# AN EXPLORATION OF SOFT SYSTEMS METHODOLOGY FOR ENHANCED CONTAINER TERMINAL PRODUCTIVITY

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## Abstract

A study by Ha et al. (2019) investigating port performance asserted that research on the logistics of container terminal operations is necessary for improved port competitiveness. Botes and Buck (2018) and Toukan and Chan (2018) state that the complexity of seaports is compounded by the involvement of various stakeholders within the transportation value chain. Dalkin et al. (2018) proposed soft systems methodology (SSM) as an approach with the capabilities of making a complex situation unambiguous, with improved transparency, precision, reliability and legitimacy of theory. Checkland and Poulter (2020) further stated that SSM is capable of addressing a variety of difficult and messy circumstances. The ranking of South African ports according to the World Bank (2022) is low ranging between 312 and 365 being the lowest scores on this measure. Due to the latest advances impacting the shipping liner market, it is critical for productivity advances, enhanced efficiencies and operational performance to be achieved at container terminals. Port efficiency is an enabler of trade competitiveness and provides the capacity for ports to contend in difficult and changing market structures (United Nations Conference on Trade And Development [UNCTAD], 2017). The paper investigated how productivity can be enhanced in a container terminal through a systems

approach, using SSM. A qualitative case study research methodology using semi-structured interviews and a focus group interview in the form of SSM workshop was conducted. Senior operations managers from a variety of port stakeholders involved with marine, terminal and hinterland operations were targeted. The qualitative analysis of this study followed a deductive content analysis approach and SSM framework. The SSM approach facilitated the development of rich pictures, root definitions and conceptual models for container terminal productivity. The SSM facilitated a process of constructing a framework for improved terminal operations by identifying system structure, transformation process, main players and customers, including their interactions within the system, using a CATWOE (customer, actor, transformation, worldview, owner, and environment) analysis. The conceptual model enabled the identification of required activities needed to improve marine, terminal and hinterland activities within the port and terminal-owned system. The original contribution of this research is in planting the seeds of a systems approach using SSM for the enhancement of the performance of container terminal operations. The study contributes to new knowledge by exploring SSM considering all three dimensions that impact port efficiencies. The study has made a contribution to the field of systems thinking through the development of the conceptual model for enhanced terminal operations within the port system. A holistic conceptual model for container terminal productivity was produced which covers all dimensions including marine, terminal and hinterland perspectives. This investigation has contributed to the field of port management through the provision of enhancement strategies for improved performance of container terminals. The research also attempted to close a gap by developing knowledge and contributing to the theory of SSM and container terminal productivity.

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