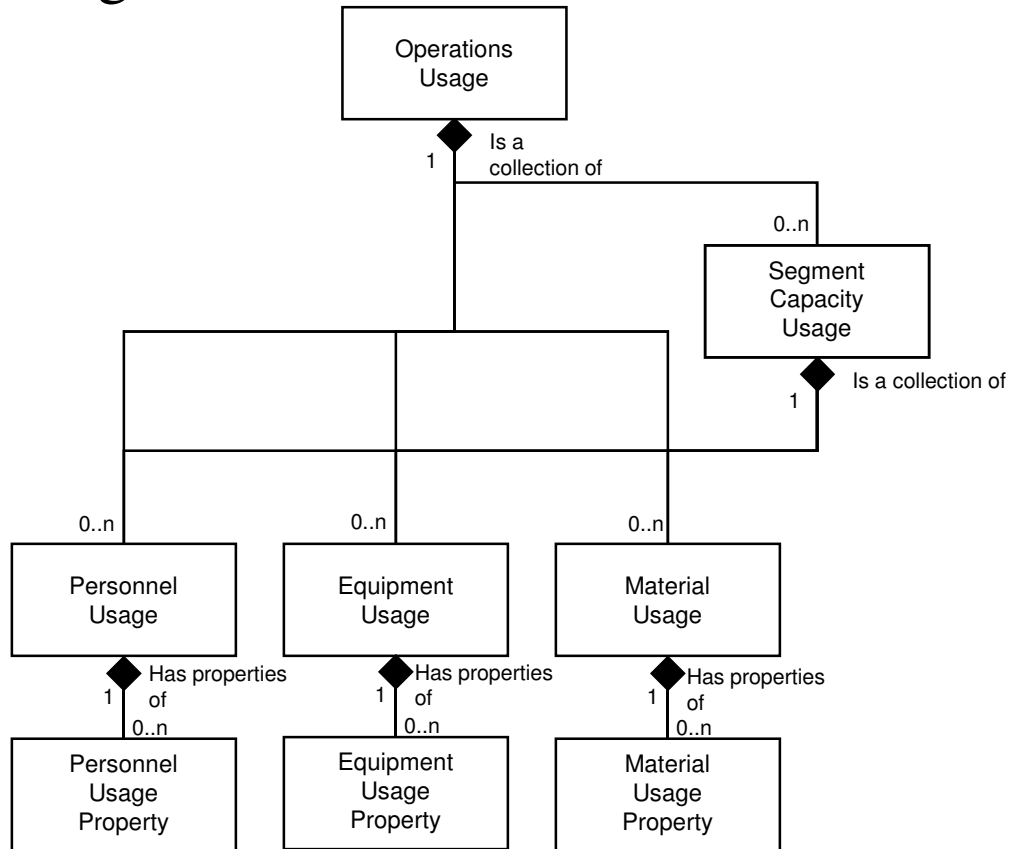




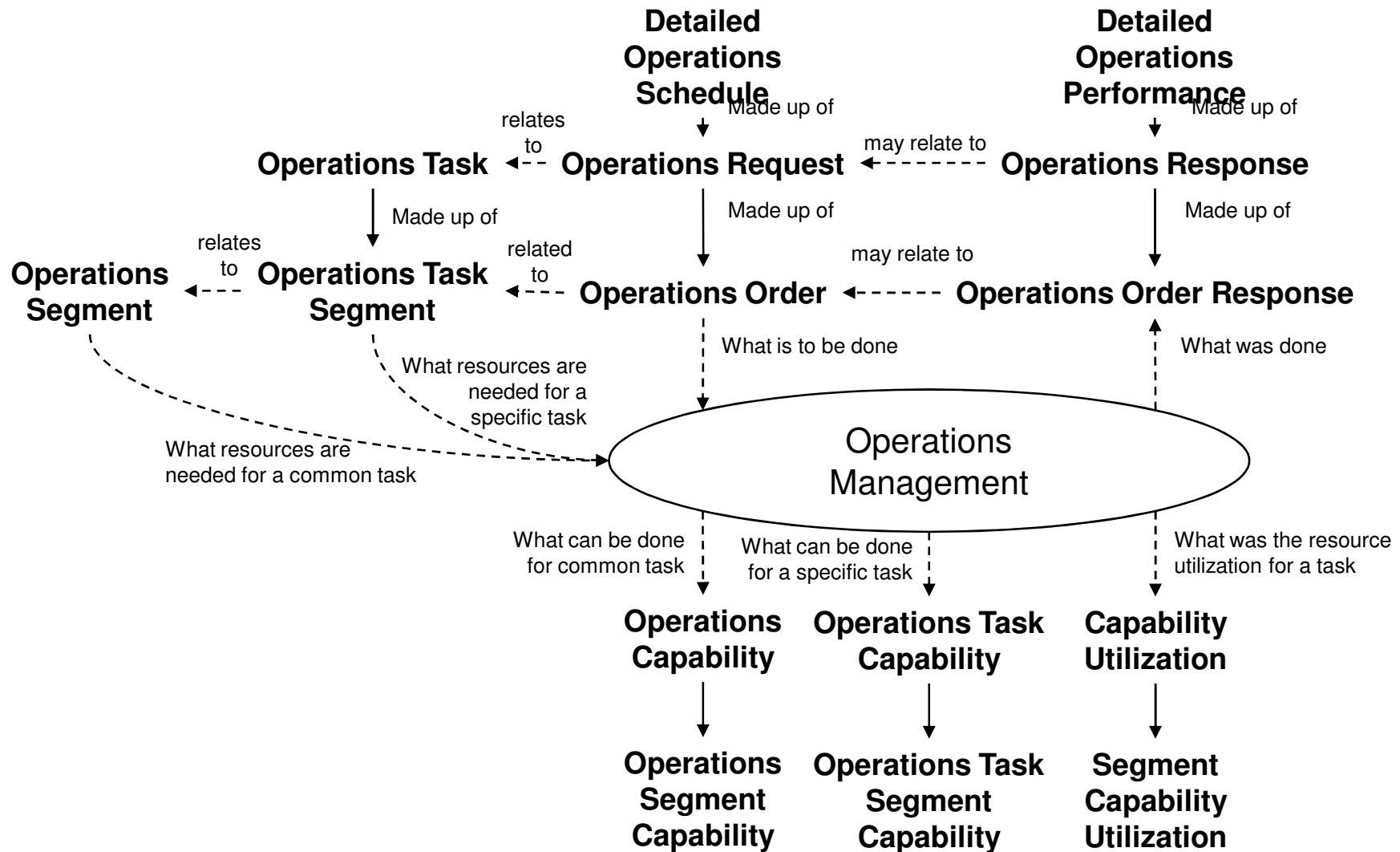
Part 4 ? Figure ?



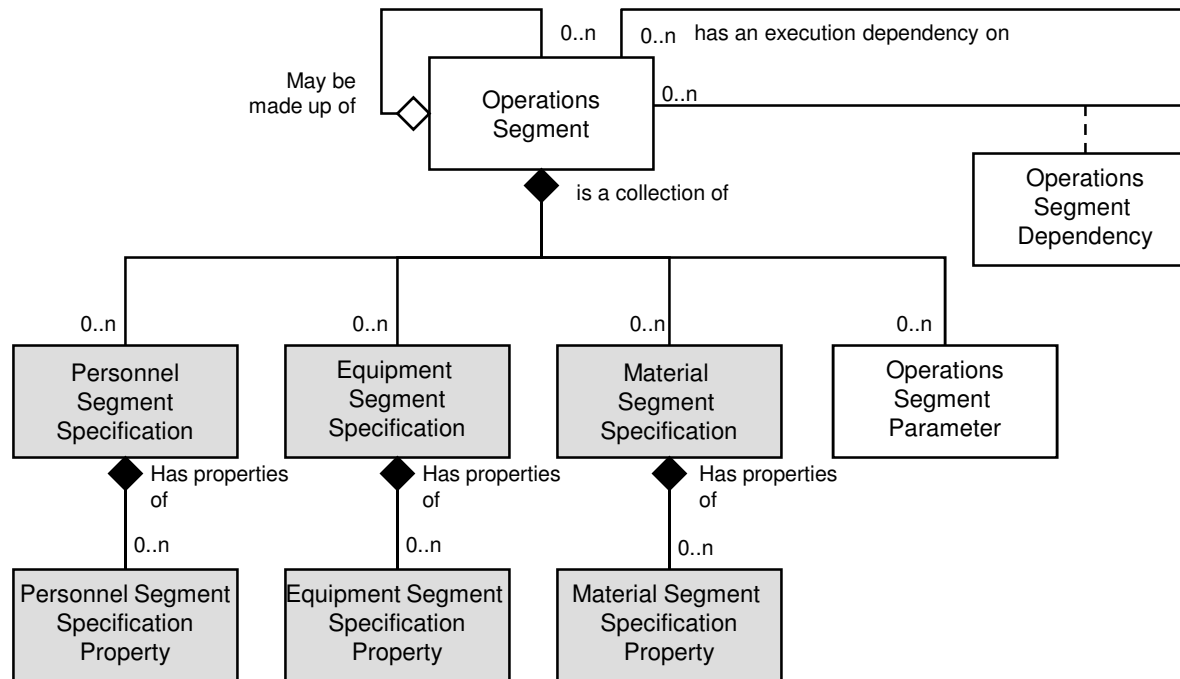
Part 4 ? Figure ?



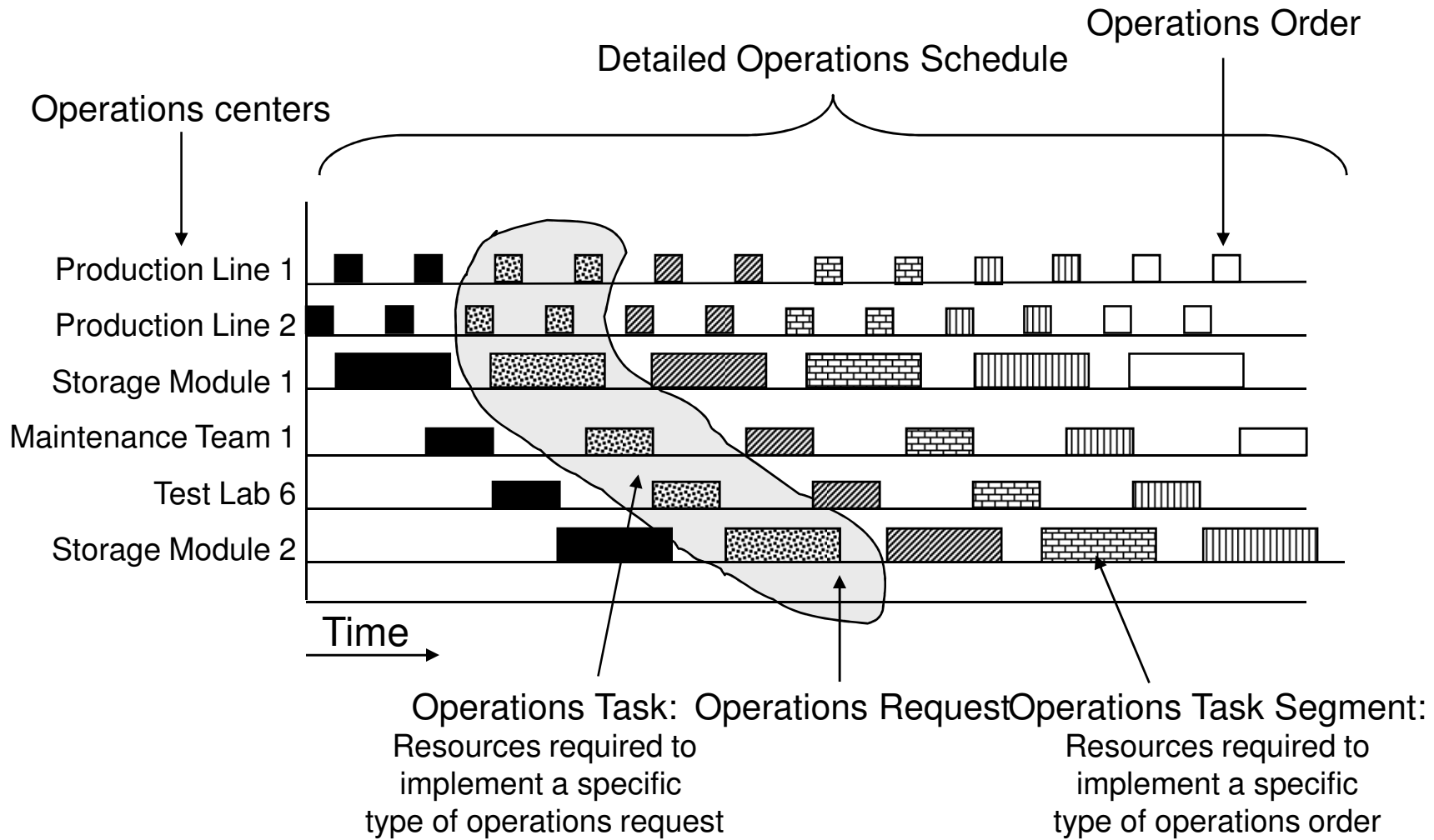
Part 4 ? Figure ?



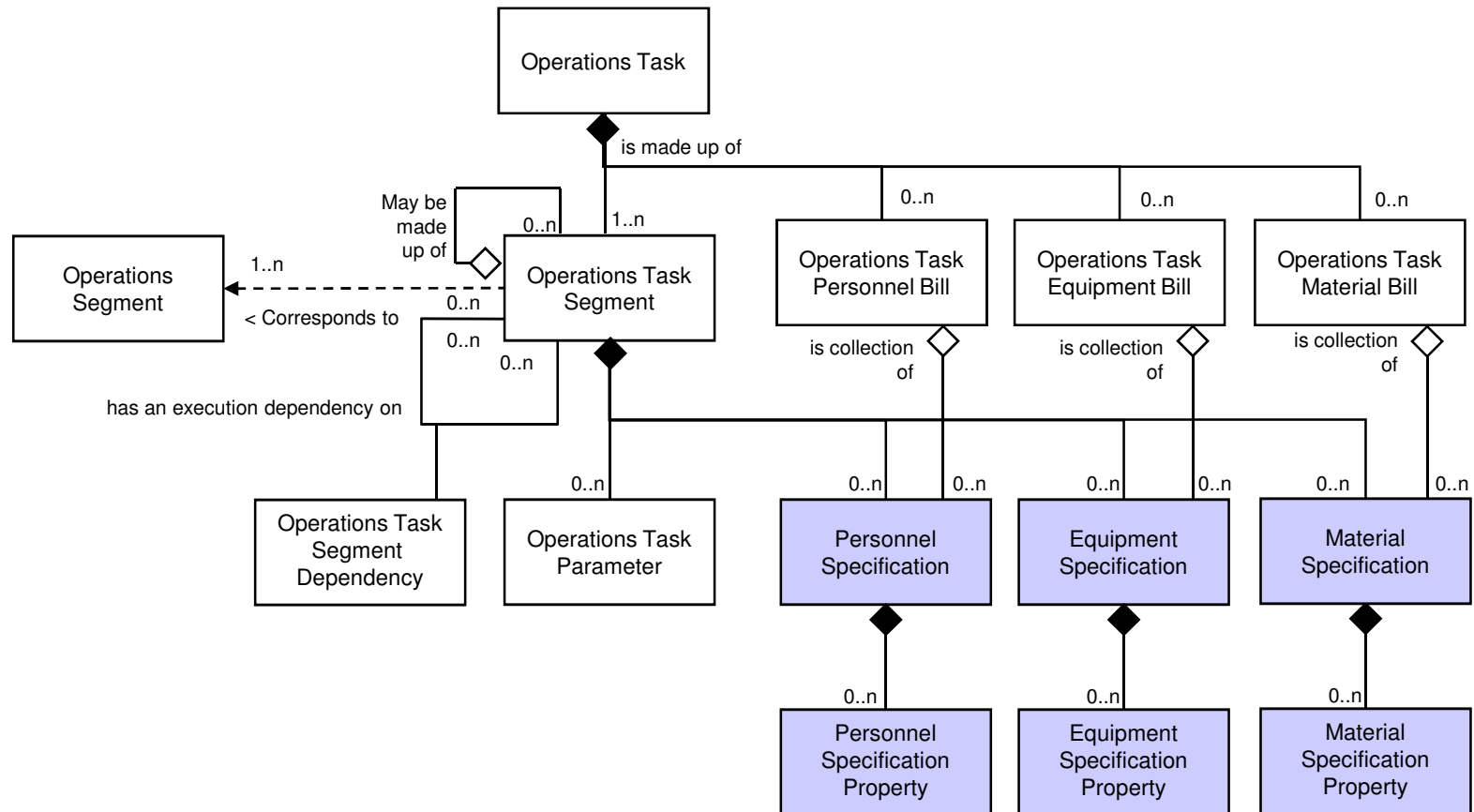
Part 4 ? Figure ?



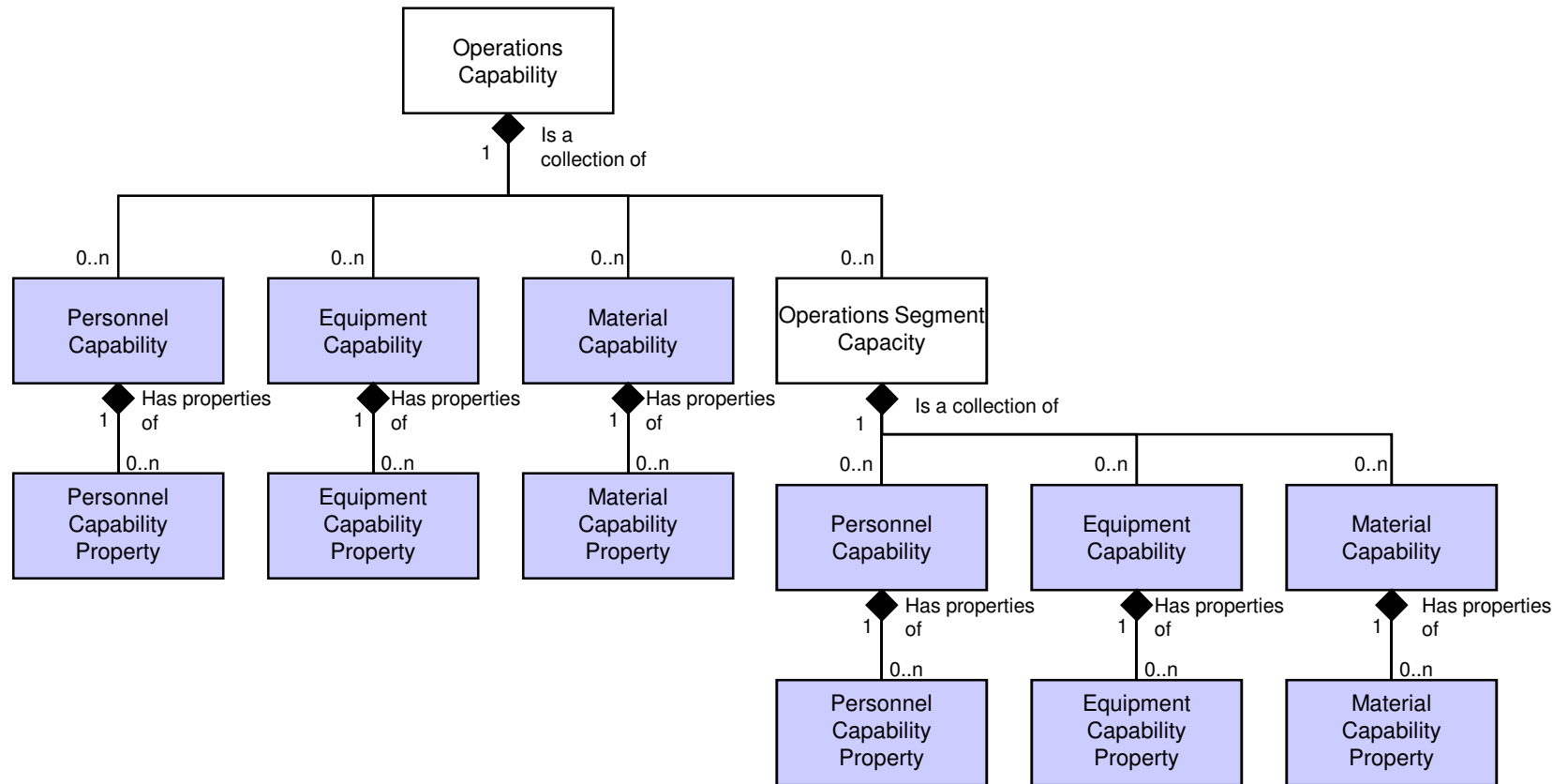
Part 4 ? Figure ?



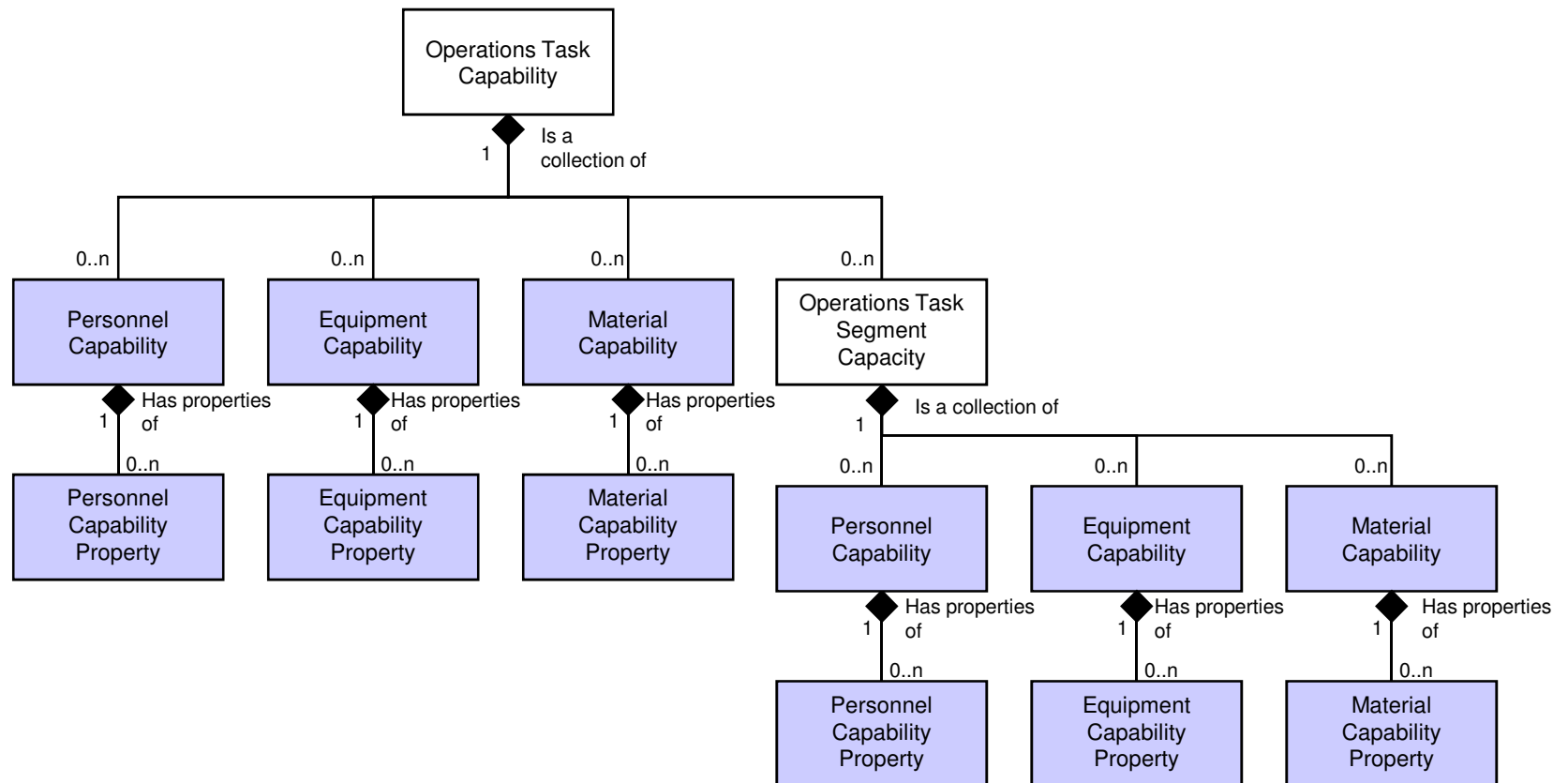
Part 4 ? Figure ?



