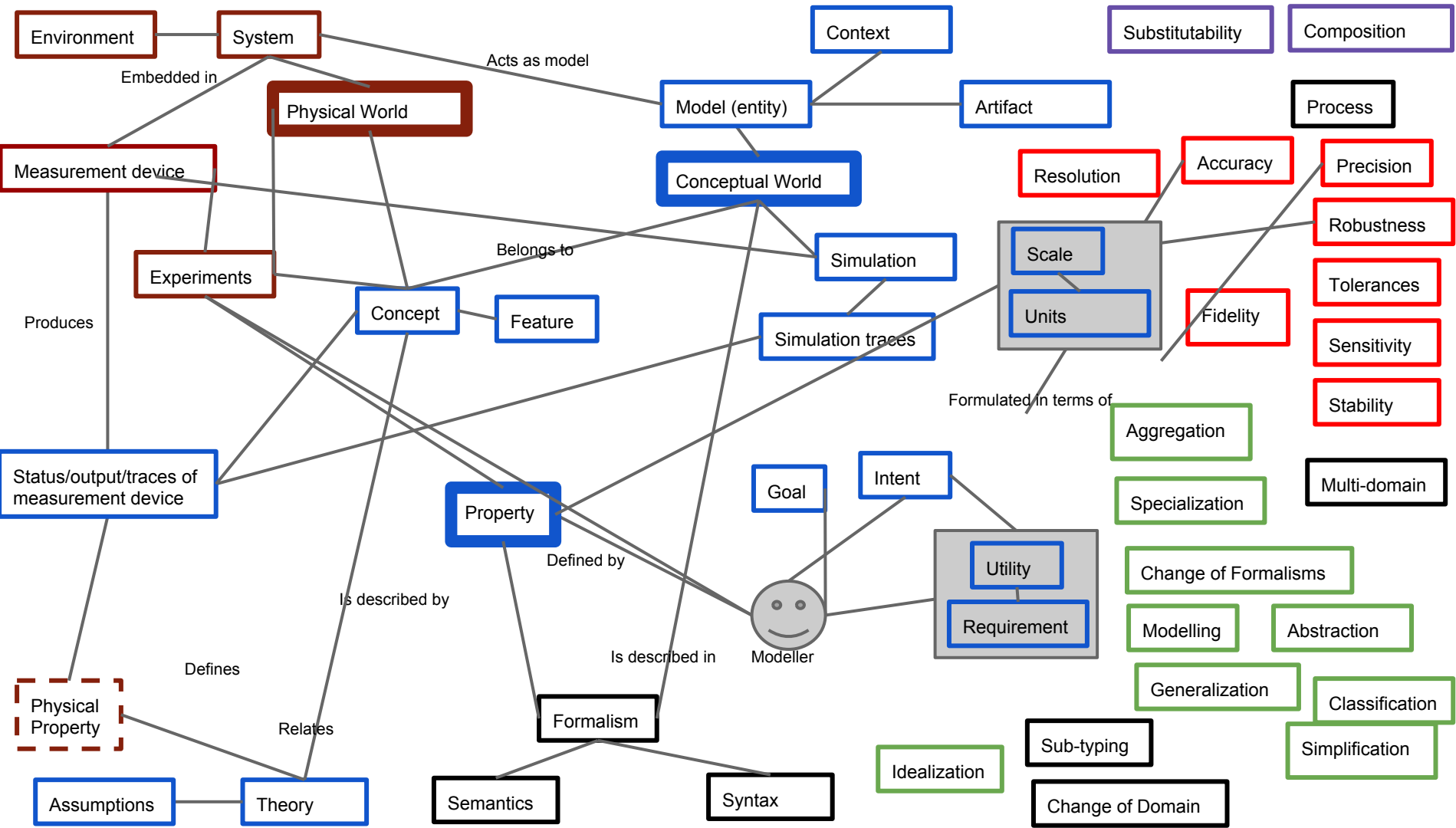
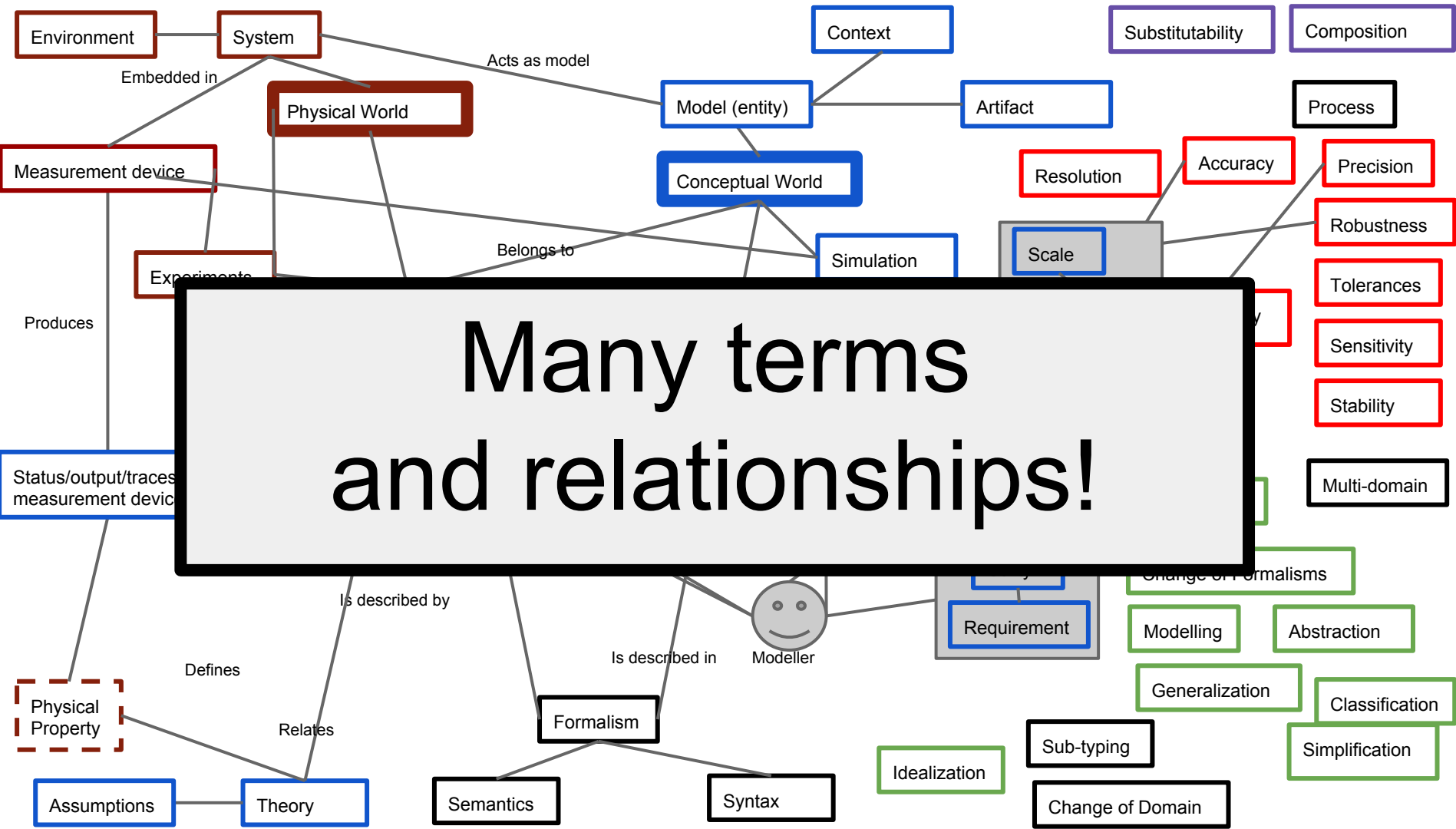


