

# Structure of Analysis Attributes

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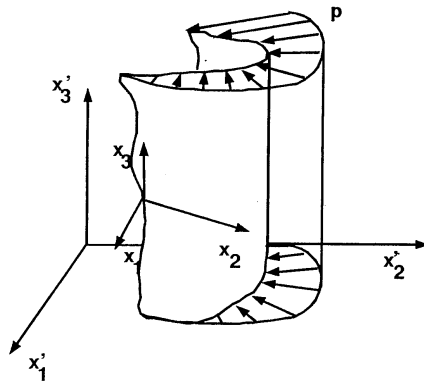
## Analysis Attributes:

- The information beyond the geometric model needed to qualify the physical problem to be solved.
- All attributes can be viewed as tensorial in nature.
- Examples: material properties (stiffness, conductivities, etc), loading conditions, boundary conditions, etc.

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- Pressure Load =  $f(x_2)$

$$p = -2x_2$$



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Examples of attributes:

- Stiffness matrix for a material region such as layer, solder, or chip

$$\sigma_{ij} = C_{ijkl}\varepsilon_{kl}$$

or

$$\hat{\sigma}_i = D_{ij}\hat{\varepsilon}_j$$

where

$$D_{ij} = \begin{bmatrix} C_{11} & C_{12} & C_{13} & & & & \\ & C_{22} & C_{23} & & & & \\ & & C_{33} & & & & \\ & & & C_{44} & & & \\ & \text{sym.} & & & C_{55} & & \\ & & & & & C_{66} & \end{bmatrix}$$

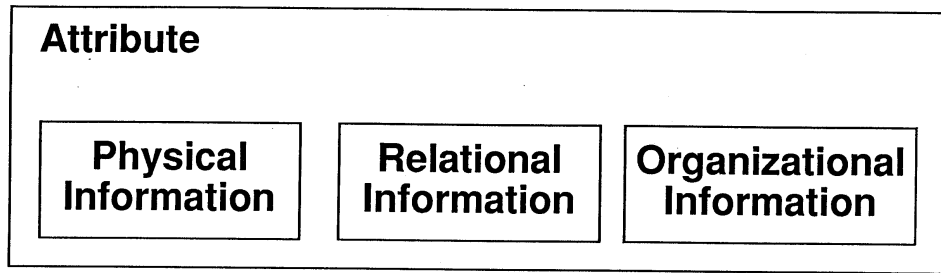
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## Analysis Attribute Specification

### Features:

- Direct links to geometric modelers
- Consistent methodology with different modelers and analysis codes
- Generalized structure independent of analysis type
- General tensorial form with symmetry information
- Generalized coordinate system specification
- General distribution functions
  - Distributions of distributions
  - Solutions from previous analyses