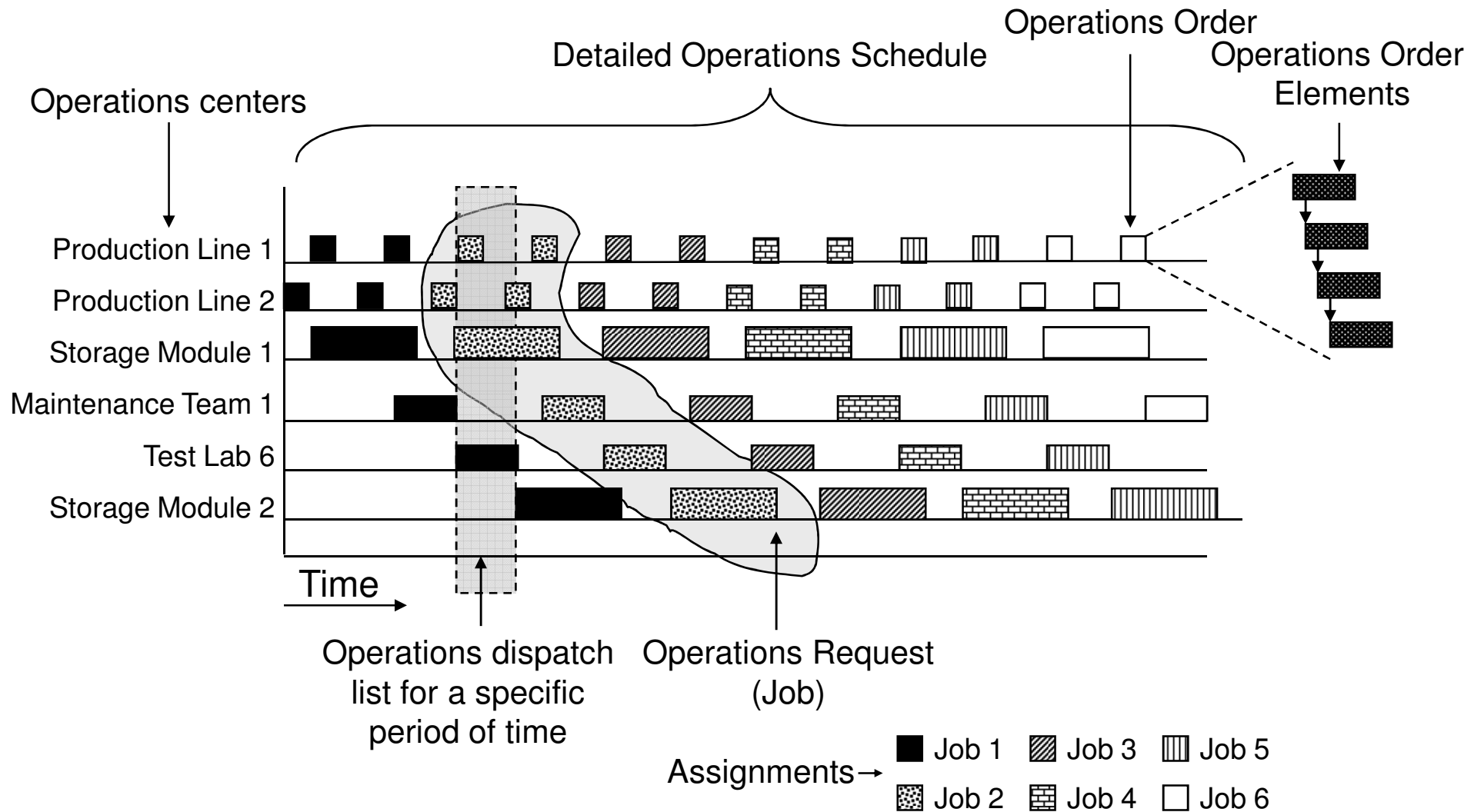
Part 4 ? Figure ?



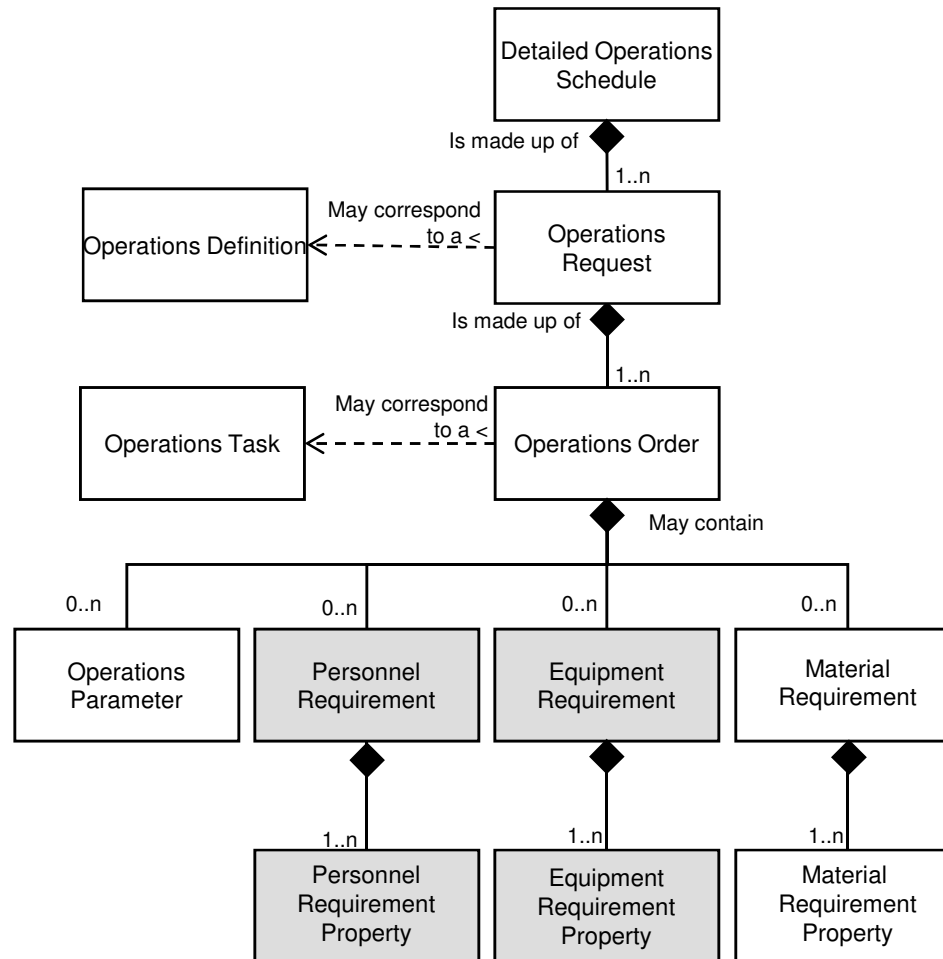
Part 4 ? Figure ?



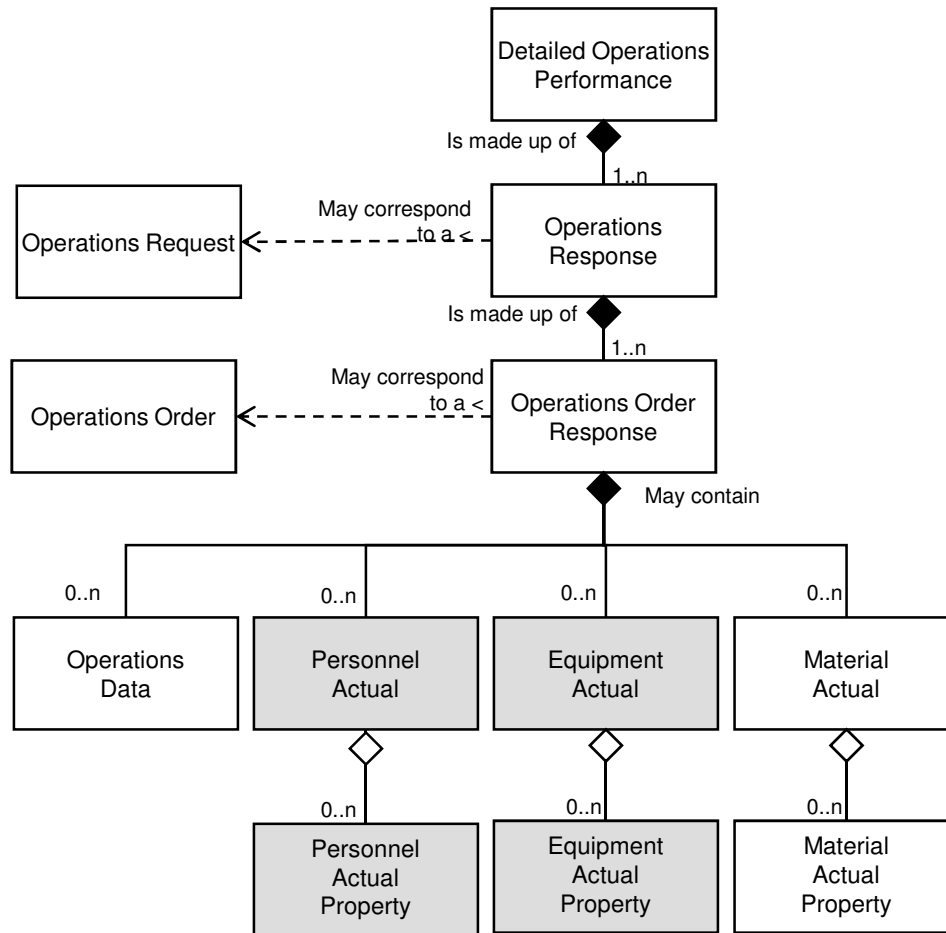
Part 4 ? Figure ?



Part 4 ? Figure ?

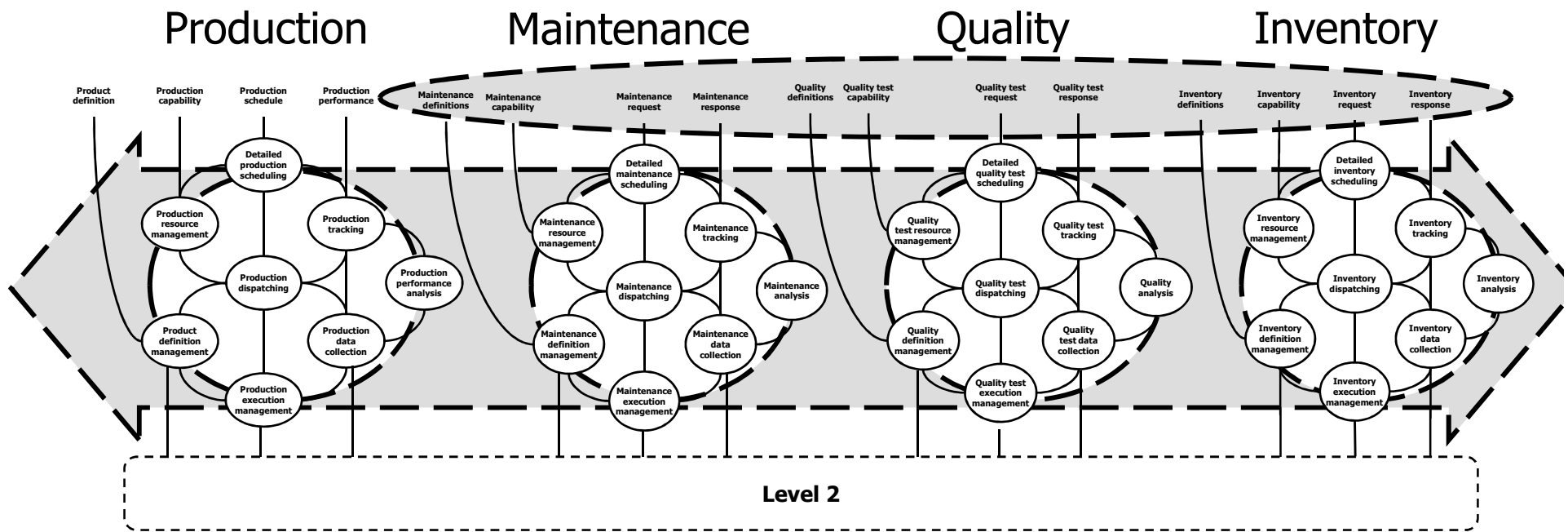


Part 4 ? Figure ?

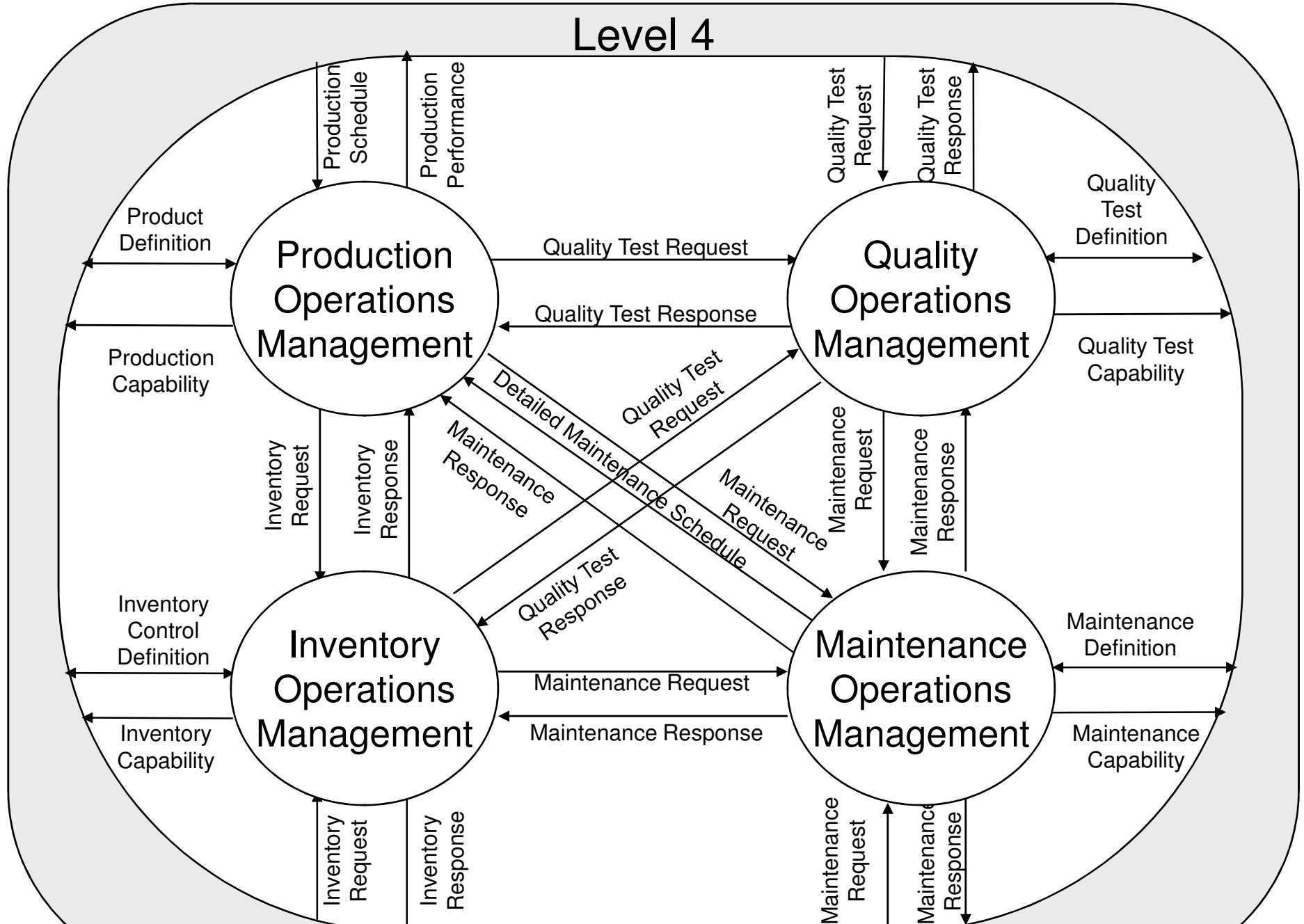


Part 4 ? Figure ?

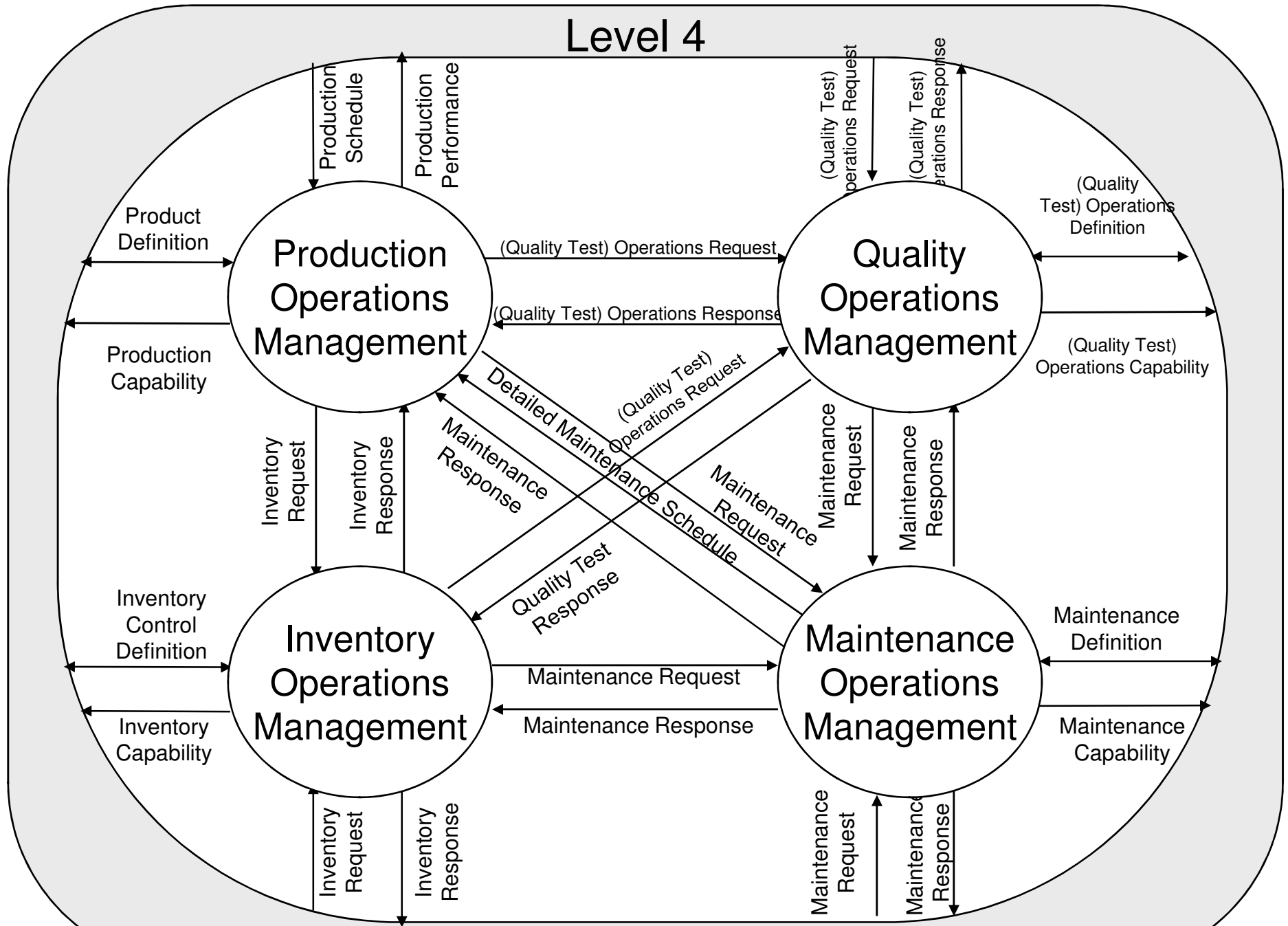
The shaded elements are the points of interest, they define the information that flows between main Level 3 areas and information which may flow to other Level 4 systems.



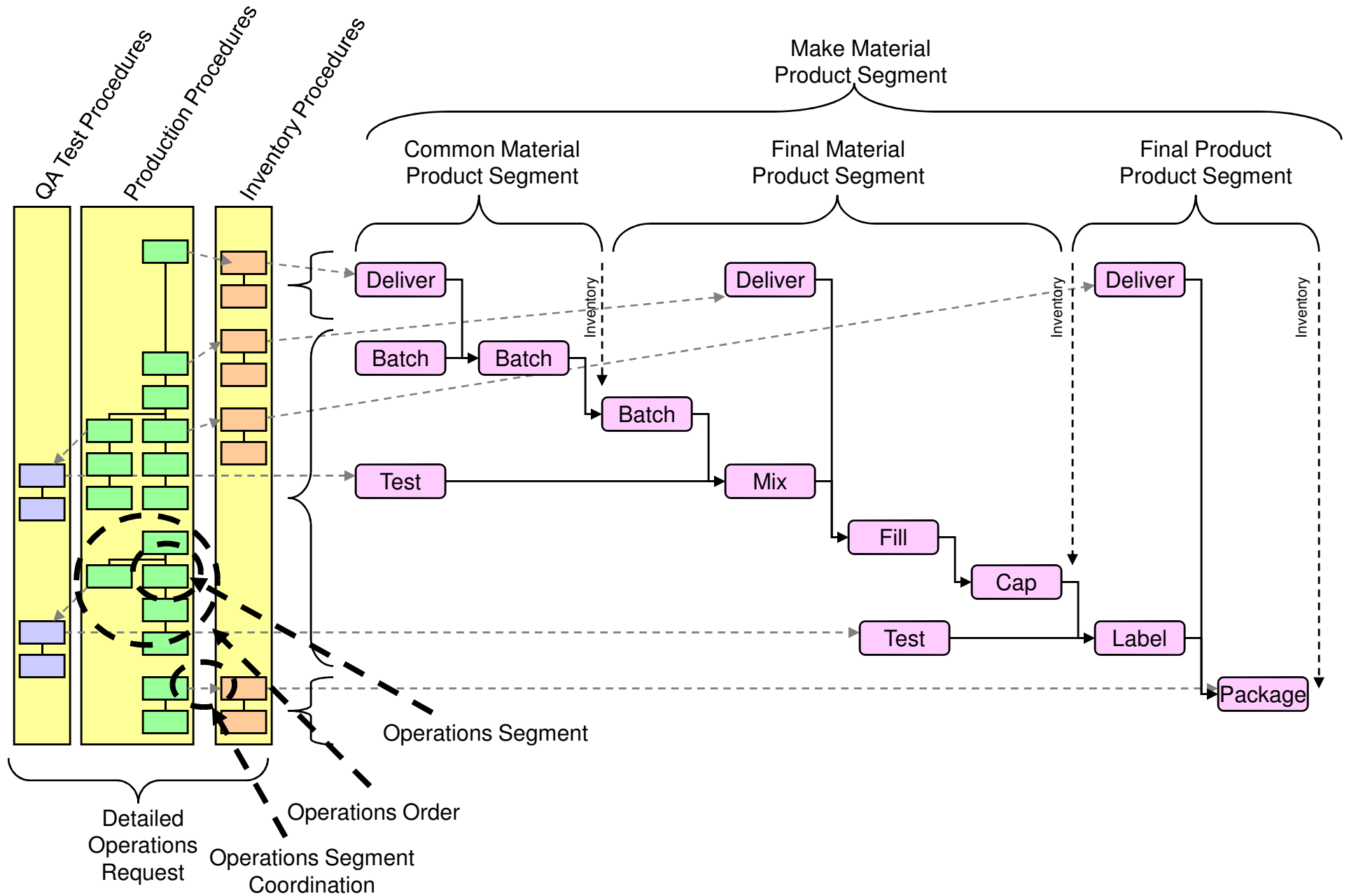
Part 4 ? Figure ?



Part 4 ? Figure ?



Part 4 ? Figure ?

