ITE consult

MULTI-PLANTS DETAIL SCHEDULER OPTIMIZER

Introduction

ALPHIA a custom contract manufacturer of super premium **pet food**, now merged with **American Nutrition**, is one of the largest independent manufacturers of super premium pet food in the US, producing a total of one billion pounds of pet food annually.
As a contract manufacturer, its production is made to order, satisfying a continuous evolving demand profile.
They produce more than 1500 different SKU's. Their goal is to accomplish delivery date, optimizing the use of their capacities, and avoiding intermediate inventory.

Objective

Build a detail scheduler tool, for a weekly run that optimizes the production capacities, minimizing work in progress inventory, using WIPS only for cross production between plants.

Goal

Deliver an optimized extrusion and packaging schedule according to capacities scenarios defined for each process step, without generating WIPs and accomplishing delivery dates.
This optimizer works as a trade-off solution, between the optimization of the different steps.

Solution

We use Anylogic, as our simulation software tool, using fluid libraries as production is a continous flow (SM), combined with a multiobjective optimizer (MOO).

The challenge was to find the best combination of extrusion sequence, with packing sequence, having in mind that we need to pack blends (five different components), avoiding storing the intermediate product in BINS for long periods and less of all avoiding the need of WIPS, that generates intermediate inventory. They were needing to store a 30% of their monthly demand in WIPs with their previous detail schedulling methodoly

The optimizer has been developed with the use of a combination of heuristcs algorithms and the use of optkest, after running the digital twin scenarios.

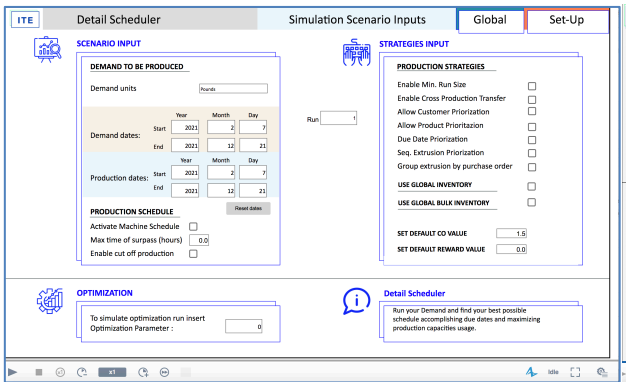
Input File:

A. Daily demand
B. BOM
C. Inventory.
D. Updating Inventory Frequency

Output File:

The output of this simulation/optimization is an optimized detail schedule for each of the process phases. As a result, we have been able to maximize the tons produced and avoid intermediate inventory, delivering within 60 days of sales order, accomplishing deliver time, with big savings for the company.
We have increased in 15 % the production efficiency.

At present, the company is using the model, for their weekly detail scheduling.

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Packaging Process
Plant
Logic
Name BEMIS1PC
Finished Good 50006017
Rate [Pound/Hour] 27,238.679
Bags packed 1,866
Connected to bin E 30000579 100%
Go to Bin
Go back toPC30
blendingTank
fluidDispose1
cleaner
cleanerDispose
50006017
Metrics
Amount of Pounds packed
Pack rate
Hours of packing versus time
Percentage of time in use
Pounds produced 211,045.8
mean packing rate 7,277.44
total amount of time 26.68
total time in use 16.38
61.62
Virtual
Paused