

## Lean Warehouse Management to Improve the Army Supply Chain Efficiency

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Lean management has been adopted in diverse environments since its introduction to the Toyota Production System (TPS). The model is focused on operational efficiency, pursuing the principles of waste reduction and value addition. While the system was primarily designed for production units, managers have expanded its scope to fit in other operational spheres. Business organizations are the primary users of lean management principles to enhance the efficiency of their warehousing, lower costs, and improve customers' overall experience. Recent trends have seen private management concepts being applied to public management, with the Army a particular beneficiary. However, the Army's supply chain is designed to promote responsiveness, given its operational needs. Nevertheless, efficiency cannot be ignored, especially in routine operations and sustainment, where needs are relatively stable. Efficiency must be ensured by managing the overall cost of operations and their resulting value to users. Warehousing is an integral aspect of supply chain management, serving as an intermediary between production and consumption. Hence, the Army's supply chain can be made more efficient by implementing lean warehouse management to minimize waste and improve value.

Operational sustainment and routine activities in the Army require consistent supply chain support. Daily consumptions must be provided for through the supply of relevant goods and services. These might include but are not limited to food provisions, artillery, training gear, service and repairs, transportation, and medical supplies, among others. These elements' timely availability is a prerequisite to the smooth flow of operations across the base (Lora, 2020). This requires an integrated approach from the purchasing, warehousing, and distribution functions to achieve effectiveness. Markedly, warehousing occupies a more central position in the supply chain, facilitating the receiving, inspecting, and storing or procured commodities while serving

as a distribution center (Faber et al., 2013). In this regard, its management is crucial to the efficiency and effectiveness of the supply chain.

Lean management is an ideal approach to improve the management of army warehousing function. It is designed to achieve operational efficiency, premised on the principles of waste reduction and value addition. The former seeks to identify and eliminate waste sources in the form of unnecessary materials and processes (Anđelković et al., 2016). Markedly, there are many types of waste in warehousing. The Army prioritizes responsiveness in warehousing and supply chain management. The goal is necessitated by the need to address emerging threats, shipping from one location to another in the least time possible. Consequently, storage is defined by capacity, stocking in abundance to avoid the inconveniences of stock-outs. However, these concerns are not relevant in routine operations, where demand is stable, and surges can be predicted. Hence, overstocking, unnecessary inventory, and increased motion to access materials are all types of waste.

On the other hand, lean management's value-addition element deals with eradicating non-value adding processes in warehousing. Notably, high stock levels in army warehouses increase aspects like movement, handling, tracking, and transportation. In most cases, these processes do not improve the quality of the final product or service. Hence, lean thinking entails detecting these instances and redesigning operations to bypass them (Abushaikha et al., 2018). Resultant benefits include reduced costs, higher quality, and increased speed of operations. Markedly, lean management is not occasional but rather a continuous process aimed at achieving sustainable operational efficiency.

A primary lean management tool that can improve supply chain efficiency in the Army is demand management. As discussed, the primary role of warehousing in the supply chain is

storage. This can be the permanent housing of functional materials and the temporary storage of materials in transit. In this view, the warehousing function must determine the standard requirements to design appropriate inventory levels for reordering and safety (Abushaikh et al., 2018). Lean management seeks to minimize or eliminate waste, and inventory is a primary source of waste. Hence, demand management entails using established consumption trends to forecast future demands to reduce excess stock purchases (Anđelković et al., 2016). Modern technologies are useful in demand management, incorporating data on purchases and consumption to produce reliable baseline inventory levels for each commodity.

In this regard, digitization is another aspect of lean management that can help improve the warehousing function. The military has been notoriously traditional, relying on human input across the supply chain function (Army Logistics, 2017). The sector's insistence on the chain of command prioritizes human interaction in management, following a top-down approach (Lora, 2020). However, the highlighted demand management software operates on such technologies as computers, radio frequency identification devices, scanners, and material control software. Hence, the Army must invest in digital platforms to facilitate cutting-edge technologies in warehousing management. Notably, digitization can substitute human labor, which is prone to waste, errors, and slowness.

Lean warehouse management also entails redesigning layouts to meet the various functions of receiving, inspection, placing, and retrieving with minimal cost and time. Army warehouses, especially those serving battalions, are usually massive. While the arrangement of items is organized, their layouts increase the time taken to inspect incoming consignments, place them in appropriate categories, arrange them according to the first-in-first-out system, count inventory, and retrieve materials required for operation (Abushaikh et al., 2018). These

activities also entail substantial over-handling, increasing labor costs. Lean seeks to minimize the time consumed during these operations by redesigning warehouse layouts to avoid reverse movement and repeat handling (Abushaikha et al., 2018). For instance, the Army can achieve efficiency by introducing multiple exit points in each storage unit. While items would be received and entered through the main door, each category must have a dedicated storage unit with an independent outlet. The model would also eliminate unnecessary movement of goods and waiting time, supporting the smooth implementation of FIFO.

Continuous improvement is a principal pillar of lean management. In an Army warehouse, the concept would entail setting periodic waste reduction targets and measuring performance (Anđelković et al., 2016). For instance, the warehouse manager can identify such wastes as obsolescence, excess materials, and erroneous orders and establish achievable reduction goals. Equally, the approach can be applied to unnecessary movement, waiting time, and unwarranted handling to achieve the least acceptable levels. Each goal should be reviewed at the end of identified periods to assess progress and undertake necessary corrective measures (Anđelković et al., 2016). These strategies are viable in the army warehousing during sustainment and routine operations.

Lean management can be used successfully in the army warehouse management to improve supply chain efficiency. The concept targets to minimize waste and eradicate non-value-adding processing across all warehousing functions. Sustainment and routine operations in the Army have relatively stable requirements, allowing for the successful implementation of lean management in warehousing. Relevant lean management tools, in this context, are continuous improvement, demand management, and layout redesigning. Digitization is identified as a crucial investment in this course because it enhances control of warehouse operations.

## References

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