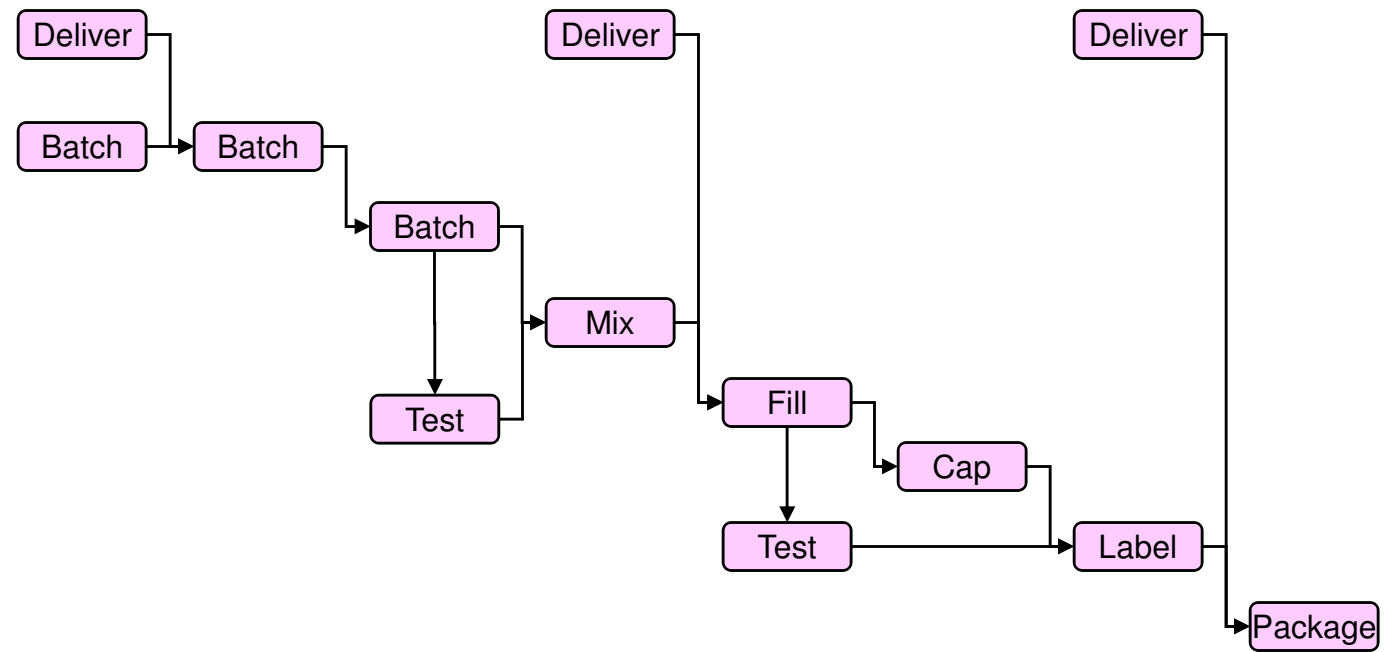


Part 4 ? Figure ?

ISA 95:

Process Diagram

made up of Physical Operations & Physical Routing

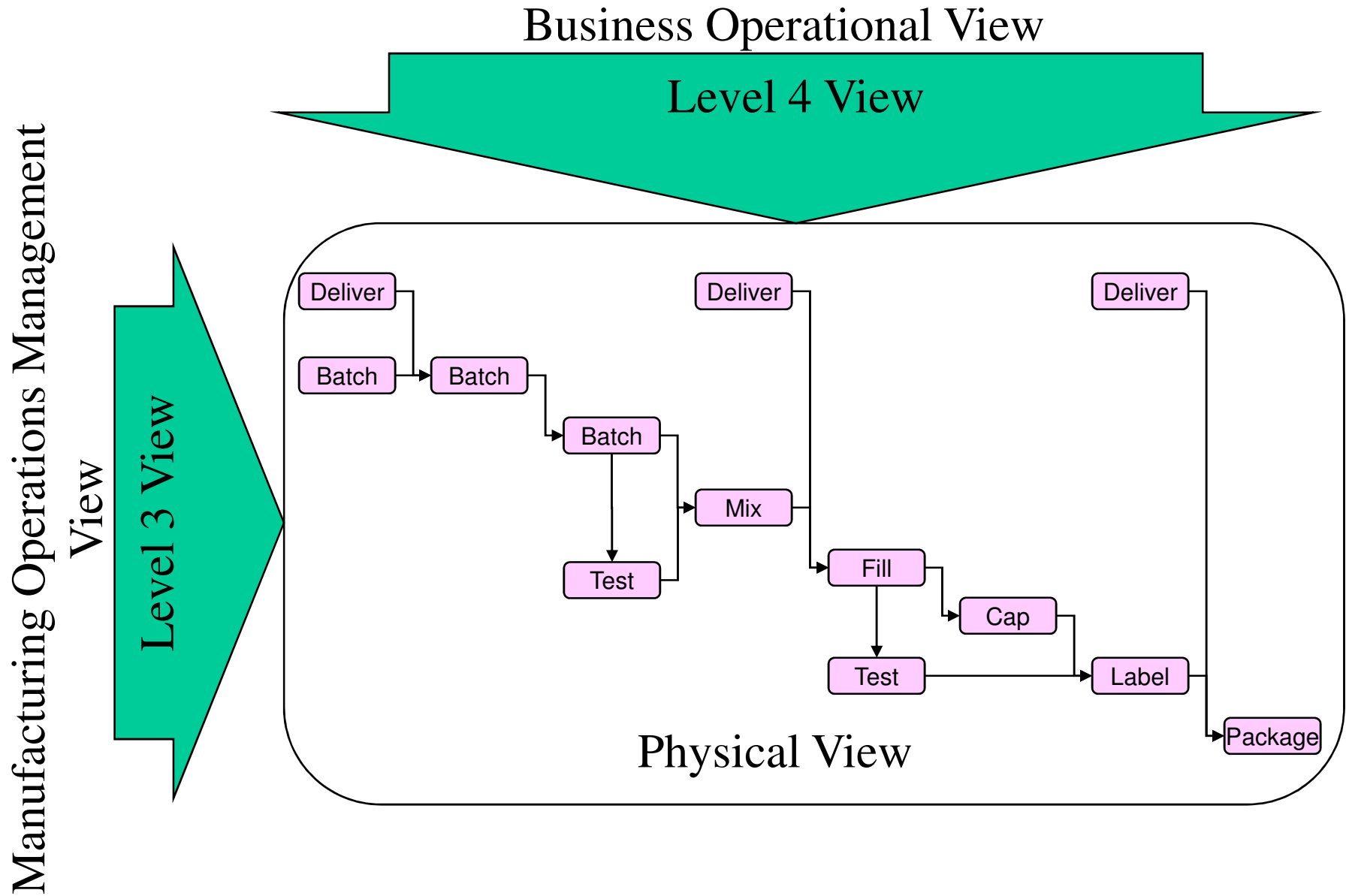


APICS:

Process Diagram

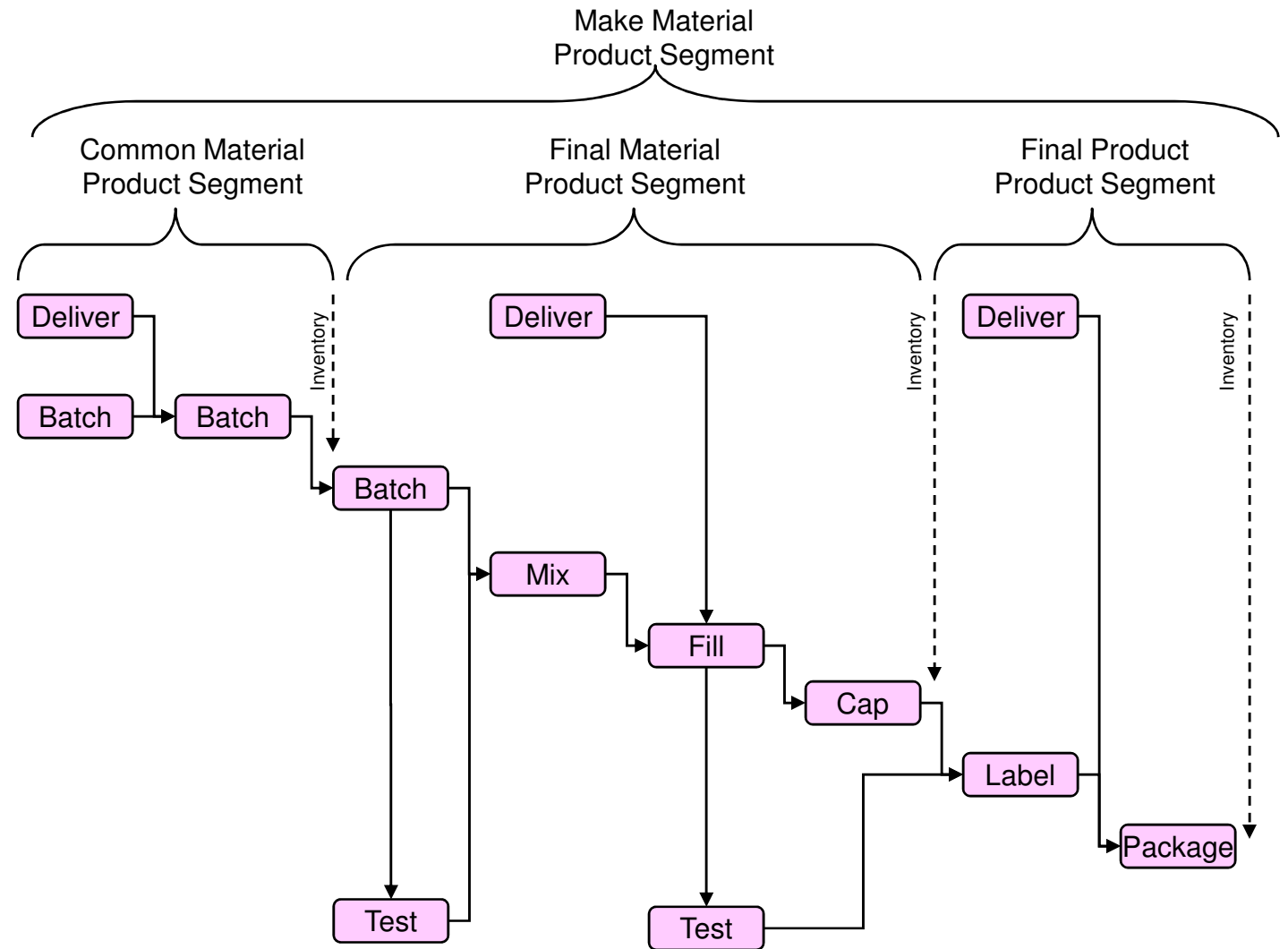
made up of Operations & Routing (Bill of Operations, Instruction Sheet, Manufacturing Data Sheet, Operation Chart, Operation List, Operation Sheet, Route Sheet, Routing Sheet)

Part 4 ? Figure ?

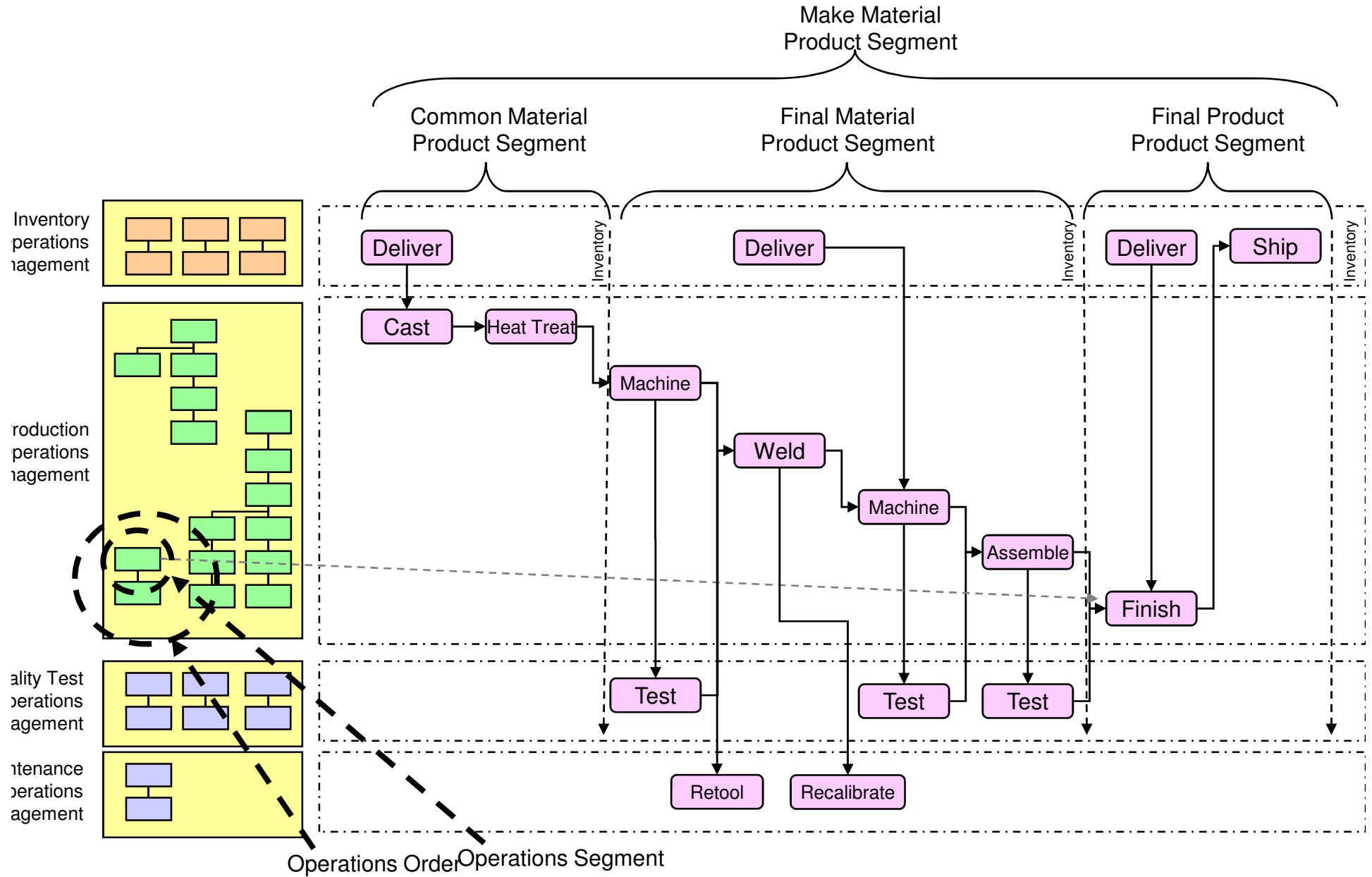


Note: Some industries/companies have the views more in alignment than others.

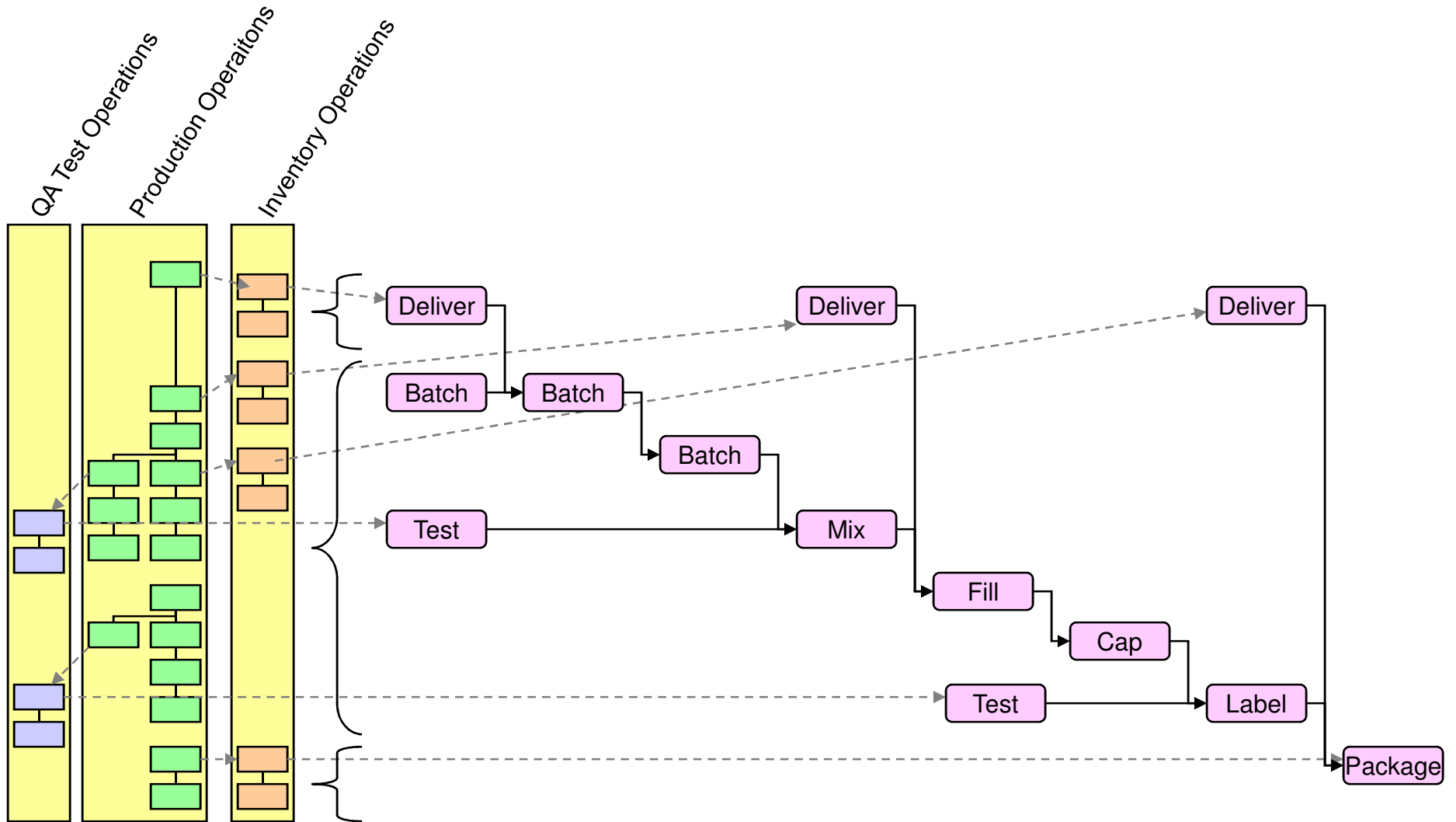
Part 4 ? Figure ?



Part 4 ? Figure ?



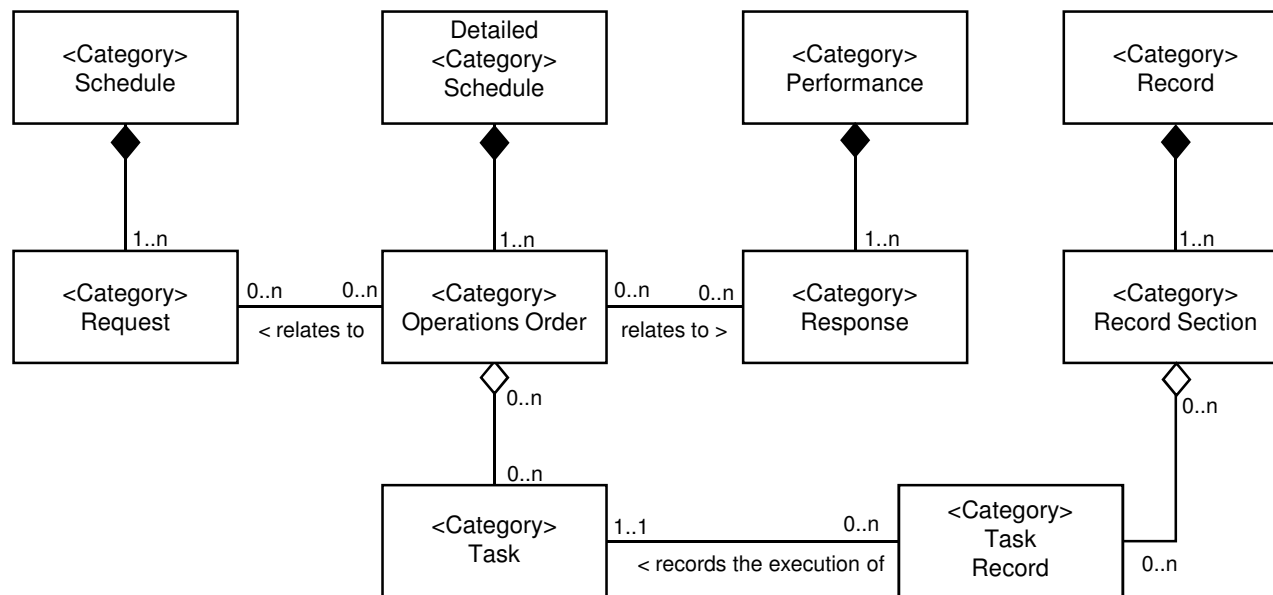
Part 4 ? Figure ?



Implied time axis on the vertical operations slices

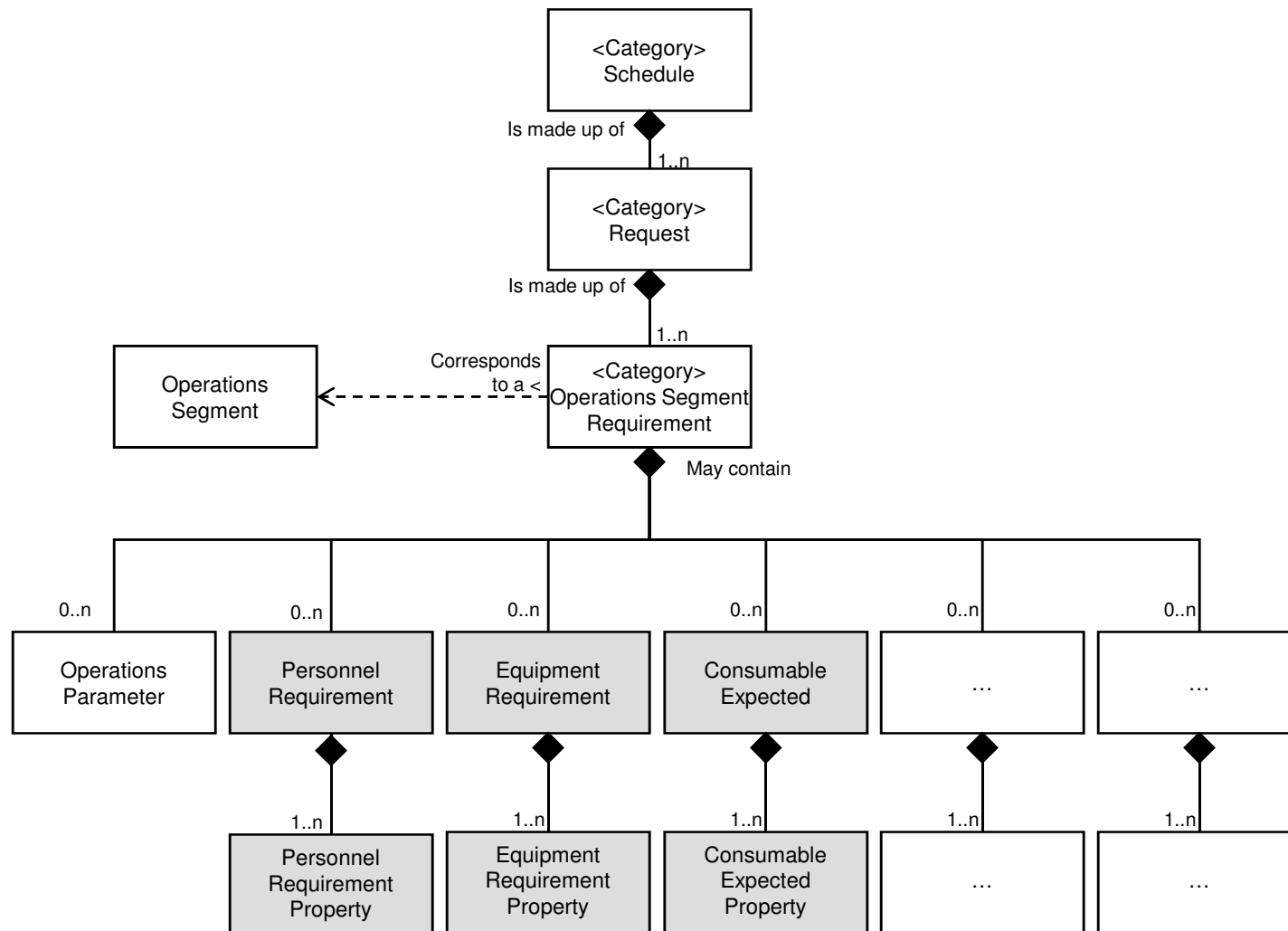
Part 4 ? Figure ?

