Optimizing logistics sites : what are the *quick wins* thanks to automation?

WHITE PAPER | a partnership

EOL

France Supply Chain by Aslog

X

The Positive Way

WAVESTONE

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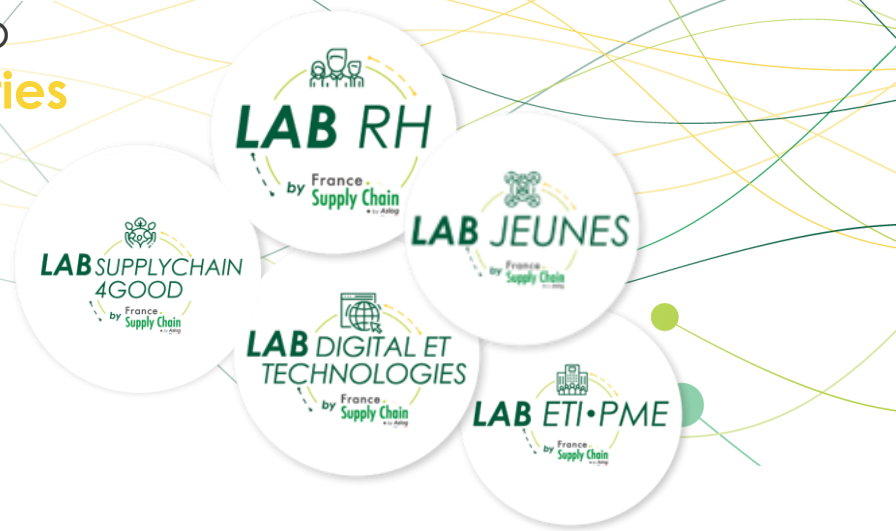

A publication of the Intralogistique France Supply Chain project

Intralogistics has been the subject of debate for several decades, and is a major factor in supply chain performance. **Its management is complex.**

France Supply Chain has entrusted its with the task of enlightening and acculturating members on the subject.

This is how the 'INTRALOGISCS project' came into being. This working group brings together professionals from various companies working in the logistics field. This reference guide is their latest production. It was made possible thanks to contributions from logisticians, manufacturers, service providers, equipment manufacturers and consultants, each of whom brought their own expertise to bear on the challenge of automation. For further information, the France Supply Chain Labs are at your disposal, giving you access to a formidable community for exchanging and sharing best practices.

Karine LOUARN
Logistics Consultant
EOL

Lucie FABRE
Manager
Wavestone

YOUR CONTACTS

Jean-David ATTAL
Chairman
Fractal Partners

Introduction

"And what about €1 million?

Let's be honest, it's an exaggeration. For €1m, many companies can build beautiful automated systems to strengthen their intralogistics and make them more reliable.

But here's the thing... our economies have been through so many upheavals in the last five years, that many of us/you would like to spread out our projects over time, working in phases to reduce risk-taking, and prioritize quick-impact projects. And rightly so.

This *quick wins* guide is for them.

First of all, it will show you that, even (and above all!) if you want to proceed in stages, it's essential to have an overall vision of what the project can be, its logic and phasing. This is the role of diagnostics and logistical planning.

And he illustrates with a few recent examples of '*quick wins*', limited by the amount invested and the space occupied, but with a real leverage effect on logistics or production.

By observing these case studies, we will be able to predict future developments in automated systems and types of contractualization in the next few years.

France Supply Chain by Aslog

This white paper is the result of the commitment of our members

Nathalie PHILIPPART
Manager
Wavestone

Cléo POUCHIN CHEMIN
Analyst
Wavestone

Léopold THIBAUT-COIGNEC
Senior Consultant
Wavestone

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How do you diagnose your logistics site?

Warehouse diagnostics

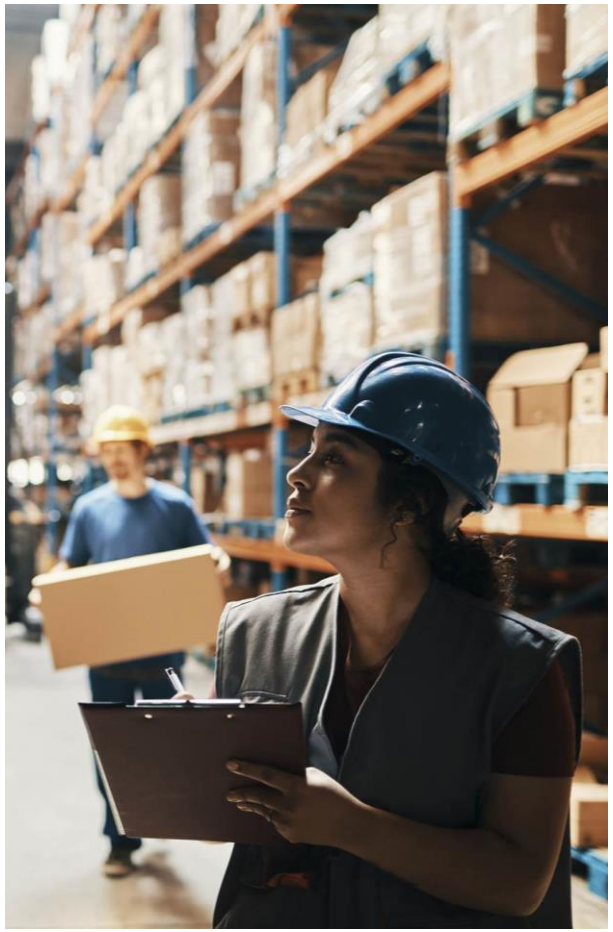
enables you to identify and implement potential gains in your warehouse, whether automated or not

