



Industrialisation du chantier & Construction hors site

Workshop 18 novembre 2021

<https://cementlab.infociments.fr/>

BALYO

AUTONOMOUS VEHICLES
FOR LOAD & PALLET MOVEMENT

Pallet-movement as a Service

November 5th, 2021



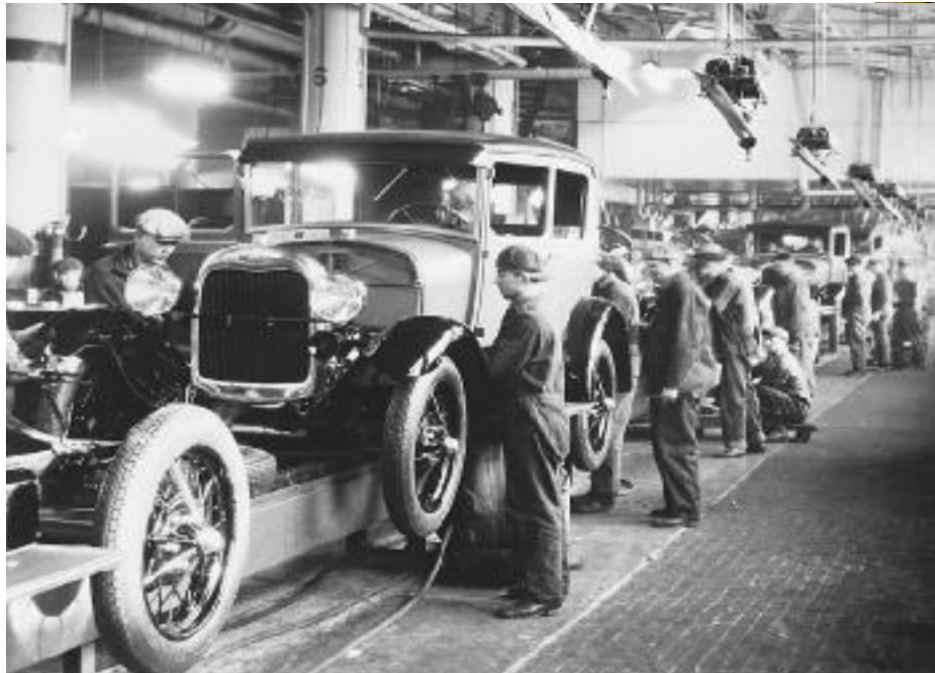
Linde robotics

INTRODUCTION

CONVERT MATERIAL HANDLING TO AUTONOMY

«BEST JOBS »OF YESTERDAY...

...NO ONE DOES ANYMORE TODAY



CONVERT MATERIAL HANDLING TO AUTONOMY

STILL TOO MANY REPETITIVE, TIRING & NON CREATIVE TASKS



NO ONE WILL WANT TO DO TOMORROW

CONVERT MATERIAL HANDLING TO AUTONOMY

A MAJOR CHALLENGE FOR INTRALOGISTICS



- **More than 5 million**
Material handling vehicles deployed around the world
- **>€40 billion**
Annual global expenditures on material handling
- **More than 80%**
Of handling vehicles operating costs related to driver costs
- **€200 billion**
Annual global expenditures on pallet handling
- **\$380 million**
Estimated annual expenditures on material handling of a major client

But, less than 1% of pallets moved today by robots !

TWO STRATEGIC ALLIANCES

SERVICEABILITY - WORLDWIDE



No.2 worldwide
No.1 in Europe
No.3 in Asia
36,000 employees*
€8.3 billion revenue in 2020*



No.5 worldwide
No.2 in the United States
7,600 employees
\$2.8 billion revenue in 2020

*KION figures

GLOBAL CLIENTS REACH

OVER 1,000 FORKLIFT ROBOTS SOLD AT 200+ CLIENTS, 300+ SITES in 30 COUNTRIES



Targetted sectors : Logistics, Manufacturing at FMCG & Automotive

LOGISTICS



FMCG



AUTOMOTIVE



AND MANY OTHERS...





