SIEMENS
Ingenuity for life

Proving The Business Case for Intralogistics

How can fulfillment centres ensure throughput meets demand?

An automated response

Automated systems and robotic devices are an increasingly familiar sight in fulfilment centres, favoured for their speed in production.

And while new conveyor systems undoubtedly make a difference to performance, the question is: how can they meet the flexibility and scalability targets set by the company?

When the challenge is as much about preparing to handle changes as it is about the actual handling, sometimes even the fastest automated system is not the solution.

Is labour the sustainable answer?

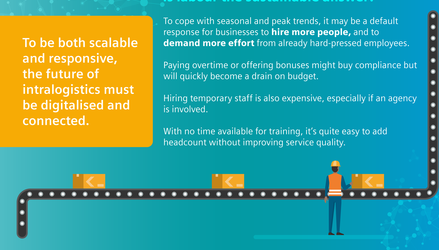
To be both scalable and responsive, the future of intralogistics must be digitalised and connected.

To cope with seasonal and peak trends, it may be a default response for businesses to **hire more people**, and to **demand more effort** from already hard-pressed employees.

Paying overtime or offering bonuses might buy compliance but will quickly become a drain on budget.

Hiring temporary staff is also expensive, especially if an agency is involved.

With no time available for training, it's quite easy to add headcount without improving service quality.



Capture, learn, adapt

Fulfilment centres are already using real-time data to become a more responsive, agile and integrated system.

In an automated distribution centre, there is a constant flow of information which is captured, analysed and factored back into distribution centre operations in real-time.

Physical

1. Connected

Distribution centre assets, such as machines, equipment and people, share information.

4. Adapt, learn, optimise

Recommendations, insights, learnings and predictive/prescriptive alerts are shared with the physical world via connected operational systems. Any adaptations are carried out automatically.

Digital

2. Capture & record

Data generated across the distribution centre is used to record and create a virtual map of centre operations, assets and resources.

3. Analyse & learn

Analytics tools routinely assess data on operational and asset performance. This is used to run algorithms which spot trends and predict possible outcomes.

Fact-based planning

Digitalisation helps to avoid fragmented information.

Instead, accurate and up-to-date data can be captured. This can be generated on everything from centre-wide performance to the 'health' and operational efficiency of individual assets and equipment.

Externally, it's also possible to learn more about the minutiae of customer shopping habits, emerging trends and previous upticks in demand.

Transforming data into knowledge

Powerful digital predictive analytics can be used to:

Analyse data on shopping habits, changes in demand and identify trends. It also allows one to see the availability and performance of resources and equipment.

Prescriptive analytics tools can be used to recommend the most effective response. A response that makes the best use of working processes and practices to improve throughput without sacrificing service quality.

The best-laid plans...

Planning is a complex process in which a wide range of variables, such as inventory management storage, warehouse layout, automation and personnel, must be considered.

Misinterpret a single piece of data and the best-laid plans could turn out to be ineffective and expensive.

Dynamic digital simulations

A digital twin is the virtual representation of a physical object or system across its life-cycle. It uses real-time data to enable learning and reasoning for improved decision making. A digital twin is often used as the starting point for a factory or centre-wide digital simulation.

Digital modelling tools allow plans to be tested, tweaked and validated, for anything from an equipment upgrade to the revision of an entire centre layout.

Digital simulations use the same type of sensor information as a digital twin, but the information is generated and manipulated as part of the simulation.

Tecnomatix allows users to create a 3D replica of the fulfilment centre – or areas where change is planned – and run "What if?" scenarios that mirror real-world situations.

A simulation takes all the guesswork out of the planning process and allows assessment of the most effective approach to adapting key areas, including:

- **Capacity requirements for personnel, storage and equipment**
- **The effects of automation, including robots, AGVs, AS/RS and carousel**
- **Storage, including ABC storage, zone storage, dedicated storage, random storage and cross-docking**
- **Planning and control, schedules and order release**
- **Order picking, batching, optimised routing, sorting and consolidation algorithms**
- **Inventory management, including ordering policies and cycle counting**

A standardised, fast and flexible response

Many fulfilment centres still deal with changes in demand on an ad-hoc basis, each time starting more-or-less from scratch.

Digitalisation provides the tools needed to build on experience and previous success. The result is a fast, flexible and cost-effective standardised response that ensures throughput will always keep up with changes in demand.

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