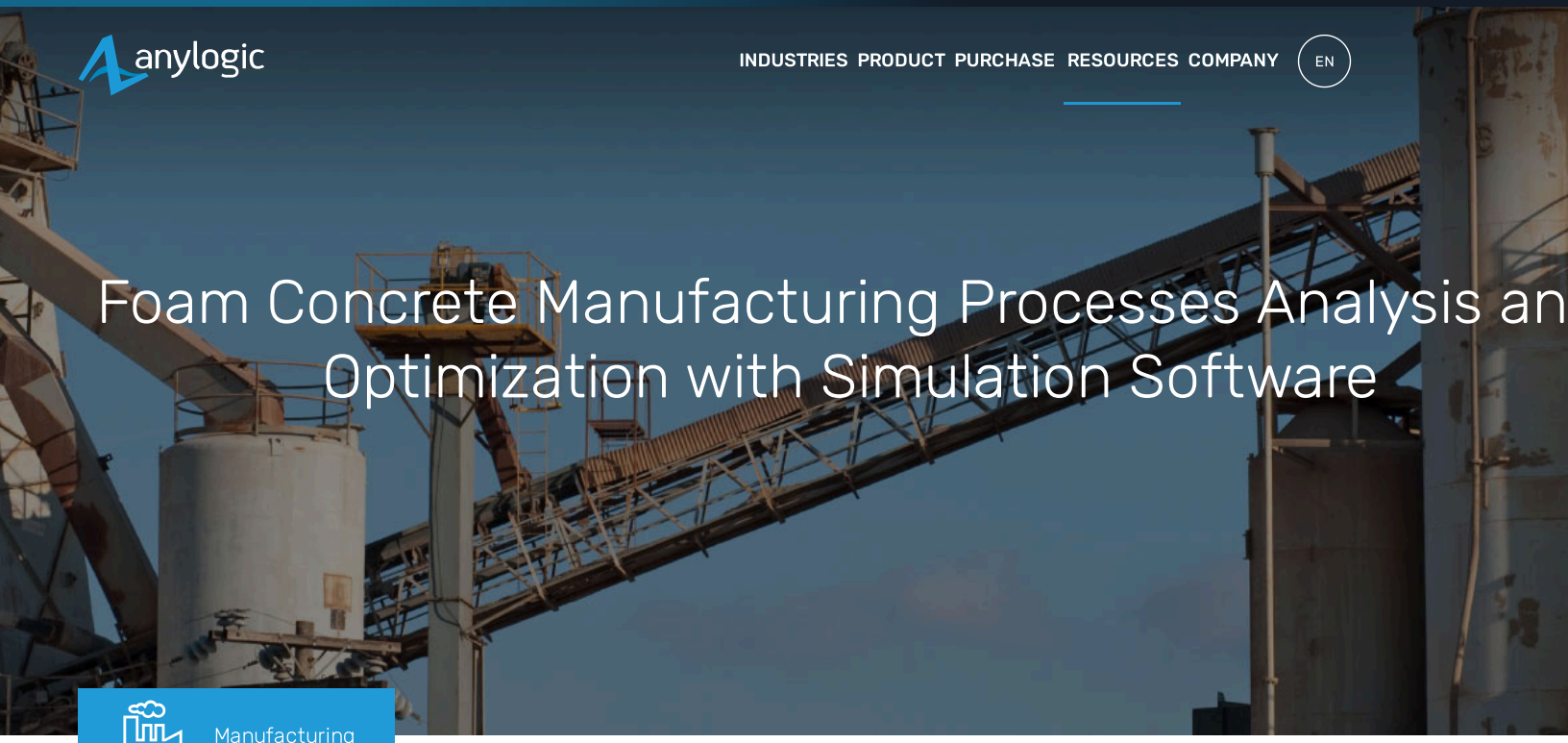


Foam Concrete Manufacturing Processes Analysis an Optimization with Simulation Software

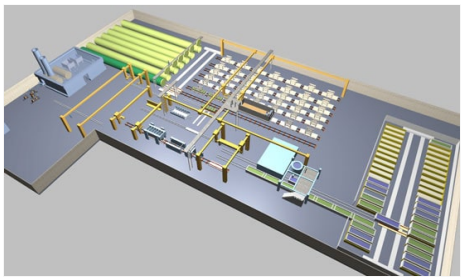
Manufacturing

Problem

The SET-Holding's newly constructed foam concrete factory in the Oryol Region could not reach its designed capacity. The plant management blamed the poor performance on the human factor: the manufacturing technique was innovative and challenging for the factory employees. SET-Holding recruited consultants to analyze the situation and increase the production capacity. The consultants decided to build the factory's simulation model using AnyLogic software.

Solution

The simulation model in details imitated foam concrete manufacturing processes including mix preparation, mix pouring, cutting, separation, autoclaving, unloading, movement of trolleys, cranes, workers, and pallets. The required parameters were loaded into the model from an external database that stores the operations duration measurements results: for each operation there is a range of results and possibilities to select from the given values.