THE LOGISTICS DIAGNOSTIC IS CARRIED OUT AFTER THE WAREHOUSE HAS BEEN DESIGNED...

The Logistics Diagnostic is staggered in time in relation to the site implementation cycle, and does not have the same objectives. It is not intended to call into question your logistics master plan (number of warehouses, their location, *route-to-market* choices, etc.), nor the technical solutions implemented (often predefined site surface, constraints).
The aim of a diagnosis is to **define an action plan to improve** your site's cost-service **performance in the short and medium term.**

... BUT CAN INVOLVE A WIDE RANGE OF ACTIONS:

- B2B/B2C customer promise
- Logistics resources and operations
- Managing supply, demand and procurement
- Supply Chain-oriented information systems
- Organization and KPIs



Chapter 01

A logistics diagnosis is a performance analysis of the processes in place in a warehouse, carried out with the aim of improving them.

A BRIEF OVERVIEW OF THE DIAGNOSTIC PRINCIPLES

OBJECTIVE

Carrying out a diagnosis of your warehouse's supply chain consists in analyzing the various internal and external processes in your warehouse, as well as their level of performance, their status and their specific features. This enables you to identify your warehouse's weak points and determine potential areas for improvement.

REFERENCE

The principle of diagnosis is to analyze the existing situation and compare it with a benchmark. It generally involves a study and evaluation of the company's performance, while observing that of its competitors. To do this, it is necessary to establish a benchmark in the field, identify best practices and define the future or desired customer promise.

RESULTS

At the end of the logistics diagnosis, we can define all the solutions identified, i.e. propose solutions to the problems encountered in the warehouse. We also determine the challenges, risks and impacts, and finally draw up a roadmap to help implement these actions.

PLAYING FIELD

Before carrying out a logistics diagnosis, it is necessary to define the scope of the project. This involves determining the number of warehouses or processes to be examined, and the product families and channels concerned. Finally, we'll identify the parameters that could affect the roadmap, such as the expected level of ROI, the timeframe for implementation, the duration of the assignment...

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A typical diagnostic approach is divided into 3 phases, and generally lasts 3 to 4 months

PHASE 1

~1 month

Appropriation

The appropriation phase involves immersing oneself in the warehouse context, so as to gain in-depth knowledge of the processes in place.
This requires a combination of field studies (visits, interviews) and quantitative analyses (data analysis, cost analysis, benchmarks and best practices).

PHASE 2

~1-2 months

Diagnosis

Once the processes have been defined and the associated data in mind, you can start to draw conclusions.
The information gathered during the previous phase is used to identify areas for improvement, to propose operational levers to address these issues, and finally to measure the associated challenges.

PHASE 3

~1 month

Action plan

The operational levers identified during the diagnosis are converted into an action plan.
By classifying these actions according to impact and difficulty of implementation, we can assign them a degree of priority.
Priority actions will be set out in an implementation roadmap.

Phase 1: Ownership

During the appropriation phase, analysts must adopt a project management posture and mobilize operational resources : several sources of information are needed to appropriate warehouse processes

Performance analysis

Analysis of warehouse data enables performance to be assessed using key indicators. For example, you can analyze flows, floor space requirements, headcount...

Field surveys

Visits enable us to obtain information that is inaccessible via analysis: out-of-process interventions, misplaced parcels, conveyor blockages, aisle congestion, etc.

Exchanges

Discussions with operational teams enable us to finalize our understanding of all site processes and operations.

Cost analysis

A breakdown of logistics costs by product family or process can be used to confirm or identify the origin of any malfunctions.

Benchmark

Internally, the warehouse's performance is judged against past performance and against the target/budget. Externally, benchmarks are used to compare existing performance with the best practices on the market.

A few notions to illustrate the Diagnostic philosophy

Lean Management

A production philosophy applicable to logistics that focuses on **minimizing the amount of resources employed** (including time) in the company's various activities. This involves identifying and eliminating all **non-value-added activities** for the warehouse, so that all logistics and administrative processes are simplified by continuously eliminating waste.

VALUE MAPPING

Analysis of all process execution steps to identify and eliminate non-value-added tasks.

