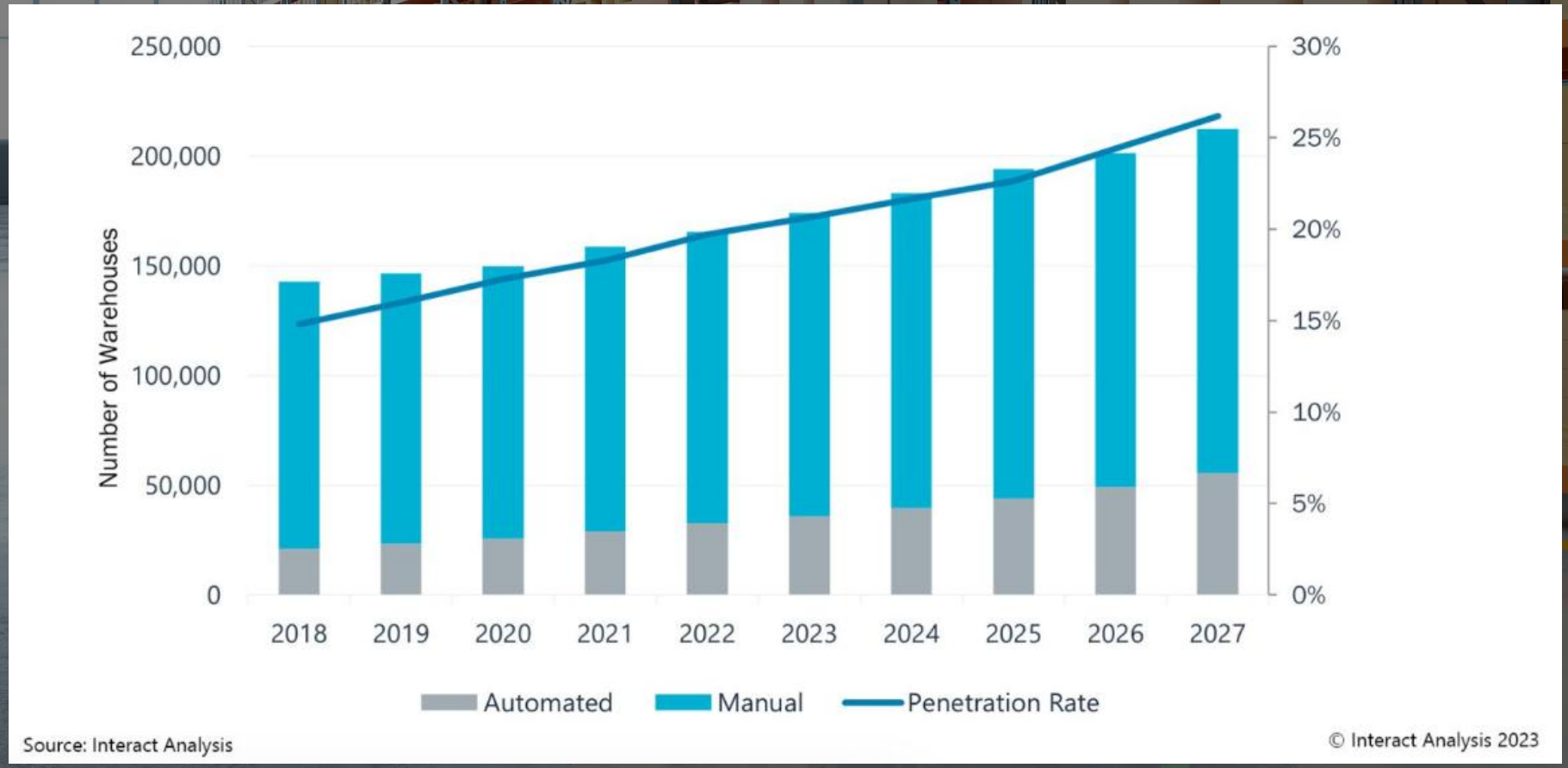
WareMind

Optimising warehouse intralogistics

An increasing number of companies are adopting warehouse automation



Warehouse intralogistics are often inefficient even in automated warehouses

Supply chain delays may often be attributed to bottlenecks in material handling systems, which may occur due to a plethora of reasons:

- **Equipment fault**
- **Poor planning and scheduling**
- **Inefficient routing**

These bottlenecks lead to significant delays and excessive costs, costing companies up to:

30% of their revenue

https://www.tsmh.com/top-5-costs-material-handling/#:~:text=Material%20handling%20should%20follow%20the,waste%20of%20time%20and%20resources.

