Full AP233 OWL Ontology with concepts for Analysis in Support of Decision Making

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ISO-SC4 Meeting
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Translation Key - Concept Model Block Diagrams to Protégé OWL Model

- **Boxes** translate to Protégé **Classes**
  - Concept Model Semantic dictionary defines all "box" concepts
  - Select sets of subclasses can be identified as mutually disjoint
  - Inheritance (generalization/specialization) requirements can be identified
- **Lines** translate to Protégé **Properties**
  - Line titles are natural language labels without definition
  - Restrictions (characterization) of properties captured in Concept Model Draft 13 pidgen UML symbol list
    - Most symbols translate to Protégé OWL representation capability
    - E.g., Generalization/specialization --> Super/sub class inheritance
  - In Protégé the relationships between classes (properties) need to be made more precise, I tried
    - Create "classProperty" natural language property descriptors (labels)
    - Protégé allows for additional property characterization
      - Inverse - extensively used
      - Transitive - Not used
      - Functional, InverseFunctional - Some use
      - Symmetric - Not used

Analysis in Support of Decision Making Oct-2005

PDES Offsite Review Inputs included

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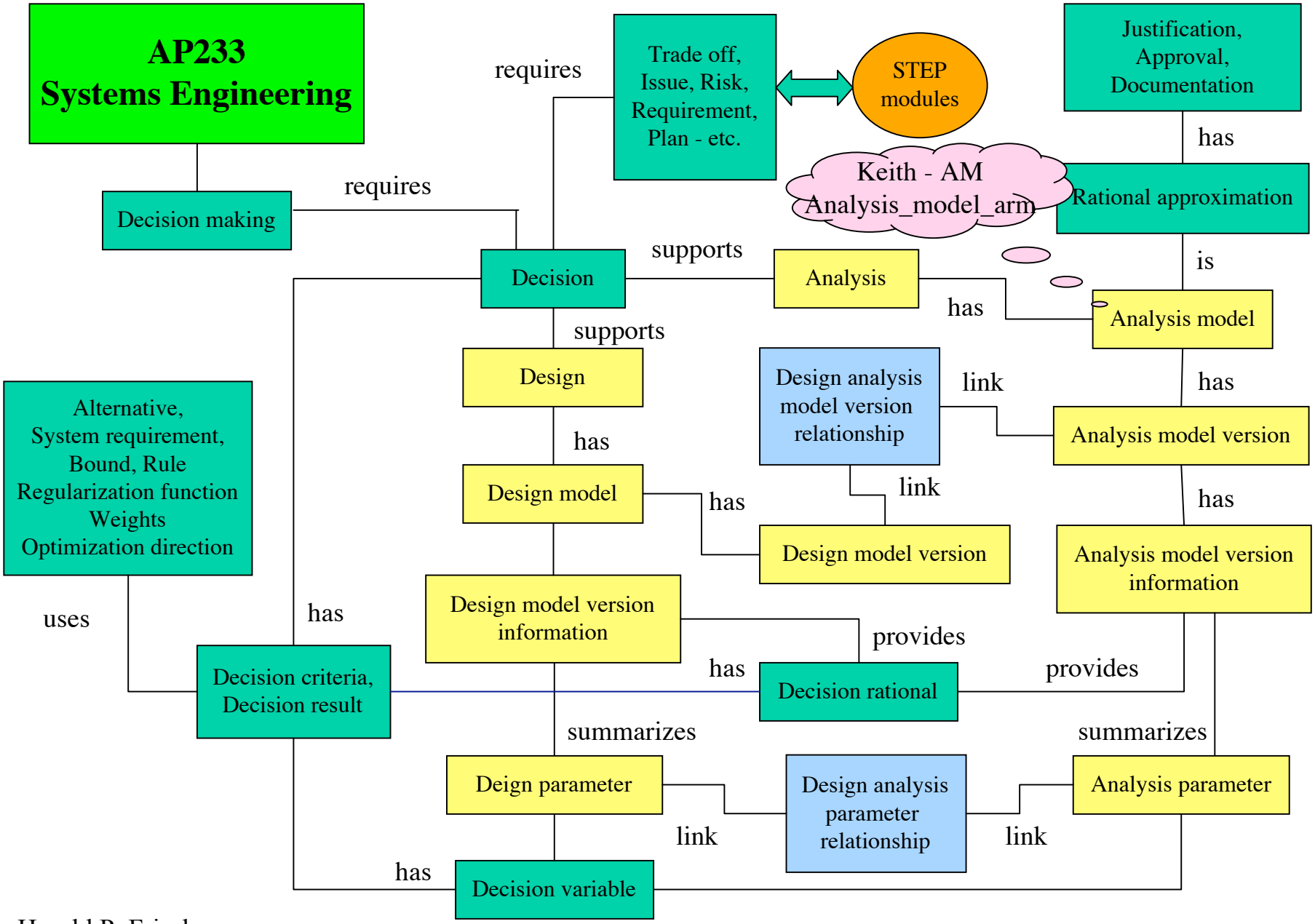
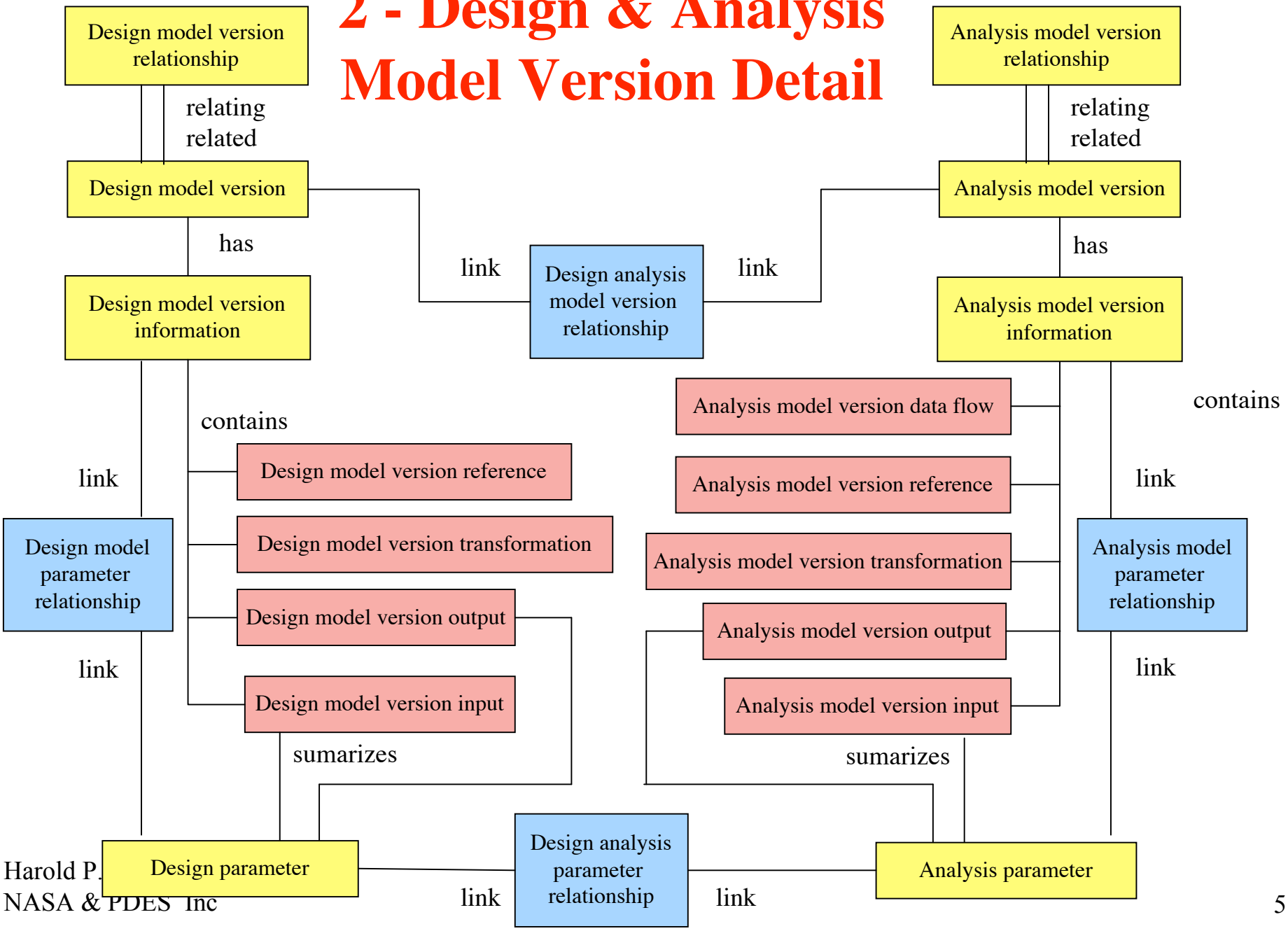
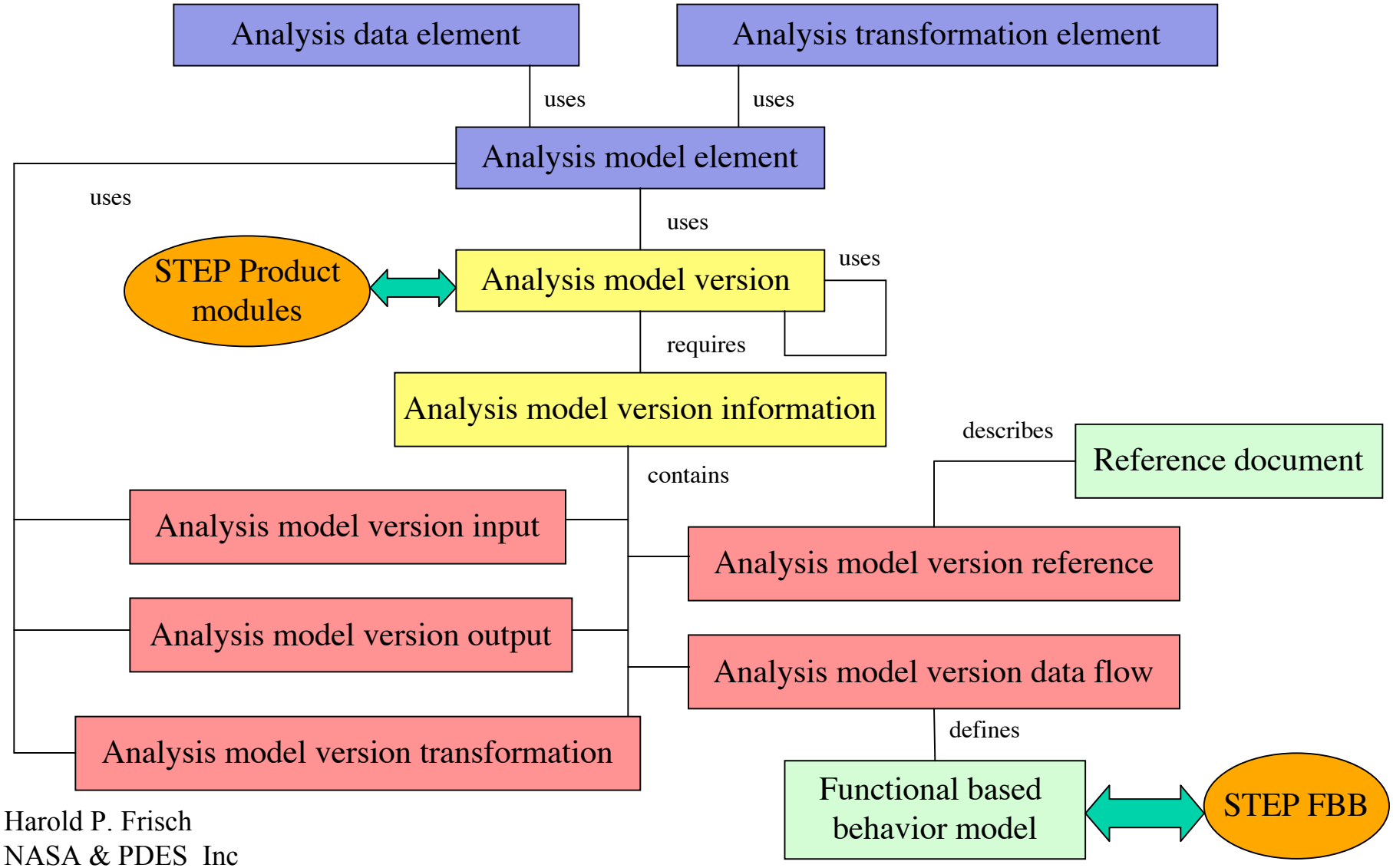


