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## Traceability of Funding Lifecycle

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# NAVAL POSTGRADUATE SCHOOL

## NAVAL RESEARCH PROGRAM

MONTEREY, CALIFORNIA

### TRACEABILITY OF FUNDING LIFECYCLE

by

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Prepared for: N9I

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## FY15 MID-YEAR REPORT

**Background:** Naval Operations for Warfare Systems (OPNAV N9) wants to gain adequate visibility and traceability of maintenance and operational funds from the Program Objectives Memorandum (POM) and DOD's Sustainable Procurement Program (SPP) build through execution. The issue with the current models that are used to develop requirement funding profiles and the articulation of intended use of the funds is that these models are not maintained or respected in execution or actual expenditures, and consequently, there is no reconciliation to the original model inputs. Aggregate workload and carryover (backlog) are tracked to inform Readiness metrics, but visibility on where the dollars went is lacking. A compounding issue is that different information systems are used for the Programming phase of the Planning, Programming, Budgeting, and Execution [process] (PPBE) cycle than are used for funds execution, in addition to having multiple activities involved in execution which have differing accounting systems and varying degrees of business- or competition-sensitive data (e.g., man day rates, etc.). The problem is that this lack of traceability potentially masks inaccuracies in the models used to generate the requirement, which could lead to inability to identify cost drivers in sufficient time to address in the subsequent POM cycle, which in turn, creates an operational gap in fulfilling mission requirements. The purpose of this research is to develop measures of effectiveness (MOEs) that reflect the various stakeholder perspectives, to provide the requisite force structure, tools, and techniques to determine the level of assurance that objectives will be met. The goal of this research is to manage and to improve the fidelity of the lifecycle model and its analyses for sustainment and operations. The integration of sustainment strategy with necessary traceability and transparency will provide better assurance through full system of systems integration. The emphasis for this research is on developing a standardized framework from which repeatable, reliable MOEs can be attributed to compliance and traceability activities. Specifically, the underlying narrative of an MOE is to determine the greatest benefit from acquisitions at the execution cost. Compliance with Federal regulations and traceability to motivate compliance are the two central themes of this research.

### Process

This is the first phase of work on traceability of the funding lifecycle. The initial phase was to validate the methods the General Theory of Systems Integration within the context of MOEs. The research is planned to follow in concert with a systems approach with quantitative evaluation through loss functions that capture the range of acceptability for compliance and traceability. The meaning of less than 100% compliance and traceability with regards to efficacy of executing tasks is the central focus of this formative work. This focus provides the structure for an error analysis that will be used throughout the work effort. The basic tasks that guided this first phase are indicated below:

- Map existing evaluation and compliance requirements for lifecycle phases, e.g., acquisition, development, operations, and maintenance to the necessary

information (specific inputs) and needs of N9I to facilitate transparency and traceability for stewardship of funds, uses, and results.

- Determine the reporting and data requirements (including reliability and accuracy to perform error analyses) and then tailor the preliminary model outputs to capture the lifecycle issues for maintenance (operations).
- Estimate the impacts on managing for results based on providing guidance for better results, identifying priorities for requirements, making tradeoffs for resource allocation, and governing based on affordability. The overall aim is twofold: (1) improve disposition and use of funds and (2) articulate a systematic approach for developing measures of effectiveness that are based on an institutionalized quantitative methodology that leads to higher levels of traceability of maintenance work and funds (and operations).

**Findings and Conclusions:** The first phase of the research has centered on a common structure framework of objects and processes to capture the various stakeholder perspectives. The stakeholder perspectives will pose the various views of compliance and traceability from which the context for MOEs will be developed and codified. The foundational role of MOEs posited as the basic “currency” of compliance and traceability was vetted against the General Theory of Integration through formal representation of predicate calculus and notional views graphed as loss functions. The key determination was that the shape factor that shapes the form of the loss functions has three characteristics. First, there is a factor of “trust” (or conversely, “risk”); second, the factor of functional performance provides a convenient set of quantifiable observables that can be monitored and assessed; and third, the factor of verifying that processes are enacted (or not) can be monitored also. In essence, the work accomplished to date provides the basis for selecting a process thread that follows the flow of money and information through its lifecycle.

**Recommendations:** Following the proposed set of tasks, the next step is to build a stakeholder context diagram that shows the flow of information and money. From that flow, the basic interactions with compliance and traceability factors will be determine and described.