

QENVI ROBOTICS

→ Artificial Intelligence at your service

At the heart of innovation (AMR)

QENVI group presentation



The story of **QENVI** began in 2008 in the Sophia-Antipolis technology park near Nice/France.

The **QENVI** parent company is made up of experts:

- In support of Quality/Safety/Environment/Lean 6sigma certifications
- business strategy
- In engineering services (IT, embedded, robotics, AI).
- **QENVI has CIR approval**



As part of its QSE/Lean 6 Sigma services, **QENVI** raises with its customers the problem of arduousness and its cost in industries, but also the lack of flexible load carrying solutions adapted to different processes.

In 2016 QENVI created its subsidiary **QENVI Robotics** which offers its customizable standard robots which have tracking and/or autonomous functions that can carry loads of up to 150kg or 300kg.

QENVI Robotics develops custom-made robots for its customers that can carry up to 2 tonnes: wheelchair, stretcher, hydraulic machine, etc.

QENVI Robotics offers you its software for: Inventory management, Fleet management.

Patents filed in France and Europe (10 countries).

History



2008

- Creation at Sophia-Antipolis

2016

- QENVI ROBOTICS
(Qenvi subsidiary)
- Stocks management

2018

- CIR agreement
- +10 patents in Europe
- Follower Robots (AMR)



2020

- Custom made solutions (wheelchair, hydraulic machine, ...)

2022

- Fleet management
- Autonomous robots (AMR)

QENVI ROBOTICS Team



Laurent Van den Reysen

CEO and founder of QENVI and QENVI Robotics

Ecole Centrale Lille, 32 years experience (SOPELEM, CAP GEMINI, PSA, ATOS ORIGIN, QENVI)



Artem - PHD robotic

More than 15years of robotic experience .

Software development: Development of signal processing, data acquisition or control applications

Automation and Robotics: Position control, Admittance or Impedance Control, Neural Control, Localization

Artem has joined QENVI in 2019



Marianne Ray, Business developer

UTT School of Technology University of Troyes: Mechanical Engineering, Specialized. production system design.

MBway School (IPAC), MBA2: Title nv1: Manager of Commercial Development. International Development Specialty

Marianne has joined QENVI in 2015

Technical teams:

The QENVI Robotics team is made up of 4 full-time robotics engineers/PHD and part-time engineers/PHD.

The QENVI team is made up of more 35 consulting engineers/PHD who are passionate about IT, robotics, embedded and AI professions.

Cobotics : Following = human + robot

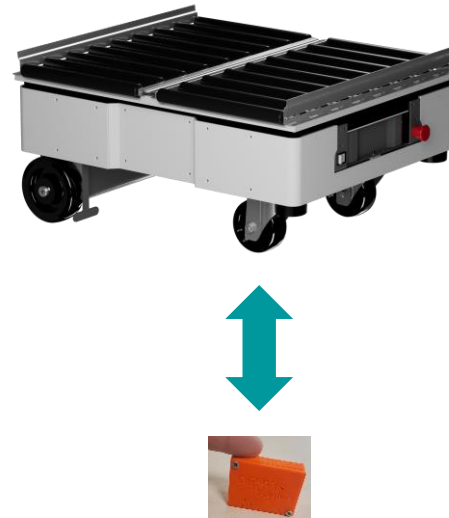
The cobot, or collaborative robot, is a robot intended to carry out work in collaboration with humans with the aim of freeing them from arduous tasks with low added value and improving their productivity.

An important segment of sector growth

Collaborative robots are the fastest growing elements of industrial automation

Easy installation

The installation of **cobots** is **simplified** and requires fewer arrangements. **Cobots** are deployed in open spaces and can adapt to their **environment**



A tool serving SER issues

Cobotics allows to respond to several issues within industrial companies

- Work accidents
- Musculoskeletal disorders among employees
- Lack of handling tools and ease of installation
- Lack of efficiency in movement operations
- The difficulty of recruiting
- **Better acceptance**

Robotics: AUTONOMY = robot

The autonomous robot replaces humans in repetitive tasks.

A very strong growing segment

Robots are the fastest growing elements of industrial automation.

A very important ROI.

A setup to watch out for

Autonomous robots must be welcomed after a detailed analysis of the processes.

Their development environments must be studied and correspond to **standards**.

No limit to a mapped environment, you can go outside.