Template Operations Activity Object Model



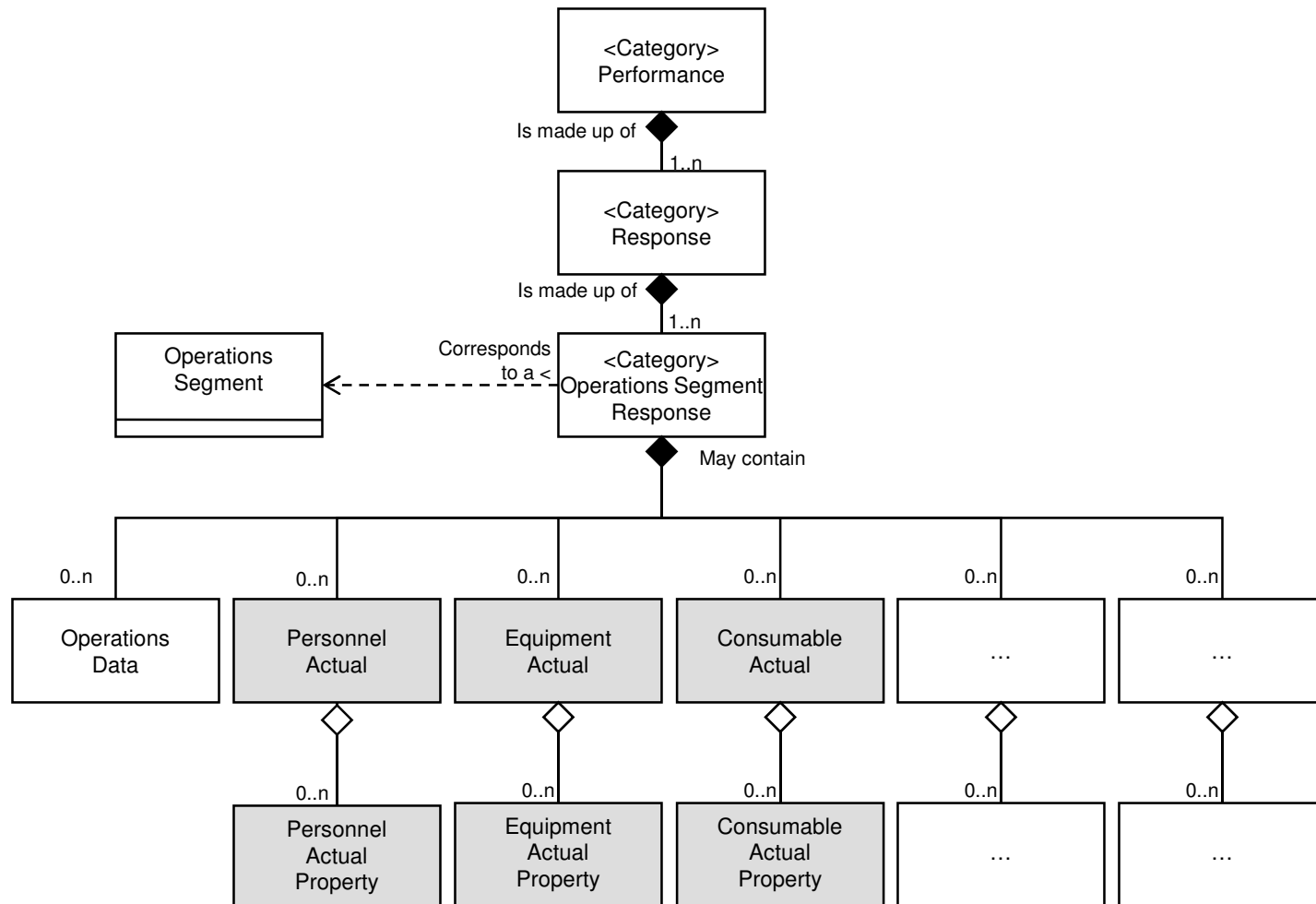
Part 4 ? Figure ?

Template for Operations Category Schedule



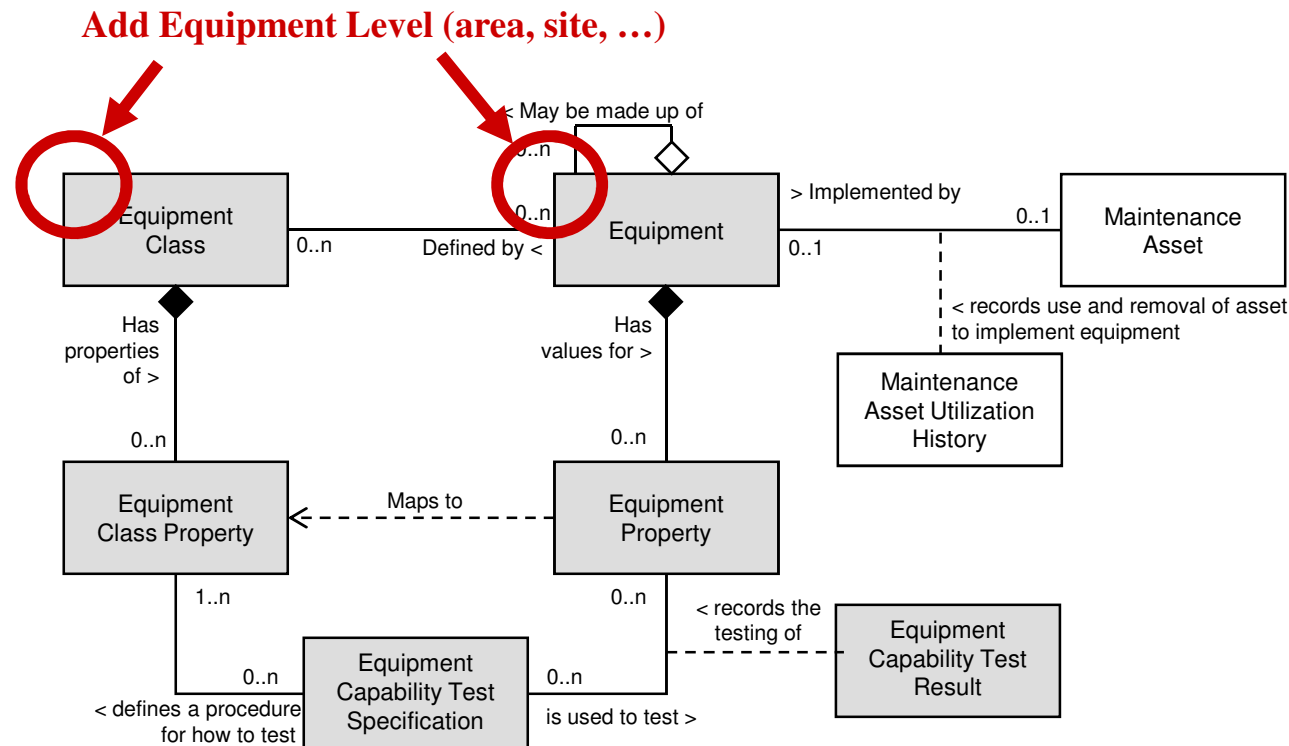
Part 4 ? Figure ?

Template for Operations Category Performance



Part 4 ? Figure ?

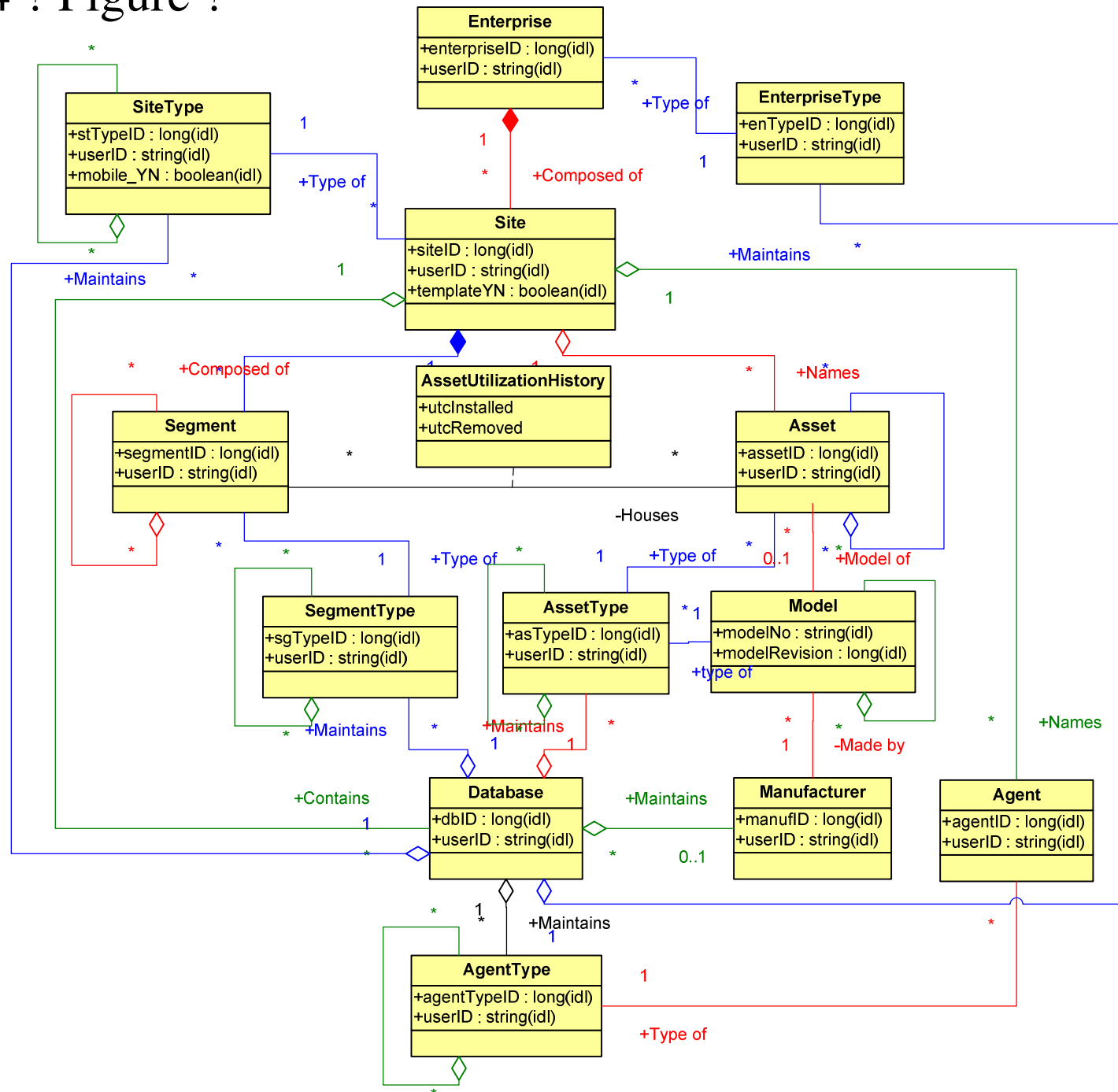
Level 3 Equipment Model



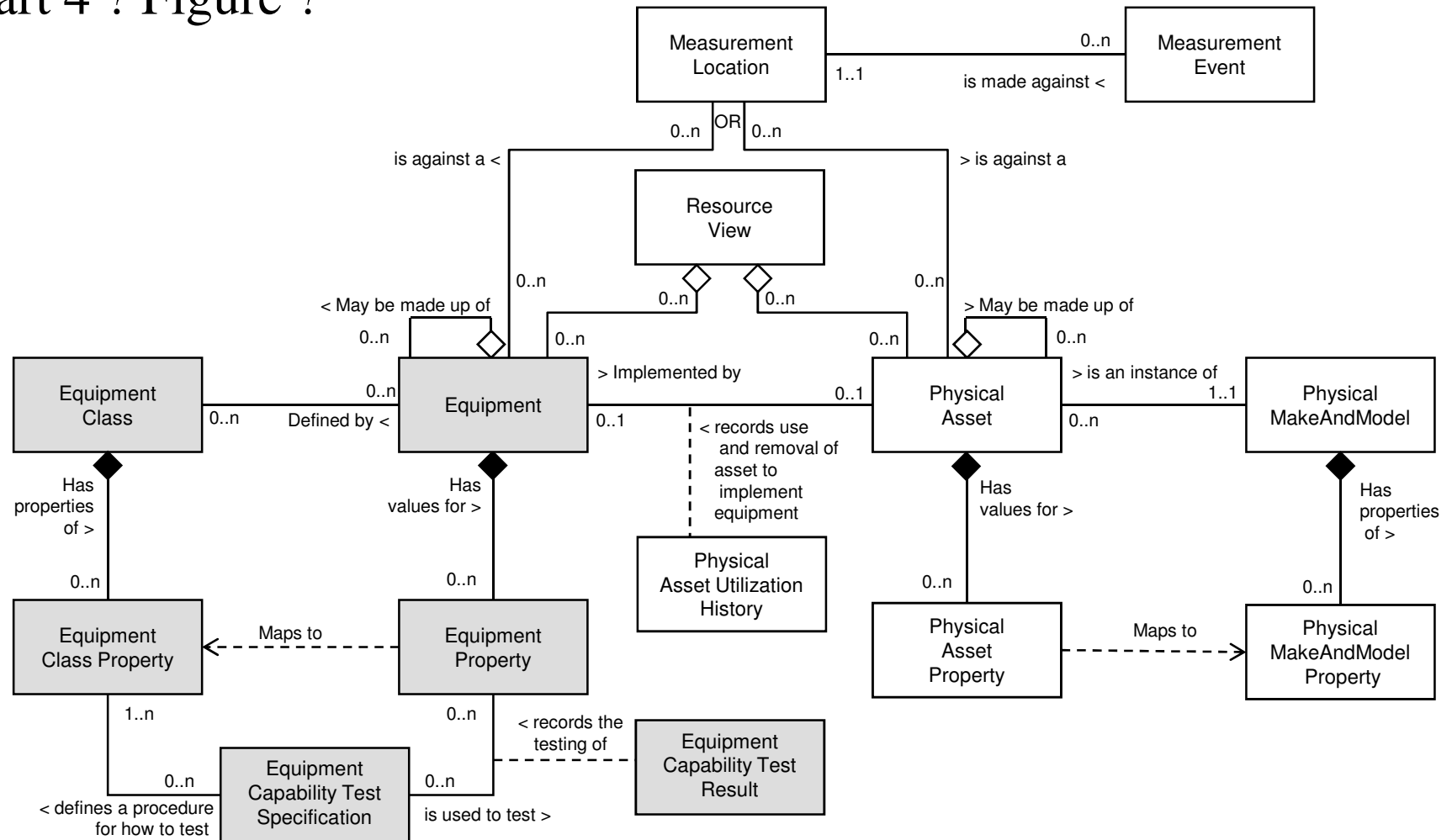
Need to differentiate the use of an asset, when it is performing a role for production, test, warehouse, etc. from the piece of equipment with a serial number. Since the actual serialized number is usually an asset on the company books (independent if it is being used or is in the spare parts store) the physical needs a name (asset) and the logical use of the equipment (role) need to be separated. Equipment IDs are TAGs (which define a role, TC184), while the asset has a serial number (TC_WED_9982002922).

A MIMOSA *segment* seems to map to the S95 *equipment* object.

Part 4 ? Figure ?



Part 4 ? Figure ?



A MIMOSA *Asset* maps to a S95 *Physical Asset* object

A MIMOSA *Asset Utilization History* maps to a S95 *Physical Asset Utilization History* object

A MIMOSA *Segment* maps to a S95 *Equipment* object

A MIMOSA *Network* maps to a S95 *Resource View* object

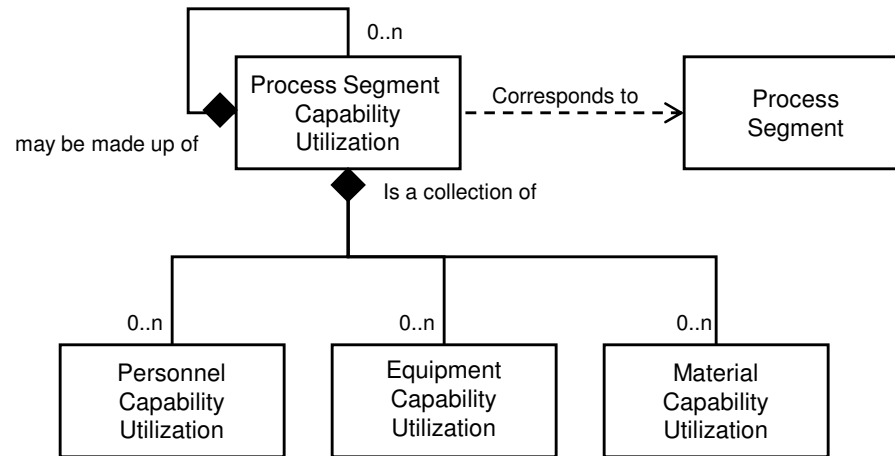
A MIMOSA *Model* maps to a S95 *Physical MakeAndModel* object

A MIMOSA *Agent* would map to a S95 attribute or property, where needed

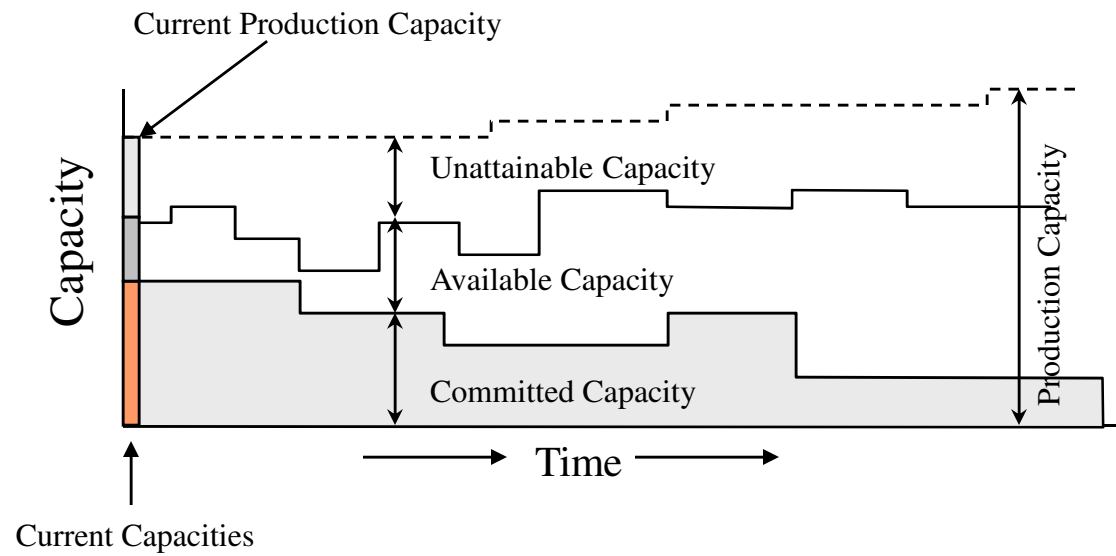
Things to still talk about

- Samples
- Calibration
- Maintenance Requests, Operations Orders, Responses

Part 4 ? Figure ?

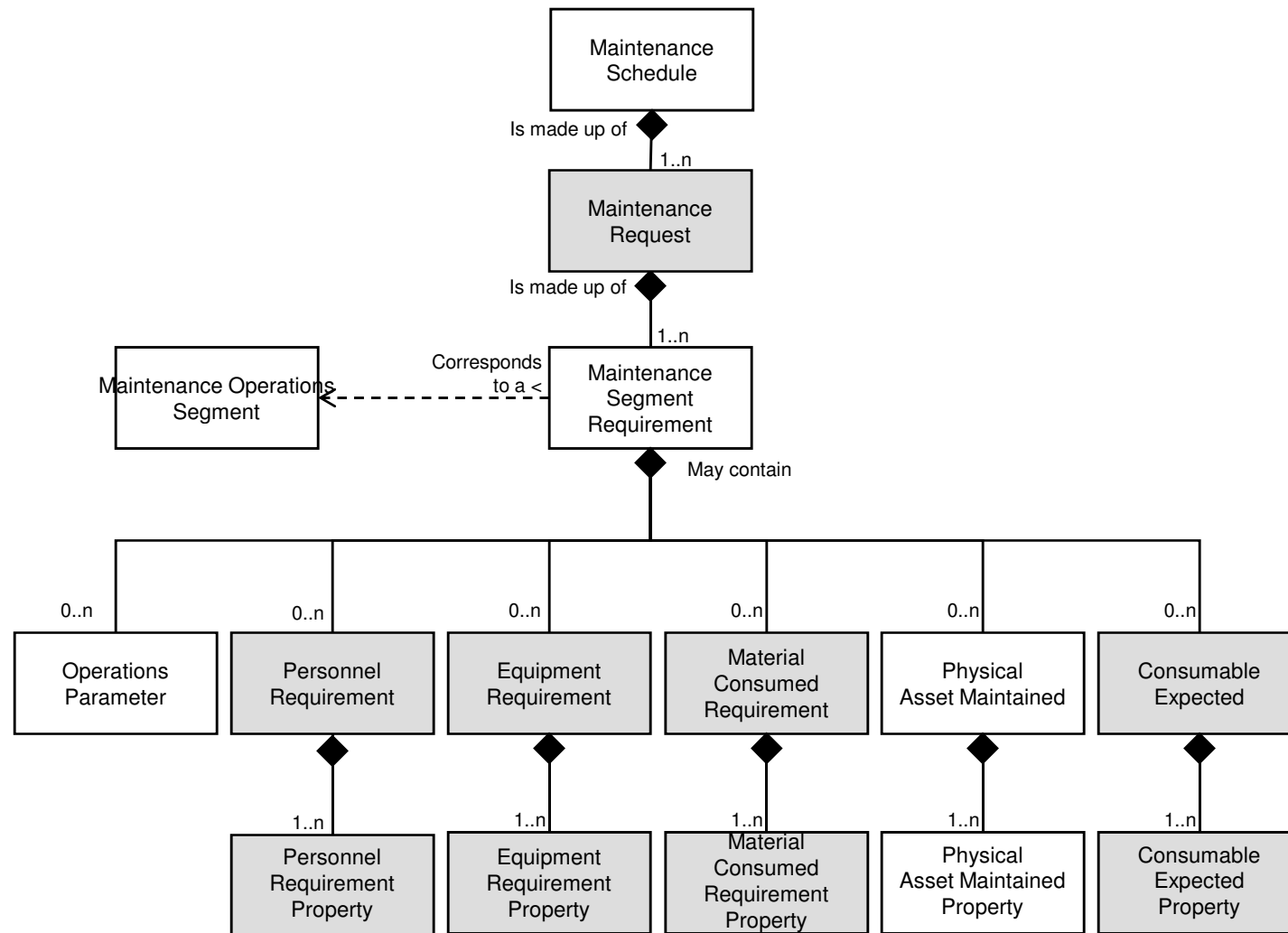


Part 4 ? Figure ?



Part 4 ? Figure ?

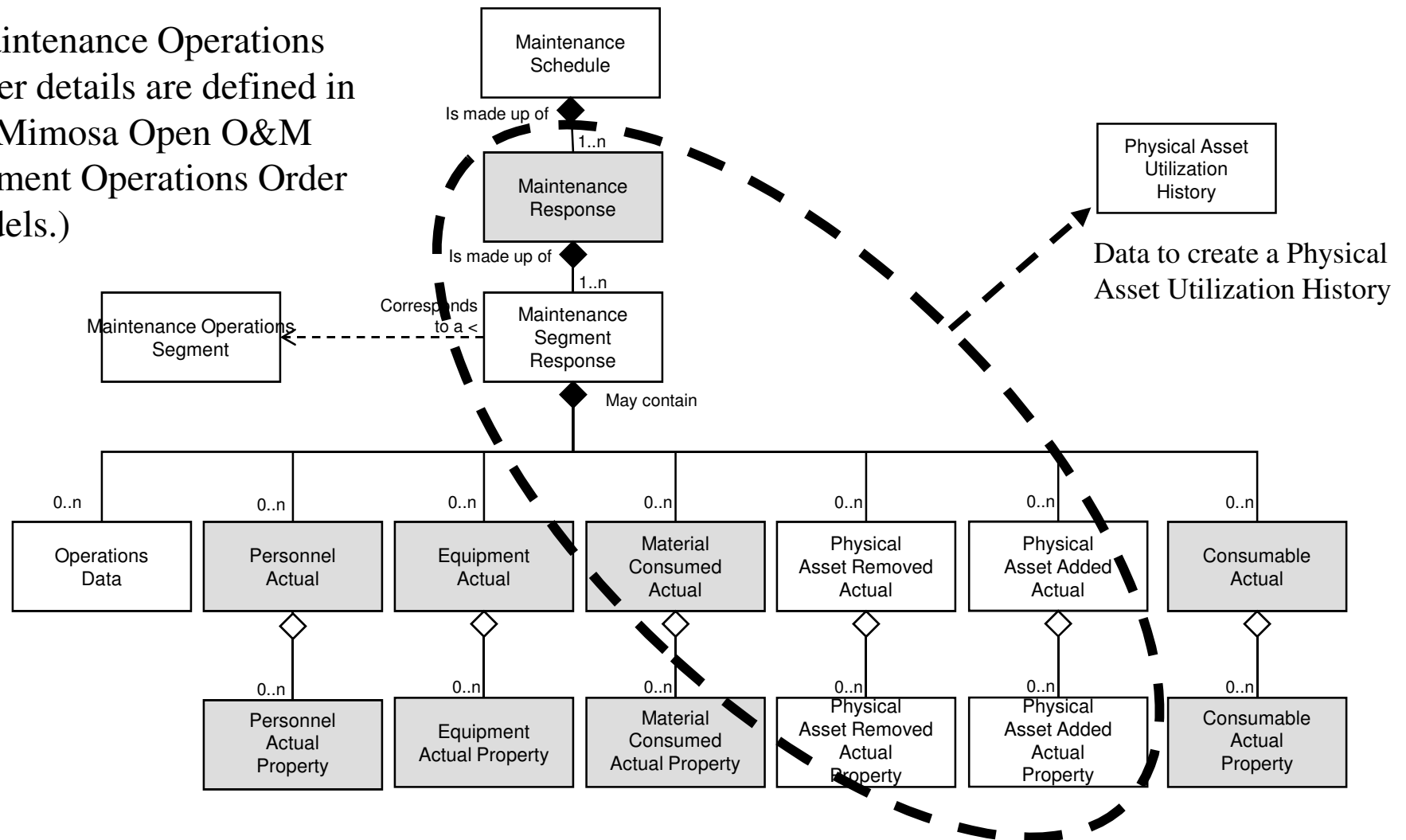
Maintenance Request



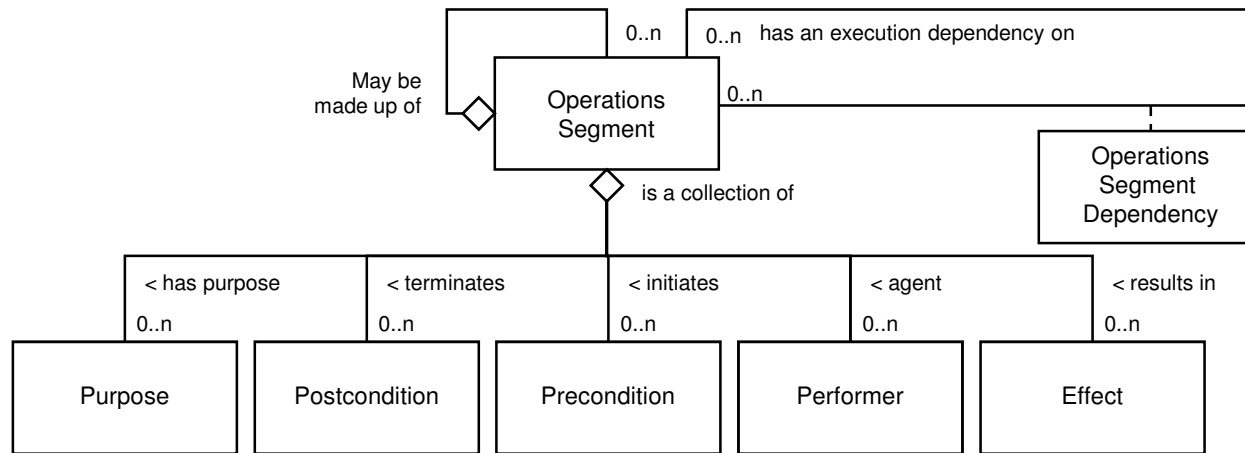
Part 4 ? Figure ?