1 - Overview - Analysis in support of decision making

2 - Design & Analysis Model Version Detail



3 - Analysis Model Version Information Detail



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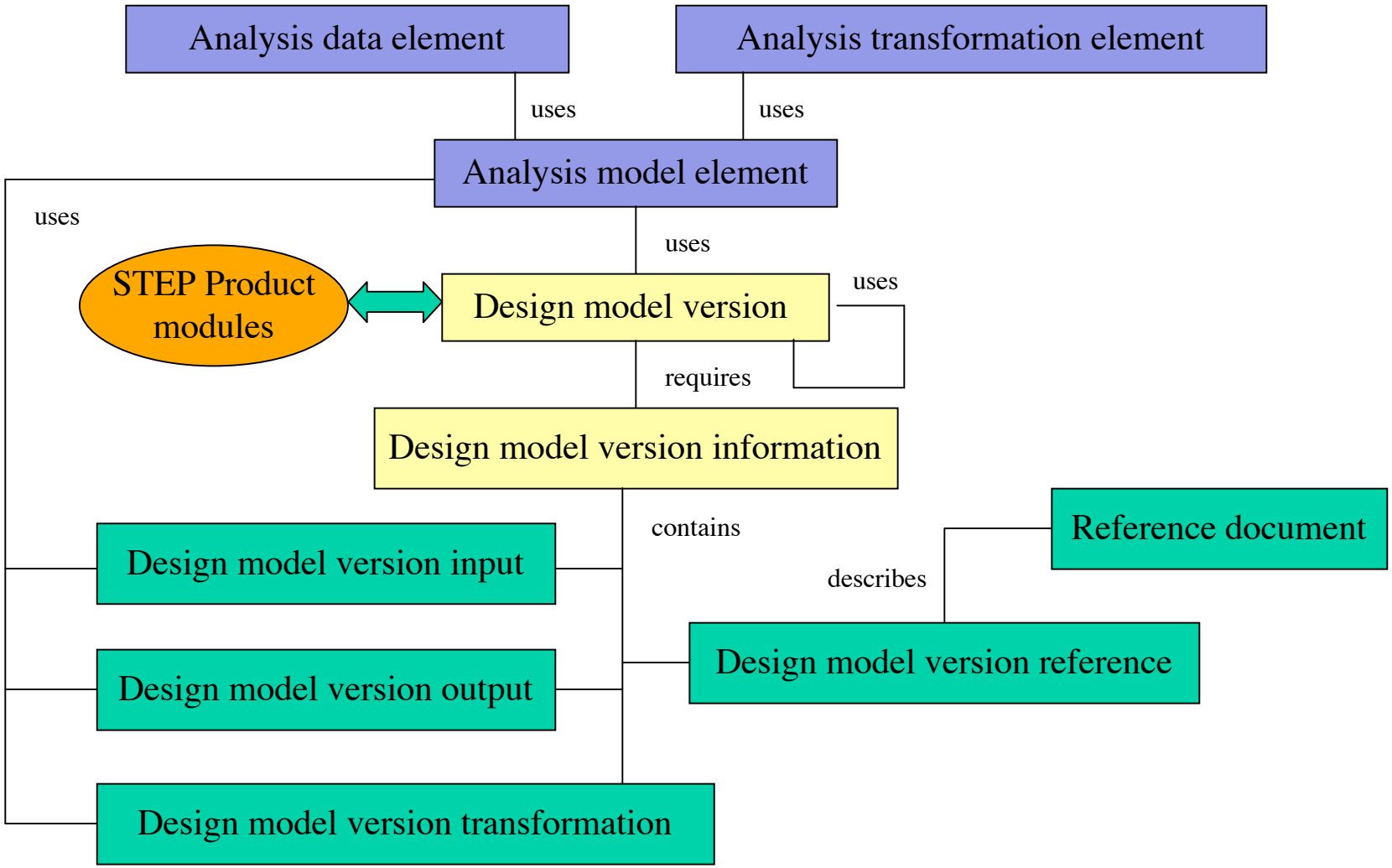
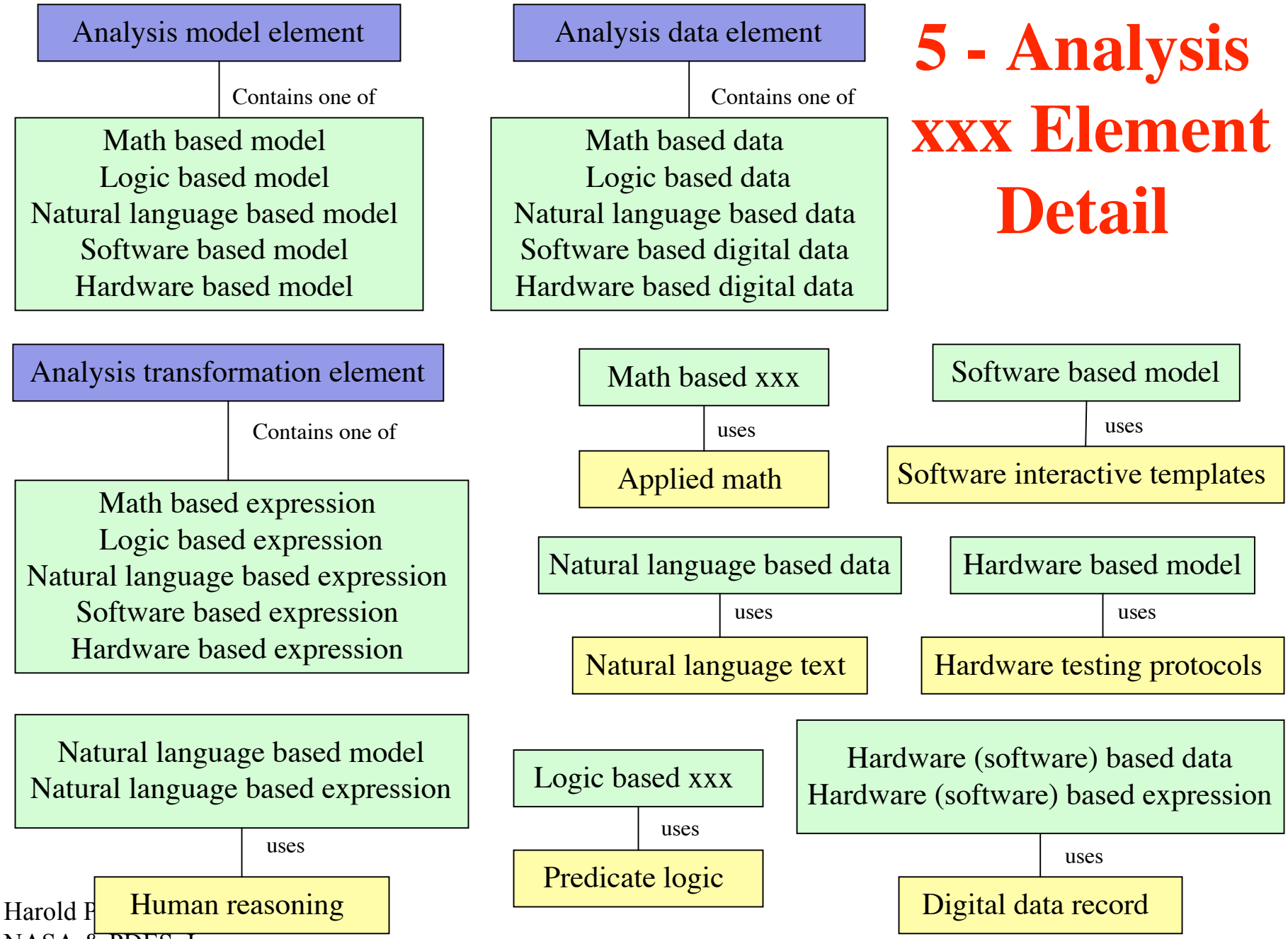
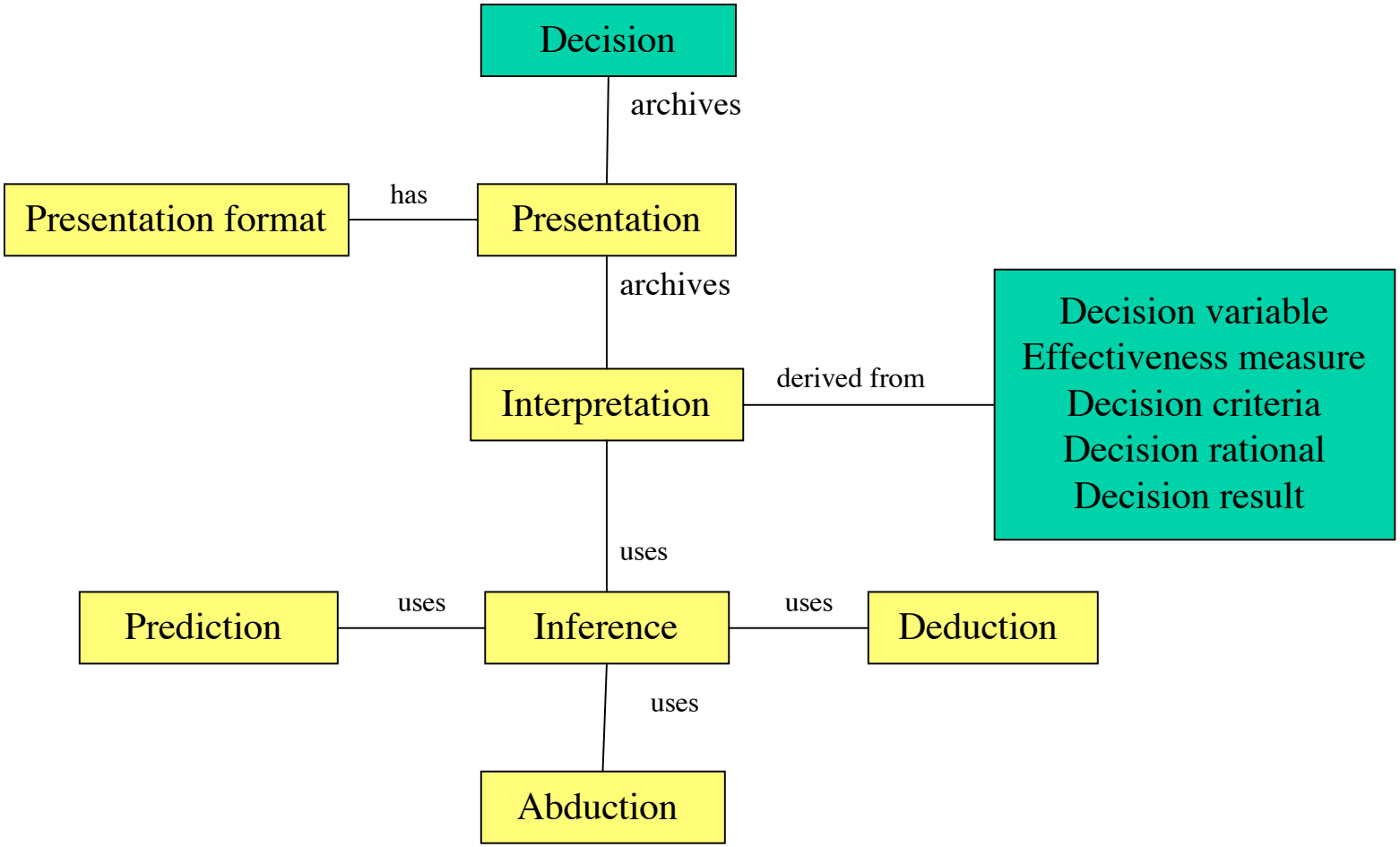
4 - Design Model Version Information Detail



