Toward a Unified Ontology for Systemists

Ontology Summit 2012

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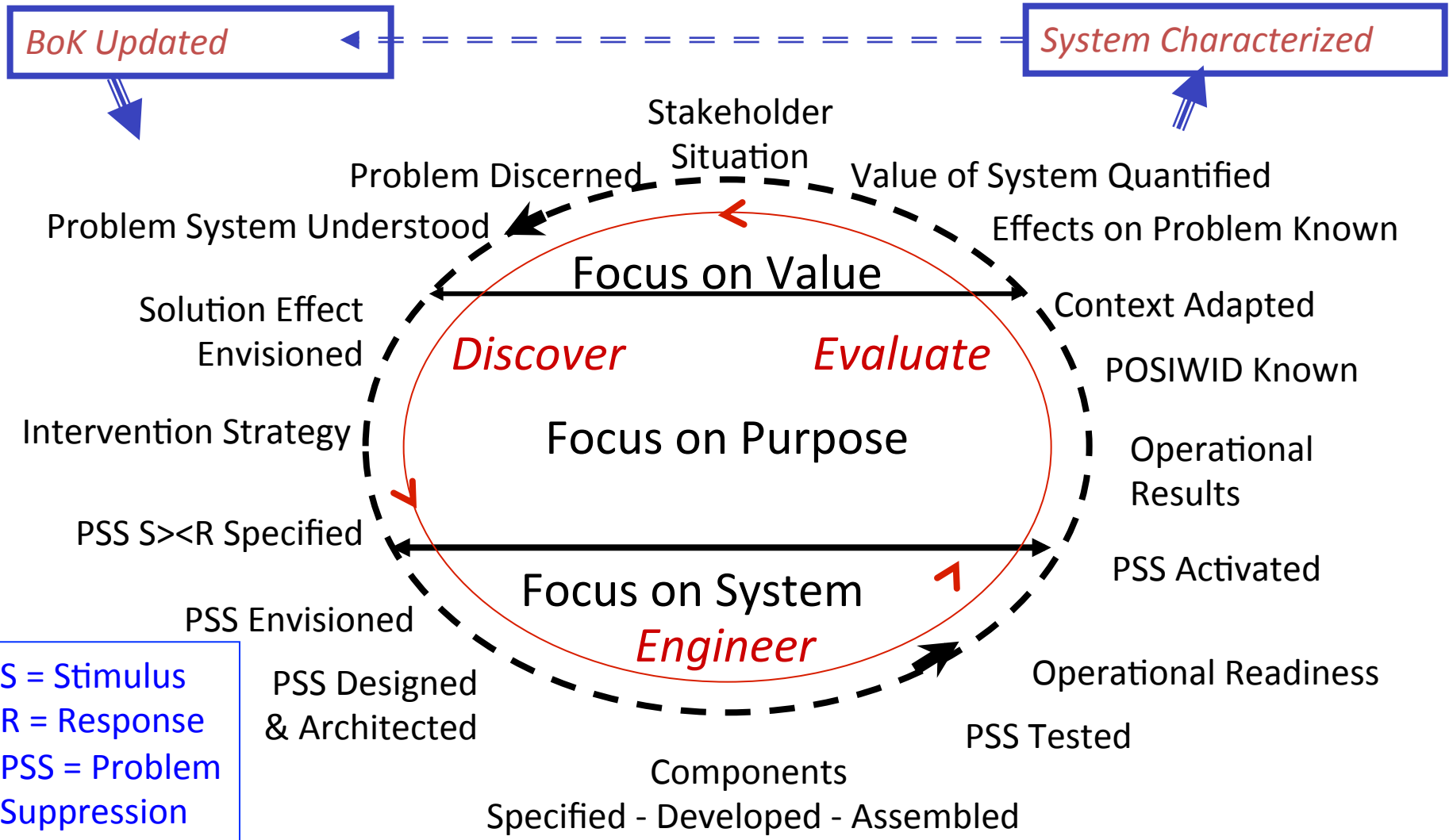
Context

