

Systems of Innovation II: The Emergence of Purpose

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Abstract. Engineers design mindful of the purpose of a system. So, engineering conceptual definitions of the concept of _system_ frequently include the idea of purpose. However, we also use _system_ to describe things not human-designed. We might refer to purpose in living systems, as in the immune system, but biologists use _function_ to avoid this. What about inanimate natural systems? Do Saturn_s rings have a purpose, or function? And what about pathologies, when systems don_t work as they _should_? Do all these _systems_ terms and concepts serve us well across these different domains, or are some force-fit? Using the language of Model-Based Systems Engineering (MBSE) and Pattern-Based Systems Engineering (PBSE), this paper describes a framework in which _system_ and _purpose_ emerge at different levels, apply uniformly, naturally, or not at all, and inform. The framework is the Systems of Innovation (SOI) Pattern. Practical benefits include insights into the nature of innovation across these domains, improving ability to perform innovative systems engineering.