5 - Analysis xxx Element Detail



6 - Decision supported by Interpretation & Presentation



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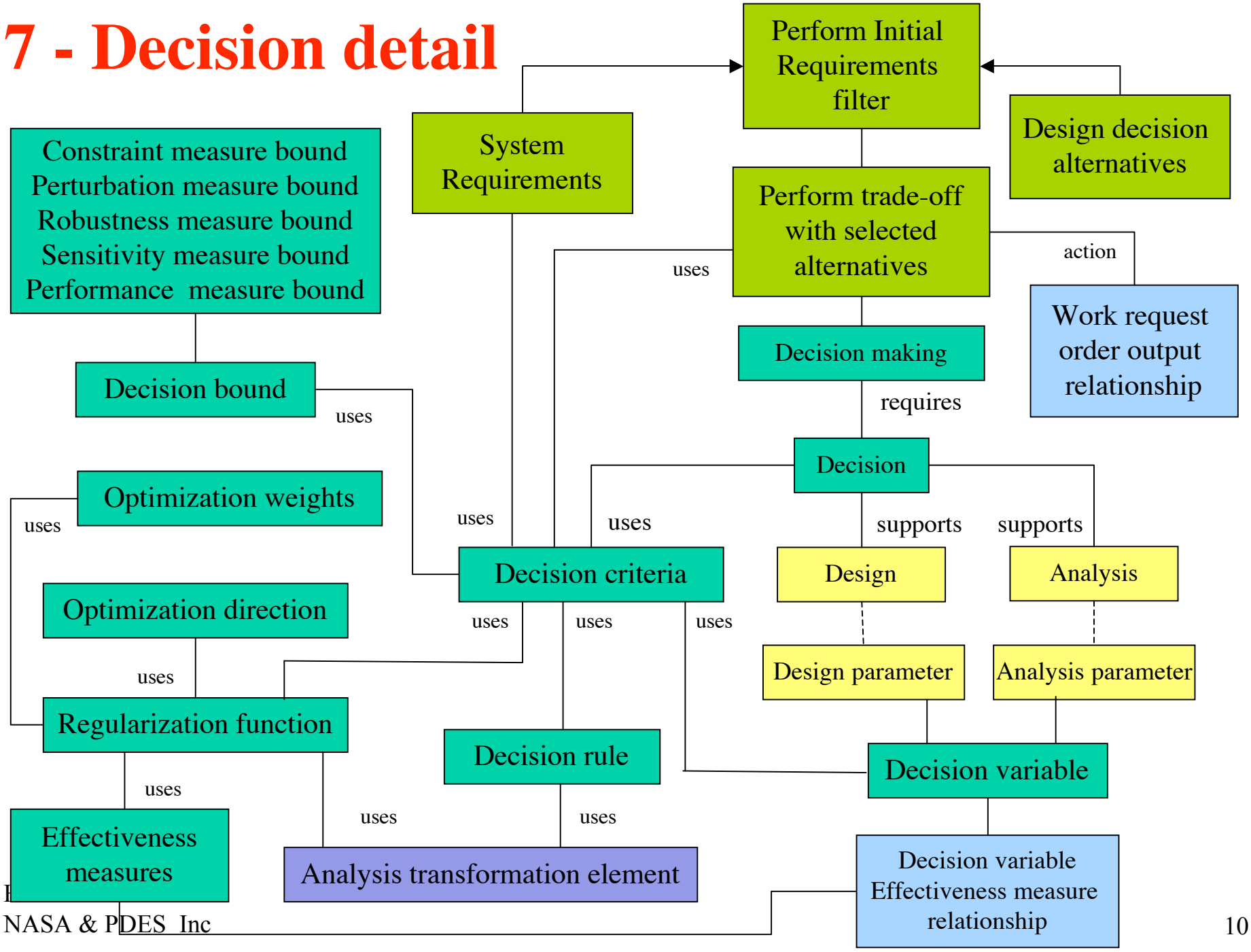
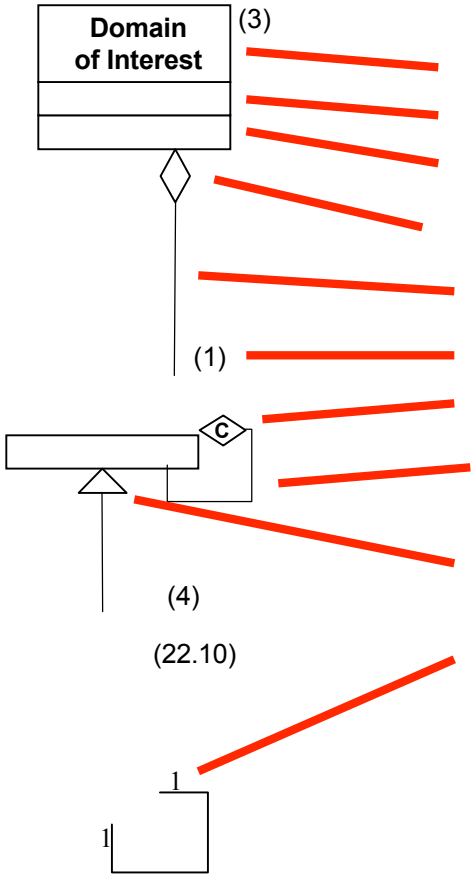
7 - Decision detail



System Engineering Definitions for pigeon UML



Box means Class or Meta Class (top is name) or type

2nd box means attributes

3rd box means Methods or member functions

Diamond means aggregation/decomposition

Line means relationship (words on line describe relationship)

