Would A Rigorous Systems Pathology Add Significantly to A Understanding of Complex Systems Military Failures?

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This talk will introduce a new, systems-architecture-level of systems pathology (how systems don't work) that might contribute to SE and its core knowledge base, systems science. It proposes to emulate the best lessons of medical science in recognizing for the first time and naming specific complex systems dysfunctions, their symptoms, their diagnosis, prognosis, etiology, potential treatments and rigorous documentation. The new top-down SysPath will be contrasted with three existing strains of bottom-up systems pathology, namely (i) conventional medical pathology, (ii) cell-molecular biology, and (iii) the new Systems Biology. Several general "classes" of systems-level diseases will be named and presented as generic pathologies true across a very wide range of natural, human and social systems. Specific examples of dysfunction for each "class" of systems architecture dysfunction (SAD's) will be listed. Sources and methods for identifying and discovering new SAD's will be suggested. The results of modelling dysfunctions using NPS's own Monterey Phoenix and Odum's techniques will be presented and critiqued. The talk will include a preliminary analysis of what contributions the new SysPath might make to a much broader application of systems engineering to systems design and curation, to understanding complex systems, and to understanding complex dysfunctions. A potential integration of recognized systems failures in SE from the research of fifteen systems engineers and several systems thinkers/scientists will be included. The presentation will also cite several very specific, practical, doctoral-level projects that could be initiated to advance our understanding of how complex military systems fail.