THE «DRIVEN BY BALLYO »TECHNOLOGY

TECHNOLOGY



Manual Truck

- Robust
- Affordable
- Parts & Services available worldwide

Driverless kit

- Infrastructure free
- Integrated design
- Adaptable to changes

Robotic Truck

- Dual driving modes : Automatic & Manual
- Global & Local service



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PALLET MOVEMENT AS A SERVICE

FROM FORKLIFTS TO PALLET MOVEMENT SERVICE

Manual Forklifts



Autonomous Forklifts



Pallet-movement as a Service



"Remote" Supervisor



Remote sites (Client HQ, Balyo or Partner Site)

Client sites



Robots "remote control enabled"



- Significant payroll expenditure
- Forklift trucks fleet operated by clients
- Very high OPEX
- Variable productivity

- Lowered payroll expenditure
- Forklift Robots fleet operated by clients
- ROI 1>2 years on 2>3 shifts operations
- Replace OPEX with CAPEX

- No/limited upfront expenditure
- Robots fitted with remote supervision kit
- Robots fleet operated remotely
- All included, simple
- Pay-per-use, immediate ROI
- No CAPEX, reduced OPEX

WHY PALLET MOVEMENT SERVICE?

- Autonomous forklifts = Free, unlimited Drivers
- Transition to Autonomy dampers
 1. I have no CAPEX for robotics projects
 2. I have no CASH for transition to autonomous material handling, as it is non-core business
 3. I want Short-term or, best, immediate RoI on industrial investments
 4. I have no Robotics Engineers to design & manage transition to robotics
 5. I have no Expert to Supervise Robots in operation
 6. I wait for the “next big thing” ...

“Pallet-Movement Service” Driven by Balyo provides a 360°, simple transition and experience from manually operated forklifts to fully autonomous and remotely supervised robots.

PALLET MOVEMENT SERVICE AT A GLANCE

1. Pay per pallet model *No CAPEX investment, fully transparent cost management*
2. Limited payment upfront, then pay per use *Limit CASH-out to a minimum, full transparency on cost*
3. Pay per use = immediate payback *One pay as a service, no service = no payment*
4. Balyo installs & operates robots for you *No need to recruit Robotics engineers, it is a service!*
5. Robots supervised & controlled remotely *No need to train and keep local robot supervisors*
6. Always the latest technology *Over the air update to keep up with latest functionalities*

HOW TO DELIVER THE SERVICE?

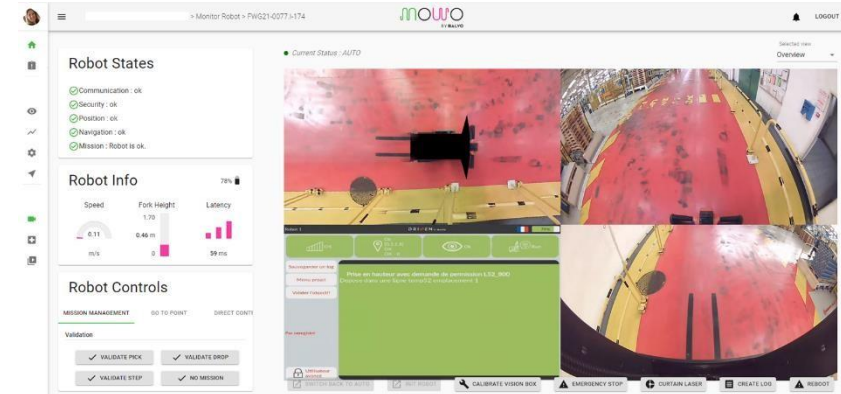
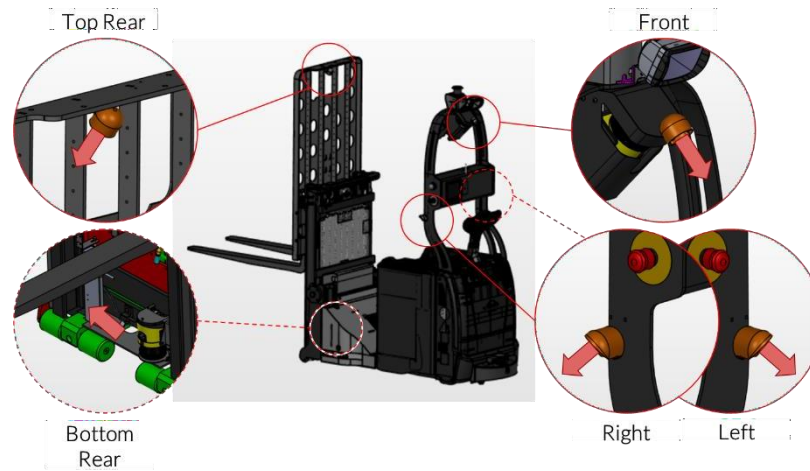
(1) Standard Autonomous Robots



(2) Remote Vision Box "Add-on"