(XX) Means look at Concept semantic dictionary

Diamond with a C in the middle means a Complete decomposition

Loop line with Diamond means hierarchal decomposition of items of the same type

Arrow/triangle means specialization/generalization Depending on direction

A number on each end of a line means mulitplcity

AP 233 Concept Model
Draft #13
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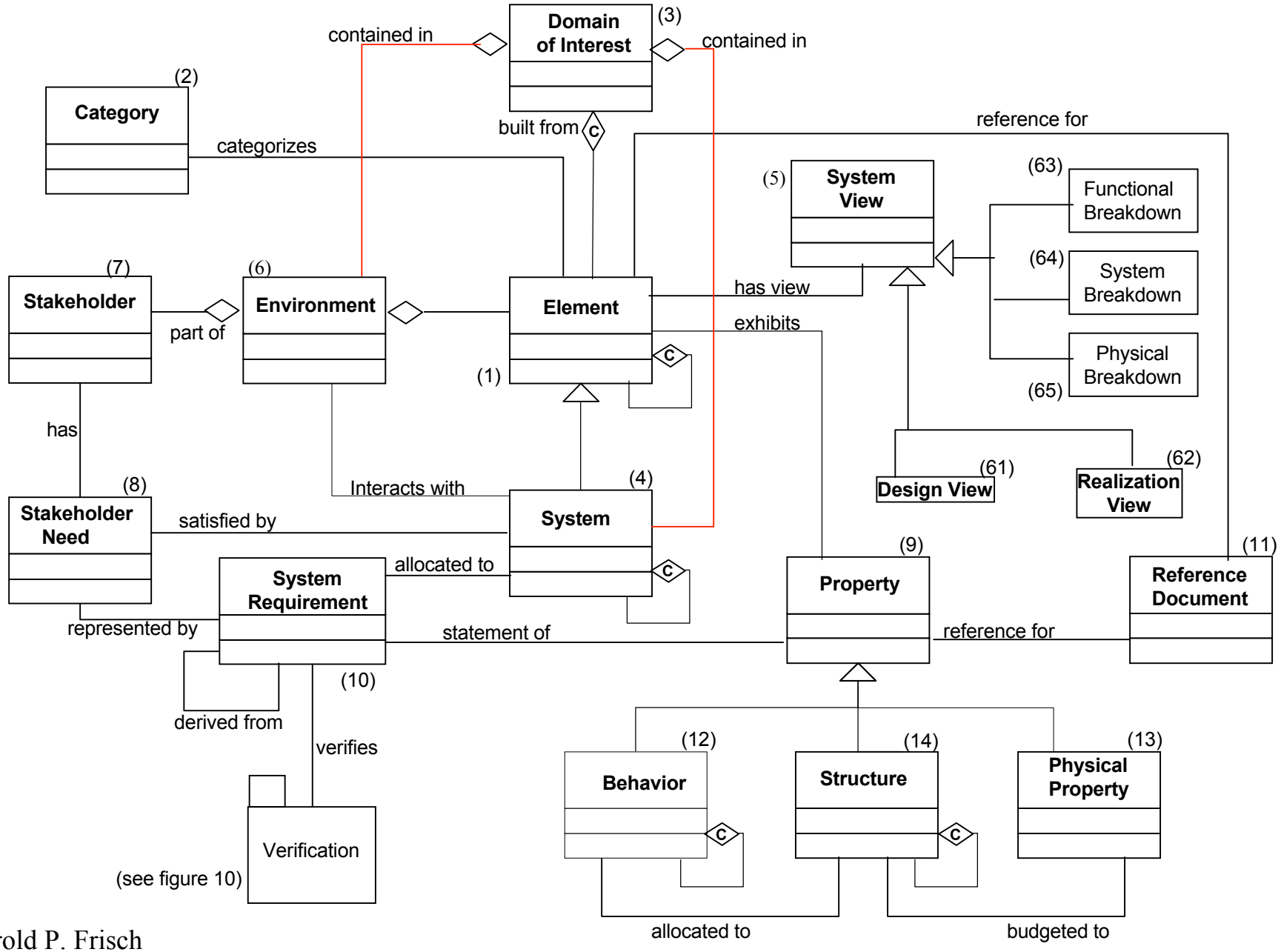
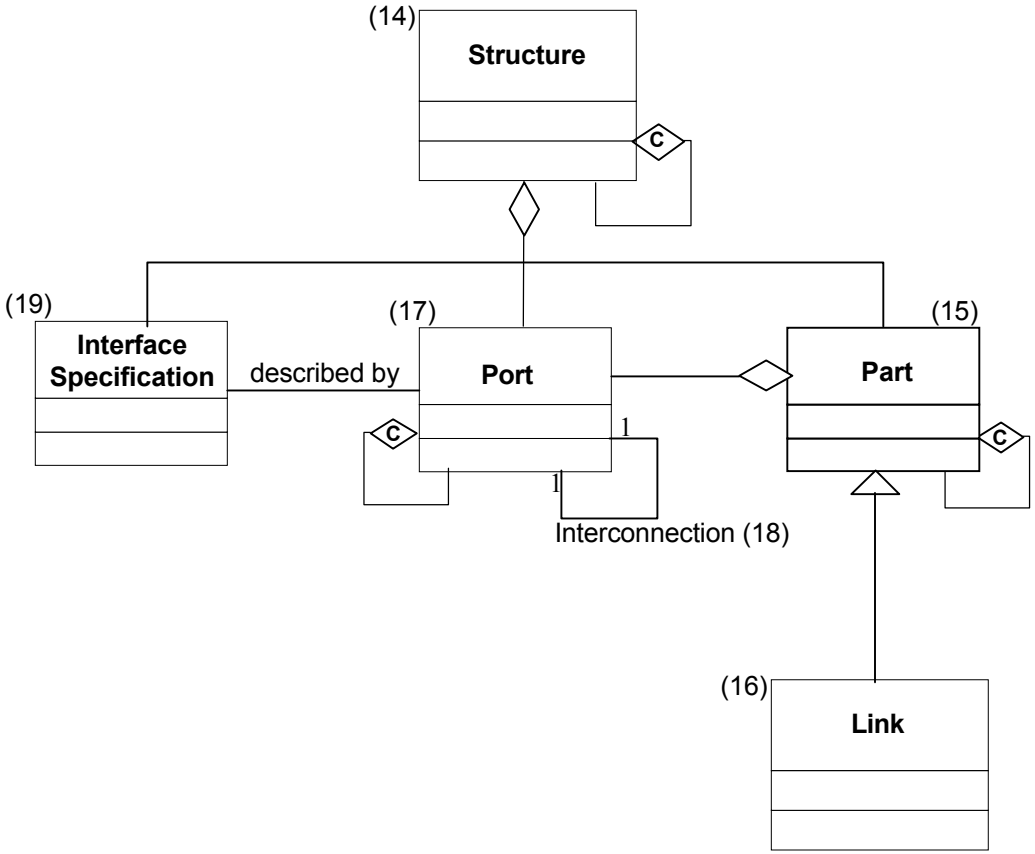
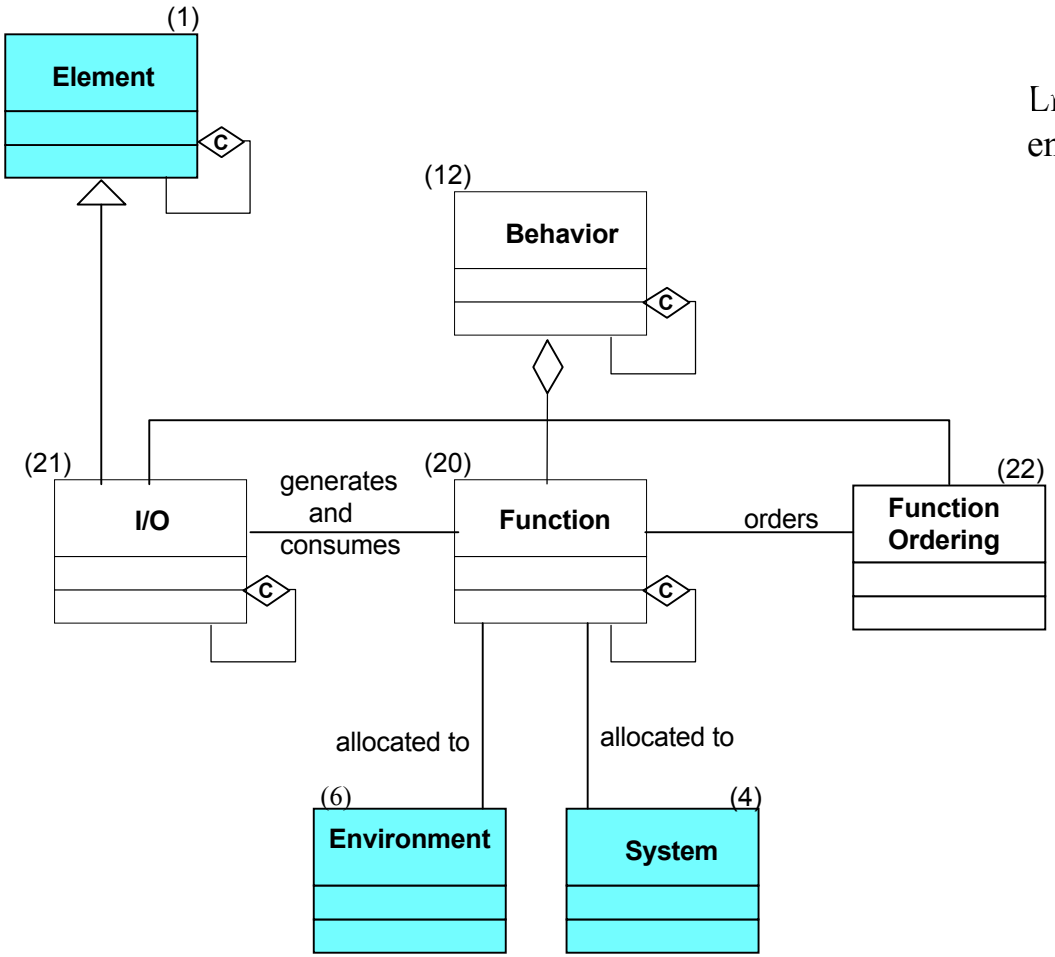