Production optimization simulation model built with AnyLogic software (click to enlarge)

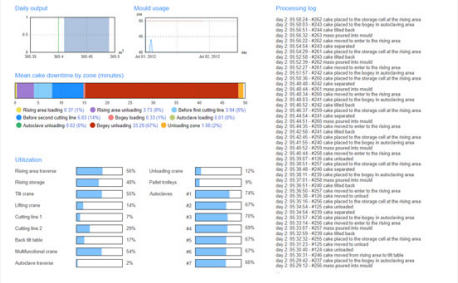
The model also demonstrated:

- Raw material bunkers' fullness

The simulation model allowed them to track various enterprise performance parameters: percentage of resources utilized (cutting lines and molds employment, queue for separation length, and the number of pallets in use), daily statistics on the finished mass compressions number (separated and disassembled), the condition of all molds to be poured, and the number of idle molds. Furthermore, with the graphs, the productivity trends and level of molds' usage could be monitored.

Outcome

The designed model allowed the factory management to review the enterprise activities in detail. The model precisely simulated all manufacturing processes, and therefore it was a perfect fit for problems analysis, decision making, and predicting changes.

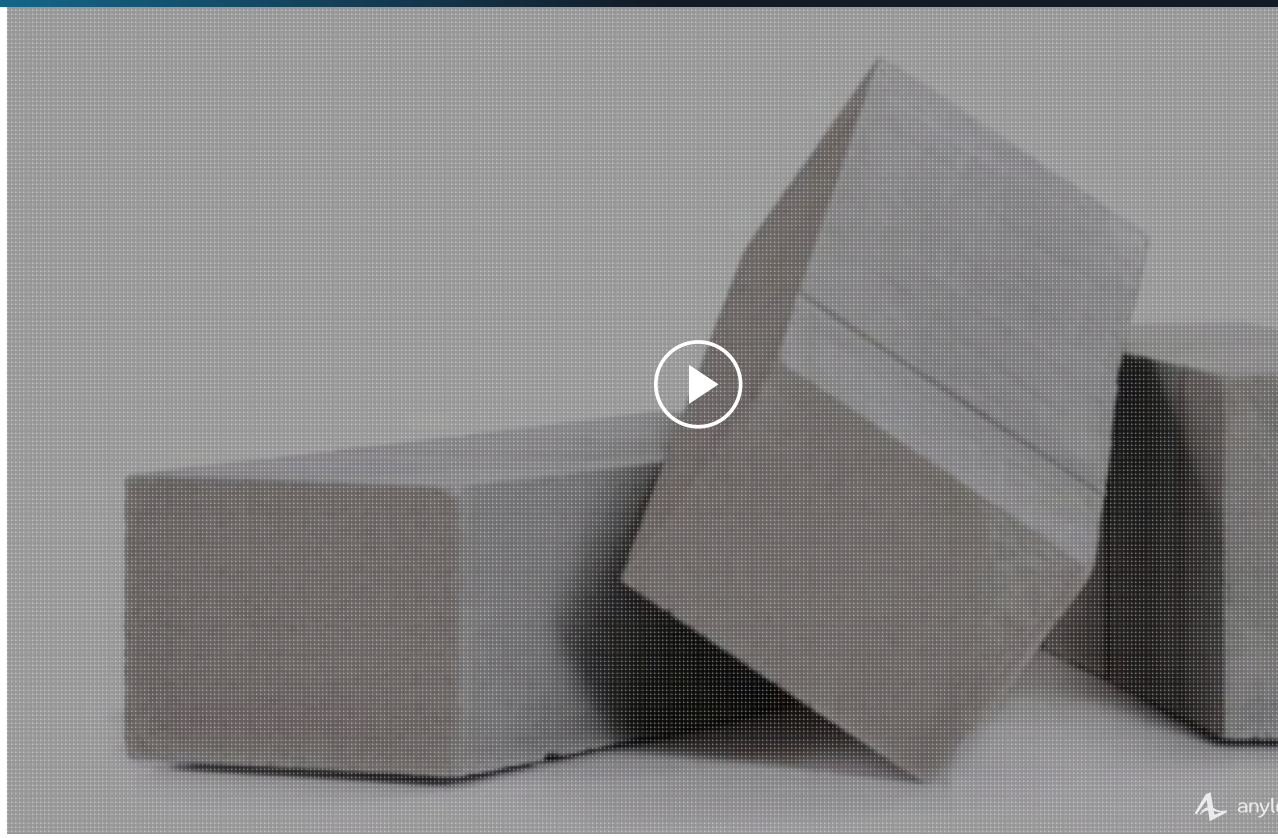


Manufacturing process simulation model built with AnyLogic software (click to enlarge)

The manufacturing simulation model enabled the management to see the workshop performance operational picture and foresee the course of events in case of various breakdowns and abnormal situations. Due to its accuracy, the model serves as a reference for the workshop activities. In particular, the model can be used to determine standards in manufacturing practices. In comparison with such benchmarks, it would be handy to record irregularities and determine their causes. The visual presentation makes the model demonstrative and easier for perception than usual tables and graphs.

As a result, the consultants managed to find solutions that significantly improved the factory's productivity. Due to the opportunity to experiment with the simulation model in a safe digital environment instead experimenting with the real factory, all the necessary changes were implemented quickly and without disrupting production.

Here you can see the model of the autoclaved aerated concrete factory, which is similar to the one that is described in this case study:



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