Maintenance Response

(Maintenance Operations Order details are defined in the Mimosa Open O&M Segment Operations Order models.)

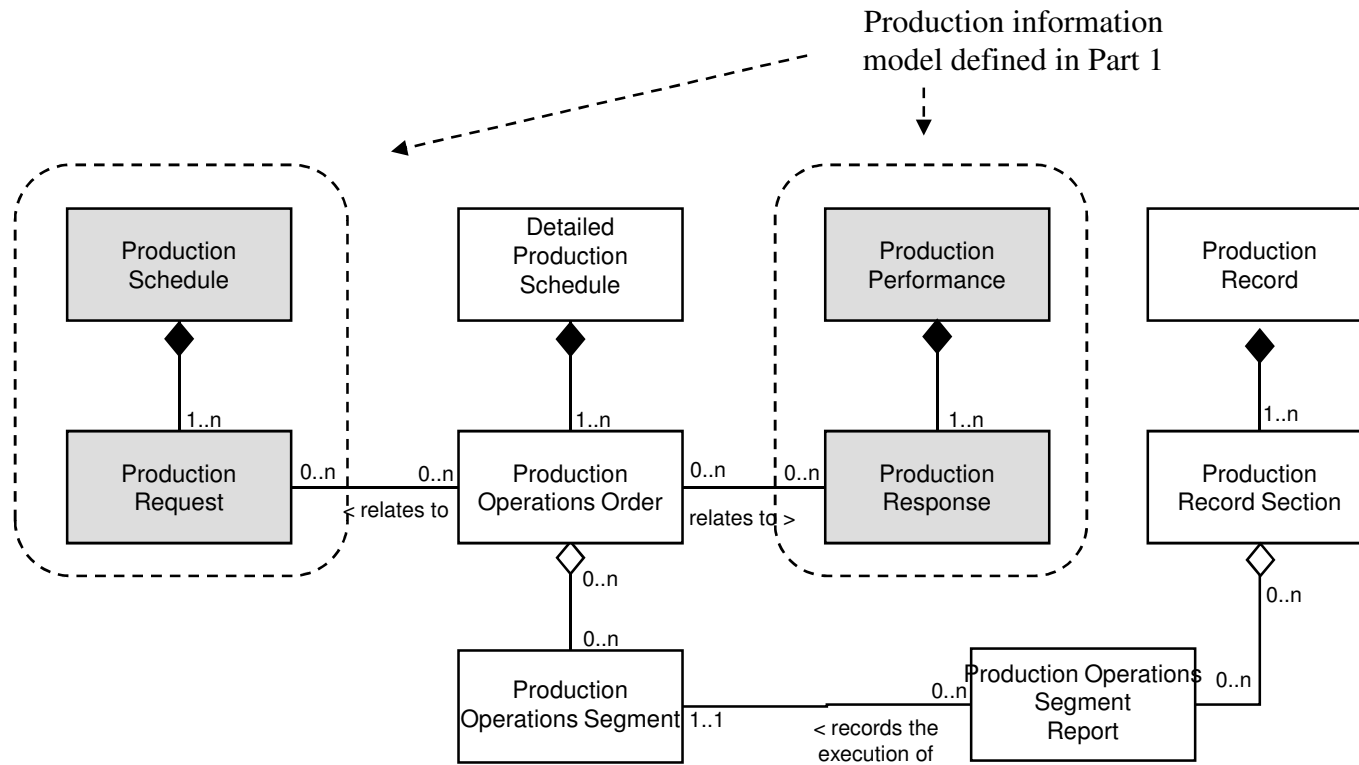


Part 4 ? Figure ?

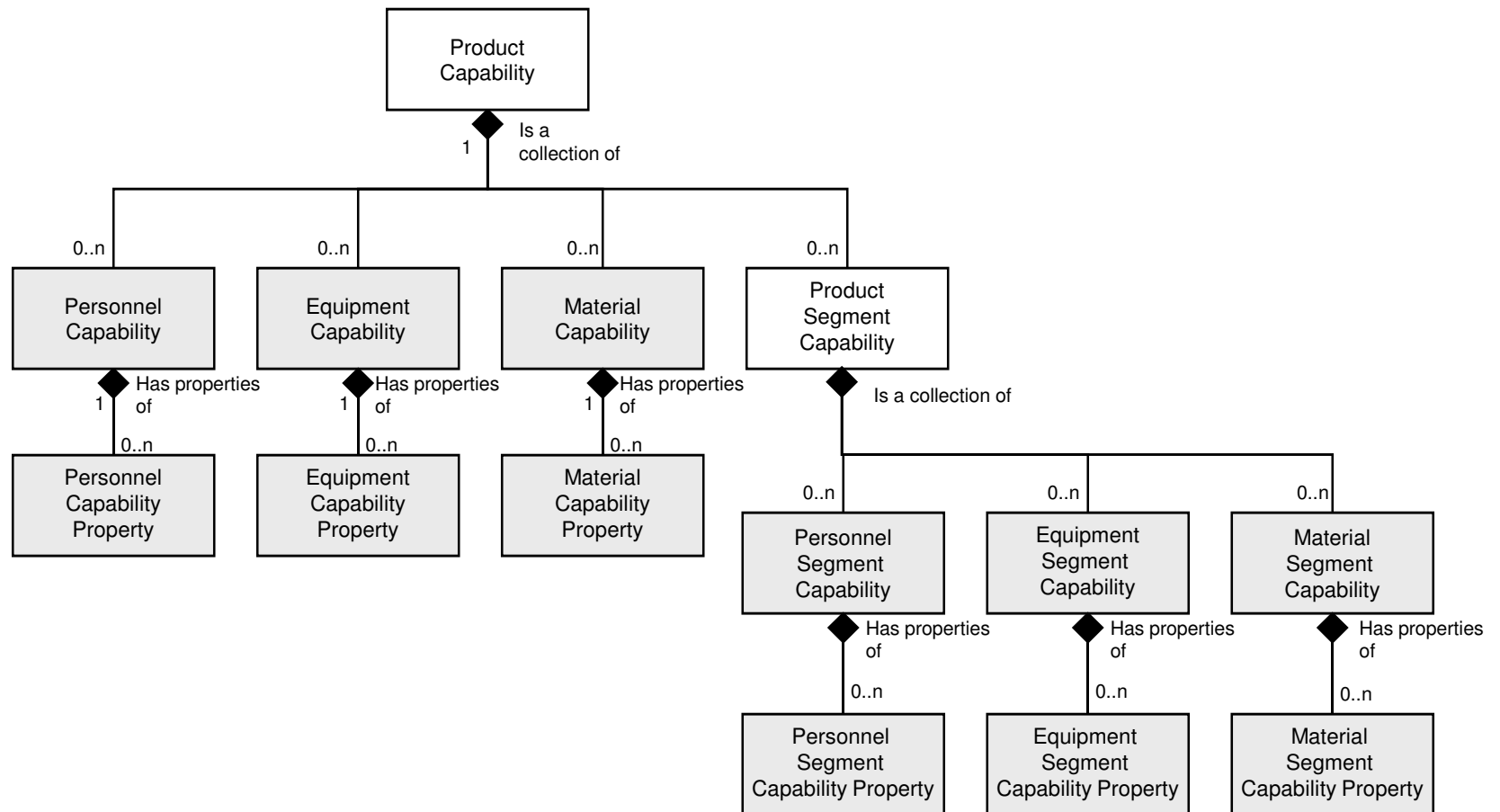


Part 4 ? Figure ?

Template instantiated for production

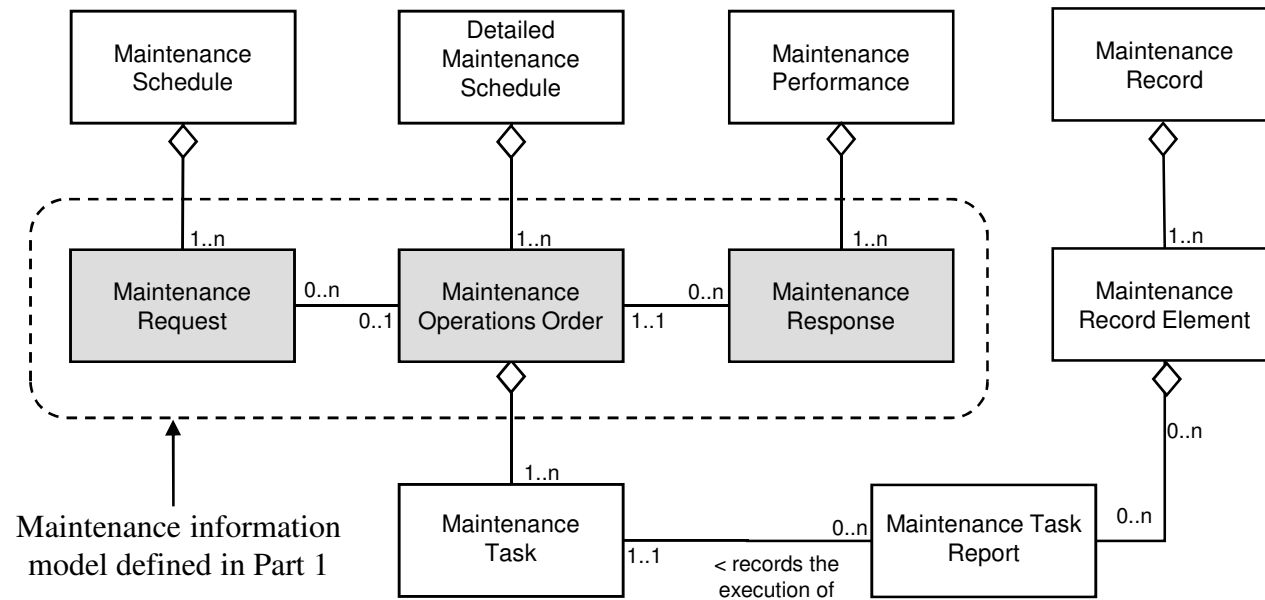


Part 4 ? Figure ?



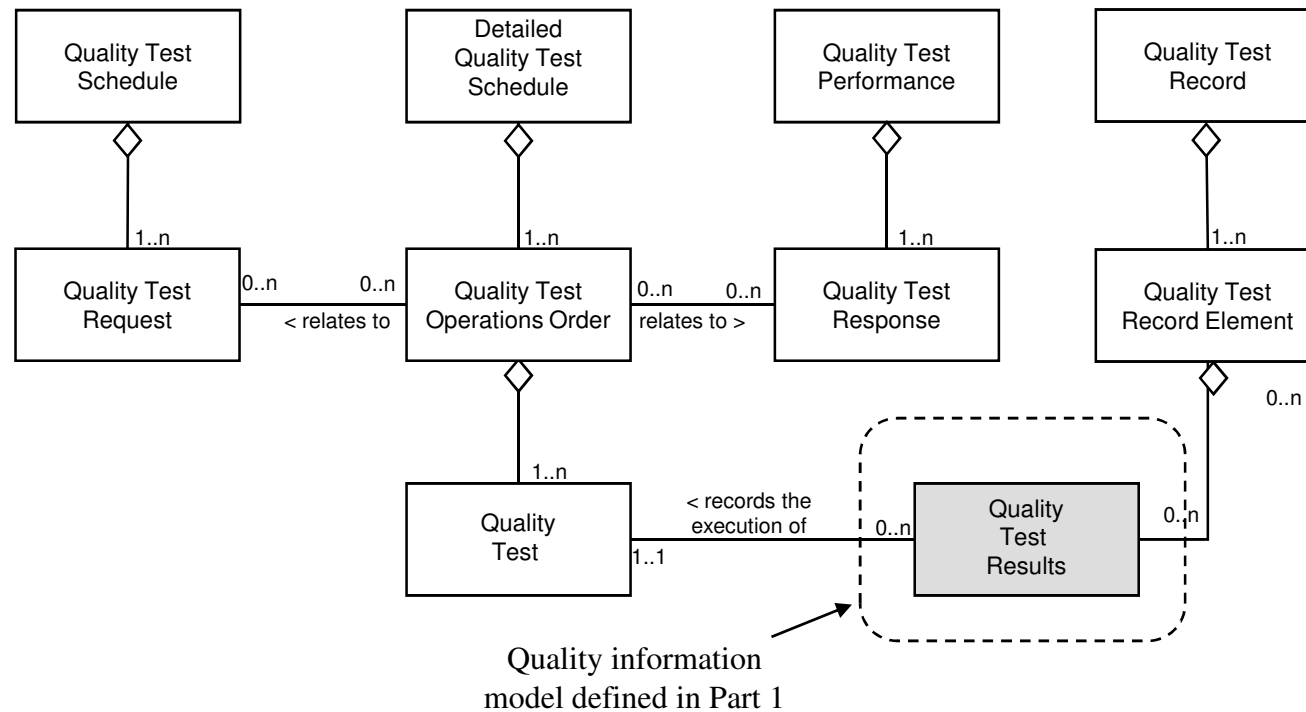
Part 4 ? Figure ?

Template instantiated for maintenance

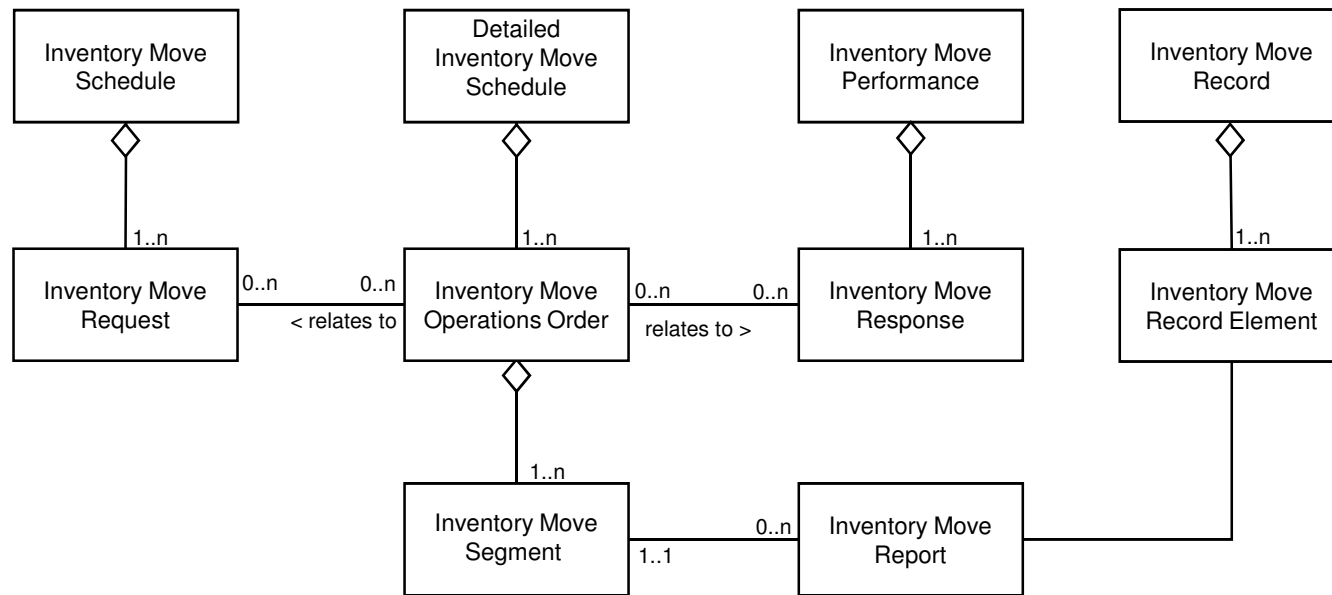


Part 4 ? Figure ?

Template instantiated for Quality Test

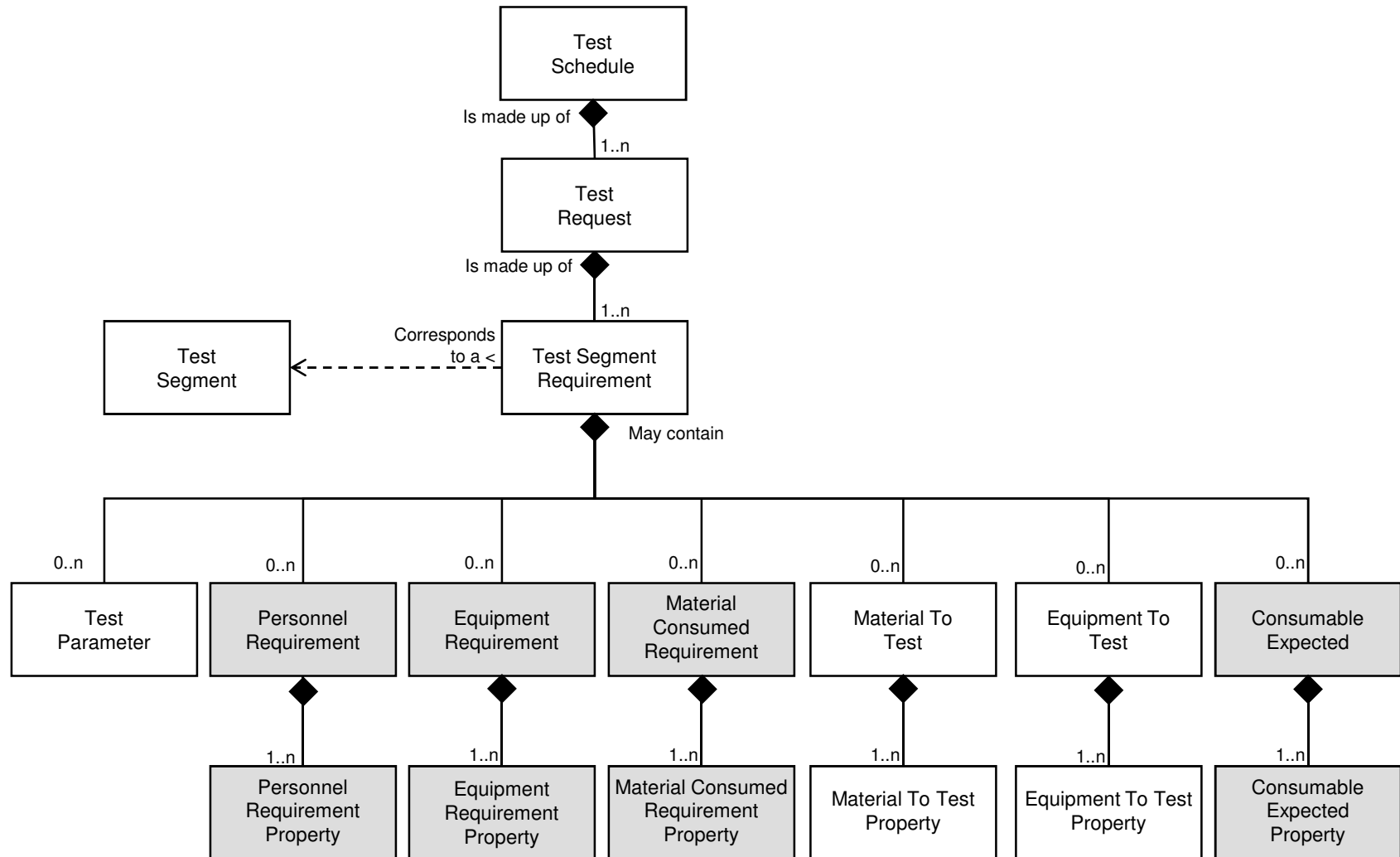


Template instantiated for Inventory Movement



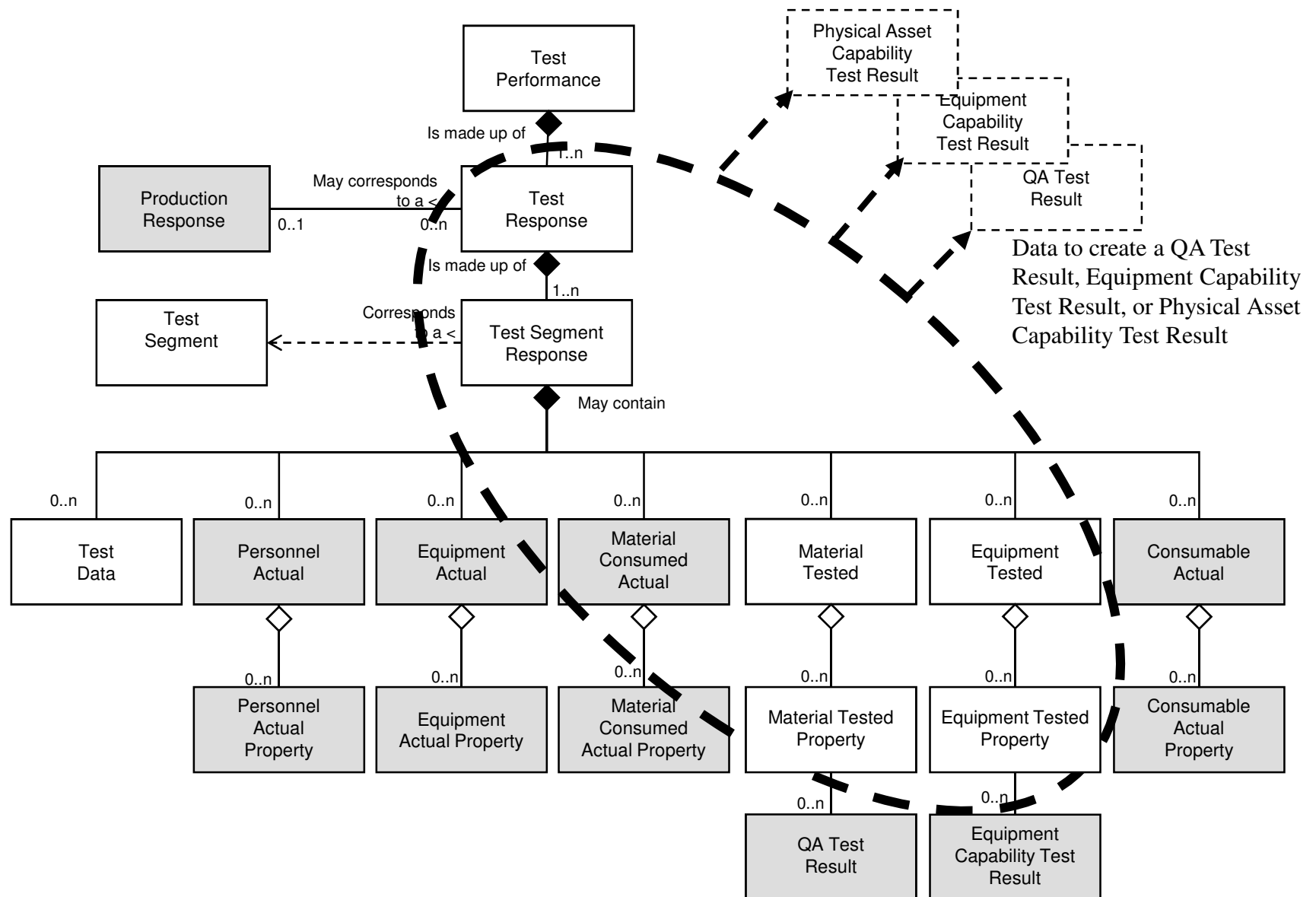
Part 4 ? Figure ?