Approaches to optimise warehouse intralogistics

Scenario 1:

Customer requires improved strategy for **warehouse monitoring** for real-time decision support and troubleshooting.

Warehouse monitoring tools

- Extended Warehouse Management
- Yard Management
- 3D Warehouse Visualization

Scenario 2:

Customer requires new system design/system redesign through **warehouse planning**.

Warehouse simulation tools

- Tecnomatix Plant Simulation
- Warehousing Simulation
- Warehouse Simulation Software

Bridging the gap between warehouse monitoring and planning

Scenario 1:

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Scenario 2:

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For warehouse monitoring:

- ✓ Digitalization + real time visualization
- ✓ Real-time bottleneck detection and prediction
- ✓ Real-time diagnostics and recommendation through AI + digital twin simulation

For warehouse planning:

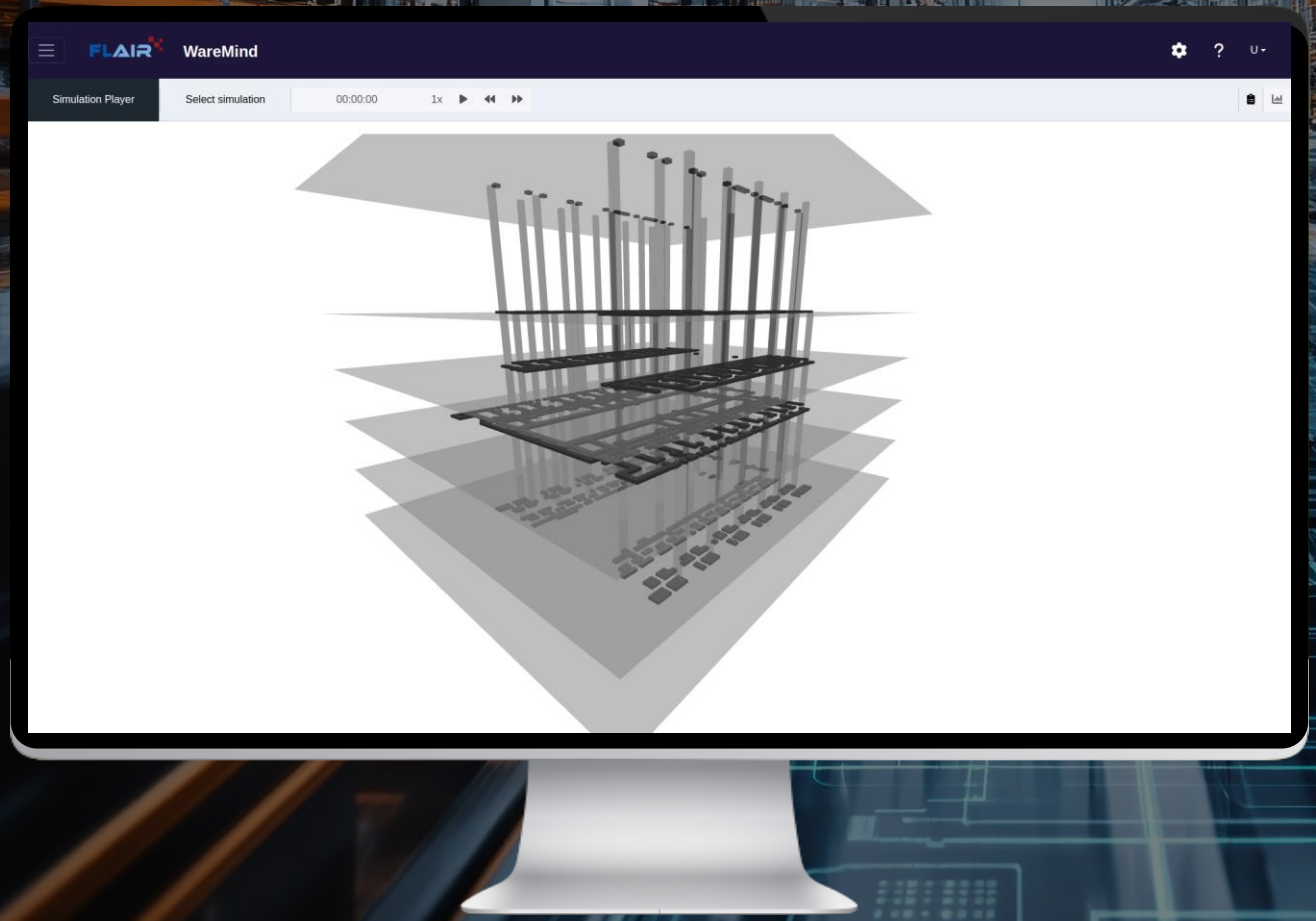
- ✓ Offline simulation
- ✓ Suggest optimal redesign/planning strategy

WareMind provides functionalities to support both warehouse operation and warehouse planning

WareMind

A Novel Warehouse Optimisation Tool

WareMind is a novel warehouse intelligence tool which streamlines both warehouse operation and warehouse planning processes in a seamlessly integrated environment.