(3) Cloud-based Remote Robot Fleet Manager



CAPEX > LEASE > SERVICE

	150k€	3k€ / month	1,5€ per move
	Buy	Lease	Service
CAPEX vs OPEX	CAPEX	CAPEX/OPEX	✓ OPEX (pallet move)
Maintenance	~10 k€/year*	~10 k€/year*	✓ Included
24/7 Robotics Supervision ⁽¹⁾	35 k€/year ⁽³⁾	35 k€/year ⁽³⁾	✓ Included ⁽²⁾
Performance vs Mean promise to Client ⁽⁴⁾	✗	✗	✓ Included
Flexibility - Pay per Use	✗	✗	✓ Included
Remote Update ⁽⁵⁾	✗	✗	✓ Included
Real Time KPI & Improvements ⁽⁵⁾	✗	✗	✓ Included
Performance vs Means engagement during contract life	✗	✗	✓ Included
Off Balance-Sheet (IFRS 16, since January, 1st 2019)	✗	✗	✓ Yes

(1) Robots needs a human supervision & trained operators in situ if not supervised remotely

(2) For Service, robots Remote Supervision & control is included.

(3) For Buy & Lease, additional cost need to be taken into account ~0.3 FTE per shift or 1 FTE / system / year

(4) For Service, if robots are not moving any pallet, one does not pay anything

(5) Regular software update for free performance improvement and service update. Incl. access to any new service (may include additional subscription)

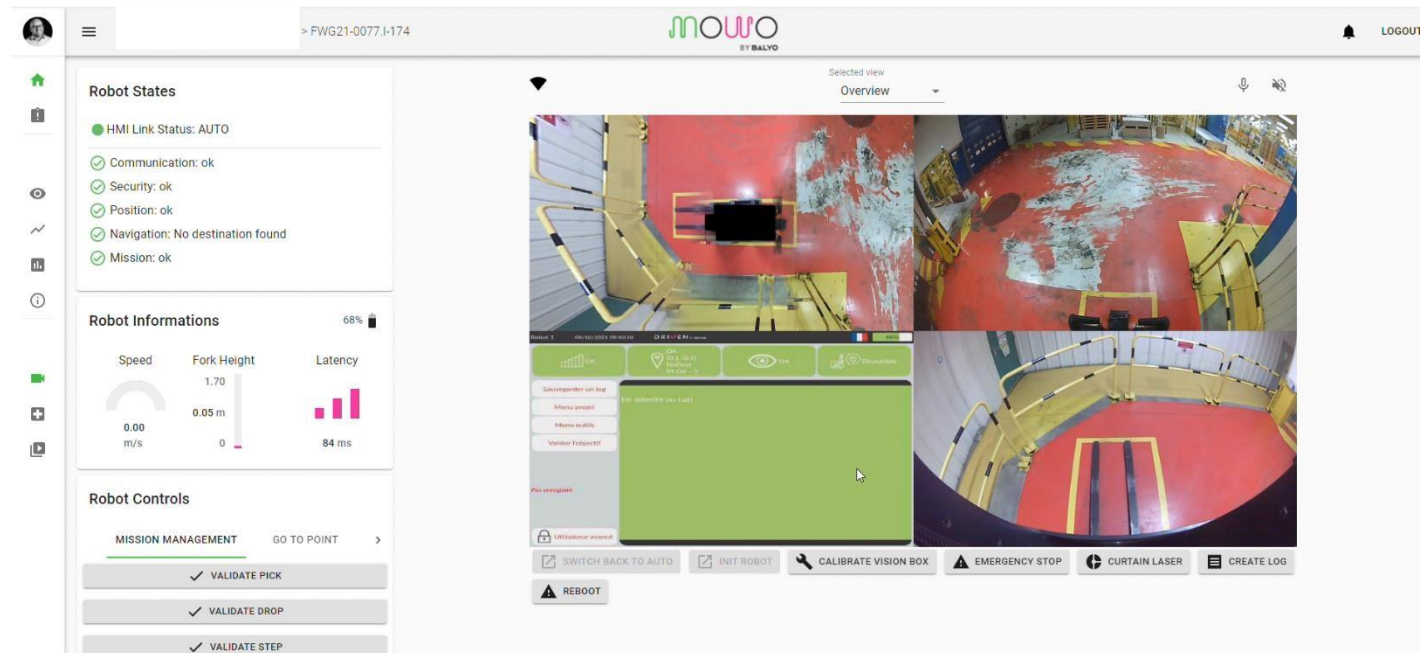
*Pricing example for a simple floor to floor application with 2 Robots



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PALLET MOVEMENT AS A SERVICE