Quality Operations Schedule

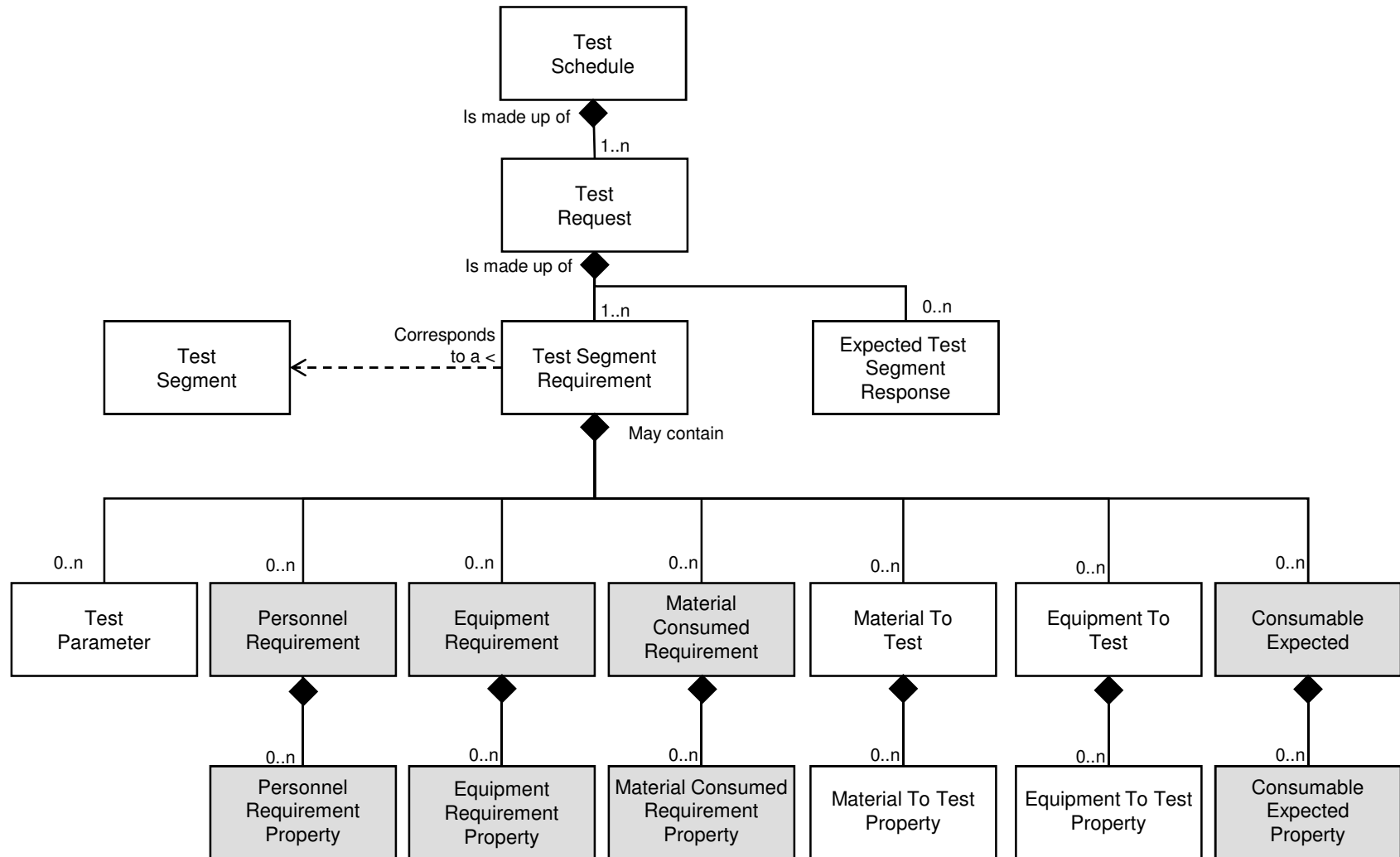


Part 4 ? Figure ?

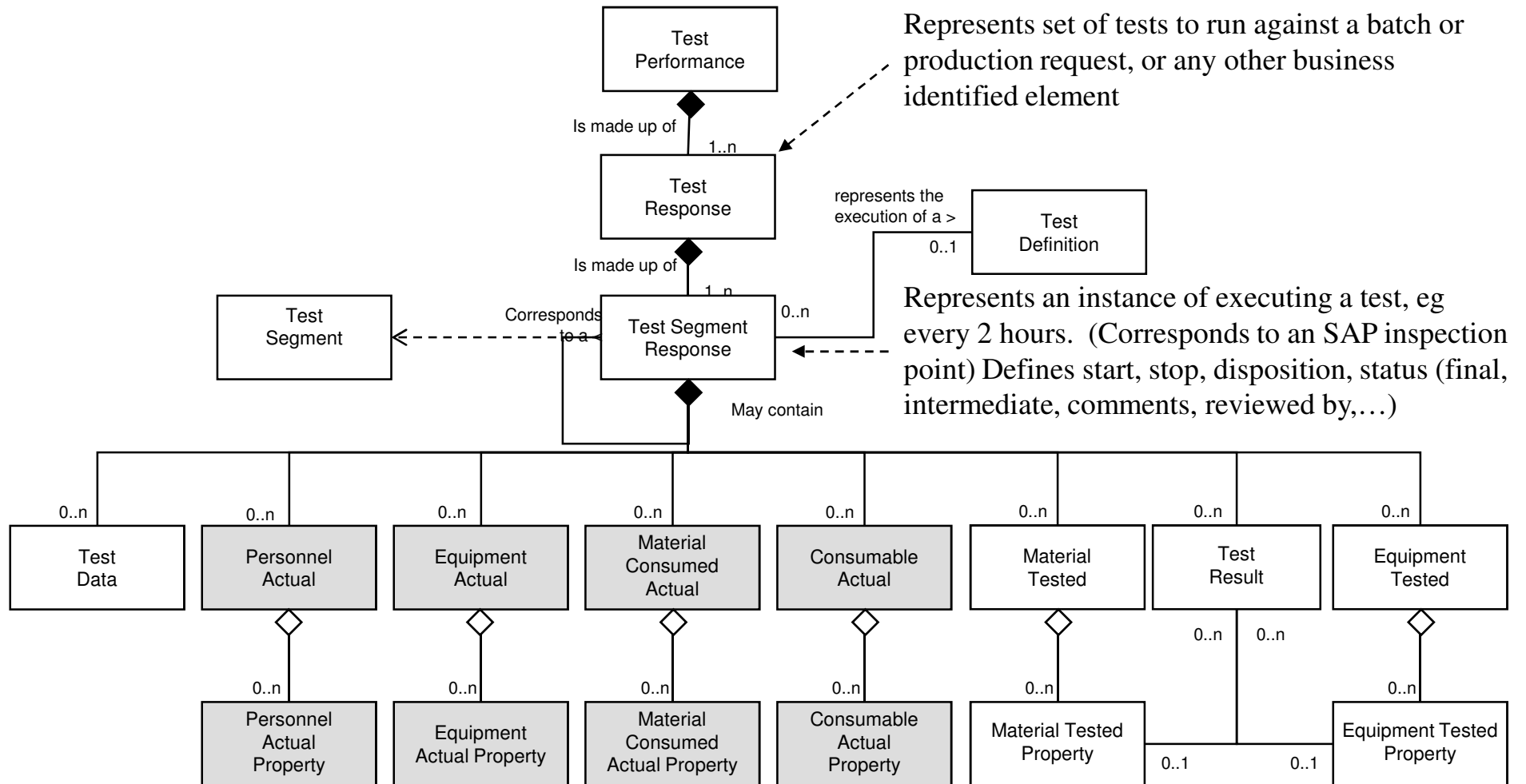
Quality Operations Performance

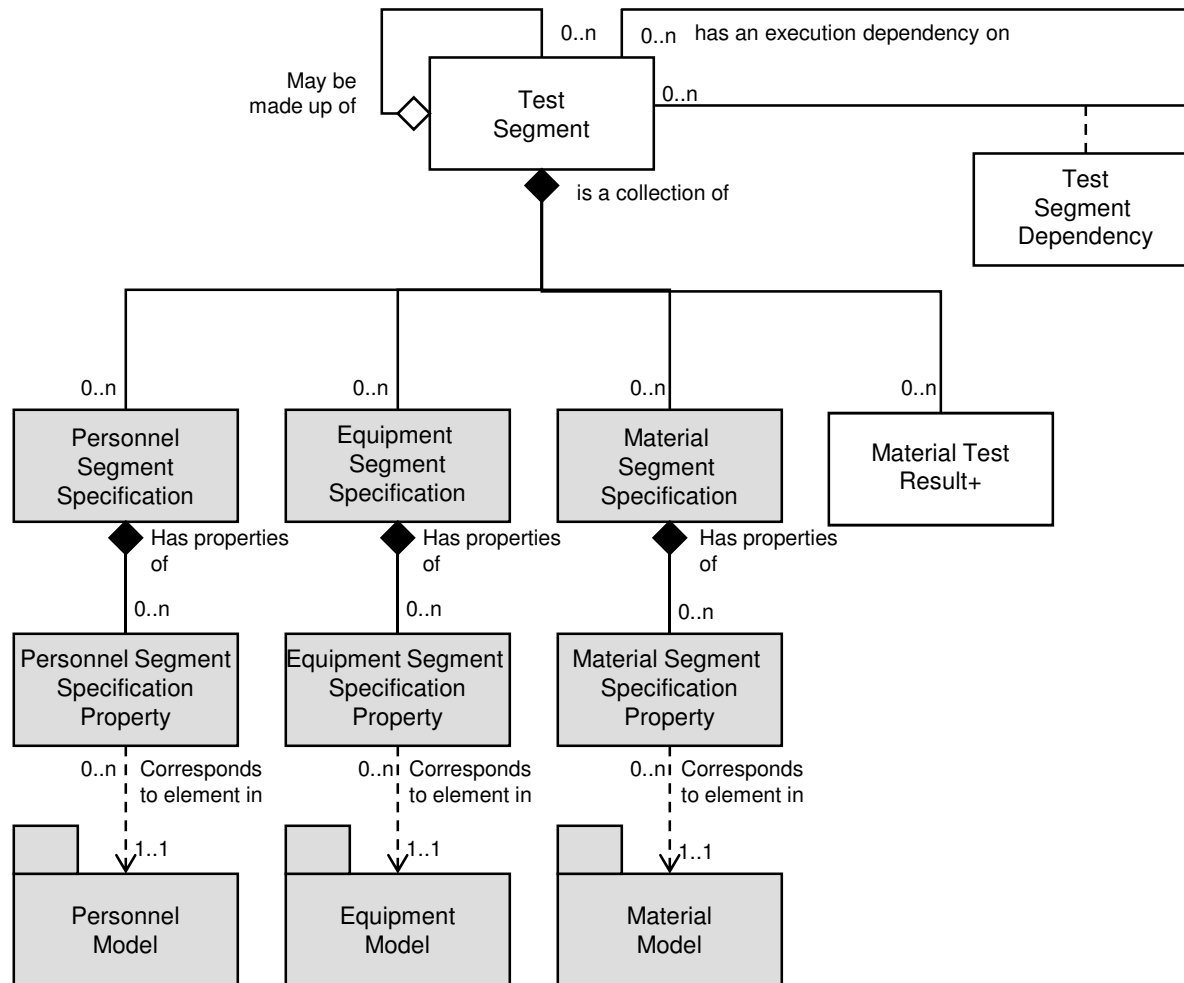


Quality Operations Schedule – x1

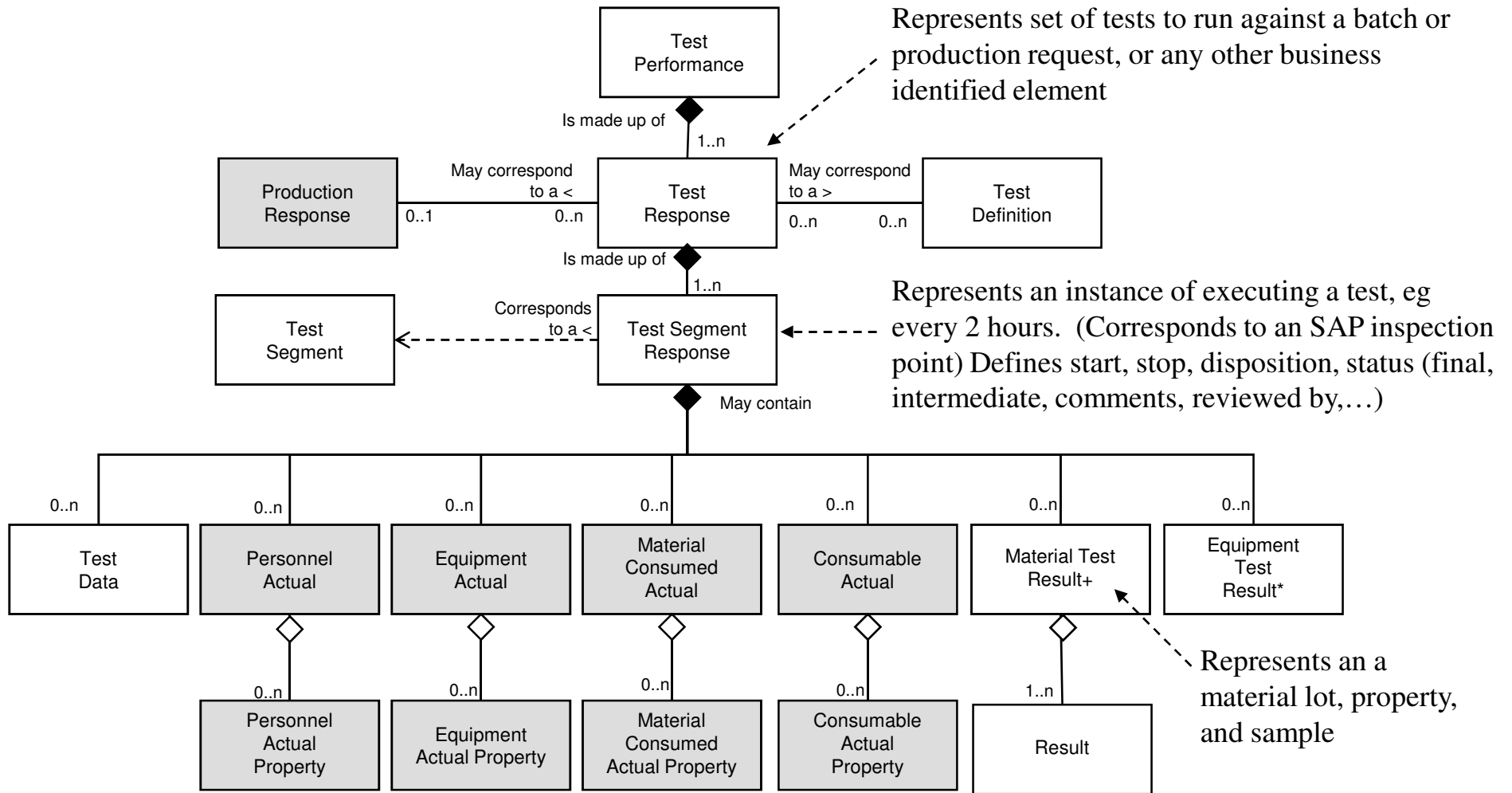


Quality Operations Performance – x1





Quality Operations Performance



Need a "Sample ID" which is specialized subplot of a material. However it may be a consumable material, with no associated Material Lot ID (eg: just any old machine oil)

+ QA Test Result, plus Material Lot ID, Property ID, Sample ID, Comment

* Equipment Test Result, plus Equipment ID, Property ID, Sample ID, Comment

SAP Test Request Info

- Process Order ID

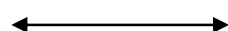
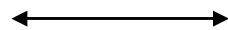
- BatchID

- Inspection Lot ID

- Inspection Point ID

- Characteristic ID

- Characteristic Value(s)



B2MML Test Request Info

- Test Schedule ID

- Test Request ID

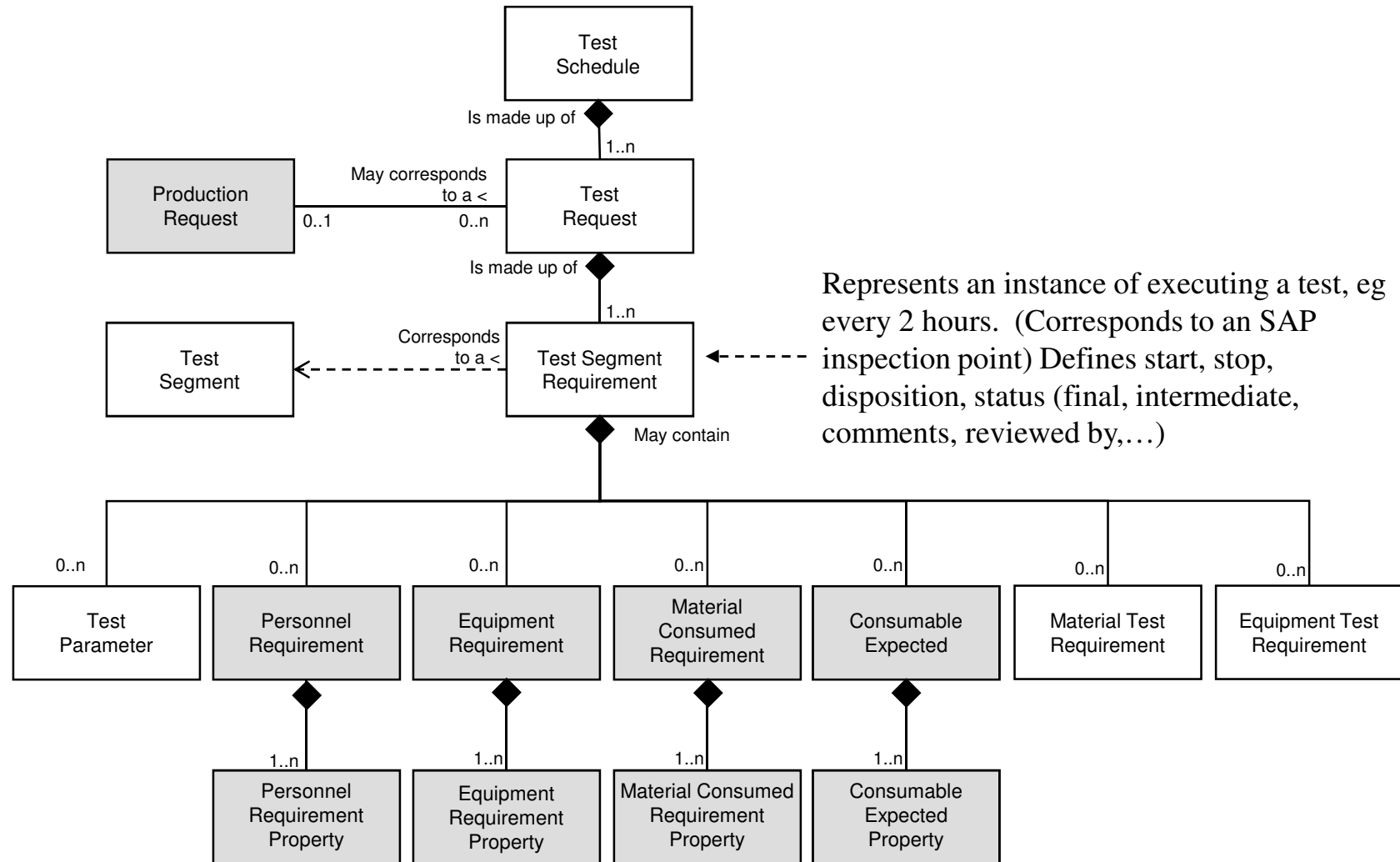
- Test Response ID

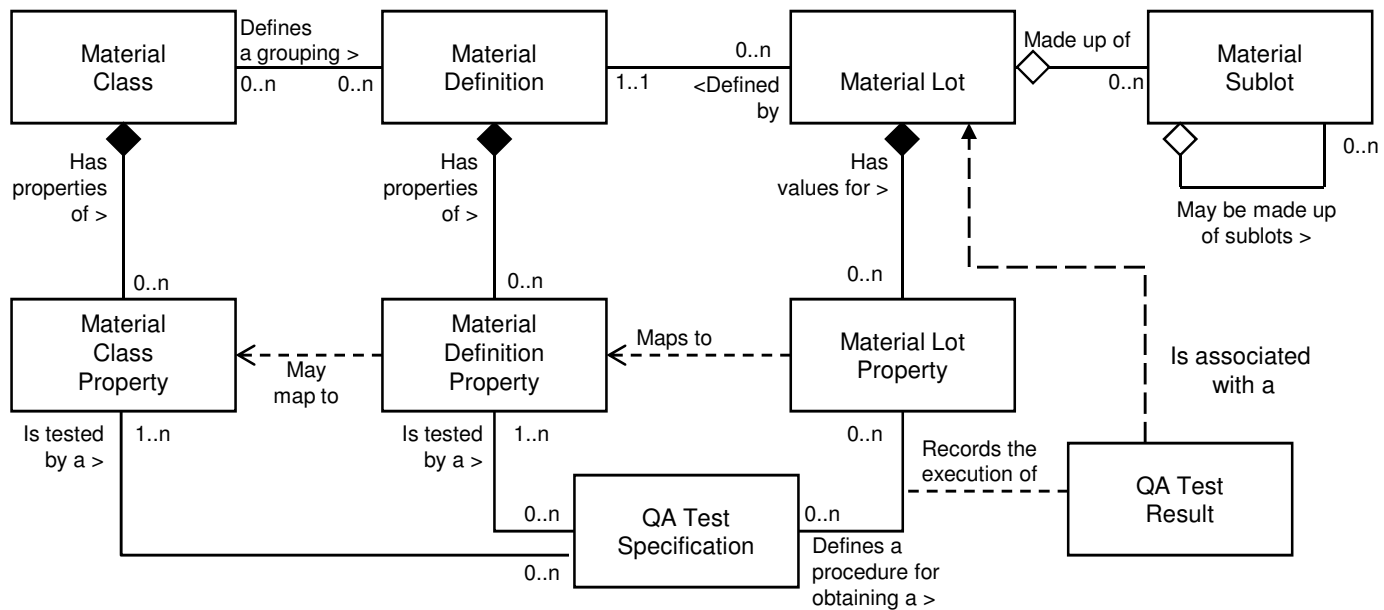
- Test Segment Response ID (when tested)

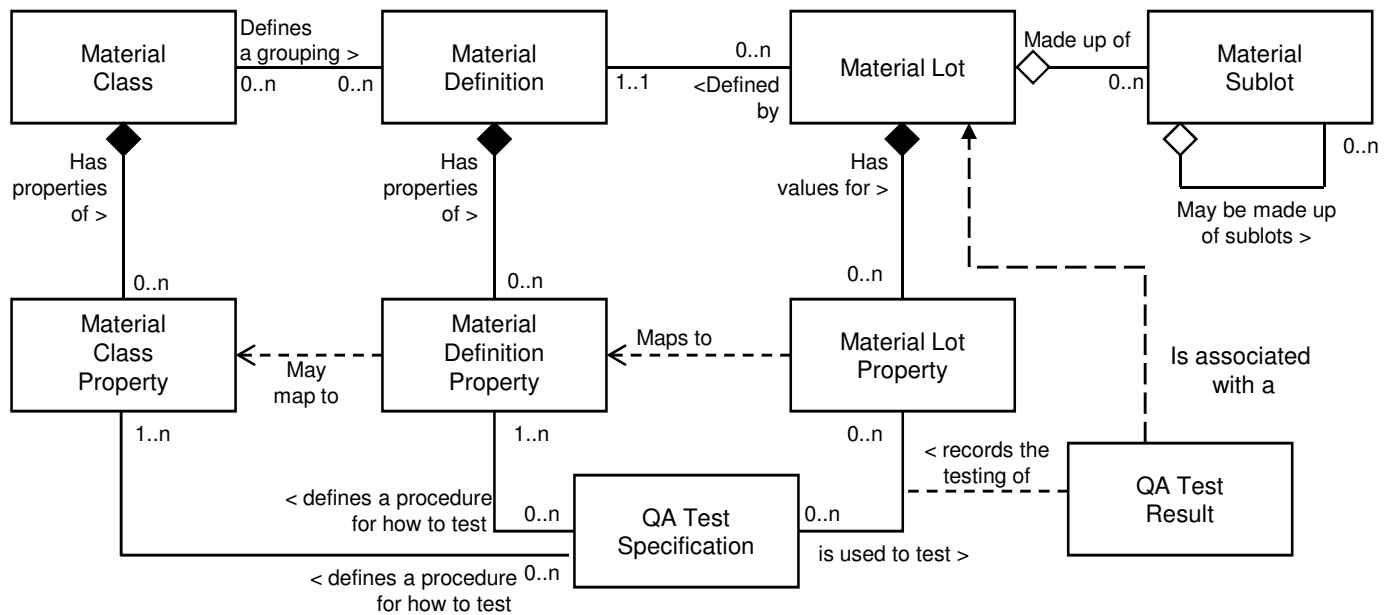
- Test Result ID (property to be tested)

