Time will tell:
The impact of product life cycle demand and supply lead times on customer order information sharing in supply chains

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Abstract

Sharing of customer order information with suppliers is often cited as adequate way of improving performance in decentralised supply chains, but its effectiveness remains problematic in practice as well as in theory. In industry practice, enthusiastic success stories conflict with accounts of scepticism and failure. In academic theory, there is a great deal of recent interest in this topic, but the benefits of information sharing that are found appear to be relatively limited and located mainly with the supplier, not the buyer.

This paper investigates if this mixed picture is perhaps due to a number of implicit assumptions in both business and academia. Perhaps customer order information sharing is highly beneficial in some settings, and not at all in others. If that is the case, then what are the factors that will tell if information sharing is worthwhile?

We introduce a generic system dynamics simulation model of a supplier-buyer supply chain to investigate what happens if these characteristics are changed. One of the key balancing loops in the model defines the relationship between delivery delays and lost (future) sales: when customer orders rise, inventories drop and delivery delays increase, resulting in a decline of future customer orders, which in turn decreases the order backlog and improves delivery delays. Because of this loop, we are able to measure whether customer order information sharing results in improving sales results and/or inventory levels for both the supplier and the buyer in the chain.

The demand pattern we simulate is that of a Product Life Cycle, describing the gradually introduction and phase-out of a new product during the modeled time interval, according to a logistic function.

For this demand pattern we simulate the effect of customer order information sharing in different scenarios based on a) the production lead-*time* of both the supplier (short/long) and the buyer (short/long), and b) the production response time of both the supplier (short/long) and the buyer (short/long).