Top Level Concept Model, Figure 1.

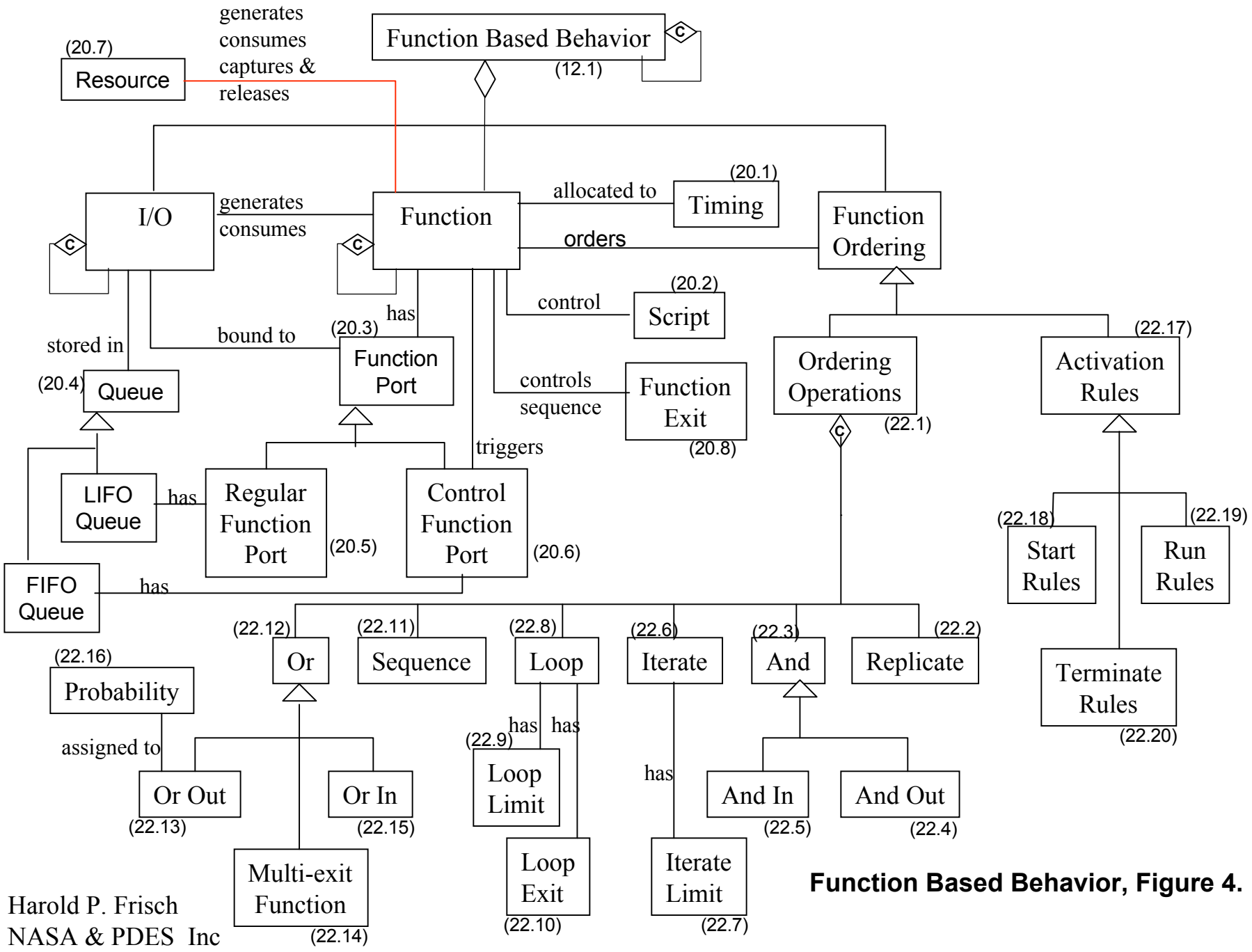


System Static Structure, Figure 2.