FLEXIBILITY

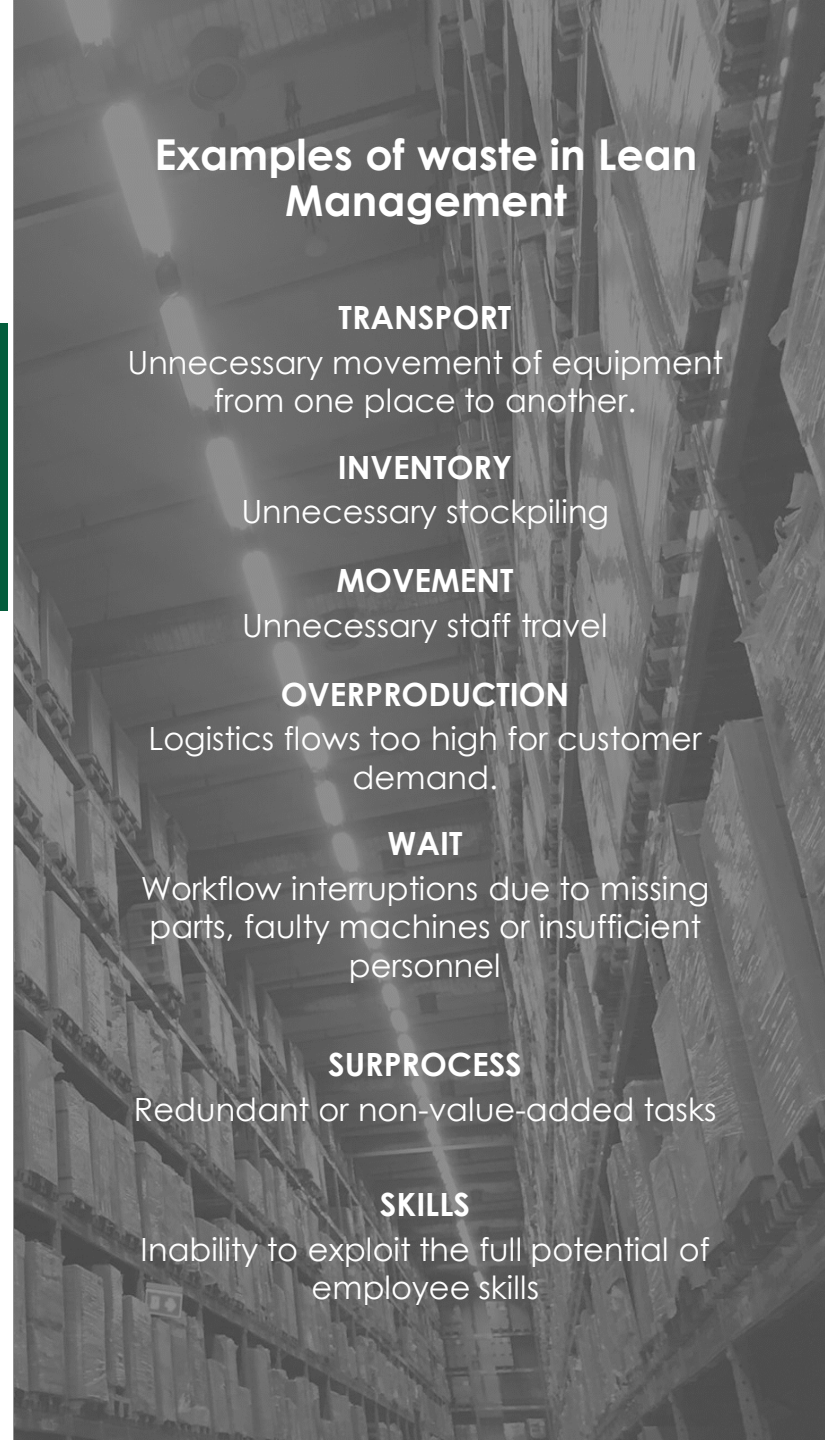
We employ multi-skilled workers at all levels, and set up flexible, increasingly automated processes to handle highly variable flow volumes.

TAKT TIME

Setting the pace of warehouse processes so that they are synchronized with demand.

5S METHOD

Methodology designed to create a working environment adapted to lean logistics.



Examples of waste in Lean Management

TRANSPORT
Unnecessary movement of equipment from one place to another.

INVENTORY
Unnecessary stockpiling

MOVEMENT
Unnecessary staff travel

OVERPRODUCTION
Logistics flows too high for customer demand.

WAIT
Workflow interruptions due to missing parts, faulty machines or insufficient personnel

SURPROCESS
Redundant or non-value-added tasks

SKILLS
Inability to exploit the full potential of employee skills

Phase 2 : Diagnosis

The diagnosis is mainly based on 4 axes

Logistics and transport costs

- Productivity
- Fill rate
- Fixed costs
- Interim rate
- ...

Flexibility / Risks Control

- Performance too dependent on organization Transport
- Performance dependent on B2B / B2C mix
- ...

Quality

- Error rate
- Breakage/missing rate
- Breakage rate
- ...

Service

- Preparation or delivery time
- Delivery support
- Sorting level Warehouse
- ...