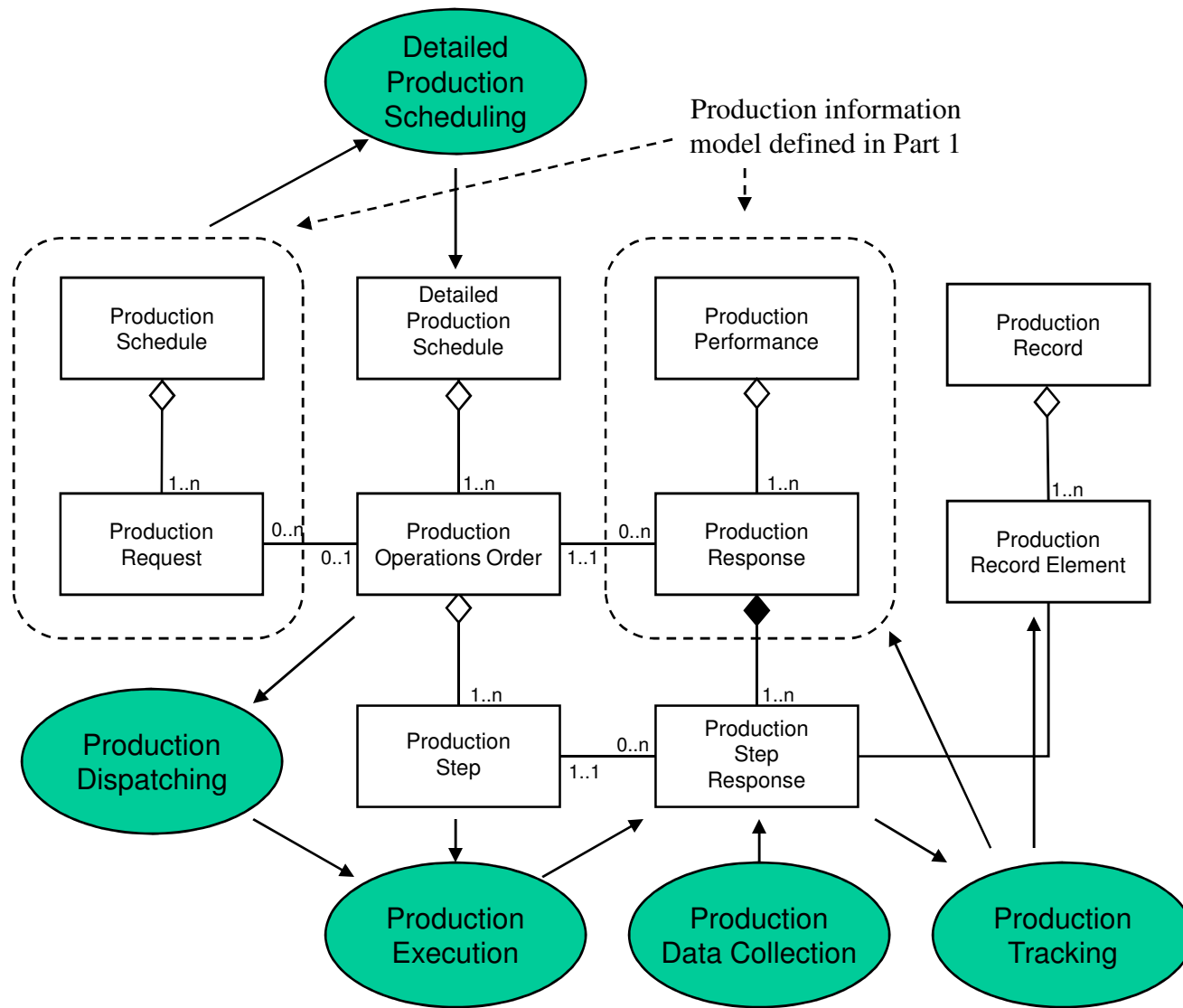
- Result (value for property)

Quality Operations Schedule



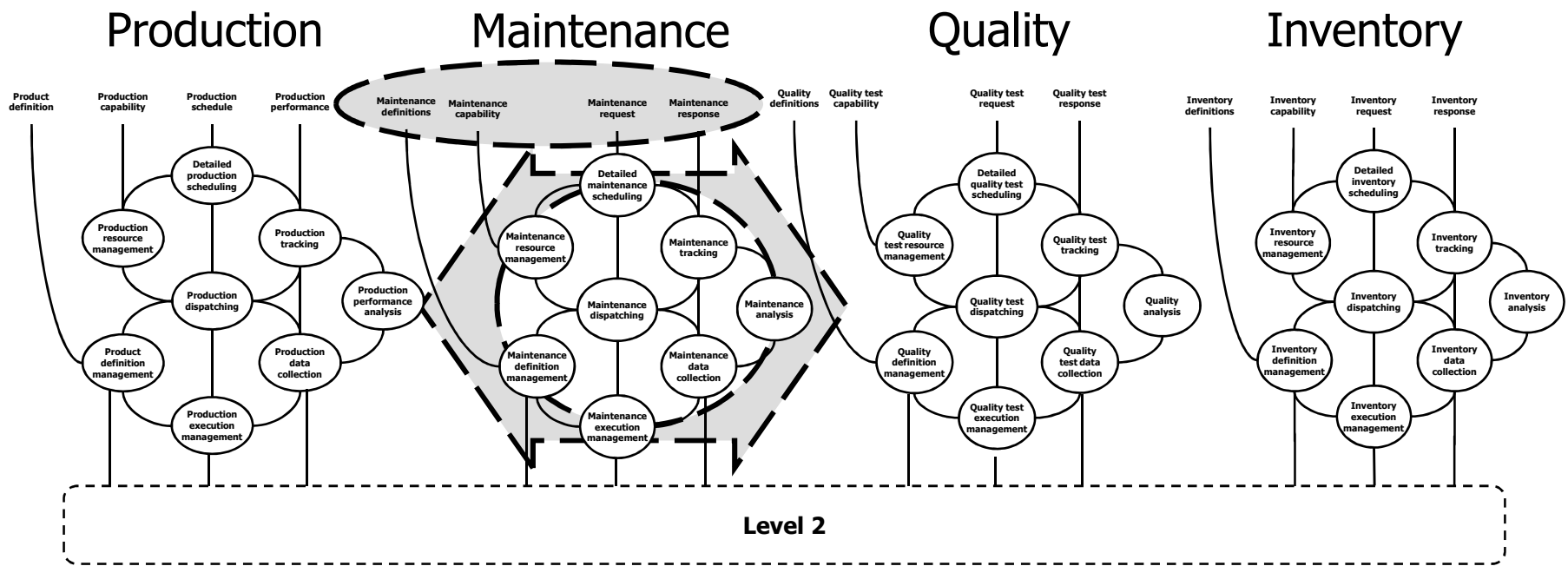


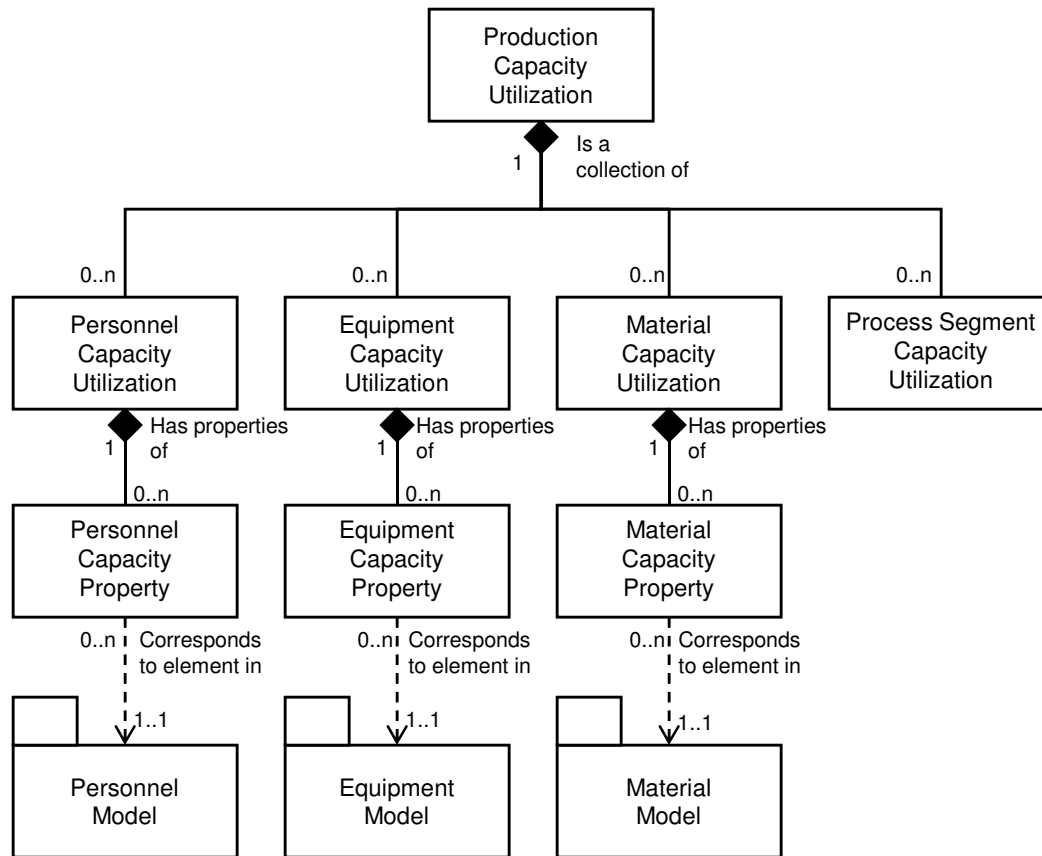




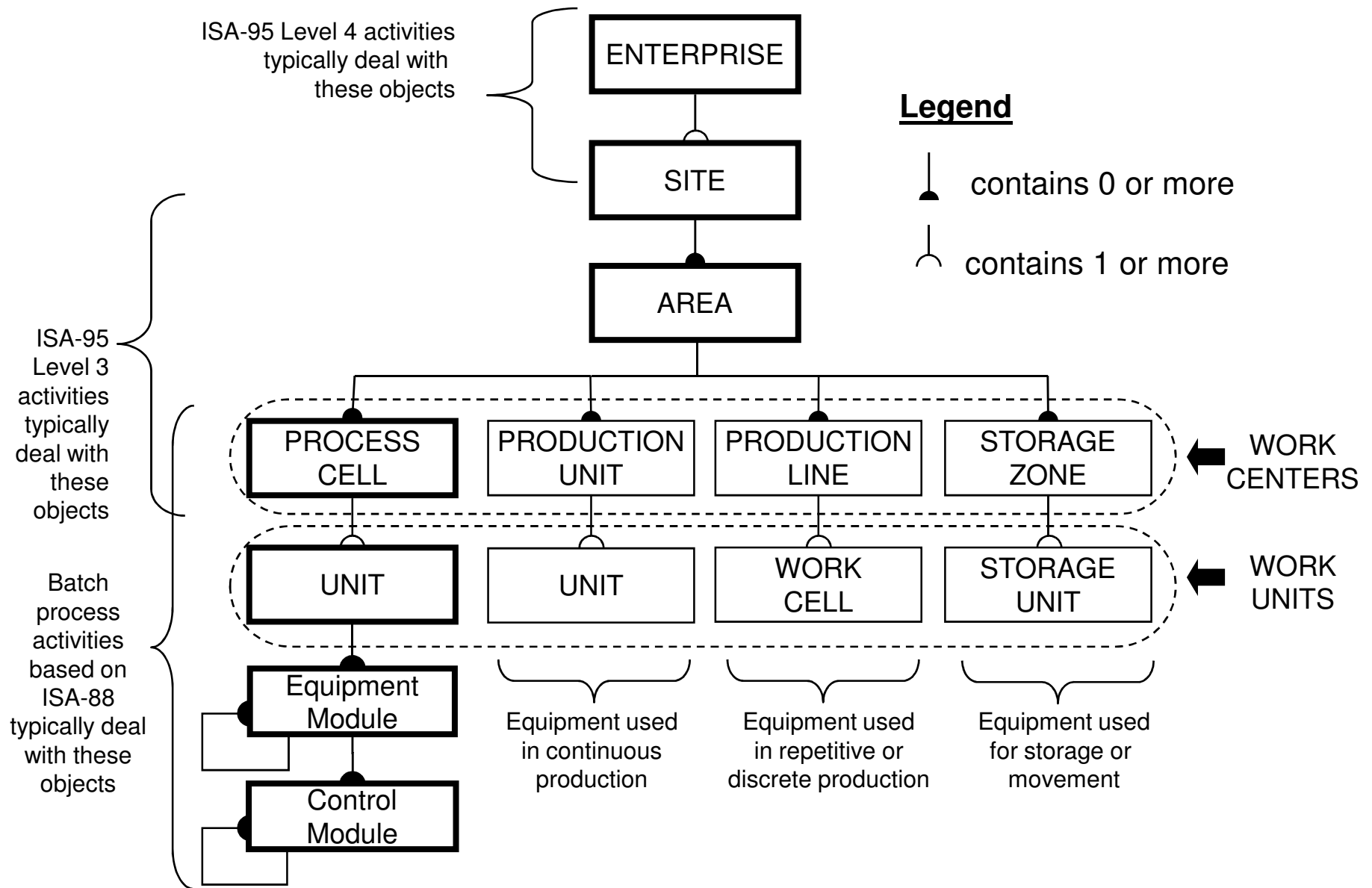
Open O&M JWG Focus

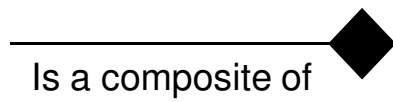
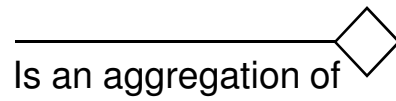
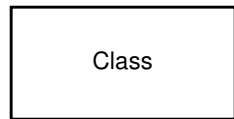
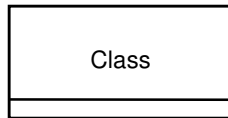
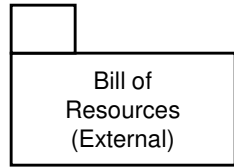
The shaded elements are the points of interest, they define the information that flows between main Level 3 areas and information which may flow to other Level 4 systems.