- 3D+VR visualisation
- Real-time monitoring
- Bottleneck detection and prediction
- Root cause identification
- AI diagnostics and recommendation
- Sandbox simulation

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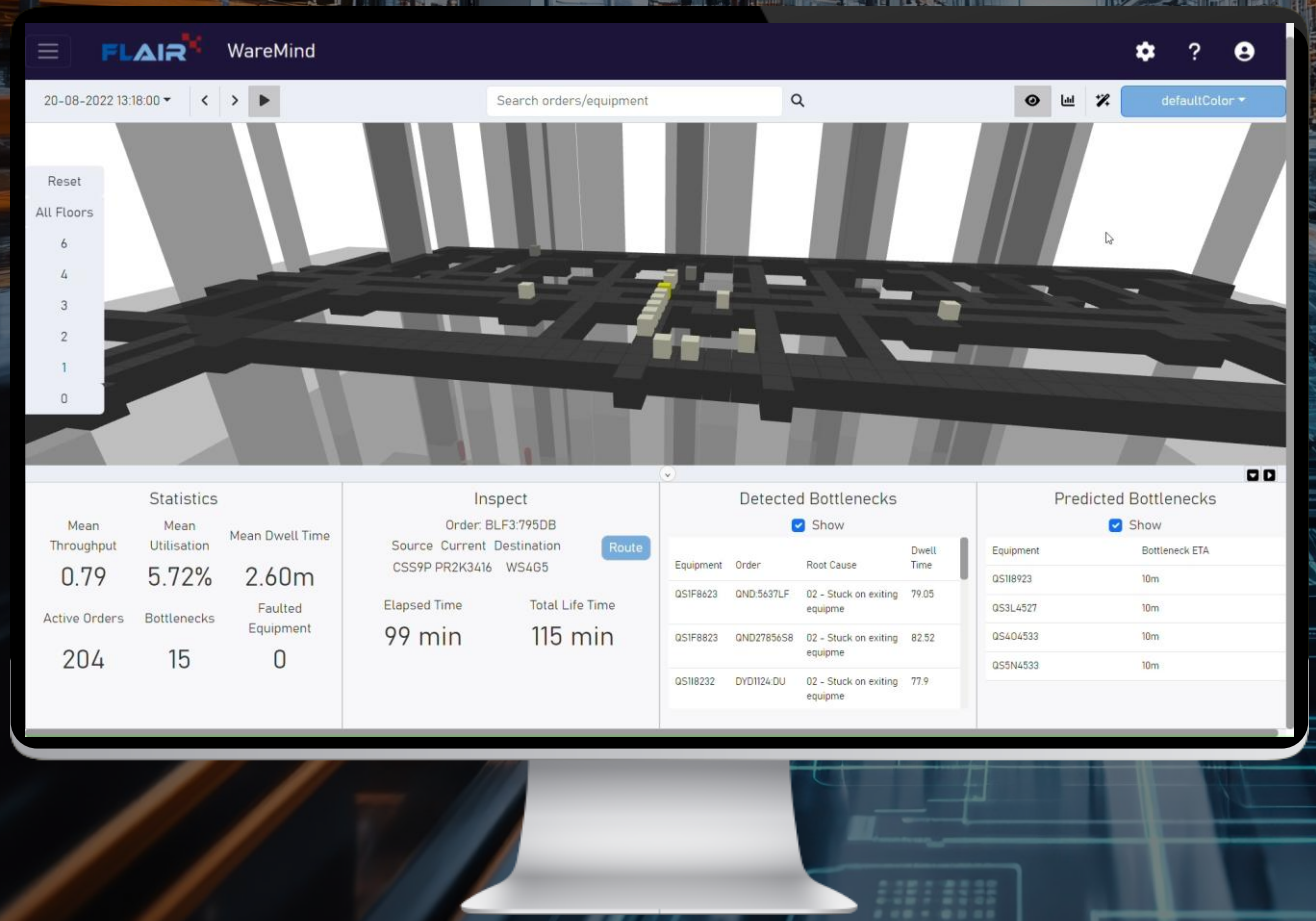