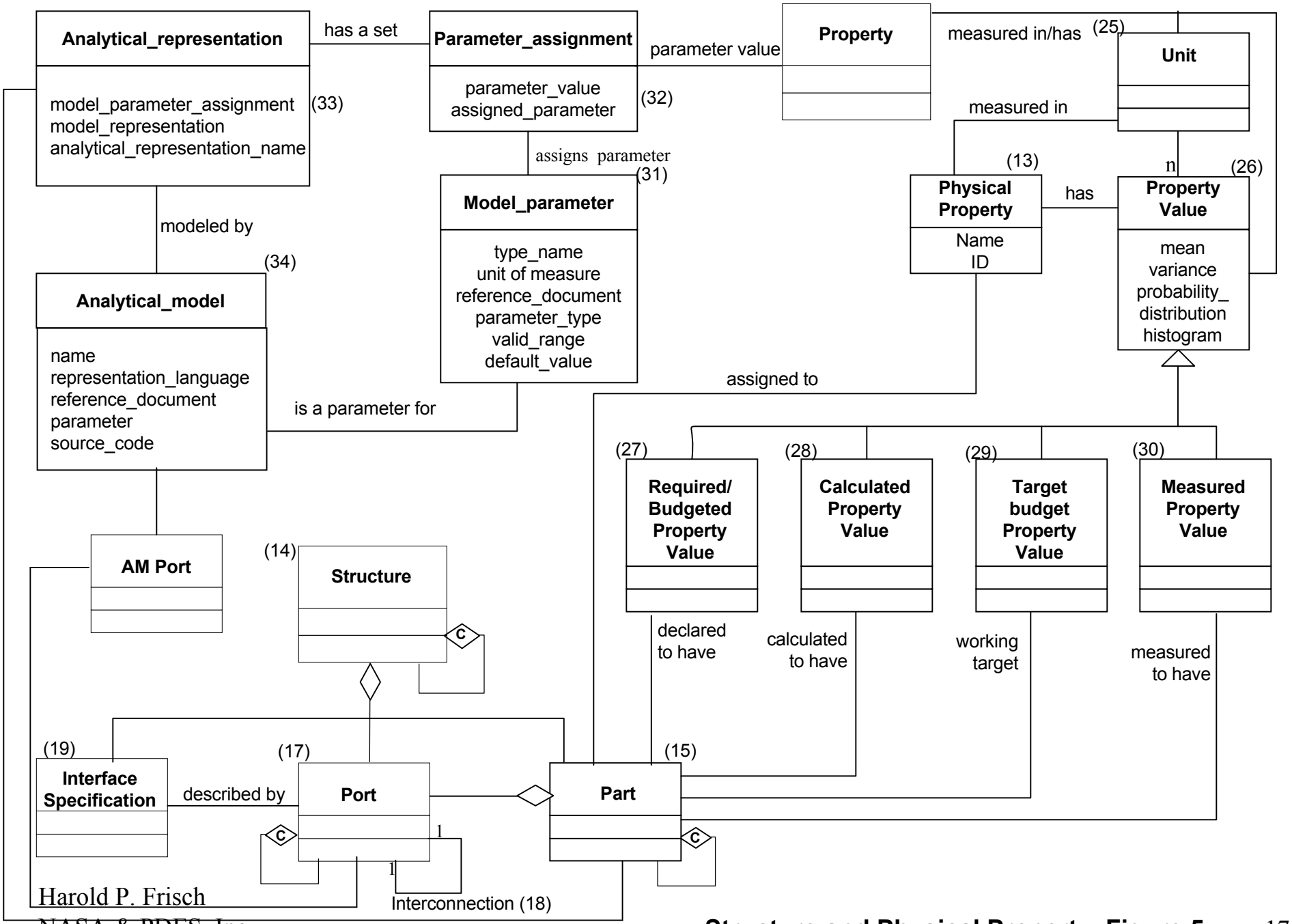


Light blue background means this entity comes from Figure 1.

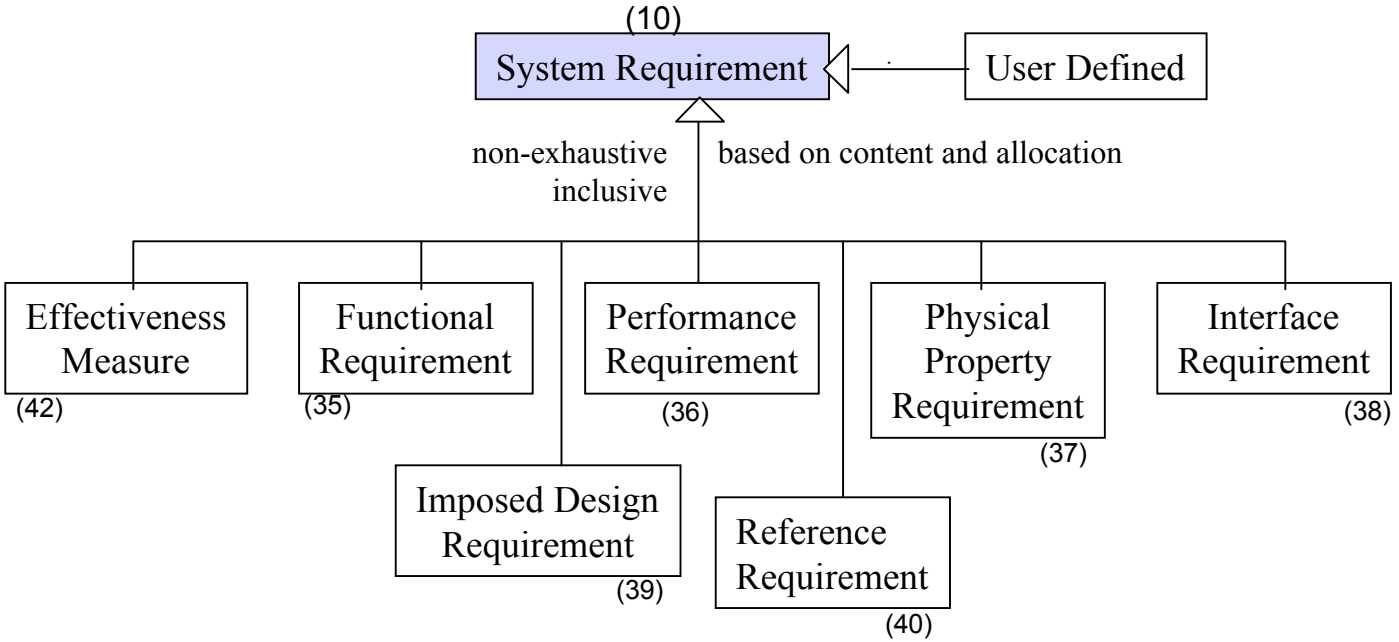
Behavior, Figure 3.



Function Based Behavior, Figure 4.

