ITE consult

DIGITAL TWIN FOR MULTI-PLANTS / MULTI-COUNTRIES DIAPERS PRODUCTION

Problem

CMPC, a Chilean pulp and paper company, one of the biggest worldwide according Forbes Global 2000 2018 ranking, produces diapers in 8 different Latin-American countries. Each country satisfies its own market with very little exchange between subsidiaries.

Their SKU's portfolio is as follows: 3 categories of diapers, 5 – 8 sizes and different presentations for each country, what takes us to to more than 200 different SKU's.

Their production is planned on 12 month's forecast bases, according to each country's demand.

The variables our digital twin should include are:

- Fixed Assets
- Inventory Levels
- Production costs
- Logistic Costs
- Service Level

The constrains are capacities, logistics and resources efficiencies, different for each country.

Their **challenge** is to reformulate their strategic production plan

Goals in mind:

The goal was to deliver an optimized Schema of SKU- Plant assignment, optimizing the return on assets

They needed a tool that allow them to explore the possibility of producing diapers lines not according to each country's demand but according to ROA, in different macroeconomic scenarios as well.

Project Goals

- Simulate and analyze different production scenarios, in the different countries, with different service levels, and different production rates, for the same SKU's.
- Represent bottlenecks in production and logistics for possible future lines (the ones that did not have an actual demand in that country) and evaluate scenarios of maximum capacities for each diapers line in each country.
- Find the optimized plan that maximize ROA

SOLUTION

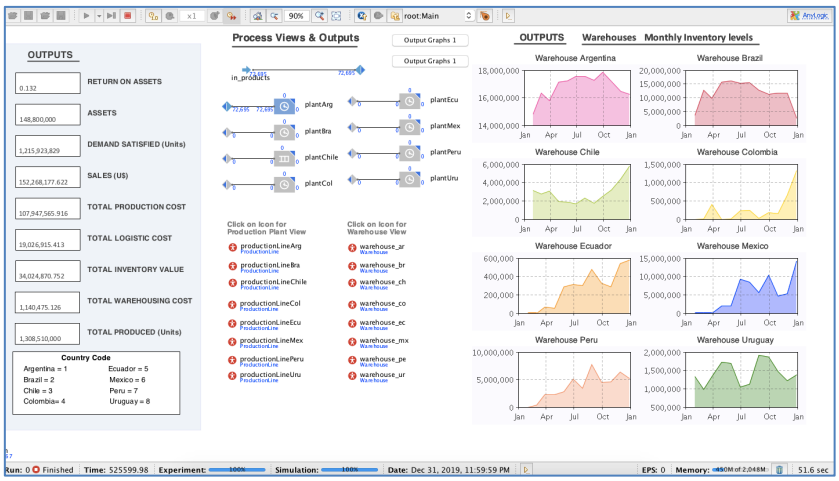
Based on Anylogic, with a discrete event approach, we have designed and developed a digital twin connected to CMPC flat files, building an internal Database.

We used multiple parameters experiment to evaluate scenarios and LP optimization methodology to

maximize ROA with simulation outputs.

The input data includes:

- Demand per SKU
- Inventory levels per SKU
- Capacities
- Overall Efficiency
- Production Costs
- Logistics Costs
- Service levels



The system considers the following:

- SKU's mapping lines and sublines
- Lines and Sublines capacities
- Lines and packaging restrictions
- Warehouse limitations
- Production times
- Production schedules

OUTCOME

The Production Planning model exports to excel the Optimized production plan suggested, after running each of the experiments. The data is open by SKU, and it shows the monthly plan on an annual basis.

It delivers where to produce and when, according to a cost optimization.