## Modeling for Reliabilty Engineering

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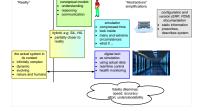
#### **Abstract**

Reliability engineering may gain from using executable models such as simulations. However, core in achieving reliability is understanding of the system, and its behavior in its actual context. This requires conceptual models complementing executable models.

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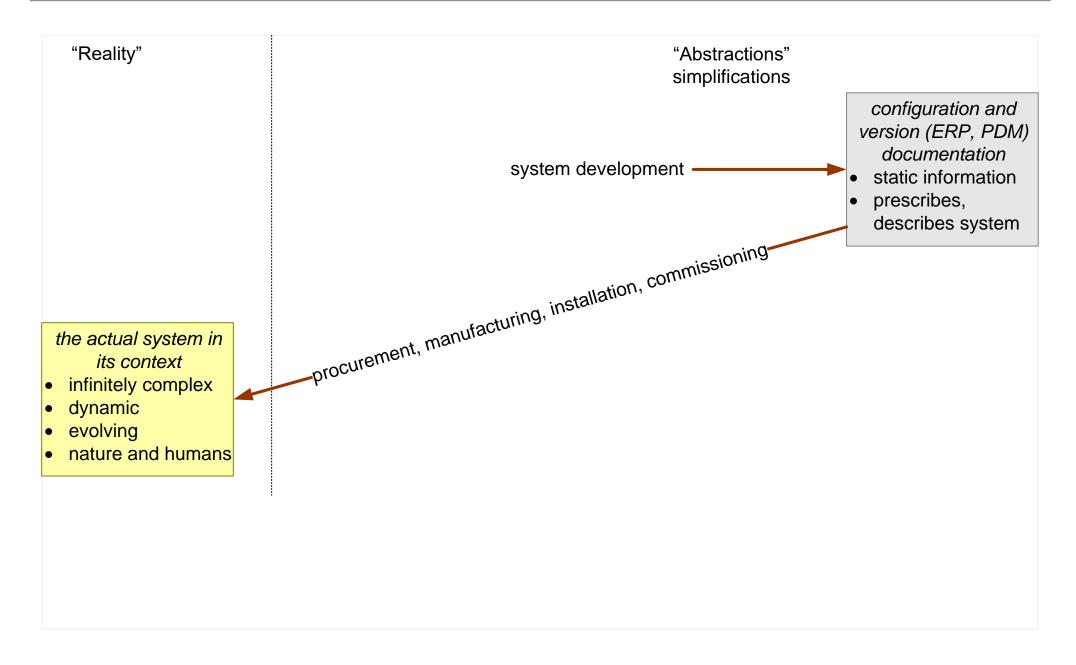
## The system

# the actual system in its context

- infinitely complex
- dynamic
- evolving
- nature and humans



## Developing, Building and Operating





## Simulating

"Reality"

## "Abstractions" simplifications

#### simulation

- compressed time
- look inside
- many and extreme circumstances
- what if ...



