WHITEPAPER

Investing in certainty

Why warehouse simulation is essential to greenfield project success

infios
a Körber company

Introduction

Planning a new warehouse is no easy task. Too often, and too far down the line, many warehouse managers wish they had allowed for an extra loading bay, found a more suitable packing station position, or chosen a smaller, less costly site. Despite all the team discussions, the spreadsheets and the drawings, many greenfield projects fall short of expectations.

In an effort to eliminate the guesswork, warehouse managers are increasingly turning to warehouse simulation software to design and test their new facilities. This software can build 2D and 3D "walk-through" visualizations of the entire warehouse operation, including people, storage locations, pick routes, marshalling areas, workstations, automation equipment and material handling equipment.

Its capacity to identify bottlenecks and improve efficiency are well established. However, some still question whether the accuracy levels, additional data demands and usability justify the investment. But, as the only way to truly determine whether your warehouse plans are fit for purpose, the real question is: can a warehouse project afford to do without it?

71% of warehouse professionals use a spreadsheet, **48%** use a computer simulation to test their warehouse designs.

Körber Warehouse 2020 Survey Analysis

Seeing is believing

When it comes to visualizing your designs ahead of a new build, warehouse simulation is second to none. Using data from your own warehouse set-up, it allows you to fully build and trial a facility in 3D. Therefore, you can compare different "what if" scenarios and test the impact of new equipment, processes, storage methods and more.

It gives an accurately scaled, detailed 3D representation of your warehouse in action. This way you can see things that you would have otherwise overlooked with a static spreadsheet or CAD visualization.

By being able to "play back" each element of your operation, at any point in time, you can identify what works and what doesn't. In today's time-pressured, multi-channel environment, spotting even the smallest issue is the secret to avoiding costly mistakes. Subtle changes, like rotating a piece of racking by 90 degrees, can make a significant difference to the travel of workers and equipment.

"With a model that has 97% accuracy representing actual complex operations we can be confident about the changes that we are going to make."

Saleh Jamal
Senior Project Manager, Panda Retail Company

"Soon as you move into a new building, you should be taking advantage of trying out different options. There isn't just one static answer to 'what should we build?' It's an iterative process and you can find things that aren't working well and improve them."

Carol Chapman
CLASS Practice Manager, Infios

Built to last

With good simulation software, you can balance your business requirements, within any set budget and space, and see the impact of each operation on productivity. This offers immediate benefits, helping you evaluate the warehouse footprint, labor costs, running expenses and any sustainability concerns, even before starting construction.

Simulation allows you to look far beyond your current warehouse operating volumes. When making such a large investment, this foresight is invaluable.

"When you build a new warehouse, you want it to last for a long time … You want to look ahead three years, five years—you get the crystal ball out in terms of what you think the volumes will be. Does the building carry on being fit for purpose all the way through the time you want it to be?"

Simon Shore
Supply Chain Optimization & Simulation—
Warehouse Layout & Design

Follow the flow

In contrast to static models, time-based simulation allows you to see the impact of different configurations over time. Following the flow of goods into and out of the warehouse, and all the activities in between, can help you understand the impact of peaks and troughs on your operation.

Unlike a spreadsheet or CAD package, simulation has a time dimension. This is essential to gain insights into how order profiles, delivery times, collection times and elements of the warehouse that share resources (storage, dock doors, people, equipment) affect the business.

Simulations represent a typical working pattern, enabling you to analyze any point during a working day or week. Observing the trucks and workers moving around the site can give you a better feeling for how busy the warehouse will be, how many resources are used and where bottlenecks may arise. You can also review the progress and timings of vehicles being loaded and unloaded.

This helps you understand the effectiveness of your picking and put-away processes and whether they are adequately resourced.

"What makes it really easy for people to understand is when they just see the operation in the new building, especially when you're doing a greenfield investment, this brings it to life. Whereas if you're just doing it on a piece of paper, sketching it out, or in CAD, you don't get this 3D visualization, you don't get the movement."

Carol Chapman
CLASS Practice Manager, Infios

Validate assumptions

The more data you have, the more accurately the simulation can build a picture of your warehouse. But even with limited data, it can support a decent simulation. You can start by modeling a new warehouse based on a previous site, drawing on assumptions on pick rates, personnel per shift and your experiences of your operation. The warehouse simulation will validate your assumptions, building your confidence with each interactive test.

A good warehouse simulation software is pre-programmed with the basic warehouse parameters, such as forklift speeds. It can therefore make intuitive assumptions with minimal data—for example, calculations based on the physical warehouse layout and the travel time around a building of that scale.

This type of validation technique is also an opportunity to test manufacturer productivity and capacity claims. It may reveal that some equipment does not respond as it should, especially when used in your particular set-up.

3.85% of warehouse professionals have all the date they need to design a warehouse, whereas **78.85%** use their own judgement to fill in the missing information.

Körber Warehouse 2020 Survey Analysis

"It'll allow you to put numbers and data in order to validate your model, so that you end up with some hard data facts to support your business case."

Simon Shore
Supply Chain Optimization & Simulation—
Warehouse Layout & Design

Share a common vision

By creating a visual of the warehouse in operation, simulation encourages collaborative working. It allows sharing of ideas among team members, connecting, for example, the architect designing the facility with the person responsible for running it.

