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# CREATING DIGITAL TWINS FOR CENCORA DC'S

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## ABSTRACT

Last year InControl introduced ERS, a new simulation development platform capable of parallel scalable simulation. We will demonstrate the use of this platform in a newly developed simulation application that allows Cencora to perform simulations by simulation and non-simulation experts within the company. This enables Cencora to locally adapt to day-to-day operational changes in their distribution centers around North America.

## 1 INTRODUCTION

Cencora was first introduced to Enterprise Dynamics in 2015. The MHE vendor that built a new facility used Enterprise Dynamics as their simulation application of choice. To align itself with the MHE vendor, Cencora started to use Enterprise Dynamics herself.

In 2020, Cencora asked InControl to develop a simulation model in Enterprise Dynamics for one of their distribution centers. The distribution center was retrofitted and Cencora wanted to know if the new design would fit the expected inbound and outbound flows. The simulation model demonstrated that with (minor) changes conveyor congestion could be reduced.

During 2022 and 2023 InControl and Cencora explored the development of additional simulation model for multiple DC's. This would allow the simulation team within Cencora to optimize the distribution centers and by doing so have the potential to save operational costs. It would also be a good tool to test design changes prior to the installment of new equipment.

The question that immediately arose was: "Can we use this on a daily basis by our staff who are not simulation experts?"

In the day-to-day operations of a distribution center there are always unexpected changes, e.g., staff is ill, unexpected additional orders, …. It would be of great help to the planner if he or she is able to update these changes and let the simulation show the consequences of these changes and if it is possible to mitigate the consequences. This planner is not a simulation expert. Together, Cencora and InControl are developing a tool with which an experienced simulation experts can make detailed changes to a simulation model and non-simulation experts run various scenarios and get output in such a way that he or she can incorporate that into the strategic, tactical, and daily planning.

## 2 GENERATING DIGITAL TWINS

Due to the sheer number of distribution centers Cencora has, modeling them all manually would be a very long and expensive process. However, Cencora has CAD-drawings for each of these distribution centers. We also know the equipment that is being used. To save valuable time, we use CAD-drawings to generate simulation models in Enterprise Dynamics. In Enterprise Dynamics we will fine tune these models and provide options for the scenarios and output.

In the application, we can create scenarios and experiments. Each experiment can contain specific input data and simulation parameters that are presented in a way a planner (or any other non-simulation expert

within Cencora) will understand. Cencora is also developing the capability in-house, so Cencora can maintain and build the models and interfaces herself, not just run them.

The input data is created by linking directly to the operational systems of Cencora. By storing this in data retention platforms, the simulation model is preconfigured for a non-simulation user to select a specific dataset (DC#, data range, etc.) as related to the specific simulation experiment desired to be performed. Simulation experts within Cencora can do more elaborate experiments in which they are able to manipulate the dataset itself or make modifications to existing equipment.

After selecting the experiment, you want to run, the model will be run in ERS. This allows the user to run the simulation faster but it also allows him to run multiple simulations at the same time utilizing the available hardware. For training and demonstration purposes, visualization in 2D and 3D is available but for the daily operations it runs as fast as possible without visualization.

## 3 WORK IN PROGRESS AND FUTURE EXPANSIONS

A system like this is never finished. There are always new features to add, new types of experiments that people would like to run and new requests for types of output to get better insight in certain elements within the distribution center.

Because it is a modular system, it is possible to use it for other purposes as well. Cencora is developing use cases for future capabilities.

## REFERENCES

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