Accounting for Lean Implementation in Government Enterprise: Intended and Unintended Consequences

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ABSTRACT

This research explores the effects of implementing a lean production system in a government facility. The organization’s formal accounting practices delay recognition of production savings, but informally the facility promotes its lean efforts through attention-getting, off-the-books, “innovative” accounting. The authors state three propositions relating to customer effects of the lean improvements and the financial approaches. They then state four hypotheses relating to the measures’ unintended effects within the defense logistics enterprise as workload varies, and test the hypotheses employing a system dynamics simulation. Through review of qualitative data and a system dynamics simulation, the authors identify minor effects upon customer behavior and labor rates oscillation, thereby filling gaps in the literature relating to government productivity improvements, and expanding knowledge on lean-induced labor savings, work demand, and workplace effects of lean change in a government environment. They identify the greater effects of supplemental funding provided to such facilities, and begin the discussion of alternatives to current enterprise-wide government finance practices that may promote greater transformational behavior.

Keywords: Accounting for Lean Transformation, Alternatives to Working Capital Funds, Change Management, Customer Satisfaction with Lean Transformation, Intentional System Delays, Labor Rate Oscillation, Rate and Price Stabilization, System Dynamics Modeling, Systems Thinking

INTRODUCTION

In 2002, a newly assigned US Army depot commander realized his organization needed to improve cost, schedule and quality promptly and very visibly. With Base Realignment and Closure Commission (BRAC) scrutiny planned in the near future and the probability that at least one

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Army depot would close, things needed quick, dramatic improvement. Colonel William Guinn decided the road to securing the future for Letterkenny Army Depot (the depot) was through lean production methods. He needed to publicize resulting lean successes promptly, before base closure decisions occurred. By design, however, enterprise-wide accounting regulations account for productivity gains only over a multi-year period. With support from his superior officer, the commander catalyzed lean efforts and introduced an imaginative accounting practice that “short cut” the multi-year accounting delay. The consensus was that adoption of lean methods and the depot’s innovative approach to reinvesting savings managed to preserve its existence. In the end, the depot even grew by several hundred jobs as world affairs increased the demand for its services.

The multi-year accounting practice threatened to mask savings and impede utilization of the vital first fruits of the depot’s lean practices. Without capturing savings, publicizing successes and ensuring all stakeholders benefited with real dollars, the lean transformative efforts likely would not be sustainable. Yet the innovative approach and specifically its operation over time raise questions with respect to accounting for operational improvements resulting through transformative lean management.

Drawing upon two case studies that detail the depot’s “forced march” to lean practices, this paper examines the intersections of contrasting purposes promoted within the Department of Defense (DoD) enterprise and explores through a systems view and simulation potential unintended and undesired consequences of the lean effort. This research opens systems discussions of intended and unintended consequences of government accounting practices that aim for rate stabilization and of the “less employees are needed” phenomenon that lean promotion may trigger whenever demand for outputs may be stable or declining. It thereby expands theoretical knowledge relating to lean-induced labor savings, workforce acceptance of transformational change within such an enterprise. These dynamics have relevance for governmental and quasi-governmental institutions that consider lean practices or, more broadly, enterprise transformation. The military, postal service and state and local governments, and lean practitioners, may take note in these fiscally challenged times. This research also presents a framework for examining the dynamics of military depots’ competitiveness in seeking commercial contracts.

Management of Accounting System Oscillation and Accounting for Lean Efforts

Von Bertalanffy (1950; 1956) advanced systems theory to explain behavior within collections of elements that mutually influence one another. In support, Forrester (1961) developed the systems dynamics method, which permits rigorous study (based in integral calculus) of the behavior of interrelated elements in producing consequences, intended or unintended, attractive or undesired, over time. Employing this systems lens, researchers observe that unintended consequences often arise through structure that connects system elements. The system may be a firm, function or process or, at a higher level of aggregation, a multiple firm enterprise or even society (Meadows, Meadows, Randers & Behrens, 1972; Forrester, 1973).

Several principles have come to be textbook learning in system dynamics. Systems may exhibit varied patterns of behavior, including equilibrium, random behavior, locally stable damped oscillation, locally unstable limit cycle oscillation, and chaotic oscillation (Sterman, 2000). Oscillations in a system occur when its structure provides for balancing feedback across a significant time delay. “In an oscillatory system, the state of the system constantly overshoots its goal or equilibrium state, reverses, then undershoots, and so on.” (Sterman, 2000). While targeting a system’s behavior to maintain a goal value is common and often desirable, such as a thermostat conditioning air temperature, overshooting and undershooting a goal often carry
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