For each axis, **operational levers** are identified, and their impact is assessed both **quantitatively** (time savings, financial gains...) and **qualitatively** (improved visibility, better working conditions...), along with their investment requirements and estimated ROI.

Phase 3: Action plan

In summary, an action plan must cover all the project's challenges

1

ACTION PLAN

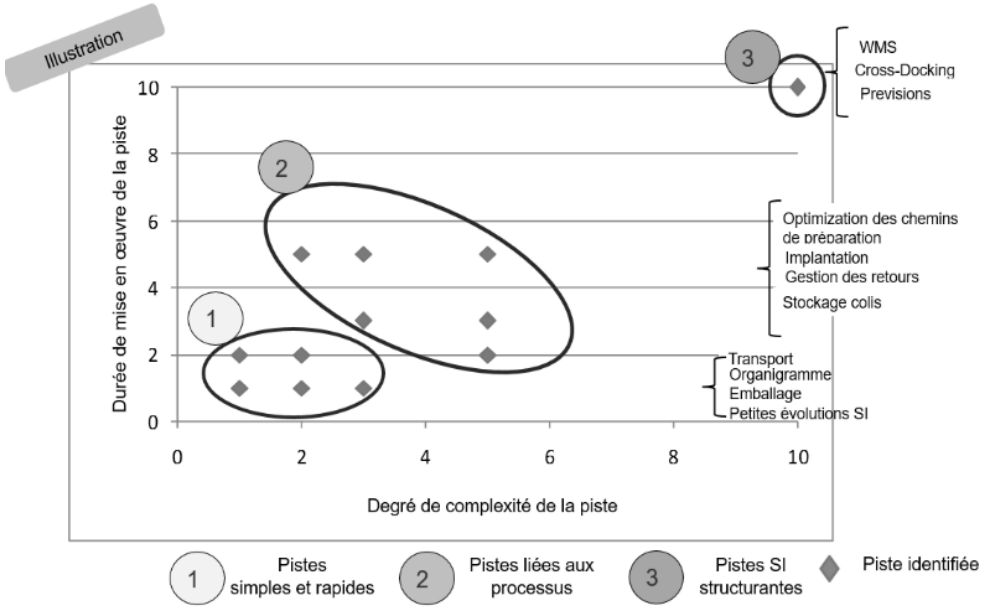
CATEGORIZATION OF PREVIOUSLY IDENTIFIED ACTIONS IN A MATRIX ACCORDING TO THEIR NATURE AND IMPACT

		Impact			
		Costs	Flexib.	Service	Quality
Quick-Wins	Action #1	x	x		
	Action #2		x		x
	Action #3	x	x	x	
Avenues under study	Action #4	x	x		
	Action #5	x	x	x	
Long-term prospects	Action #6	x			
	Action #7	x	x		