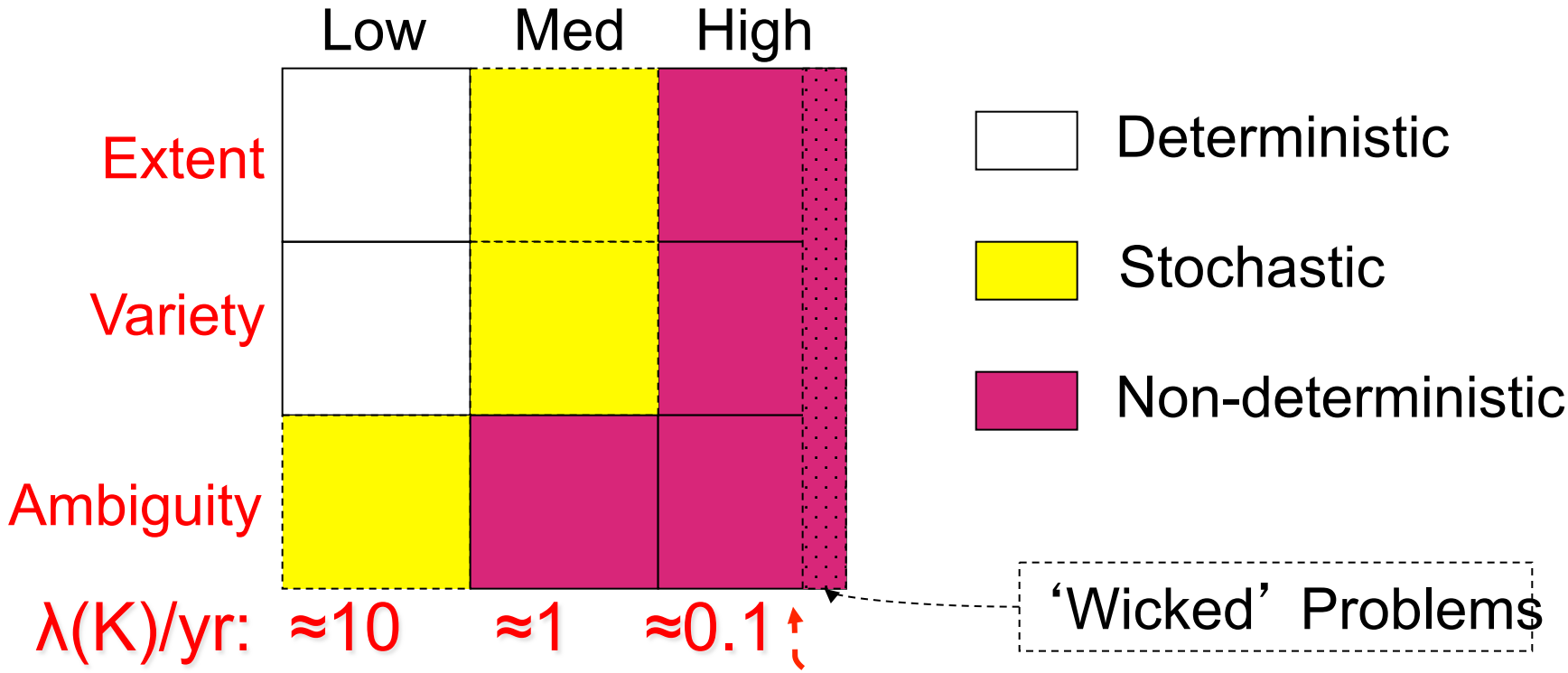
- Approximately 1KK individuals world-wide engage daily in the creation or evolution of systems. Most do not label their work 'system engineering' or view it according to any prevalent reference or standard.
- Various groups use myriad conceptualizations and terminologies. Ambiguities within local tribes often lead to misunderstandings and unintended consequences. The incidence of error increases with workgroup size, heterogeneity, and style.
- Societal demand for ever-more encompassing thereby complex systems.
- One aspect of this diversity is illustrated in http://www.youtube.com/embed/nd5WGLWNllA?rel=0

Systemist Field of Endeavor



Usage Case: Which Category of System?

Ring, J., Modeling a Systems Engineering Enterprise, 2007 Conference on SE Research, Hoboken, NJ



Extent: # of cognates
Variety: # of unique cognates, both semiotic and temporal
Ambiguity: fog, conflicting data →cognitive overload

Objective

- To enable adequate, accurate and timely Knowledge Exchange among systemists.
- Meanwhile increasing systemist productivity and innovation 10-fold by 2015 for sufficient responses to societal problems.
- Favoring unification of diverse weltanschaaungs rather than standardization.
- Encourage and facilitate relevant efforts within Ontology Summit 2012, International Council on Systems Engineering, International Society for the Systems Sciences, International Federation of Systems Research and others.

Unified Ontology Project Approach

- Variety of system classes and types.
- Human readable and associative (Concept Maps, http://cmap.ihmc.us) → Machine readable and algorithmic.
- Multiple levels of abstraction.
- Multiple stages of Big System realization.
- Multiple signs for same interpretant (-nyms)
- Serves multiple levels of proficiency (e.g., 30:1).
- Appropriate localization modularity.
- Appropriate arrangement of the multiple viewpoints and nyms.

Current Trial Modularity

- System,
- System Praxis,
- System Engineering,
- Fault Detection and Correction,
- Model and Modeling.

Expressed in CMap
Expressed in MindMap
Other expressions welcome

Panel Discussion Prompts

- Are we clear on the distinctions between ontology, language, process and ends (as in 'start with the end in mind')?
- Is the ontologists' goal (iteration stop rule) Proof of Correctness or Fit for Purpose or what?
- How to ensure the continual integrity of any resulting ontology?
- Are system model, situated ontology and algorithm semantically equivalent?
- Is it useful to see a formal ontology as an N-term algorithm of N multiple entrances?
- Relevance of Category Theory and Abstract Data Types to modularizing an ontology.