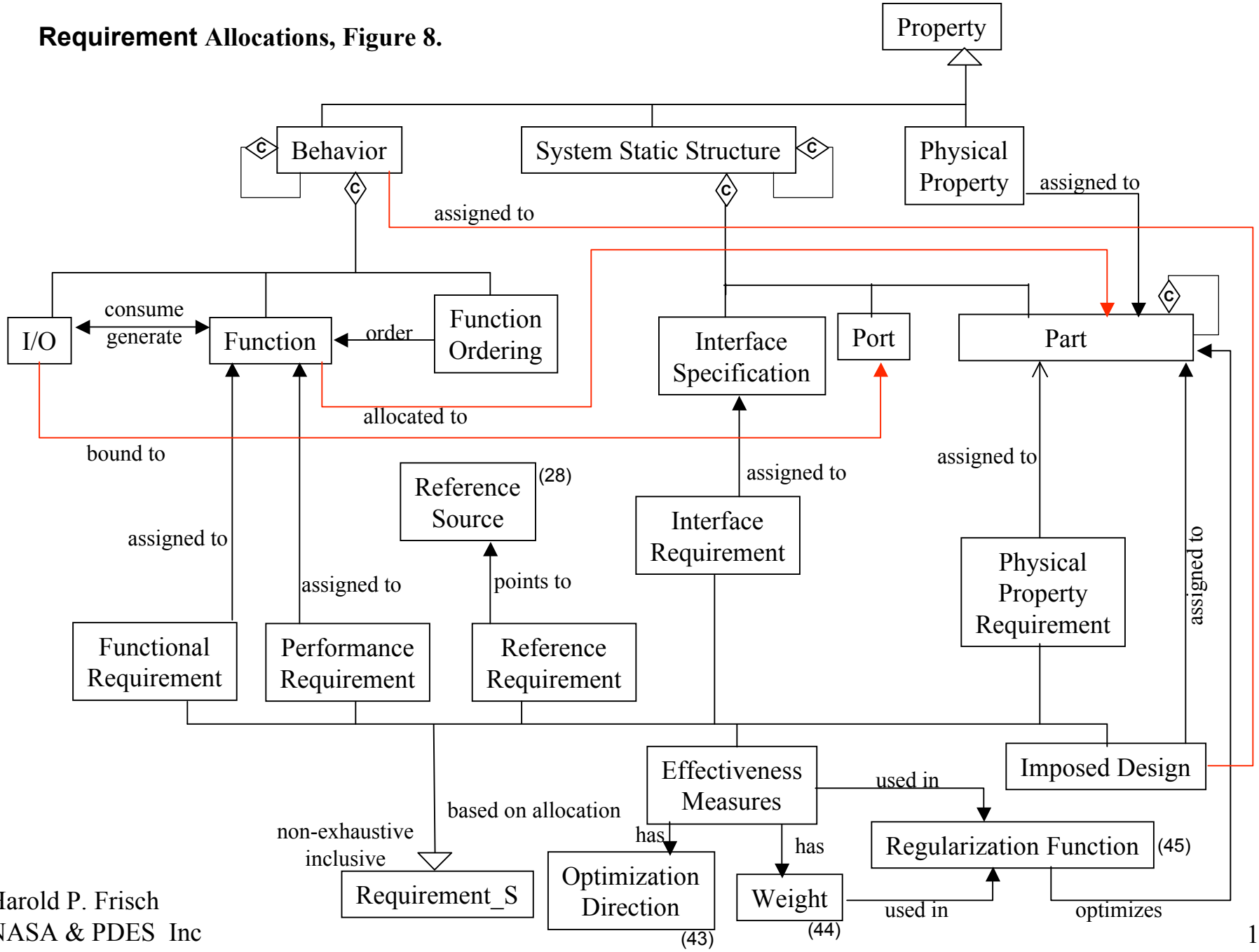

Analytical_representation
has a set
Parameter_assignment
parameter value
Property
measured in/has
(25)
Unit
model_parameter_assignment
model_representation
analytical_representation_name
(33)
parameter_value
assigned_parameter
(32)
measured in
assigns parameter
(31)
(13)
n
(26)
Physical Property
Name
ID
has
Property Value
mean
variance
probability_
distribution
histogram
Model_parameter
type_name
unit of measure
reference_document
parameter_type
valid_range
default_value
modeled by
(34)
Analytical_model
name
representation_language
reference_document
parameter
source_code
is a parameter for
assigned to
(27)
(28)
(29)
(30)
Required/ Budgeted Property Value
Calculated Property Value
Target budget Property Value
Measured Property Value
declared to have
calculated to have
working target
measured to have
AM Port
(14)
Structure
C
(19)
(17)
(15)
Interface Specification
described by
Port
Part
C
1
1
C
Interconnection (18)

A Requirement Classification, needed to show how requirements are allocated to Behavior & System Structure



Classification of Requirements for the Purpose of Allocation, Figure 7.

Requirement Allocations, Figure 8.



