

# MISQ Archivist

## The Dynamics of Drift in Digitized Processes

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### Abstract

This paper uses a simulation to build new theory about complexity and phase change in processes that are supported by digital technologies. We know that digitized processes can drift (change incrementally over time). We simulate this phenomenon by incrementally adding and removing edges from a network that represents the process. The simulation demonstrates that incremental change can lead to a state of self-organized criticality. As the process approaches this state, further incremental change can precipitate nonlinear bursts in process complexity and significant changes in process structure. Digital technology can be designed and used to influence the likelihood and severity of these transformative phase changes. For example, the simulation predicts that systems with adaptive programming are prone to phase changes, while systems with deterministic programming are not. We use the simulation to generate a set of theoretical propositions about the effects of digitization that will be testable in empirical research.

**Keywords:** Process complexity, complexity bursts, self-organized criticality, digitized processes