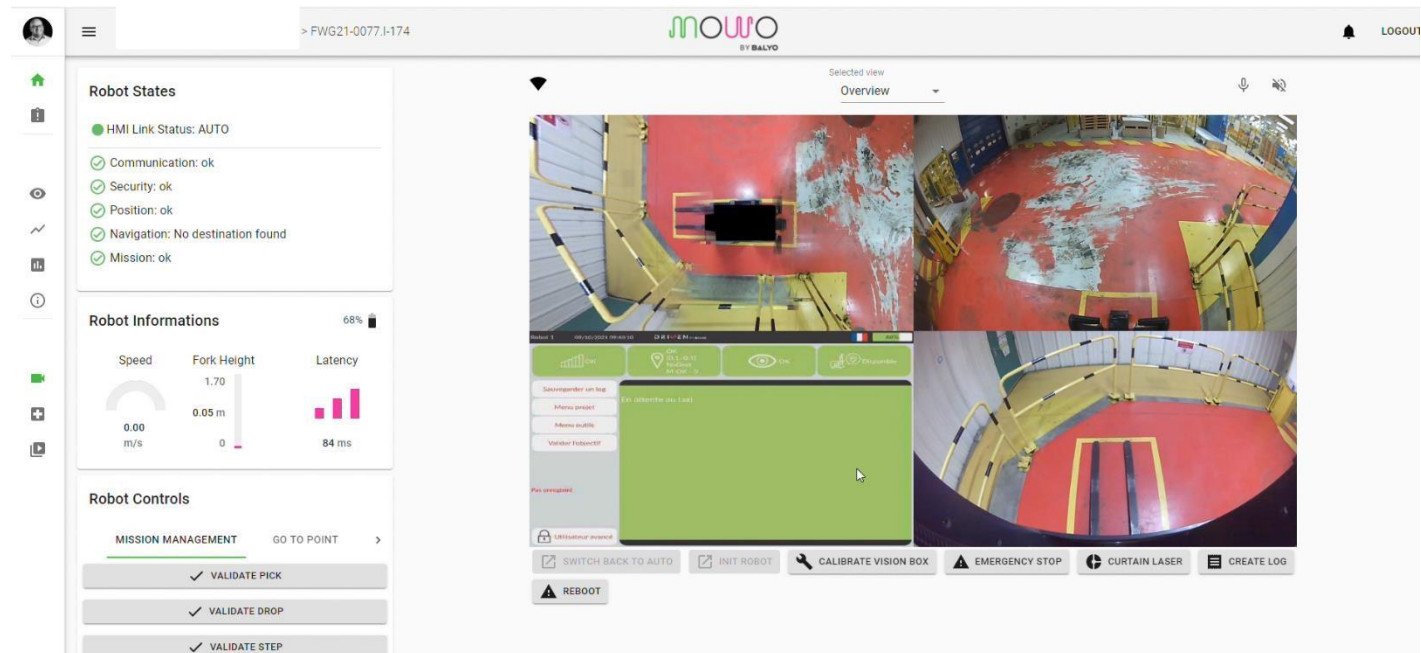
KEY ADVANTAGES: MONITOR FLEET

- Check on robot environment in real-time, as if you stood there !
- Communicate with operators for action, as if you stood there !



KEY ADVANTAGES: CONTROL ROBOT

- Using a simple joystick
- ✓ Correct robot errors / movements
- ✓ Adapt robot behavior (misplaced pallet)
- ✓ Reset robot
- ✓ Send robot to alternative location



KEY ADVANTAGES: LOG CALENDAR

- Event logging onto calendar

No need for long issue root-cause analysis - all facts are at your hand !

- Improve operational execution quickly

Speed up operational learning-curve

The screenshot displays the mouro BY BALYO monitoring interface. The top navigation bar includes the user profile, a search bar with the text '> Monitor Robot - FWG21-0077-I-174', the mouro BY BALYO logo, and a LOGOUT button. Below the navigation bar, there are camera view selection buttons: Front, Left, Movebox Gui, Rear Bottom, Rear Top, and Right. The main interface is split into two panels. The left panel, titled 'Videos available on 2020/02/18', shows a log calendar with 19 rows. It indicates '9 recordings found that day'. The calendar entries are: Event: 8:11 (green), Event: 11:26 (green) and Event: 11:41 (green), Event: 13:16 (green), Event: 15:30 (pink), Event: 17:11 (green) and Event: 17:18 (green), and Event: 18:28 (green). The right panel shows a video feed from the 'Front' camera, displaying a robot in a warehouse environment. The video player shows a timestamp of 00:05 / 1:40. A 'DOWNLOAD LOGS' button is located in the bottom right corner of the video player area.