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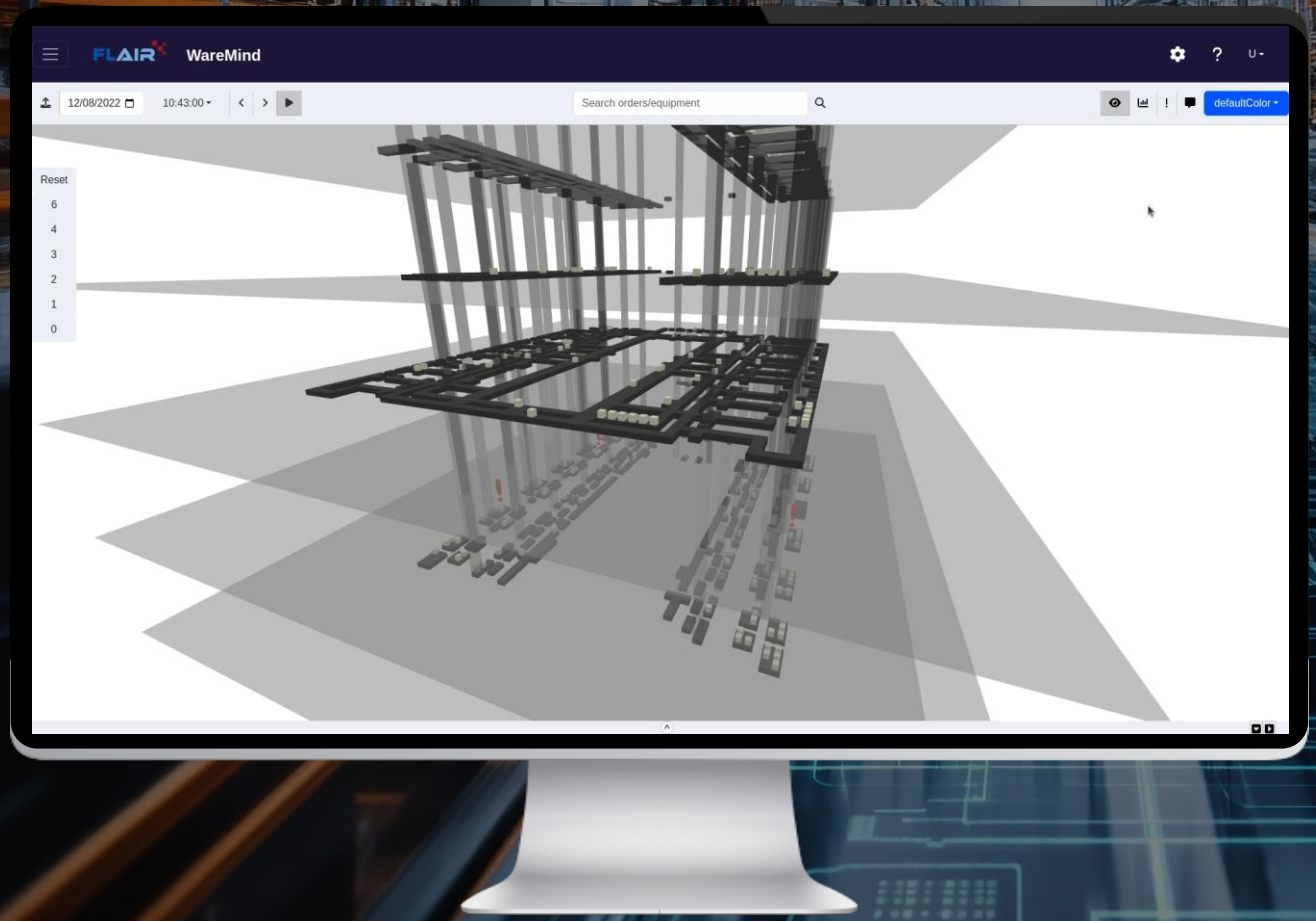