2

PRIORITIZATION

CLASSIFICATION OF ACTIONS ACCORDING TO IMPLEMENTATION TIME AND DEGREE OF COMPLEXITY

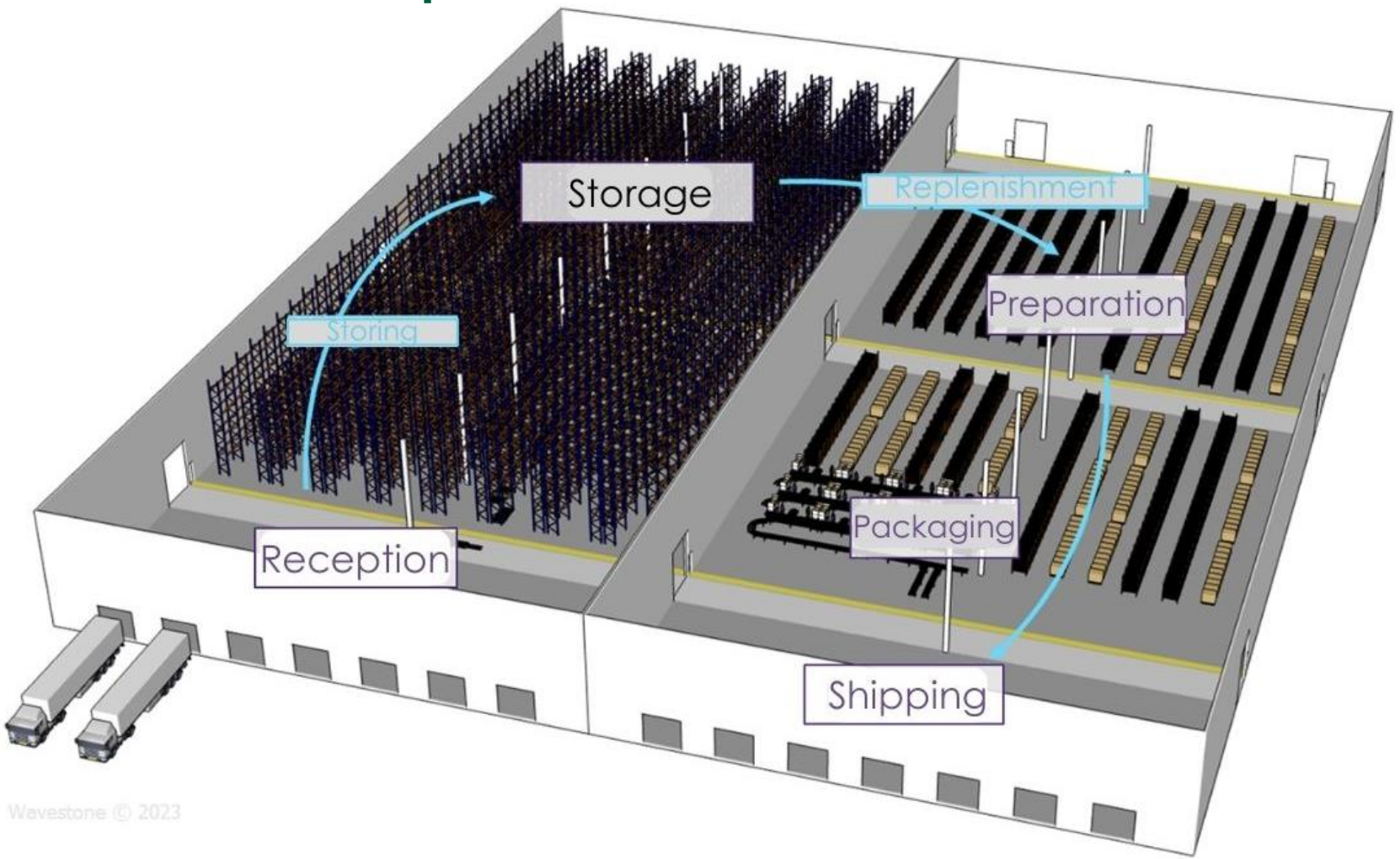


3

ROADMAP

DEFINITION OF THE ACTION IMPLEMENTATION PLAN, PRIORITIZING HIGH-IMPACT BUT LOW-COMPLEXITY ACTIONS

Phase 3: Action plan



Team management

The action plan is designed **to optimize the entire** warehouse **supply chain.**

Actions can therefore cover **all activities**, from product reception to dispatch, **as well as team management.**

Examples of actions impacting different warehouse activities

	Receiving / Shipping	Storage	Preparation	Packaging	Steering and management
Maximize deliveries by parcel and/or full pallet	x				
Facilitate container unloading (unloader, supplier pre-sorting, etc.)	x				
Receive with an expected receipt (no re-keying of BLs), receive to packing list (not to BL).	x				
Improve management of picking base replenishment to avoid shortages during preparation (priority management and adjustment of picking base sizing).		x	x		
Multi-order detailed picking (a single picking path for X orders)			x		
Prepare detailed orders by parcel (rather than by order) if many parcels are involved			x		
Optimize picked quantities by rounding up or down to the nearest package and/or pallet			x		
Optimizing the preparation path (slotting)			x		
Identify single-sku orders for specific pick-ups (differentiated preparation)			x		
Synchronize multi-sku pickup missions and order sorting operations			x		
Reduce the cost and quantity of packaging (purchase and cardboard fill rate)				x	
Identify mechanization possibilities (packing, goods to person, conveying, preparation, etc.)	x	x	x	x	
Optimize the use of existing mechanized equipment (correct allocation of sku, ergonomics of input/output stations, review of sizing, availability, etc.).	x	x	x	x	
Reduce the number of times parcels/items are touched from entry to exit	x	x	x	x	
Implement a WMS with appropriate IS functionalities (storage reliability with control key, preparation control, rotating inventories, etc.).					x
Manage resources and increase their versatility					x
Annualization of working hours					x
Reduce fixed overstaffing (structural, administrative, etc.), adapt management, digitalize administrative tasks					x
Set up a dashboard with appropriate KPIs					x

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Performance monitoring

Once the diagnosis has been made, warehouse performance needs to be monitored - if it hasn't already been done - to ensure that activity is aligned with objectives on a daily basis, with overall consistency at all levels of the company. This monitoring needs to be carried out both in real time, using a control tower, and a posteriori, using a dashboard.

CONTROL TOWER

Operational management tool

Timing:
- **Real-time** data observation for **immediate decision-making**

Functions :
- Prioritize tasks
- Managing resources
- Manage physical and financial logistics flows
- Provide visibility and traceability of field operations

DASHBOARD

Performance monitoring tool

Timing:
- Acknowledging **past** results and comparing them with indicators to move **towards change**

Periodicity :
- Choice of the appropriate **measurement grid** for the dashboard to **highlight changes** without letting the noise show through

Functions :
- Measuring change and progress
- Check whether targets have been met

02

Quick wins with automation under €1M

Quick wins in automation

For warehouses without automated systems and warehouses that are already automated

A **quick win** is a measure requiring few resources to implement, but with concrete, rapid results for the company.

-

In the warehouse, this corresponds to leverage requiring less than one million euros and less than one year to implement.

WAREHOUSE WITHOUT AUTOMATED SYSTEMS

In warehouses that have not yet implemented mechanized systems, it is possible to introduce automation solutions that require little initial investment and can be implemented quickly.

