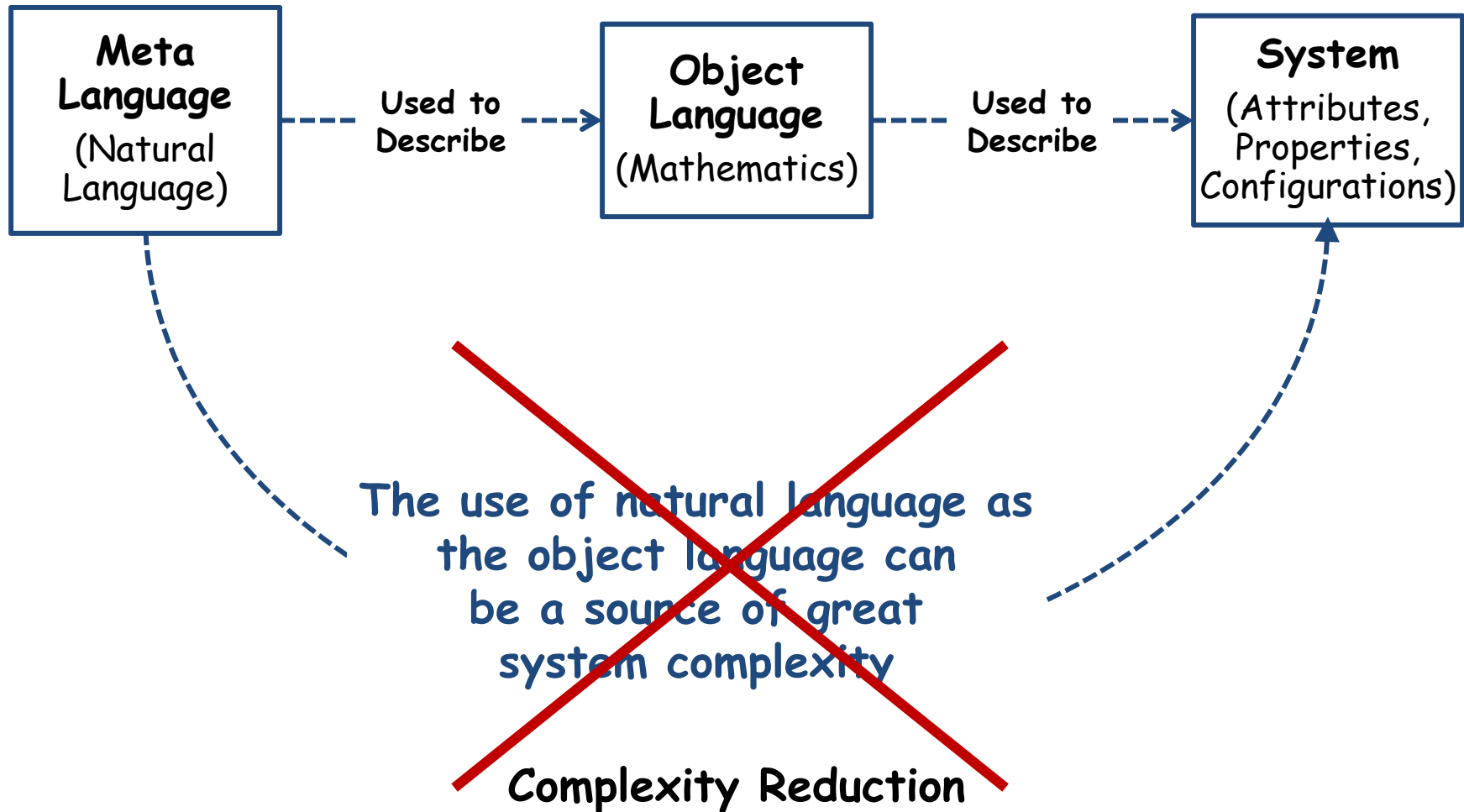
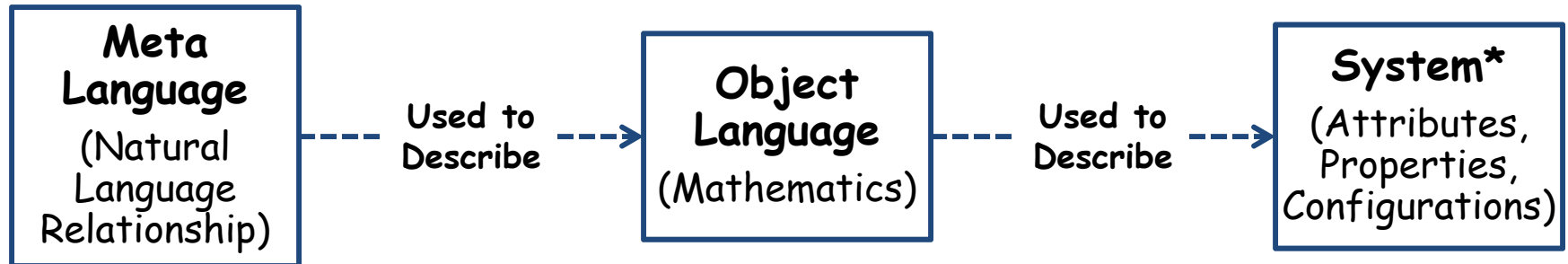


# An Observation related to System Description



# A General Approach to System Description



\*Where 'system' is a relation mapped over a set of objects

- "Is antecedent to" -----> Reachability Matrix
- "Is adjacent to" -----> Adjacency Matrix
- "Is subordinate to" -----> Subordination Matrix
- "Is included in" -----> Inclusion Matrix
- "Is north of" -----> 'North-of' Matrix



**There is a significant difference between the meaning and use of this term by Warfield and by Sage**

# Warfield and Sage re Uses of the Term Adjacency Matrix

## Warfield

Warfield describes an adjacency matrix  $A$  as:

- Including a binary matrix  $A'$
- Constrained such that no element is adjacent to itself

## Sage

Sage describes an adjacency matrix consistent with common mathematical usage:

- Of a graph
- Of a digraph

## The Implications

Only zeros (0) and ones (1) may be used when forming the matrix model

The logical properties are irreflexive

More than zeros (0) and ones (1) may be used in the formation of the matrix model

The logical properties are unconstrained

# Warfield and Sage re Operational Approach to Structural Modeling

## Warfield

- Starts with a relationship
- Discovers objects that relate
- Creates mappings **wherein all systems objects participate in the binding system relationship**

## Sage

- Starts with complete object set
- Maps relationship on objects
- Creates mappings **wherein some objects do not participate in the system mapping**

## The Result

Restricted matrix types with constrained logic properties

Unconstrained matrix types with unconstrained logical properties