Proposed Title: Model-Based Methodology for System of Systems Engineering with Application to the Development of the Architecture for the Unmanned Vehicle Sentry

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Abstract:
Unmanned vehicle (UV) systems are a vital part of military operations, performing dull, dirty, and dangerous tasks that are key to achieving the 21st Century Maritime Strategy. A major factor which has inhibited unmanned systems from meeting their full potential has been that the majority of architectural developments for their use have principally been technology driven, with the developer having a preconceived notion of the solution. Our work shows the development of a method that is capabilities driven, based on mission activities needed to deliver desired effects. Our model-based architecture development method provides a basis for solution neutral investigation of possible alternative physical architectures to meet overall functional System of Systems (SoS) needs based on a traceable path to the 21st Century Maritime Strategy. Key outcomes described in this paper are an architecture generation process (with focus on stakeholder needs and utility) and an example architecture suited to unmanned SoS that integrates the diverse assets involved in this complex system.