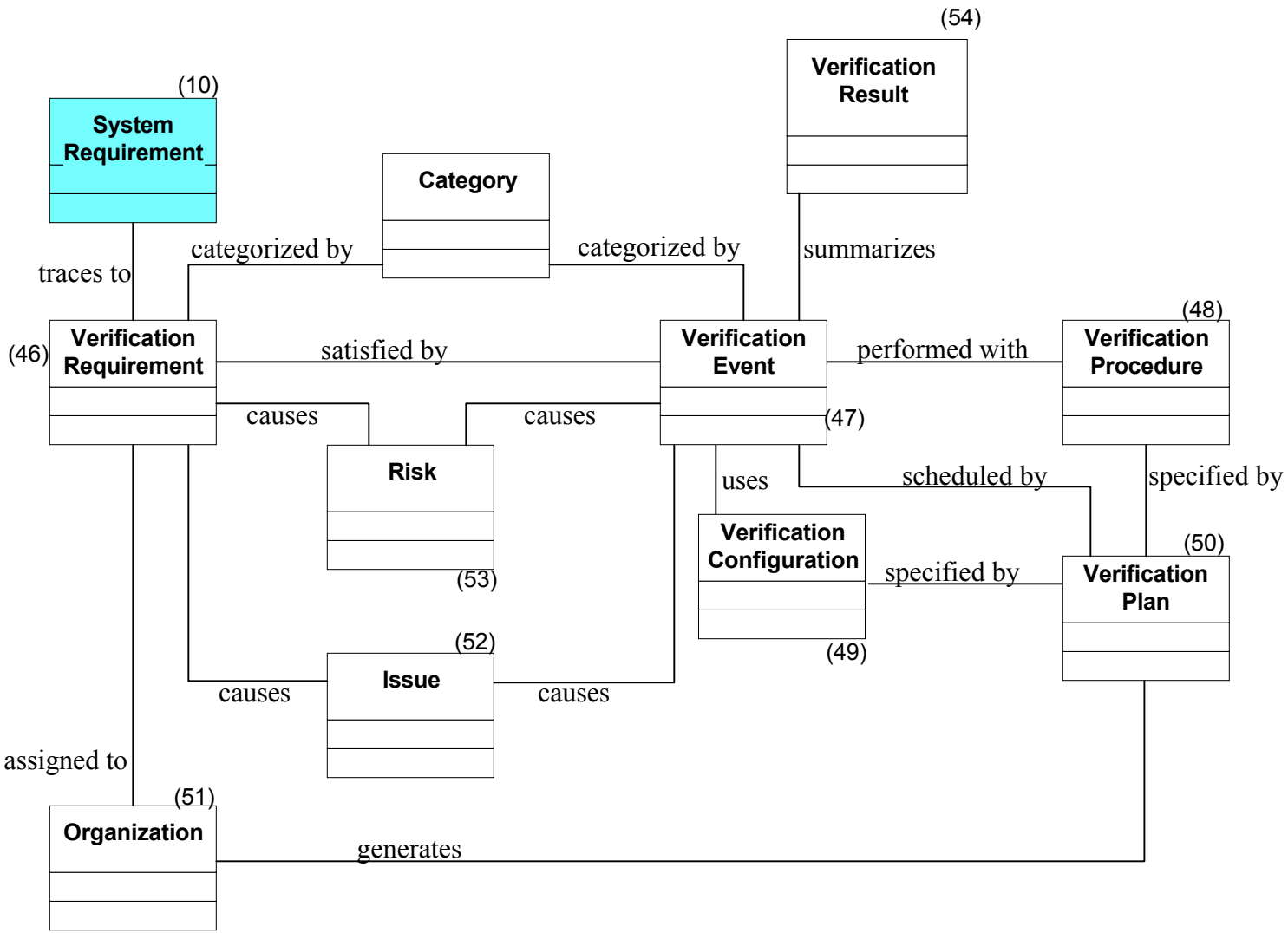


Figure 10. Verification

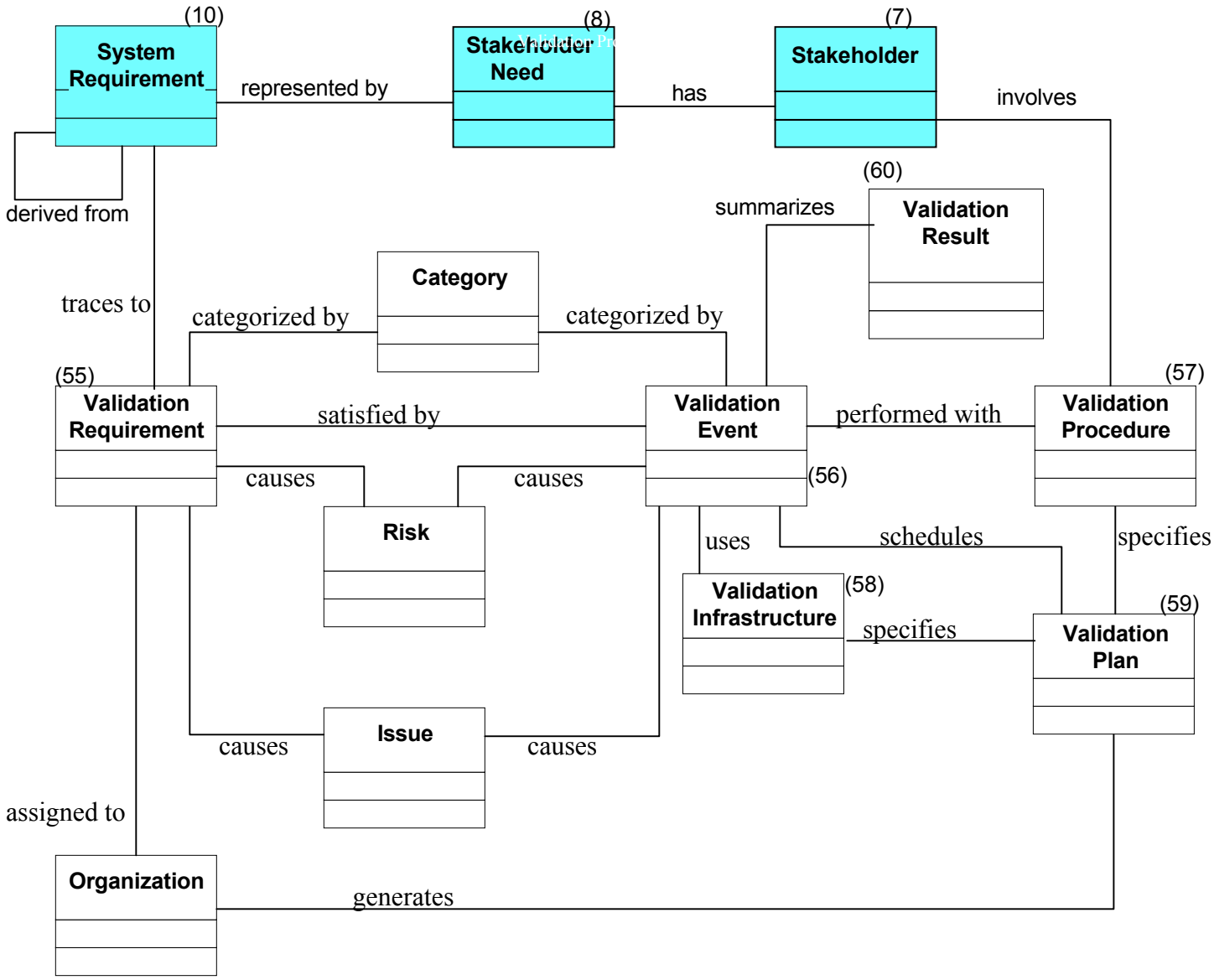


Figure 11. Validation

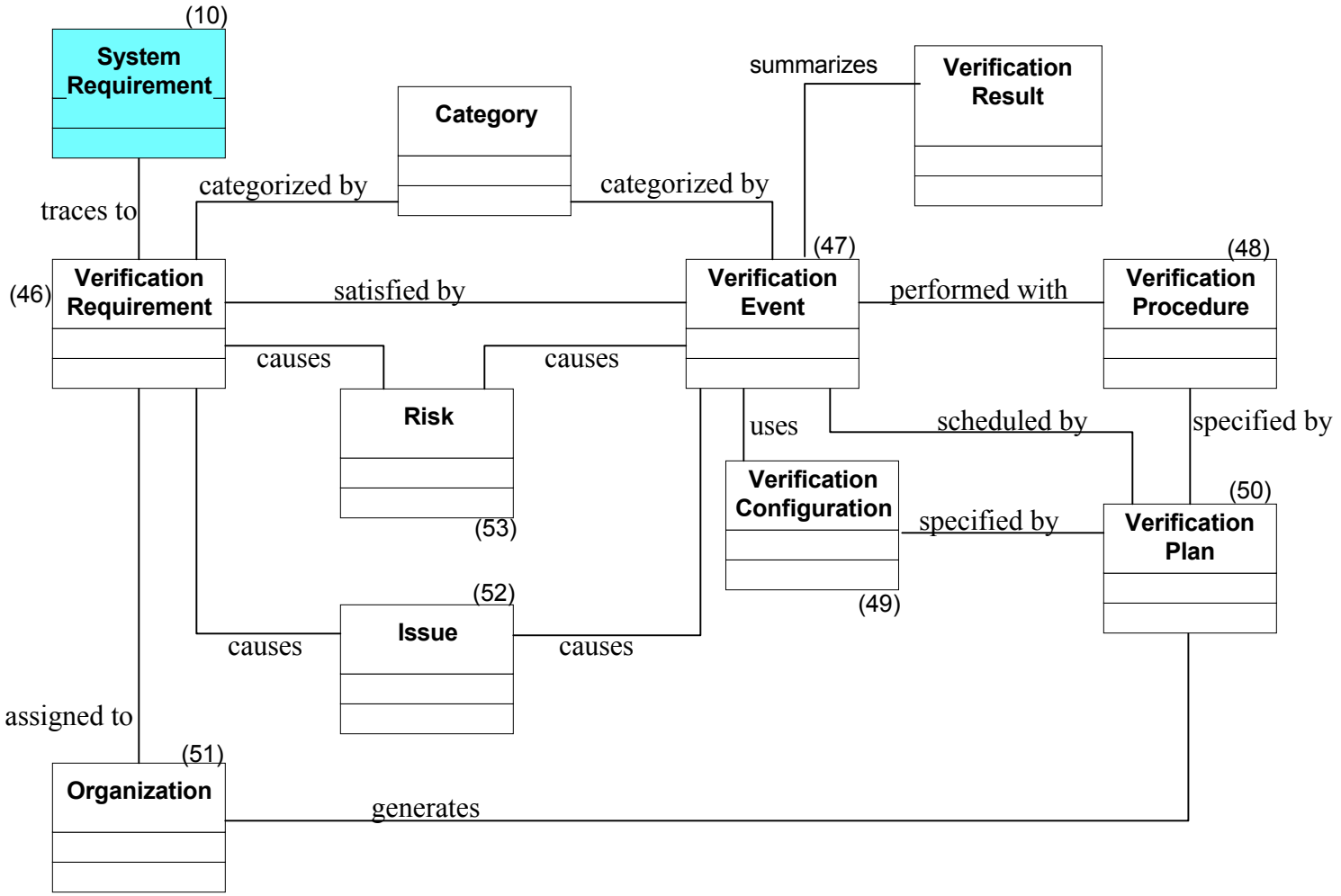


Figure 1. Verification, from Concept Model

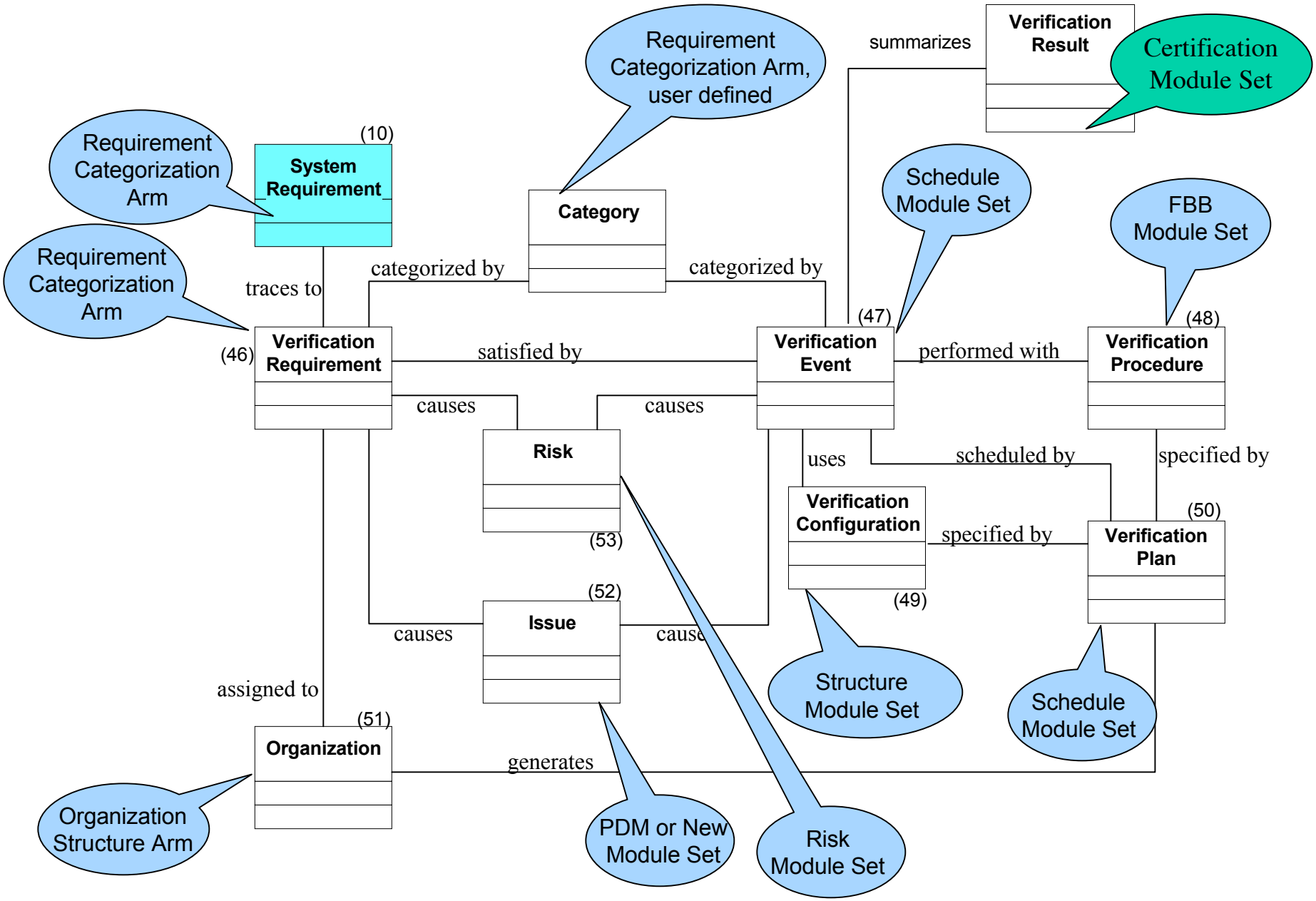


Figure 2. Verification mapping to modules