KEY ADVANTAGES: REAL-TIME KPI

- Track robot & flow performance
- Understand top error list & act on impacting technical or operational issues
- Identify service requirements, drop in performance
- Follow cost transparently

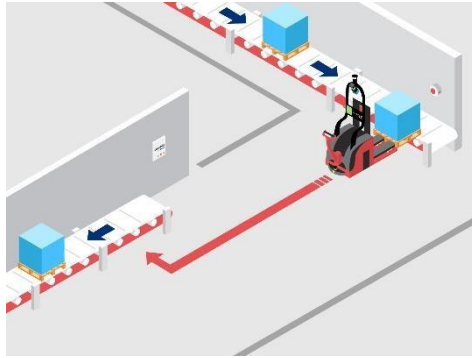




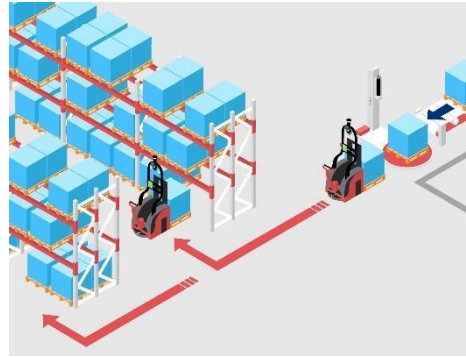
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PRODUCTS & APPLICATIONS

AUTONOMOUS APPLICATIONS

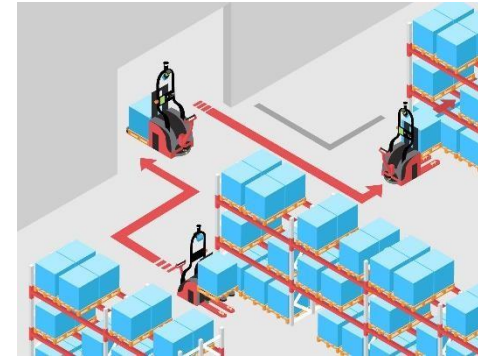
CONVEYORS
INTERFACE



END OF LINE
& STORAGE



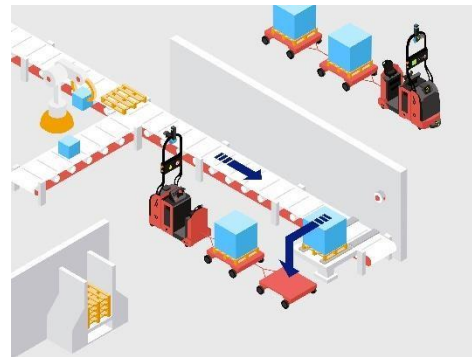
STACKING



MACHINES INTERFACE



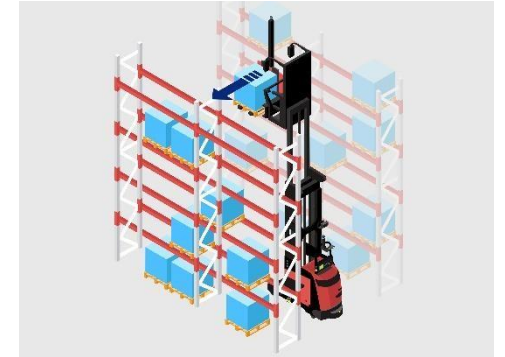
LOGISTICS TRAIN



HIGH STORAGE



VERY HIGH STORAGE



AUTONOMOUS «IN-RACK» APPLICATIONS

ONE OF THE BROADEST HIGH-LIFT STORAGE APPLICATION COVERAGE ON THE MARKET WITH MOBILE ROBOTS

AVAILABLE

SOON

NOK



From 2.9m aisles up to 11m



VNA up to 17m+



Gravity



Canteliver



Shuttle



Mobile rack



Block storage



Drive-in



Push back



Double deep

GLOBAL ROBOT RANGE: 360° WAREHOUSE



TRUCKY



CB LOWY - READY*



TUGGY



LOWY - READY*



LOWY ML/HL



CB LOWY ML/HL



REACHY - READY*



VEENY

Tugger, Pallet /Jack, Stacker & CB Stacker robots for Floor & Low-lift up to 3,5t pallets and 7t trailers

Stacker & CB Stacker robots for Middle-lift up to 4m Pick & Drop and 1,6t pallets

Reach & VNA robots for High-lift up to 17m Pick & Drop and up to 1,6t pallets

*Pallet movement as a service

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