Story and Diagram for the Physical- World-to-Conceptual-World Abstraction

Process to Understand Abstraction

- Capture related terms in structured manner
- Define relationships between terms to get taxonomy
 - Literature review for taxonomy
- Create example of what actions modellers take and what it leads to
 - Discuss notions of approximation, fidelity...
- Describe tool support for this abstraction taxonomy
- Describe change to processes with improved understanding of abstraction
 - FTG - PM
 - Decision making





Physical-World-to-Conceptual-World Abstraction

- Creation of models to reflect physical world
- Example: Building a model of a resistor
- Enables simulation of properties
- Example: Can now determine behaviour in isolation or within a connected system
- Note that reasoning is based on validity of model

Physical-World-to-Conceptual-World Abstraction Story

Our intent is to create a conceptualization of a physical system, in a given context. To achieve this, we will distinguish the system under study from its environment.

We are interested in certain properties. The properties we are interested in drive our choice of what we account for in our conceptualization. What we account for is based on our understanding of the physical world (system and environment). Given the properties we want to study, we make assumptions about what to account for in our conceptualization.

We define an experiment which will make use of a measurement device in the physical world that will have an effect on the state of the measurement device. The choice of measurement device is influenced by the properties we are interested in, as well as the experiment

The state of the measurement device is then observed, conceptualized, and represented as X.

We can create a corresponding (wrt properties) experiment in the conceptual world that will produce resulting information Y in the conceptual world (such as a simulation trace). This resulting information allows us to reason about the properties.

For this conceptualization to be valid, X and Y must correspond (with some measure of correspondence)