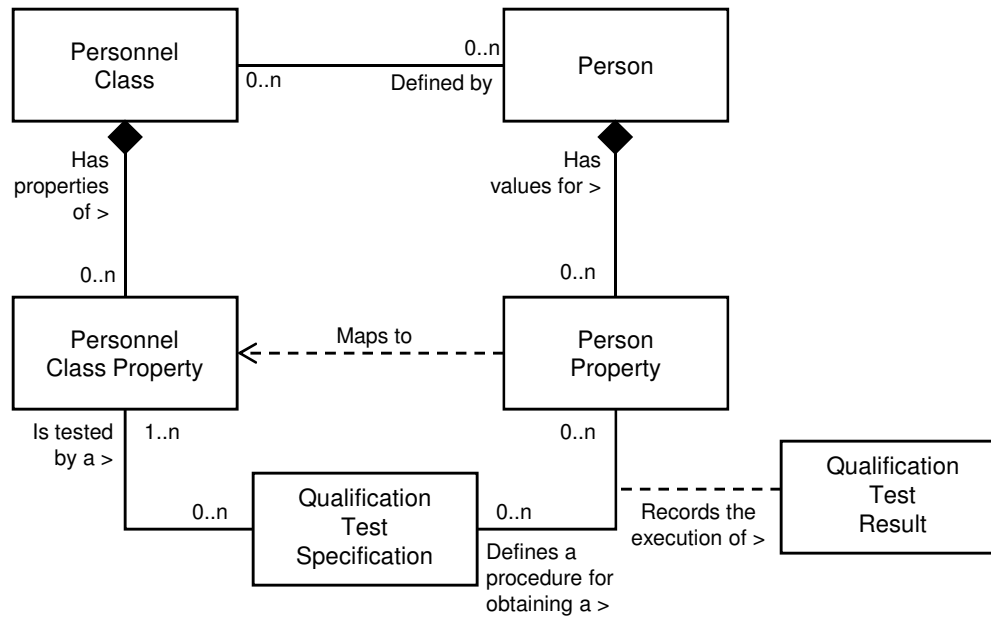


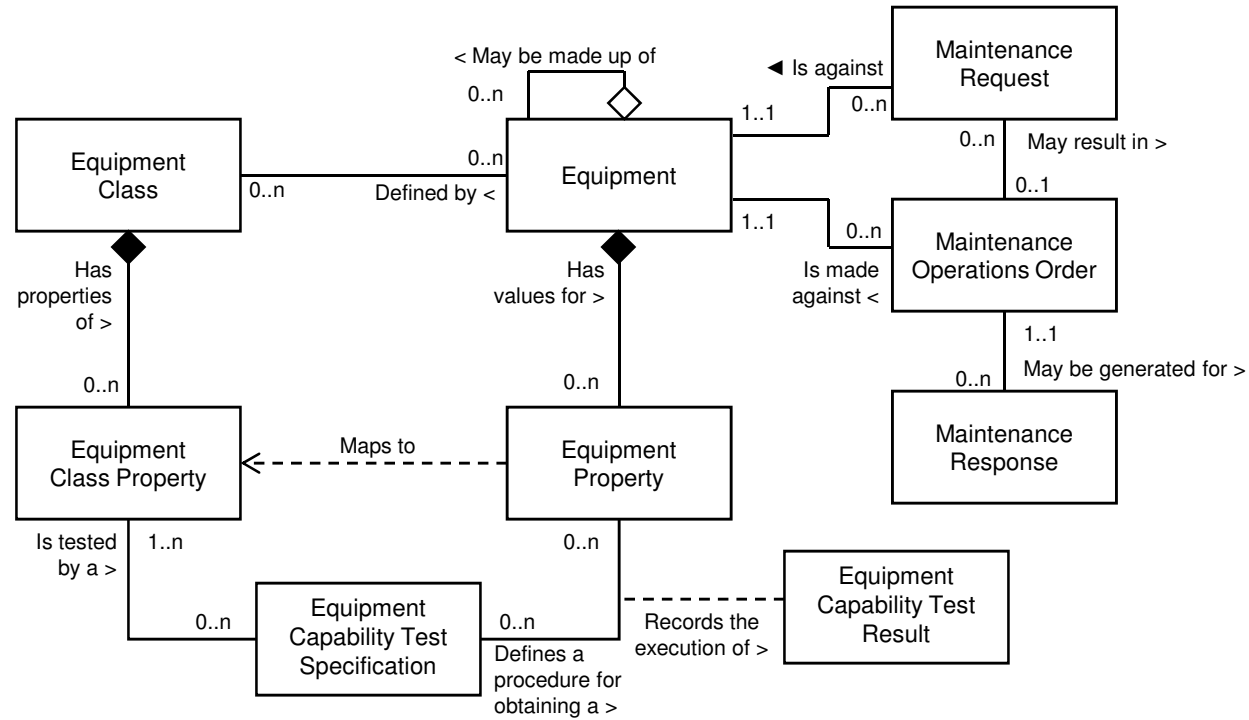


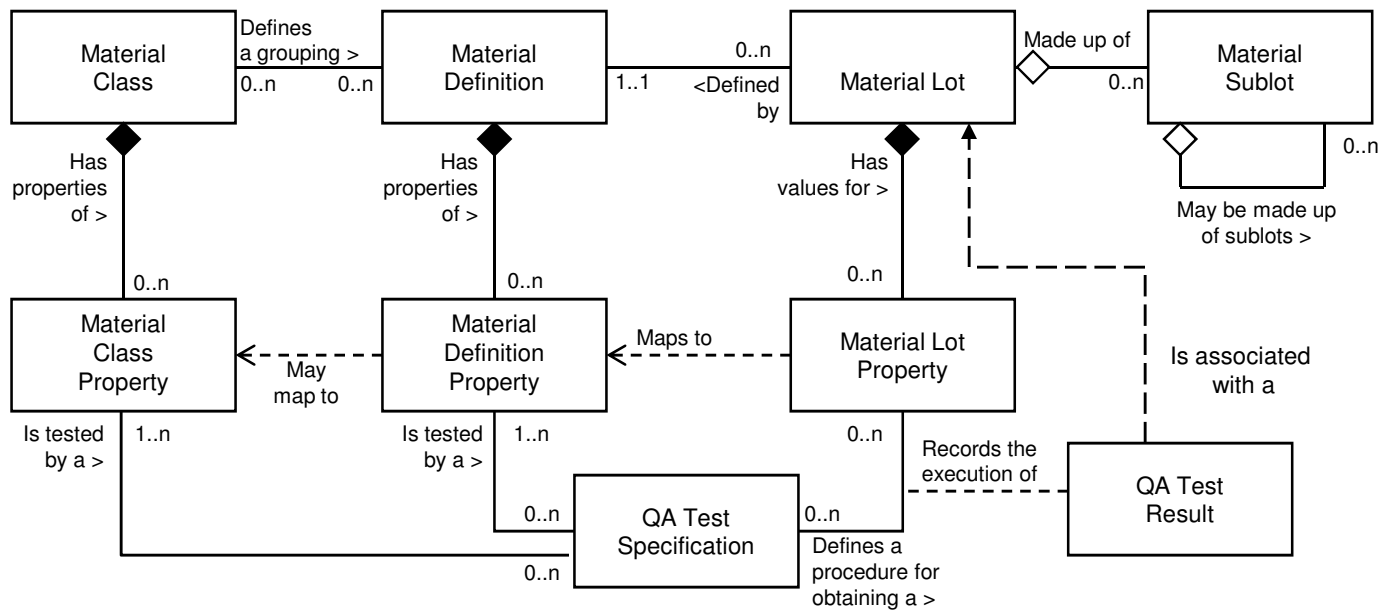
Part 4 A Figure x

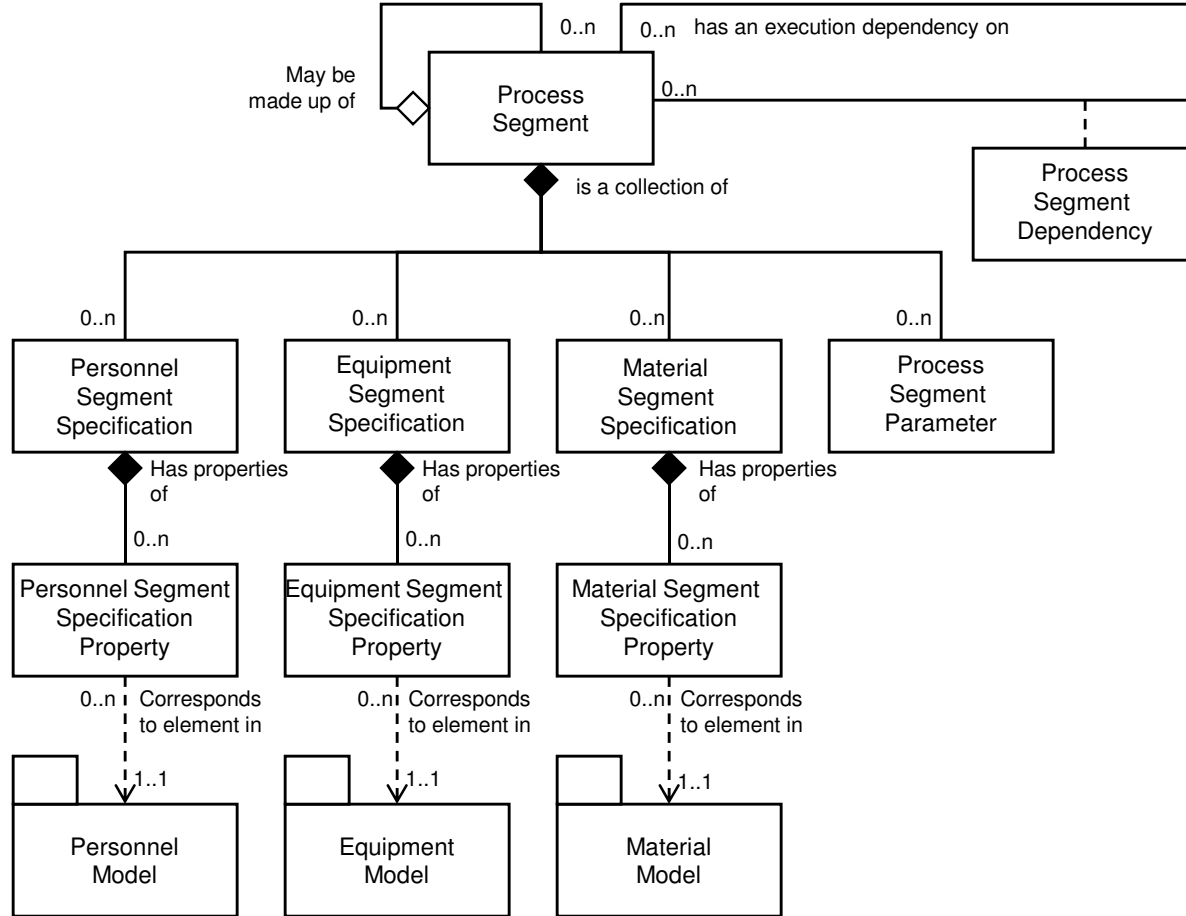


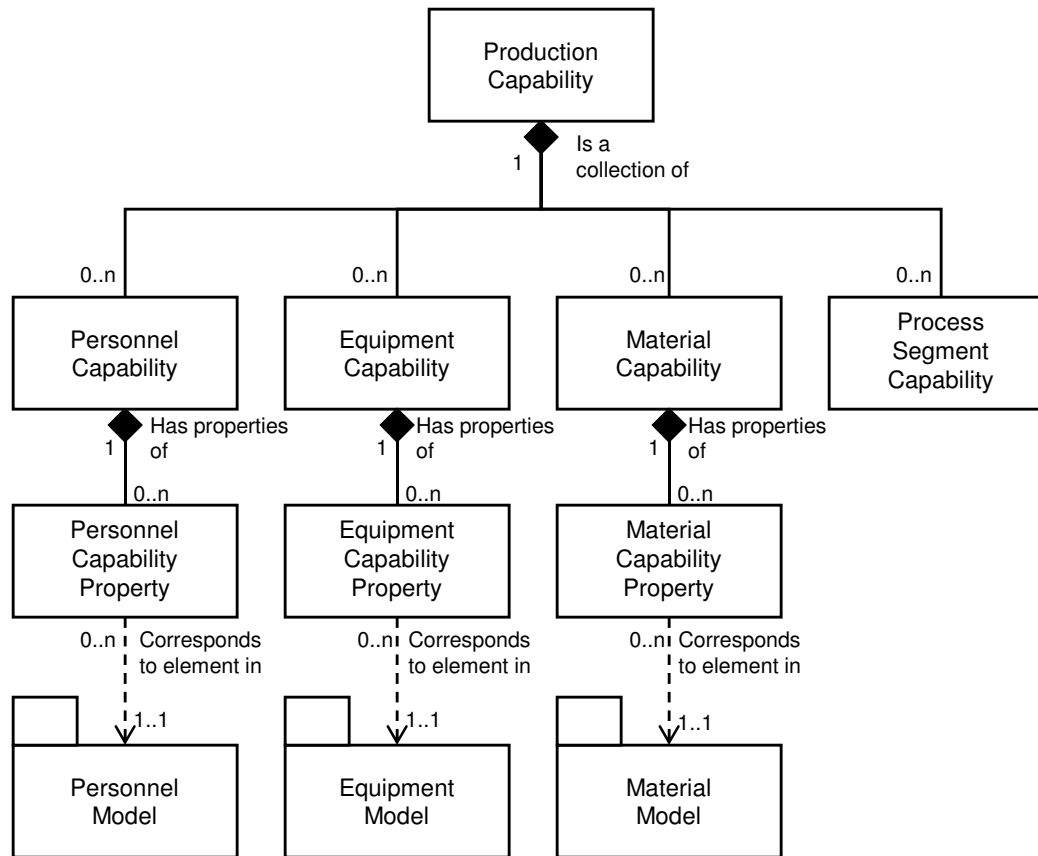


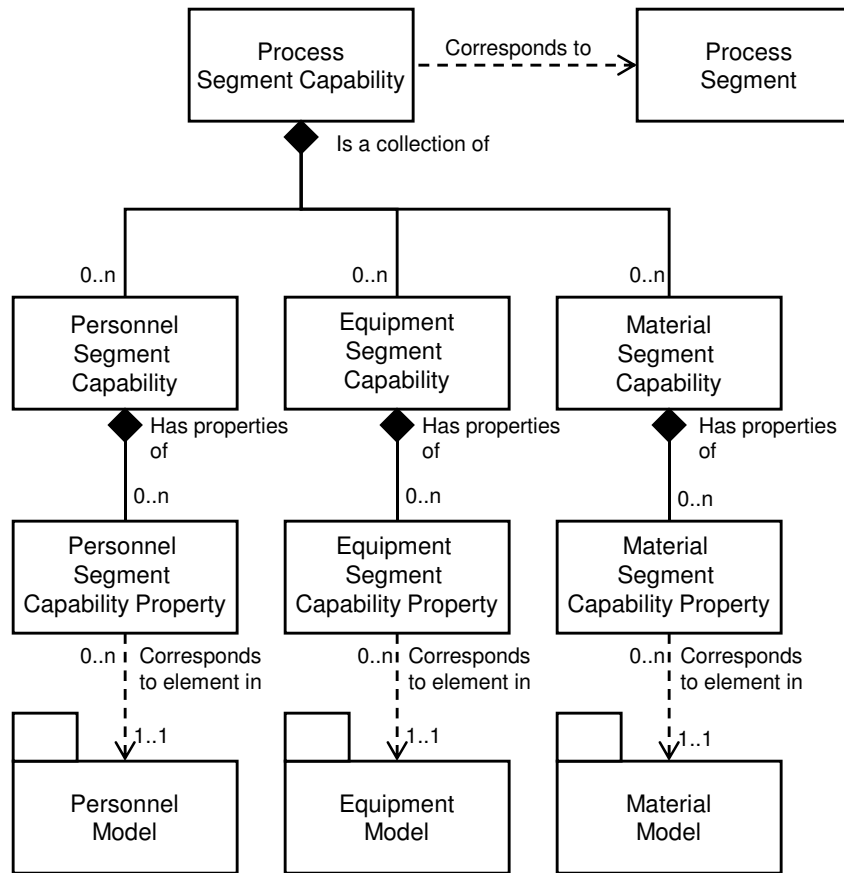


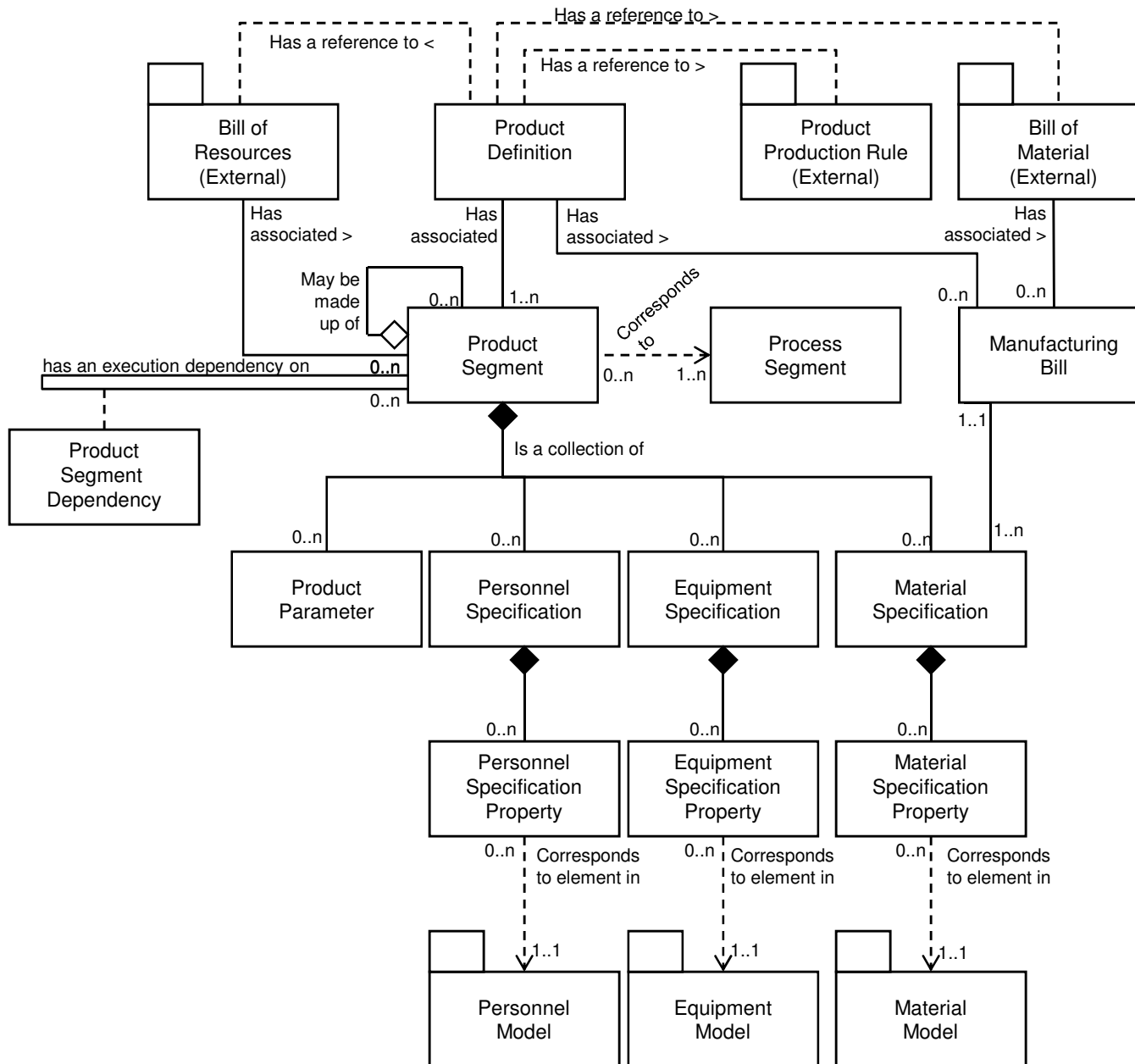


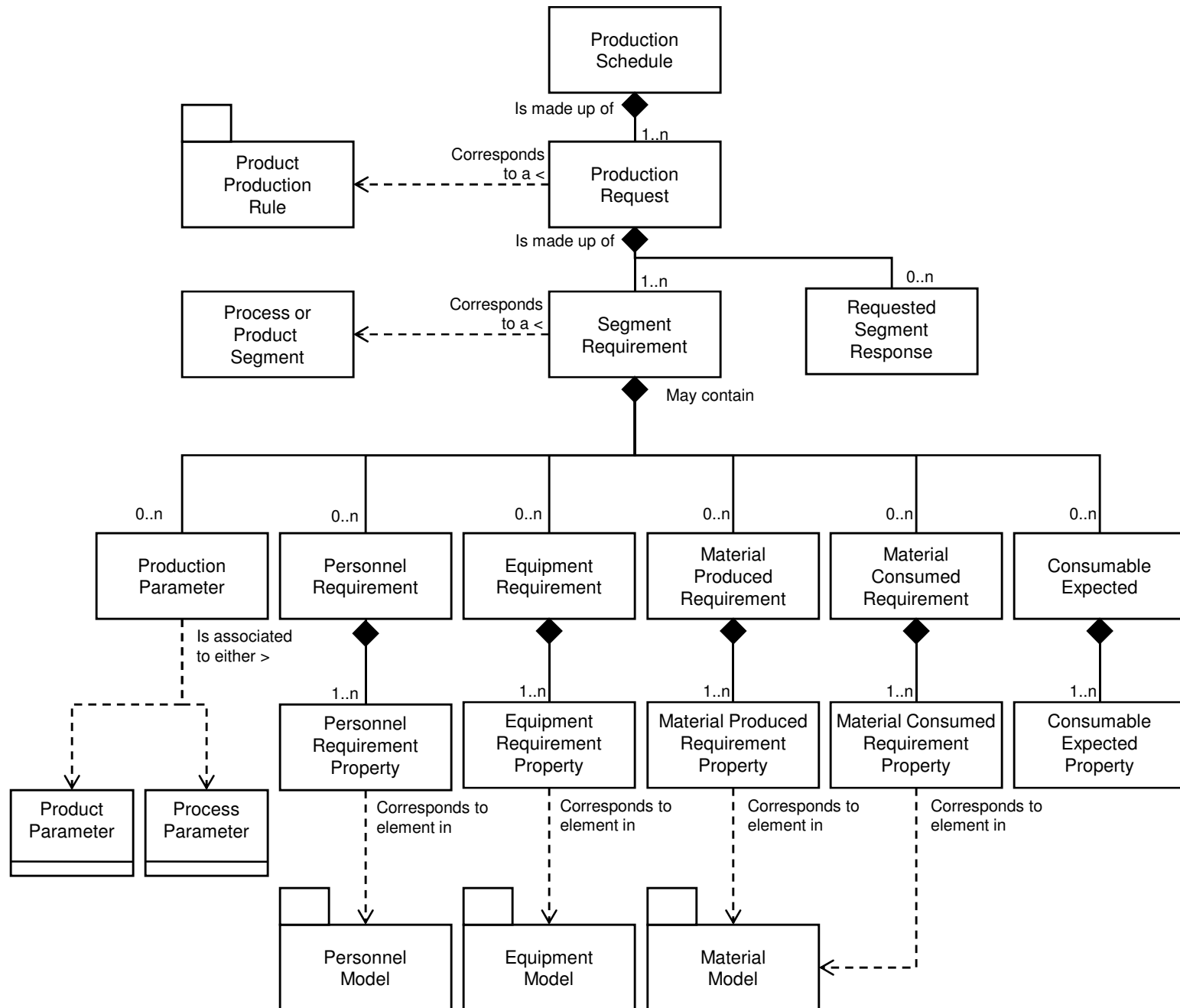


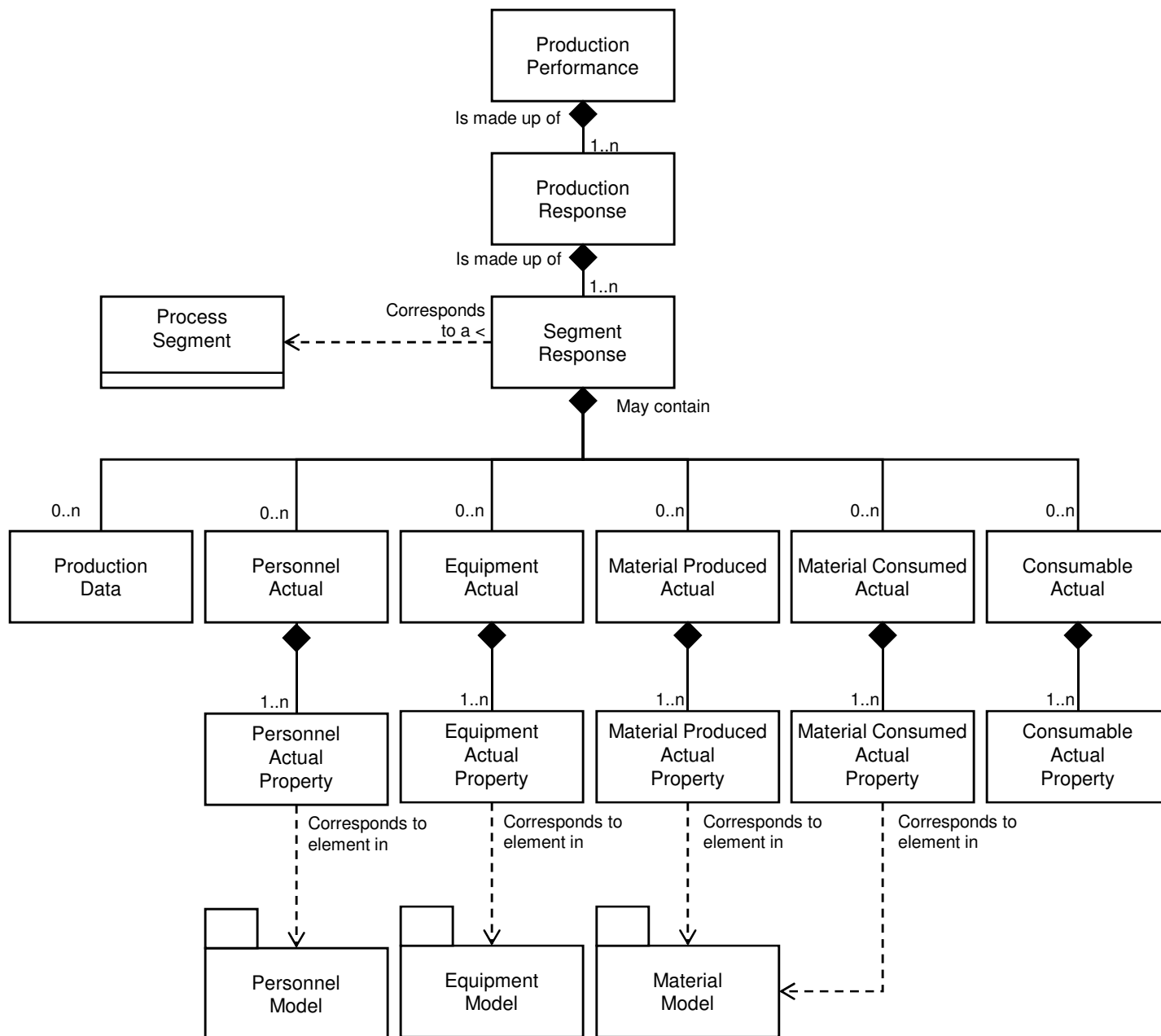




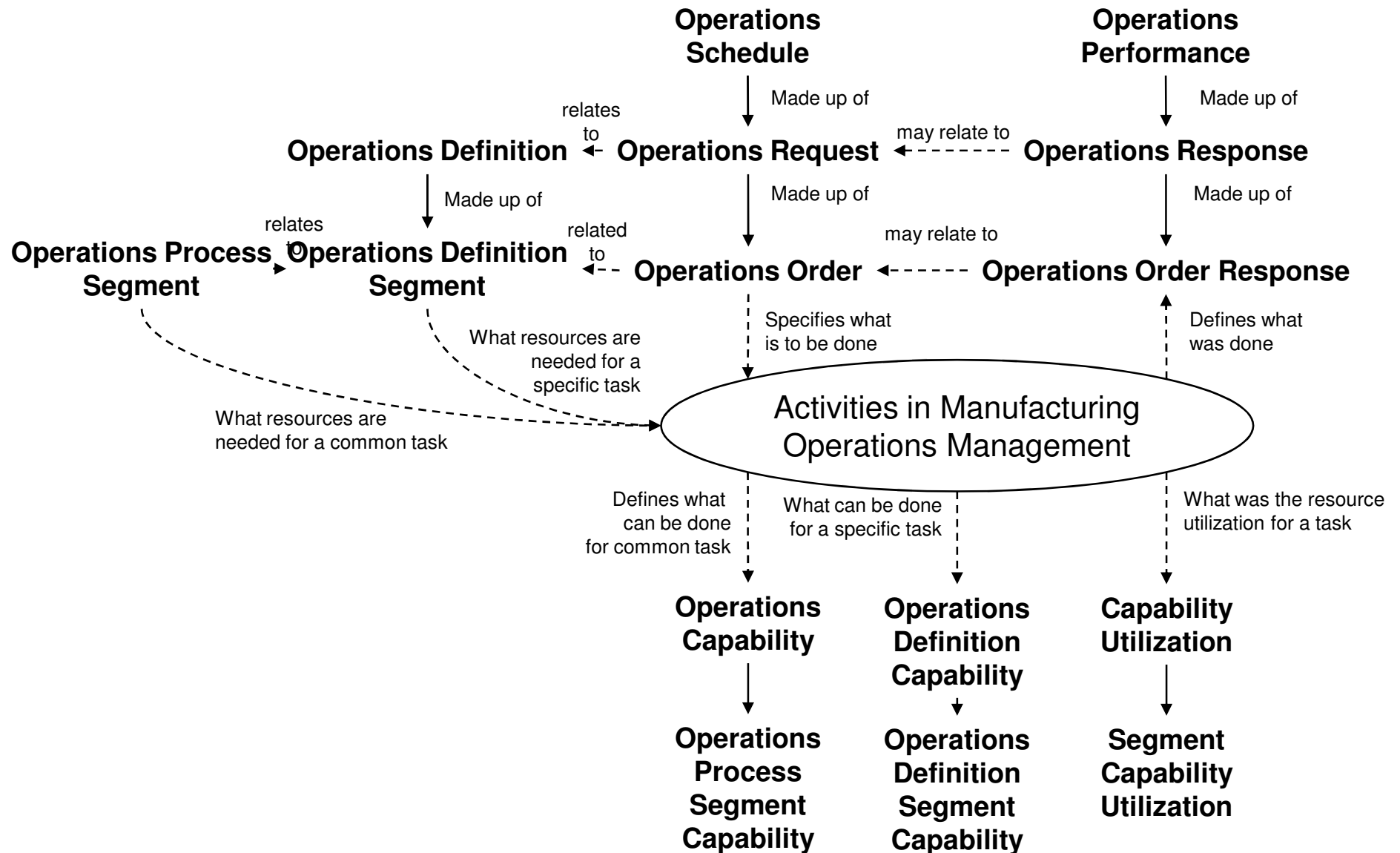




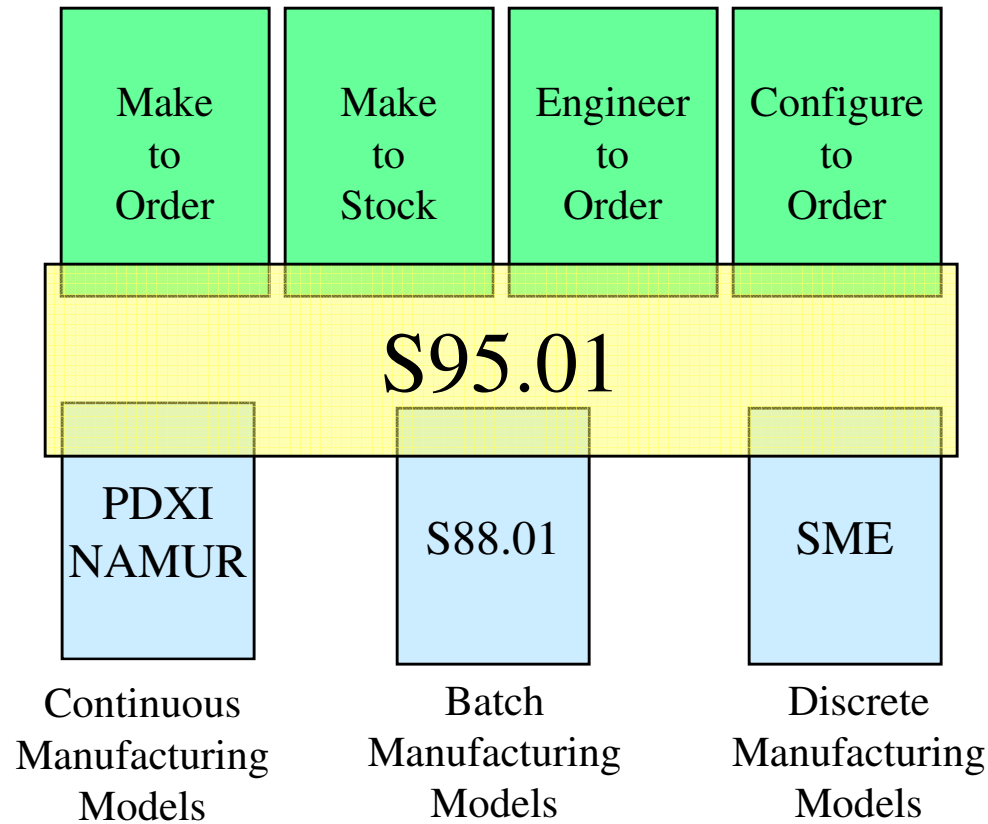




Part 2 ? Figure ?



Alternate Logistics Strategies



Alternate Manufacturing Methods

