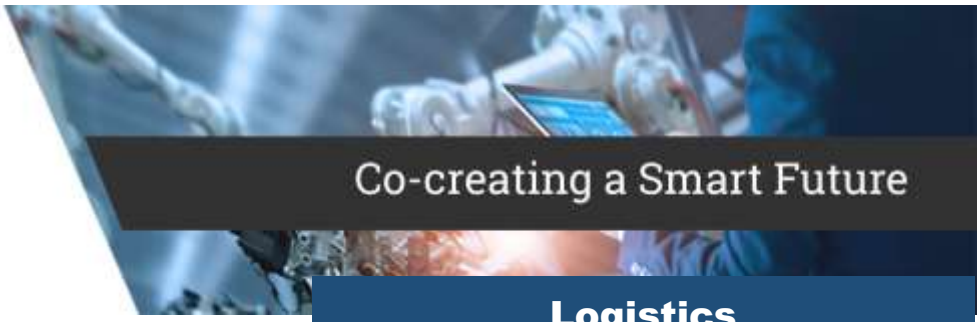
PDA
Process Design & Automation



Logistics

Simulation Helps to Determine Stock Levels and Stock Space

The Company

As the biggest dairy company in South Africa, Clover's core business is the processing, marketing, and selling, and distribution of dairy, dairy-related, and other food products. The company's product range is marketed under national brand names and includes short and long-life products.

The Challenges

Clover distributes over 1000 product lines that are grouped into product categories. Clover's distribution is done by a fleet of refrigerated trucks. Its central distribution center is in Johannesburg from where products are transported to regional Distribution Centers (DCs). Clover management wanted to determine if, by following a certain delivery policy, enough products could be delivered to DCs at Polokwane in the Limpopo Province and Kimberley in the Northern Cape in time to satisfy demand. They also wanted to determine the minimum stock levels at the two DCs to ensure minimum sales losses.

The constraints were:

- Short life and fresh products must be delivered within a certain time window.
- Trucks must be full when going to Polokwane and Kimberley.
- Orders are fixed daily.
- Fresh dairy products have priority over other products.

The Deliverables

Arena® simulation software was used to analyze the viability of Clover's new distribution concept and to establish the minimum stock levels for different product categories at the DCs. The number of docking bays at all DCs was considered as a possible constraint. To determine whether distribution would be successful, the model measured such outputs as maximum stock at the DCs that indicated what storage space would be required; sales lost at each DC per product category; truck load utilization; and time products spent in the system.

The Results

The minimum stock levels of the different product categories at the Polokwane and Kimberley DCs were first determined by assuming infinite stock levels at the Central DC in Johannesburg. By considering real life constraints (e.g., actual sales figures), the Arena model determined minimum stock levels, avoiding sales losses at the two DCs and establishing the stock levels at the Central DC. Additionally, the Polokwane DC was planning to expand its facility, so the model's calculation of available storage space was especially valuable. More importantly, simulation assessed the viability of a new distribution concept before a costly implementation.

For more information, contact us:

- **marketing@processdesign.co.za**
- **+27 (12) 547-6524**