

WHITEPAPER

Unleashing your potential

Using simulation technology to drive
process improvement in your warehouse

Introduction

Simulation technology is broadening possibilities for how warehouses evaluate their:

- Processes
- Physical space
- Use of technology

Compared to traditional forecasting models on spreadsheets, warehouse simulation gives you a holistic overview of both current and potential operations, with a user-friendly interface. It eliminates the risk of costly errors, while producing simulation models in a fraction of the time.



“To get the best effect from a warehouse simulation model, it is important to revisit and review it periodically. You can measure the effectiveness of a particular seasonal promotion for example, or benchmark performance as your operations change.”

Simon Shore

Managing Director for Supply Chain Modelling—
Infios

What is warehouse simulation?

Through warehouse simulation, you accurately represent all the attributes of the warehouse in a 2D or 3D computer model, then run a day or week in the life of your operation and get back data on its performance capability. Areas can include:

- In- and outbound workflows
- Staffing requirements
- Material handling
- Vehicle movements
- Aisle widths
- Storage capacity
- Entrance gate, loading/offloading bays and other external areas

Simulation means you can compare different “what-if” scenarios.

For a greenfield site, for example, these might be different layout and storage configurations. For a brownfield site, they might be current process bottlenecks. By evaluating the “breaking points” in your capacity, both obvious and hidden, you can create an accurate longer-term projection for future expansion.



Examples of use

Driving performance

If you are using warehouse simulation as an improvement tool to current operations, the first step is to create an exact computer model of your current end-to-end processes. This is typically over a seven-day period, reflecting a weekly distribution cycle. Then you can run different scenarios over a similar seven-day period, against the data you have collected, to create an accurate “compare and contrast” picture. For example, you can compare fixed automation with the use of autonomous mobile robots.

Utilizing space

The simulation software has a library of different components pre-configured to industry standards—for example, aisle widths and pallet sizes.

- By placing these into the simulation model according to your allocated space, you can see exactly how many locations you are creating, in order to optimize your storage capacity
- As you change the size of the allocated space, the number of locations automatically adjusts. You can then customize each configuration—the height or width of a rack and number of locations, for example
- If your storage system is automated, you can compare the speed of putting away or retrieving items against different automation technologies.

Seasonal peaks

Warehouse simulation helps you prepare for seasonal peaks by identifying areas which will need more attention, a change in process, or extra resources. This is particularly prevalent when you consider that during peak periods warehouses can expect to double staff levels. You may need to consider the area you will need to allocate for a 10% rise in demand for a particular product, how many more AMRs you may need to lease, or—if you deploy voice technology—how many additional headsets you will need.

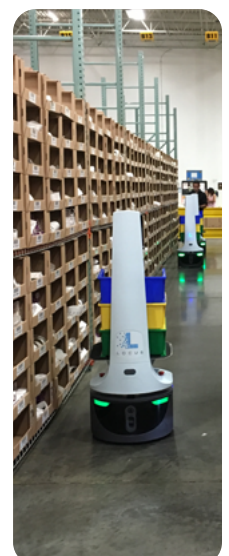
AMRs vs fixed automation

Warehouse simulation can help you evaluate possible performance benefits achieved by deploying autonomous mobile robots (AMRs) into your operation.

Unlike conveyor systems, and other fixed automation, AMRs take a digital map of their environment through sensors, cameras and embedded safety mechanisms. They can detect and move around objects, or take alternative routes with no instruction. This means you can dispense with restrictive guiding infrastructure and free up floor space. Using a “robotics-as-a-service” model, you can opt for a leasing option and minimize capital expenditure.

Voice technology

Voice technology is becoming an increasing feature for warehouse processes such as replenishment, cycle counting and put-away. But the most common use is for picking, which comprises around 70% of warehouse labor. You can use warehouse simulation to assess how it can benefit your operations. Voice works by sending a team member instructions through a headset, who will then send a verbal confirmation as each task is completed. By remaining hands free and eyes free (the technology eliminates the need for paper or hand-held devices), voice is proven to add 20% performance efficiency almost instantly.



Calibrating the model

The more accurate the data, the more effective the simulation.

Your simulation partner should run the model based on the information they have assimilated. They should then consult with you on how closely the numbers reflect the reality, and fine tune to achieve the closest fit. If they have not achieved 90–98% accuracy, you should question it.

Warehouse simulation at a glance

- Clear 2D and 3D visualization of your operations from A to Z
- Evaluation of current and potential technology performance
- “What-if” scenarios for peak seasonal demand
- Models to assess your breaking points
- Preparation for long-term growth
- Huge time and cost savings with decreased risk
- Unlimited potential through IoT.



“When inducting a new employee, you can use simulation software to provide a ‘virtual’ walk through to show different areas of the warehouse.”

Simon Shore

Managing Director for Supply Chain Modelling—
Infios

Why Infios?

We have over twenty years’ experience providing warehouse simulation solutions tailored towards each of our clients. Companies including DHL, Waitrose & Partners, Co-operative Group and Palletforce Ltd have all relied on us to provide warehouse simulation solutions to address their tailored operational challenges.

Our strengths lie in:

- Our global presence, which ensures you have local support wherever you are located
- Our technology, that is widely compatible with your key host systems
- Our service provision, that gives you the flexibility to run the software independently with our complete training support, or for us to manage the project in close consultation with your operational teams
- Our solutions, which are tailored for every company size, sector and case use. They are completely scalable to different degrees of complexity, allowing you to keep aligned with the changing needs of your business



“We wanted to move at speed, so it was imperative that we quickly create a visual plan for the new build. Having previously worked with the Infios team, I knew they’d be able to deliver.”

Rob Flint

Strategy & Network Planning
Manager—John Lewis

Case example – John Lewis

John Lewis is the UK's largest chain of department stores with 2.4 million sq. ft. of distribution center space. For their new 600,000 sq. ft. warehouse, they commissioned Infios to:

- Create 2D and 3D simulation models from the architect's blueprints
- Identify the most operationally efficient warehouse design in collaboration with John Lewis Partners
- Predict labor and equipment requirements



CONCLUSION

Warehouse simulation technology is continuously evolving. The Internet of Things (IoT) in particular—the connectivity of devices and software—is exploring possibilities we could previously not even imagine. As time goes on, the sensors and information within a warehouse will be able to provide far more accurate information, which simulation software can then use as a basis for optimizing the operations.

Predictive maintenance—where you can evaluate the health and lifetime of a piece of equipment in advance of any failure—is another example of how warehouses will improve their performance into the future. By feeding these predictive insights into a simulation model, you will be able to better maintain performance levels and direct capital expenditure. Looking through a future lens, the possibilities of warehouse simulation are endless.

Find out more

We pride ourselves on being a long-term partner for our clients, and as your business dynamics change, we are on hand to support your emerging needs.

Learn more about how we can help you enhance your processes through warehouse simulation:

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