configuration and version (ERP, PDM) documentation

- static information
- prescribes, describes system

## the actual system in its context

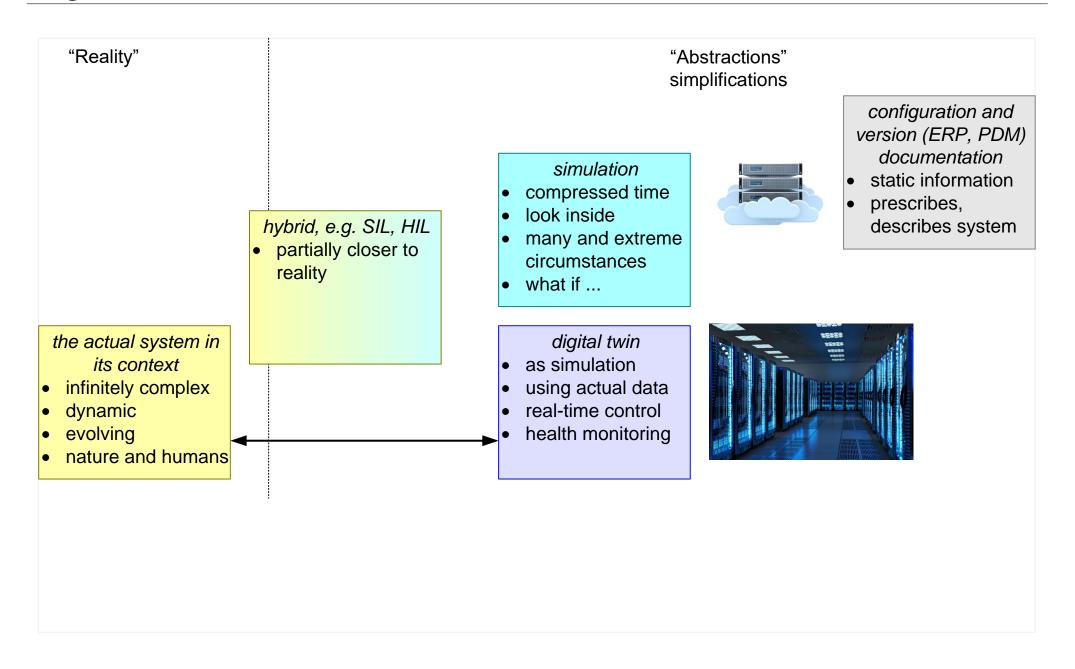
- infinitely complex
- dynamic
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- nature and humans

## Hybrid simulators

"Reality" "Abstractions" simplifications configuration and version (ERP, PDM) documentation simulation static information compressed time prescribes, look inside describes system hybrid, e.g. SIL, HIL many and extreme partially closer to circumstances reality what if ... the actual system in its context infinitely complex dynamic evolving nature and humans

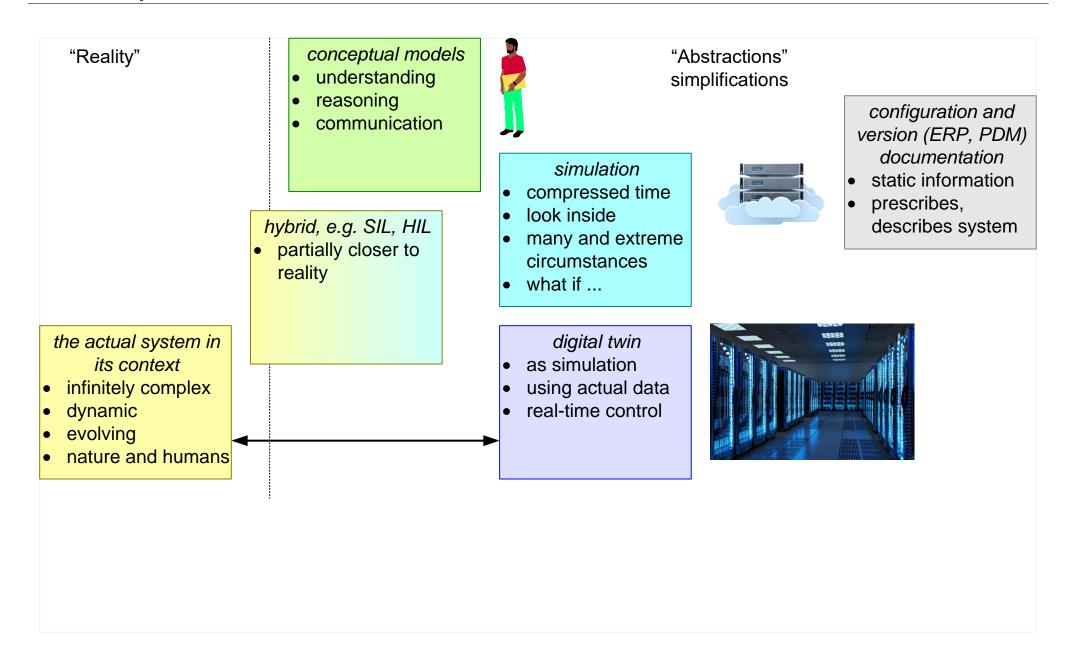


### **Digital Twin**





### Conceptual Models





## The Modeling Playing Field