ALREADY AUTOMATED WAREHOUSE

In the case of warehouses that have already been automated, it is possible to identify quick gains that do not require a complete redesign of the systems.

Non-automated warehouses

In non-automated warehouses, it is possible to implement low-capex systems that offer gains in several areas

DIRECT EARNINGS

PRODUCTIVITY/ SPEED

Automated systems help to reduce **order processing times**, define a **more fluid and responsive organization**, and **cut piecework costs.** What's more, mechanized processes are easier to **monitor in** order to identify where efficiency can be improved.

WORKING CONDITIONS

Mechanized systems can handle tasks requiring the **carrying of heavy loads**, **non-ergonomic** positions, **long** walking **distances** and operations in **difficult environments** (cold, negative cold, noise, etc.). Improving working conditions helps to **ensure the reliability of resources** and avoid absenteeism. It also makes it easier to **recruit new staff**, by reducing the constraints associated with fitness restrictions.

SERVICE QUALITY

The use of mechanization in warehouse processes helps to avoid **human error**, thus improving **service quality** and **operational performance** (less rework required).

CAPACITY

Some installations significantly increase a warehouse's **storage capacity** by exploiting the site's volume rather than just its surface area, through **accumulation** (high-bay storage) or **density** (deep-bay storage). **Peaks in activity** can be easily passed, and production capacity can be optimized within the same building.

Examples of low-capex technologies

		Productivity Speed	Service Quality	Working conditions	Capacity
Receiving / Shipping	**Container/truck loading/unloading (telescopic conveyors, automatic loading/unloading docks, etc.)**	⚙		👷	
	Automatic **movement of** parcels/pallets between work areas (AMR, conveyor)	⚙		👷	
	Automated *buffering* between zones	⚙			📦
Storage	**Automated pallet storage systems** using height or enabling stock densification (high pallet storage; narrow-aisle storage; multi-depth storage, etc.).				📦
	Use of mezzanine floors to exploit the available height of preparation areas				📦
	Sloting/mapping of products to be prepared	⚙	🎯		
	Implementation of mechanized systems capable of adapting rapidly to changes in capacity (mobile shelving, 3D robots, shuttle robots, etc.).	⚙	🎯		📦
Preparation	**Operator picking** (Hand scanners, Voice Picking, Pick to light, Put to light, weighing...)	⚙		👷	
	Mechanization of transport/preparation operations in **difficult environments** (cold, negative cold, noise)			👷	
	Ergonomic workstations (handling assistance for heavy/bulky products, workstation height adjustment, exoskeletons, palletizing/depalletizing wells, etc.).	⚙		👷	
	Sorting of prepared packages (mechanized sorter, AMR sorting system, etc.)	⚙	🎯	👷	
	Automatic carton **forming / closing / opening**	⚙	🎯		
	Automated preparation/shipping **label application**	⚙	🎯		
Packaging	Package/pallet **preparation control** (weighing, camera checks, RFID readers, etc.)		🎯	👷	
	Pack height and closure		🎯		
	Packing of parcels/pallets for transport optimization	⚙		👷	
Steering & Management	**Digitization** of systems (elimination of paper, use of PDAs, screens, hands-free mode, etc.)		🎯	👷	

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Automated warehouses

In automated warehouses, identifying the sources of performance degradation enables you to select ways of making rapid gains.

Equipment/system performance not achieved

Mechanized systems are sometimes undersized or oversized in relation to the flows they handle. It's easier to adapt existing systems than to completely redesign them.

Possible causes of the problem

Non-flowing parcel traffic, bottlenecks, shortage of work on certain sub-systems, lack of buffers at strategic points, etc.

Operator performance, performance of complete equipment/system not in line with expectations

Equipment failure: availability of a complete piece of equipment/system that does not meet expectations

Product mapping/slotting

To make the most of the added value offered by automation, it is preferable to use the mechanized part to handle low-volume references that require more energy for preparation, rather than products with the largest flows.

Possible causes of the problem

Product mapping between different sub-systems resulting in load imbalances between sub-systems

Product slotting leading to increased reorder movements or excessive stock coverage rates

Changing product/order mix, leading to under-utilized or bottlenecked subsystems

Deterioration in system use or control

Making the right choices in terms of launch and order mix management is crucial when managing automated systems.

Possible causes of the problem

Size of waves launched not compatible with buffers used

Coverage rate too high or too low

Unreliable forecasts / pre-packing calculations, WCS/WMS rules

Team organization: managing breaks, loss of knowledge, turnover

Ageing installations

Time can take its toll on automated systems. It's important to maintain systems and make continuous improvements to keep pace with changing flows.

Possible causes of the problem

Inadequate maintenance

Complexity of absorbing growing volumes

03

Success stories with 5 different solutions

Retail preparation optimization for class B and C cosmetic products

DIAGNOSTIC

Soditra Logistic has a 16,000 m² logistics platform in Nivelles, Belgium. This platform handles, among other things, the **preparation of small cosmetics products for L'Oréal, which represent a large volume of different items in class B and C** (medium and slow turnover).

