ISB CTO

Week 14: Digital Supply Chains

Video 1: The Bullwhip Effect

- Inventory management is a critical aspect of supply chain optimisation.
- The bullwhip effect is a significant development in supply chain analytics, which emphasises the importance of supply chain coordination.
- Supply chain partners often struggle to coordinate due to strategic reasons, lack of capabilities and information sharing concerns.
- The bullwhip effect causes increased cost and reduced responsiveness in the supply chain.
- Organisations should collect data on the bullwhip effect and focus on improving coordination to mitigate its impact.
- Achieving coordination requires top management commitment, resource allocation and real-time data sharing.
- Benefits should be distributed equitably, not equally, to promote fair sharing of cost reductions.

Video 2: Supply Chain Coordination

- Supply chain coordination and data sharing are essential to reduce the bullwhip effect and enhance efficiency.
- Companies should proactively use analytics to remove the bullwhip effect and improve their supply chains.
- Lead time reduction and 3D printing are effective strategies to minimise the bullwhip effect and lower supply chain costs.
- Combining supply chain and manufacturing costs is crucial for optimising supply chain efficiency.

Video 3: Postponement Strategy

- Supply chain optimisation involves minimising costs and collaborating with partners to reduce the total supply chain cost.
- Postponement is a valuable method for streamlining supply chain processes by creating commonality and delaying the final product assembly.
- Commonality and postponement are applicable not only in traditional supply chains but also in service supply chains, where they can be even more critical.
- The concept of store-in-store involves retailers renting space to suppliers to improve inventory management and reduce the bullwhip effect.
- Data, coordination, and understanding of the bullwhip effect are essential for implementing these strategies, and analytics plays a crucial role in achieving these objectives.

Video 4: Supply Chain Optimisation: Example

- Operating room processes have high variability, and it is not feasible to reduce the surgery time or process variability.
- A centralised control desk for patient allocation and an app for real-time updates on surgery progress were implemented to address the issue.
- Centralised decision-making and real-time updates resulted in a three-minute reduction in average holding room length of stay, while the app achieved a 10-minute reduction.
- These improvements led to reduced blood loss and increased operating efficiency.
- Supply chain analysis concepts can be applied beyond manufacturing, including in service supply chains where variability is high, and data is abundant.

Video 5: Optimisation of Facilities

- Facilities play a crucial role in supply chain optimisation, involving decisions about warehouse locations and the service level offered to consumers.
- E-commerce companies, in particular, are focused on achieving faster delivery times, ranging from two-day to 10-minute delivery.
- The relationship between the number of facilities and response time follows an initial decrease, but the advantage diminishes exponentially as more facilities are added.
- Facility-related costs, such as inventory, transportation, and labour costs, vary based on the number of facilities, with inventory and transportation costs showing different trends.
- To optimise facility locations, it is essential to consider the total cost and the desired service level provided to customers.
- Companies should strike a balance between cost and service level based on customer preferences and competitive factors.

Video 6: The Future of Supply Chain and Value Chain

- Blockchain technology offers significant potential for addressing supply chain challenges, enhancing transparency, reducing fraud and generating valuable data.
- Companies like Walmart have mandated the implementation of blockchain in their supply chains to improve traceability and reduce the risks of contamination.
- Blockchain adoption extends to various sectors, including pharmacy supply chains, payments, meat traceability and cold chain monitoring.
- By leveraging blockchain, companies can monitor, and trigger actions based on temperature and humidity readings for critical drugs.
- The value of supply chain analytics lies in eliminating demand and supply mismatches, enhancing efficiency, and providing more tailored services to customers.
- Companies like Amazon and Netflix have succeeded by using data to identify demand-supply gaps and cater to customer preferences, driving the creation of web series and content based on data.
- Supply chain analytics can be used to address bottlenecks in various industries and bridge demand-supply gaps.
- Privacy and ethical considerations are crucial when collecting and analysing data in supply chain analytics.
- Emerging technologies, including drones, autonomous vehicles and eye-tracking data, are transforming supply chain analytics and offering new opportunities for optimisation.
- Maintaining a holistic view and considering the broader societal impact of data collection, analysis and mindset is essential for driving positive change.