

Disruption & Supply Chain Coping

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SUPPLY CHAIN PLANNING DECIDES ON DIRECTING COMMODITY FLOWS

in the SC to efficiently balance supply and demand at the aggregate level in the medium-term planning horizon subject to a given facility location structure, capacities, customer demand, and order quantities.

With greater role of IoT, new normal and customer awareness SC disruptions occurred in greater frequency and intensity, and thus with greater consequences. Such disruptive risks represent a new challenge for SC managers who face the ripple effect subject to structural disruptions in the SC. The ripple effect describes the disruption propagation, the impact of a disruption on SC performance and the disruption-based scope of changes in the SC structures.

Three basic types of disruptive risks that should be considered by SC managers: production, supply and, transportation disruptions. Recent studies show that efficiency paradigms of lean processes, single sourcing, etc. have failed in disruption situations. Disruptions in a global SC, especially in its supply base, does immediately affect the entire SC. With the increased specialization and geographical concentration of manufacturing, disruptions in one or several nodes affect almost all the nodes and links in the SC. Different recovery strategies could be used in reducing disruptive risk as follows:

- **Back-up suppliers.**
- **Back-up depots and transportation channels/modes.**
- **Inventory and capacity buffers.**
- **Facility fortification.**
- **Capacity expansion.**

Reaction to disruptive events can be performed depending on the severity of disruptions:

- **Basic adaptation.**
- **Structure adaptation.**

Basic adaptation represents the simplest case where stabilization and recovery are possible through tuning of some critical parameters like lead-time or inventory. Structure adaptation considers back-up supplier on contingency transportation plans. SC managers has to concentrate mainly on mitigation strategies and identification of the impact of disruption on financial and operational performance regardless of what caused the disruption.

Investment in SC protection can help to avoid many problems with disruptive events. However, it is impossible to avoid disruption completely. Focus should be directed to the recovery policies regardless of what caused the disruption. Therefore, adaptation is needed to change SC plans in order to achieve the desired output performance.