The issues are as follows:

- **Costs:** limited productivity
- **Flexibility:** manual preparation (conveyor or in-station)
- **Quality:** risk of human error
- **Service:** managing rising demand

SOLUTION IMPLEMENTED

Scallog is a B2B and B2C order-picking solution with **mobile shelving and robots.**

Benefits

- Goods to Person (GTP) principle: fixed-station preparation, ergonomics, traceability, quality
- Stock management, inventory and replenishment at the same time as picking
- Enables B2B and B2C order picking

Limits

- Unsuitable for Class A products (high turnover)

Key points of the project, in 2 stages :

- "Starter Kit" in 2018: 12 robots, 150 shelves, 4 stations
- Expansion in 2022: 32 robots, 500 shelves, 8 stations

FEEDBACK

Success factors

- Anticipation, construction of a slab dedicated to the project
- Technology for multi-phase installation

Challenges met

- Production continuity management
- Robot version upgrade (V6)

KEY PROJECT RESULTS

Cost: 500 K€ (2018) + 800 K€ (2022)

Deployment time: 4 weeks

ROI: 3 years

Benefits :

- Productivity gains x3 (400 to 450 pickings/h)
- Storage savings of 30 to 50%.
- Reducing drudgery

Densified warehousing for highly variable products in the industrial equipment sector

AMDP MADE FOR INDUSTRY | OCETA WE CONNECT YOUR SYSTEM | AutoStore | DEMATIC

DIAGNOSTIC

AMDP and OCETA distribute industrial equipment and tooling for industry. They are based on the same logistics site at Saint-Cyr-L'Ecole. The items concerned **vary widely in size, with some products compatible with automated totes,** the rest in storage and preparation on shelves.

The issues are as follows:

- **Costs:** lack of storage space
- **Flexibility:** highly manual preparation, various product sizes
- **Quality: a** lot of operator movement
- **Service:** growing demand, increasing flows

SOLUTION IMPLEMENTED

AutoStore empoweredby Dematic is a Goods-to-Person automated storage and order-picking system.

Benefits
- Very high storage density (optimized space)
- Adaptable and quick to install
- Scalability, productivity (robots can be added)

Limits
- Suitable for processing small parts

Key points of the project
- Replacement of 2/3 of a mezzanine floor+1, floor area 144 m²
- Deployment of an AutoStore with 4,900 bins, 4 R5 robots, 3 conveyor ports, 83 m² footprint

FEEDBACK

Success factors
- Communication
- Collaboration between the Dematic and AMDP / Oceta teams
- Involvement of all staff in the project

Challenges met
- Business continuity
- Very limited space for equipment storage
- Concerns about such a transformation

KEY PROJECT RESULTS

Cost: <€1M

Deployment time: 2 months

ROI: recent project (N/A)

Benefits :
- Improved service quality: 100% of BLs prepared the same day
- Gains in product traceability
- High elasticity of productivity/operation
- Gains in teams' interest in their work

Vertical storage and improved working conditions in the building materials sector

DIAGNOSTIC

The customer is a building materials distributor in France. On its platform, **the growing customer was encountering several problems**:

- **Costs:** low productivity
- **Flexibility:** varied products (scaffolding, wheelbarrows, etc.), complicated high-level storage with forklifts
- **Quality:** product deterioration, safety risk for forklift drivers
- **Service: a** growing business

SOLUTION IMPLEMENTED

For this project**, Alfi** developed an automated storage system**: a multi-product, large-dimension, high-load stacker crane.**

Benefits

- Storage of various products, heavy loads, large dimensions
- Complete solution integrating WMS to optimize storage densification

Limits

- Suitable for complex, bulky, heavy products

Key points of the project

- Stacker crane: 3,000Kg, 15 m high
- Duration: gradual transfer, rapid ramp-up

FEEDBACK

Success factors

- Digital warehouse twin
- Operator training
- Integrator availability

Challenges met

- Business continuity
- 1st mechanization project, lack of knowledge of operators

KEY PROJECT RESULTS

Cost: €1M

Deployment period: 12 months

ROI: recent project (N/A)

Benefits :

- Implementation of KPI monitoring: quality, traceability and productivity
- Reduced use of floor space
- 50% productivity boost for fast-moving orders

Improved efficiency and increased capacity without business interruption

DIAGNOSTIC

Refresco, a bottling specialist, has a logistics platform in Saint-Alban les Eaux, where up to 40,000 pallets can be stored. This sizeable **automated site, with a** workforce of 250, enables Refresco to **bottle and store** products 24/7.

After an initial AGV conveyor project in 2012, the site is now facing the following issues:

- **Costs:** limited capacity
- **Flexibility:** system made up of 10 ageing AGV robots
- **Quality:** aging of existing equipment
- **Service:** increasing flows

SOLUTION IMPLEMENTED

Alstef Group's CM3 AGVs are the transmission belt between upstream flows *(production lines)* and downstream flows *(storage and dispatch)* for pallet handling.

