Management Decision Making using a Simplified Stock & Flow Diagram and System Dynamics Training with the Balanced Scorecard Framework

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ABSTRACT

Managers make resource allocation decisions in multi-period business environments, which are intended to achieve long-term strategic goals. Historically, however, principals, investors and analysts have focused on financial measures of the firm's output at the end of a period, and contract on this output. The balanced scorecard framework (BSF) was designed to better enable managerial decision making that focuses on achieving long-term performance, by communicating the long-term business strategy and providing financial and non-financial performance information to measure performance against this strategy. Recent research in accounting demonstrates beneficial effects on long-term profit performance, when using the BSF in dynamic business environments; but also finds that learning varies depending on the extent of dynamic complexity (i.e., length of time delays and presence of nonlinearities).

The current study examines the effects that providing system dynamics training for a non-business system and a simplified stock & flow diagram for the business have on managers' long-term profit performance in a dynamic decision-making environment, when BSF information is provided. Using a computer-based business simulation task, we conduct a 3 x (4) experiment (control group; system dynamics training for a non-business system; system dynamics training for a non-business system and a simplified stock & flow diagram for the business; four simulation rounds). We posit that managers presented with system dynamics training (both alone and with a stock & flow diagram) will generate greater long-term profit compared to the control condition. We further predict that managers presented with a stock & flow diagram will demonstrate greater learning across the four simulation rounds, relative to those in the control condition and the condition with system dynamics training only. We also examine the cognitive mechanisms through which training and a stock & flow diagram impact performance, by measuring both managers' mental model accuracy and mental simulation abilities.