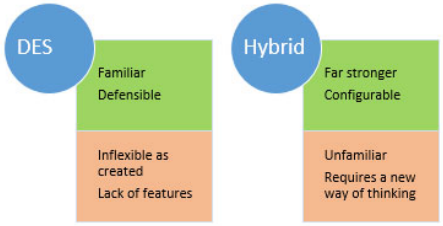
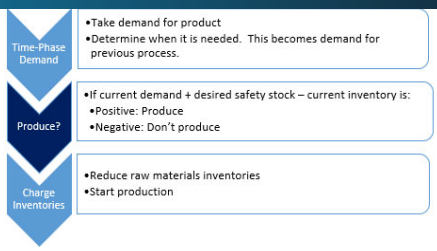
Pharmaceutical Supply Chain Simula

Supply Chains Healthcare

Problem

The Sterling Simulation consulting company was hired by a pharmaceutical giant to create a supply chain model. The client was introducing one of their





The client had previously built a discrete-event supply chain model in AnyLogic. However, it lacked flexibility because it could not be easily adjusted to new conditions. Sterling Simulation engineers offered a solution: build a hybrid model, which would combine agent-based supply chain components with discrete-event processes. The new model was easier to configure and use, as it allowed for run-time construction of both the supply chain itself and the processes inside each component.

The model's core included agents that represented:

- Production facilities, containing one or more processes and shared resources.
- Production lines, which incorporated production and shipping logic.
- Production process steps.
- Types of batches with preassigned sizes.
- Shipment requests for product batches.

After the initial processing, the model used MRP scheduling to determine production needs. The model was impacted by demand variability as it created surpluses or shortfalls in safety stocks. Using these results, the developers reached the client's prime goals of satisfying demand and reducing financial and operational risks.

To determine whether to produce, the model

To validate the model, the client could not use the existing supply chain because it did not include the new markets. By leveraging the model's configurability, they applied it to a different supply chain which had available data, and showed that the model's logic worked properly.

Outcome

The model showcased how lead time reduction techniques could reduce inventory in a pharmaceutical supply chain. The model's hybrid nature allowed analysts to combine supply chain components, including production facilities and lines, with features of production and shipment flows, making the model highly flexible. It was largely possible due to AnyLogic multimethod modeling abilities, which combined agent-based and discrete event approaches. Thanks to AnyLogic, model building time was also drastically reduced.

To include more dynamics into the supply chain model, and conduct in-depth experiments with it, the company and the contractor want to shift the AnyLogic model to anyLogistix, a specialized software for supply chain design and analytics. This approach could bring more insights to the company's executives, including the case of supply chain expansion.

Project presentation by Scott Hebert, Vice President of Sterling Simulations:

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