Benefits

- Automatic battery charging system ensures business continuity
- Agility and scalability of the solution, enabling the system to evolve as needed
- Reduced load damage

Limits

- Risk of traffic saturation

Key points of the project, in 2 stages :

- First project in 2012: 10 AGVs, 9 to 12 months of project work
- Second project in 2021: 6 AGVs, < 9 project months

FEEDBACK

Success factors

- Preparing for the life of the plant (maintenance and operating skills)
- Functional analysis at start-up

Challenges met

- Absorption of very high flow rates at start-up
- Interdependence of components for scalability

KEY PROJECT RESULTS

Cost: >€1M (2012), <€1M (2021)

Deployment time: 4 days

ROI: recent project (N/A)

Benefits :

- Increased productivity: >200 pallets/h
- Greater flexibility: 19 different flows managed by AGVs
- Securing the aging risk of older robots

Increased productivity at the end of the line thanks to modular, scalable semi-automated operation

DIAGNOSTIC

SOS Accessoire, France's leading e-commerce retailer of spare parts for household appliances, is experiencing very strong growth, which has prompted it to invest in a **new** 8,000m2 **logistics site** in Maurepas.

Due to **growth** and the wide **range of** product sizes, weights and packaging, the site is faced with the following problems:

- **Costs:** problems at the end of the line
- **Flexibility:** need for scalability to keep pace with growth
- **Quality:** plurality of supply
- **Service:** saturation of preparation processes, m² constraints

SOLUTION IMPLEMENTED

BOA Concept was entrusted with the automation of the preparation processes. The installation comprises a manual picking system and two separate packing zones with conveying, case sealing and dispatch sorting.

Benefits

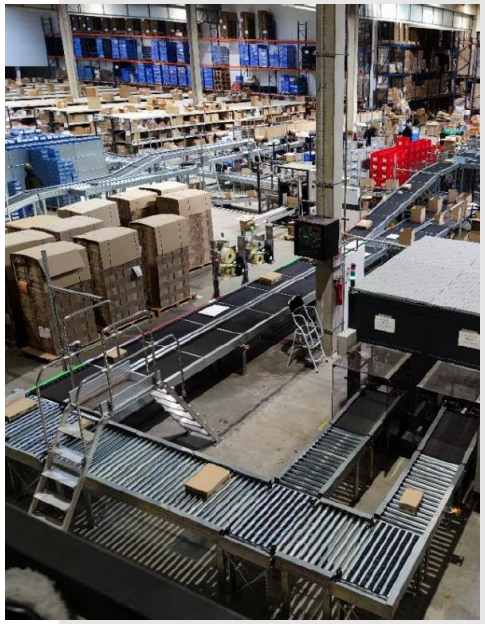
- Mixed bag/carton/bag chain from 0 to 30kg for easy management of heterogeneous loads
- Expandable solution for growth thanks to modular installations

Limits

- Rapid growth in flows, leading to plant upgrades

Key points of the project :

- 400m of conveyors on a 1500m² surface on several levels



FEEDBACK

Success factors

- Accompanying change
- Involving operators during the design phase

Challenges met

- Sizing assumptions that varied during the project
- Mixed loads

KEY PROJECT RESULTS

Cost: €1m

Deployment time: 4 weeks *(without production downtime)*

ROI: confidential

Benefits :

- Increased productivity: 1000 parcels/h
- Semi-automated operation designed to evolve towards more complete automation

CONCLUSION

A stacker crane, automated storage, fleets of vehicles on the ground or in/on a rack... what's the story behind these projects?

- They range from the most specific (a stacker crane, for example) to the most versatile (an AGV or AMR moving bins and pallets).
- From the most fixed, bolted-to-the-ground solution (rack, conveyor, sorter) to the easiest to move and reconfigure.
- From heavy to light...
- And with ever-decreasing energy requirements.

Speaking of "*quick wins*", we would have said...

- 20 years ago, compact picking machines...
- 10 years ago, AMR, reconfigurable conveyors...
- And in the last five years, the exponential growth of mobile robotics...

This current surge prefigures automation without investment (except in people, of course, as all projects must be intelligently managed), where equipment is installed, leased or financed on a pay-as-you-go basis, removed and reinstalled at new customers' sites - a model already well known for forklift trucks, as well as for logistics IT (SaaS).

This evolution in technology is well suited to the concerns of markets that are unable to predict long-term economic trends. It will enable the use of technology to be democratized, with limited risks, and it will be that of "quick wins", alongside much more structuring operations (automated storage or sorting, for example), which will retain their legitimacy for compacifying and enabling significant storage or activity in a restricted space (and which are justified to a large extent by the constructive savings made).

It already enables companies to start small, grow, shrink, rent, move... equipment.

See you in a few years' time to think about what's next...

France Supply Chain by Aslog

They make our ambitions possible

To stay connected :

LinkedIn :
@FRANCE SUPPLY CHAIN by Aslog

Contact:
contact@francesupplychain.org

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