This clear visualization opens discussions, helping resolve any obvious issues from the get-go. It also helps the warehouse team get buy-in from stakeholders outside the immediate team—e.g., financial officers.

Only a quarter of respondents create the design on their own, whereas the majority work as a team.

Körber Warehouse 2020 Survey Analysis

Break down barriers

It's important to find a simulation tool that's easy to use, to encourage users to trial different scenarios and bring a 2D plan to life. It should also be specifically designed for warehousing, with relevant libraries of equipment, and the ability to import CAD drawings and run different operating procedures.

Infios's solution uses a drag and drop interface, with tools to draw and scale specific warehouse elements at the 2D stage. For example, to draw a new piece of racking, you simply select and stretch a rack to size before dragging it into position, changing any of its unique characteristics using drop-down menus. Once you get to the 3D simulation stage, you can run both inbound and outbound flows. To add a new inbound flow, you can quickly make that change with one click. You can also edit equipment parameters according to the needs of your operation—like configuring forklifts to work at a set speed.

The system is intelligent enough to update all of the connected functions too. It knows, for example, that arriving vehicles will need to be unloaded.

"It knows what happens in warehouses. We've embedded that intelligence in it, if you like. So, a user doesn't have to do any programming, which if you look at some of our simulation competitors, most of them require some coding to get a model up and running."

Carol Chapman
CLASS Practice Manager, Infios

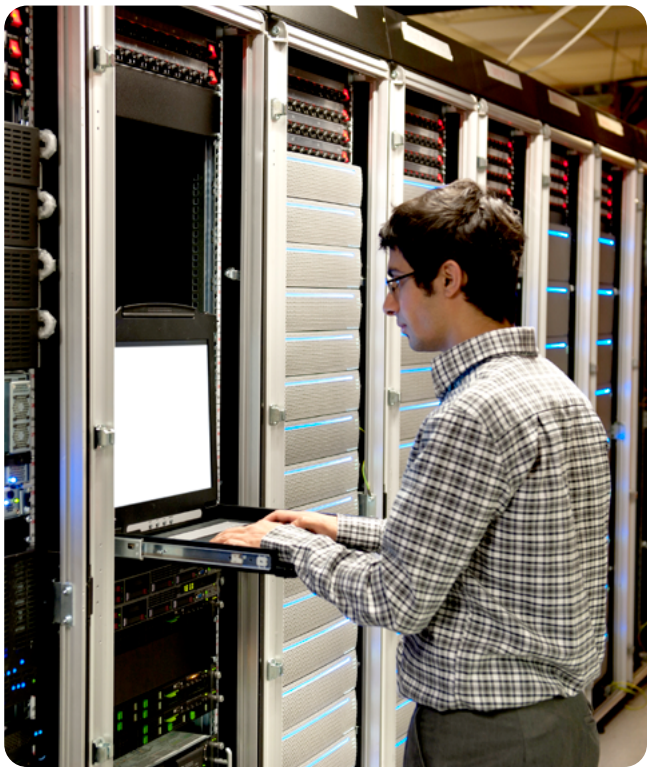
See the big picture

To gain a fuller understanding of how your operations will run through the entire process, it is critical to model the areas beyond the warehouse, such as the yard, gatehouse, parking bays and surrounding road systems. Only with this wider perspective can you build an accurate model of your entire working operations and how they perform together.

> "The worst thing you can do is put up a big warehouse on a site next to a main road and then block the road with queuing traffic. So again, this is something we can model and make sure that the flow outside works as well as the flow inside."
>
> **Simon Shore**
> Supply Chain Optimization & Simulation—
> Warehouse Layout & Design

A future in the cloud

The next step is to take desktop-based simulation software into the cloud. As well as removing the hurdle of installation, this will make the software more accessible to more businesses. It will also enable a number of other exciting features, such as the integration of warehouse management systems, helping to accelerate the uploading of data and, ultimately, the time it takes to model the warehouse environment.



Our solution in use

John Lewis
Infios used a combination of consultancy and simulation software to develop and refine John Lewis' warehouse design. By importing their existing blueprints we were able to ensure their predicted labor, equipment and throughput assessments were accurate.

A 3D simulation modeled the live warehouse environment, running numerous operational scenarios to identify the optimum layout. This aided communication between stakeholders, and provided crucial insight into the design and operational features of the proposed warehouse.

CONCLUSION

The power of hindsight
In today's ever-changing, competitive supply chain environment, it's more important than ever to ensure your greenfield sites measure up before building begins. Even the smallest issue can have a huge impact on productivity. But armed with a good simulation tool, you can accurately measure and visualize your warehouse designs, and safeguard the efficacy and efficiency of your warehouse long into the future.

Infios has over twenty years' experience providing warehouse simulation solutions, tailored to visualize and address client operational issues. Our technology is widely compatible with key host and existing CAD systems, and we also offer you the option to run the software independently or to manage and implement the entire project for you.

Find out more

Learn more about how Infios simulation software can help your organization by visiting our website.

READ MORE

infios
a Körber company

Infios.com