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FMCG Upgrade - High-tech Modernization of Flexible Supply Chains



By George Karlaftis*

The Fast-Moving Consumer Goods (FMCG) sector faces critical challenges due to global circumstances (pandemic, wars, climate crisis, etc.) which cause problems in storage nodes and transportation channels, affecting the smooth flow of operations, as well as inevitable delays in raw material shortages, resulting in multiple issues requiring immediate resolution. These factors necessitate adaptation and reinforcement interventions to achieve reliable supply chains and flexible Logistics systems by combining IT solutions using mature technologies that operate reliably along with cutting-edge technologies in their path toward sustainability and continued development. The main goal is to achieve Agile Driven Supply Chains that enable operational improvements, cost control, and immediate adaptation capabilities to constantly changing market conditions.

Alternative Holistic Approaches

At the business ecosystem level, the proposed solutions initially concern the ability to address a geographically and functionally expanded and diverse range of Suppliers, aiming to balance any shortages in quantities or delivery deadlines, as well as inflated costs by redirecting efforts and automating negotiations and bureaucracy. This way, smooth supply and acceptable cost are ensured in the inflow of products to Logistics facilities.

In the field of internal operations, the main challenges relate to the use of storage and retrieval technologies, secondary production or service provision, such as customized packaging, and their effective routing through the transportation channel to Customers. All of the above require the modern implementation of systems and practices based on digital readiness to exploit automation, secure quality control, and low-cost execution of automated tasks and management.

Beyond the above, it is important to have dynamic planning and forecasting of new means or adoption of cutting-edge technologies, e.g., IoT, use in omni-channel environment, etc., when they have proven their maturity by providing operational improvements and competitive advantage. This also strengthens relationships with the customer base, personalized and improved offerings, value-added services, a pricing policy that leaves profit margins, as well as faster delivery times more favorable than the competition.

Risk Management strategies need to have more depth with the implementation of models for evaluating and reducing risk due to imbalances and discontinuities in the supply chain, in how transportation conditions are shaped, in which cases natural disasters, wars, and macroeconomic discontinuities affect the whole or individual parameters, such as cost or delays of activities throughout the FMCG lifecycle and especially in the supply chain. These models require thorough, reliable, and always up-to-date Data Analysis with parallel implementation of prediction models leading to Data Analytics & Data Science solutions for operational readiness and enhancement of decision-making, while recently this is also done with the auxiliary adoption and support from Artificial Intelligence algorithms. Consequently, inventory can be controlled and maintained at optimal levels, while flows in Logistics facilities (inflows and outflows) have the potential to have smooth fluctuations at both ends (Suppliers, Customers) with speed and consistency in deliveries if all are successfully implemented.

Every improvement related to the above holistic system achieves and maintains the prerequisites for sustainability and development; however, it intensifies the efforts that lead Supply Chains towards further consideration of agile practices (Agile Supply Chain). The basic structural and functional components of the Agile Supply Chain with the Operational improvements it brings at a business level constitute a critical requirement which I will briefly discuss below.

A fundamental element that is considered classic in this sector is the ability to operate platforms that allow seamless communication and collaboration between suppliers and manufacturers. Improved collaboration with suppliers ensures better visibility in the supply chain near the initial supply end and market needs, allowing faster response to changes in supply and demand.

Another fundamental element is employee training to increase their readiness in the new digital or hybrid work environment. This leads to continuous investment in training programs for familiarization and in-depth understanding of innovation use, digital improvement, adequacy control, and ergonomics revision in the new work landscape through acquiring proven experience in using high-tech tools and platforms to maximize advantages in the supply chain.

Additionally, the following characteristics are also provided, such as cloud-based supply chain platforms offering scalable and flexible solutions for managing and optimizing processes, the use of Internet of Things (IoT) sensors and Radio-Frequency Identification (RFID) tags for real-time tracking and control of goods movement, collaborative robotic systems (Cobots) designed to operate alongside humans, with the ability to be quickly reprogrammed to adapt to changing conditions, facilitating collaboration in manufacturing, standardized activities, and support throughout the supply chain.

Digital twins, which are virtual copies of physical objects, resources, products, and general assets, as well as processes or systems that allow simulation models to 'run' with flexibility, projecting alternative scenarios for early diagnosis of product or process characteristics and improvements in their supply chain processes. The power of Predictive Analytics, in other words, advanced technologies for analyzing multiform data and using artificial intelligence (AI) algorithms for insightful information, prognoses, predictions, and proactive risk management.

Blockchain technology - when uniformly implemented - ensures transparency, traceability, and security in the supply chain by creating a decentralized and immutable Distributed General Ledger for tracking the movement of goods, verifying product authenticity, and ensuring transaction integrity, which are recorded and stored between collaborating corporate entities in a way that cannot be disputed and under a regime of absolute control.

Further Utilization of three-dimensional (3D) printing and the ability to implement production processes locally, where possible, to accelerate product delivery without the need for transportation, thus without dependence on central production hubs.

The last, but neuralgically central point for consideration, is the use of advanced supply chain network optimization algorithms based on real-time data analysis, allowing organizations to dynamically restructure their supply chain network to adapt it dynamically to changing conditions.

In conclusion, the integration of high-tech solutions and specialized action teams in an agile supply chain, combined with necessary operational improvements, enhances an organization's ability to navigate and overcome all types of crises in a sustainable way, contributing to increased flexibility, holistic visibility from raw materials to product delivery, as well as the degree of responsiveness and continuity, strengthening the operational effectiveness of the supply chain and corporate resilience itself.

**Founder/Entrepreneur*