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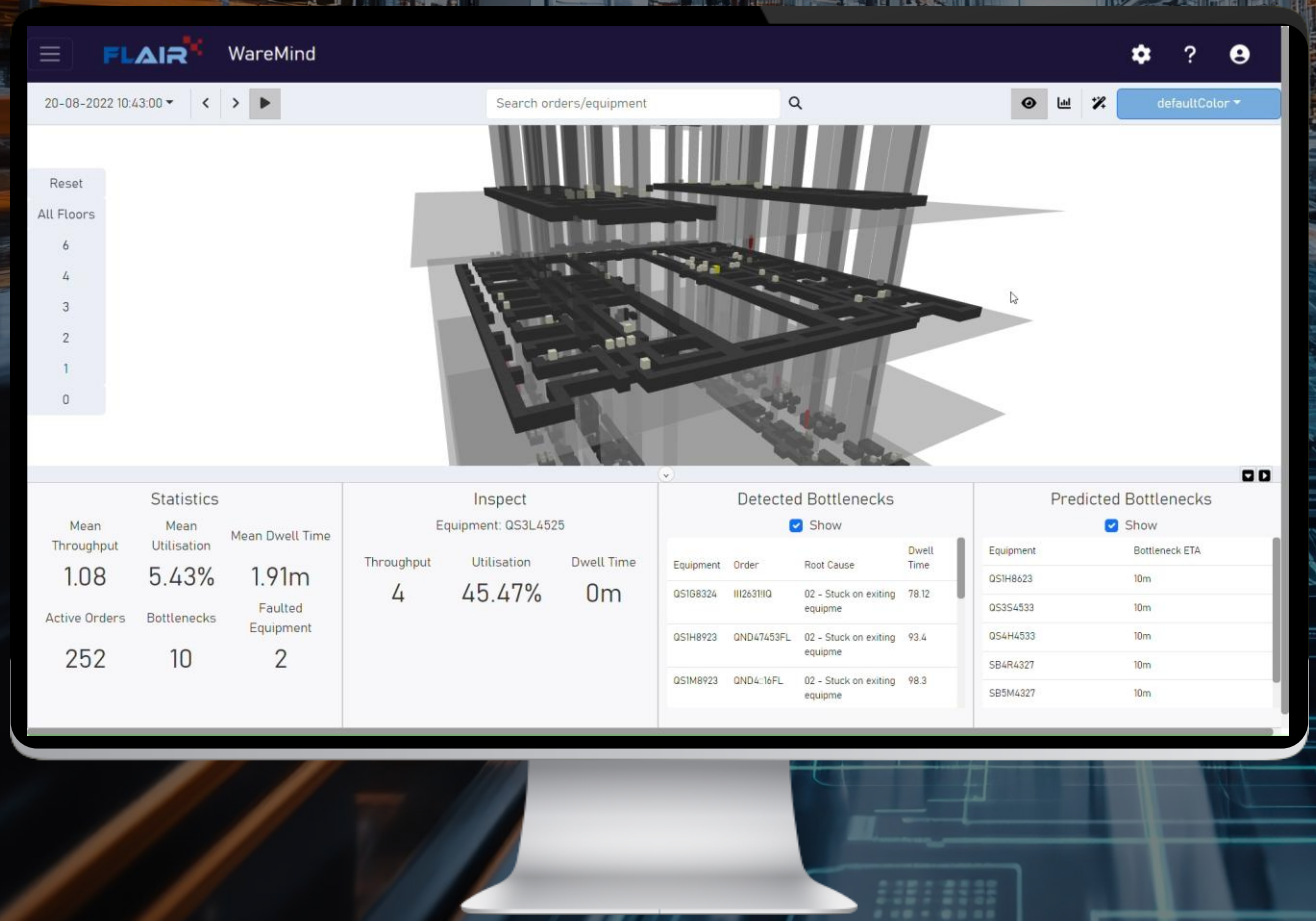

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Successful Use Case

WareMind is already being used by Hong Kong Air Cargo Terminals Limited as a licensed software.

Hong Kong Air Cargo Terminals Limited

- Largest air cargo terminal in the world
- 6000+ material handling equipment
- Annual throughput of 2.9 million tonnes of air cargo

Tksteven. (February 2008). *Super Terminal One*[Photograph]. Wikipedia. https://upload.wikimedia.org/wikipedia/commons/7/73/Super_Terminal01.jpg

Simulation for operation and planning

95%

Accuracy in system throughput

Automate bottleneck detection

>93%

Accuracy

Reduced time to analyse bottlenecks

> 30 mins per bottleneck → 10 mins all bottlenecks in a day

Reduced manpower

350

Working hours saved each day

Achievements

Awards

3rd Asia Exhibition of Innovations and Inventions

Silver Award

49th International Exhibition of Inventions Geneva

Silver Award

Publications

Research papers

Rectify Sensor Data in IoT: A Case Study on Enabling Process Mining for Logistic Processes in an Air Cargo Terminal

Li et al., Cooperative Information Systems 2023

Unveiling Bottlenecks in Logistics: A Case Study on Process Mining for Root Cause Identification and Diagnostics in an Air Cargo Terminal

Li et al., International Conference of Service-Oriented Computing 2023

Patents

Method for detecting and predicting a bottleneck in a transportation process of a logistic center

Hong Kong Industrial Artificial Intelligence and Robotics Centre

HKSAR 32023070062.9

PRC 202310280578.6


FLAIR
Flowmatics
Thank You!