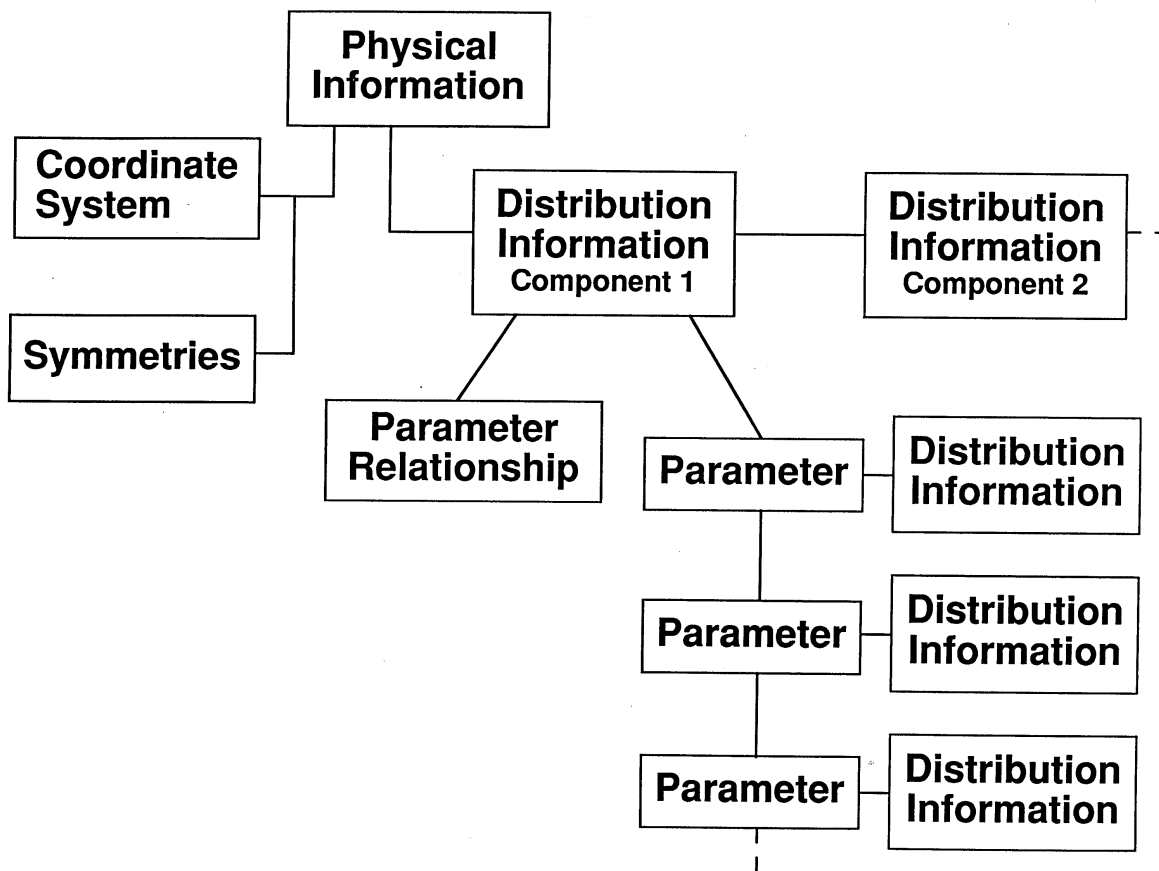
## Overall Structure of an Attribute

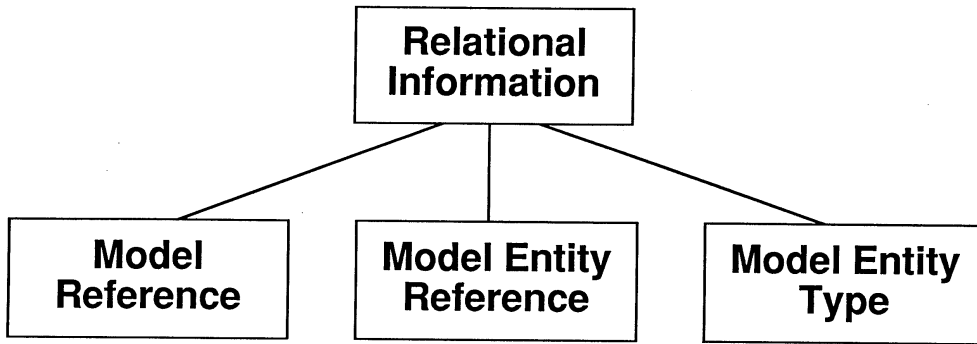


**Physical:** Tensorial description of the properties of an attribute

**Relational:** Relation of the attribute to a model

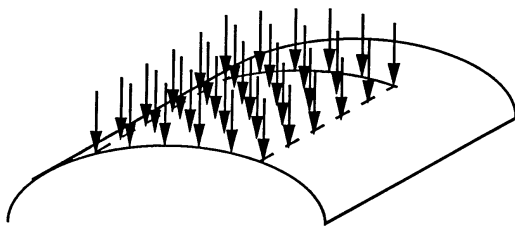
**Organizational:** Relation of the attribute to other attributes



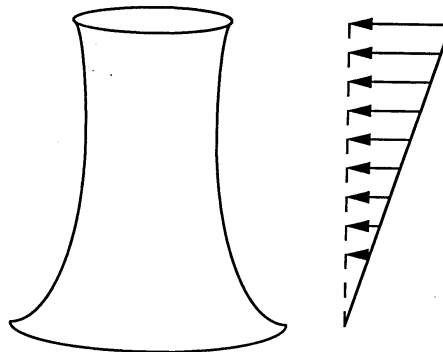


- Model Reference:** The model on which the attribute is acting
- Model Entity Reference:** Identifier for the model entity on which the attribute is acting
- Model Entity Type:** The type of model entity that the attribute is on

**Examples of auxiliary attribute geometry**



**Load over part of a face**



**Wind load on a structure  
(projected load)**

# Overall Organizational Structure