An acceleration tool

- Work accidents
- Musculoskeletal disorders among employees
- Lack of handling tools and ease of installation
- Lack of efficiency in movement operations
- The difficulty of recruiting
- **Almost total replacement of the workforce for impacted tasks**
- **Moe is reoriented towards tasks with greater added value**

Our standard products: 2 customizable bases

They carry 150kg and 300kg and can be equipped with “following” and “autonomy” functionalities as desired or in combination.

Small and handy, the Qbot150 allows optimized handling in the narrow aisles of your warehouse.



The “Qbot150” robot can carry your loads up to 150kg. ()
Battery life of 8 hours.
Interchangeable rackmount battery*

Impressive and easy to handle, put the Qbot300 to the test when carrying your heaviest loads!



The “Qbot300” robot can carry your loads up to 300kg. ()
Battery life of 8 hours.
Interchangeable rackmount battery*

All QENVI Robotics robots are CE, machine, radio, BT and EMC certified. (see ISO3691-4 driverless trolley)

Examples of personalization



Qbot150 Customized Trunk



Qbot150 Customized Trunk



Qbot150 Custom Rollers



Qbot150 Custom Rollers



Qbot150 custom drop sides



Wheelchair

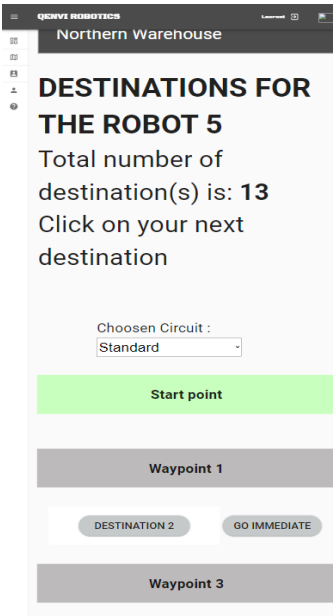
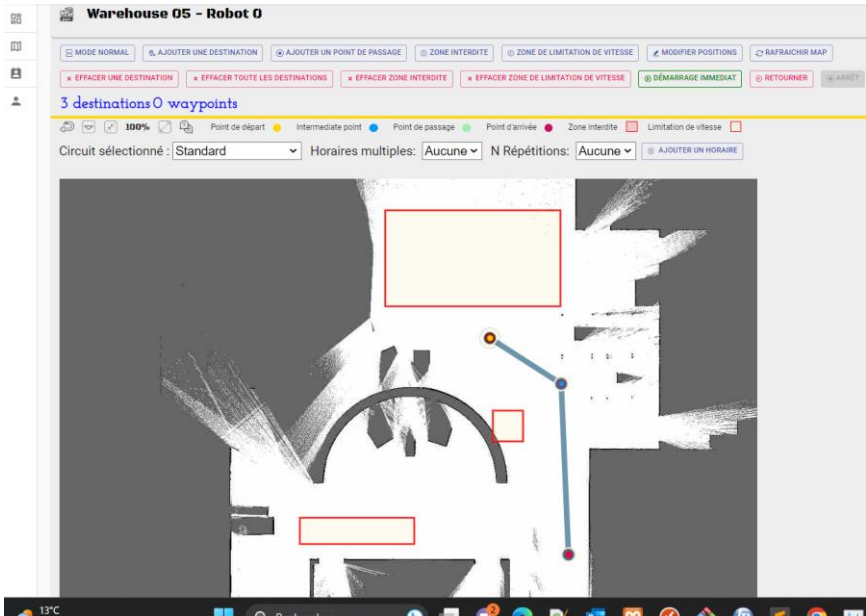
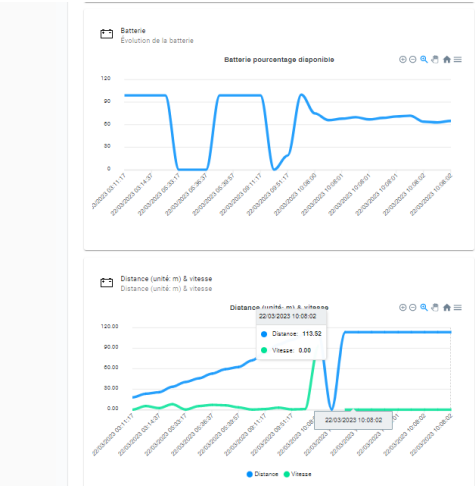
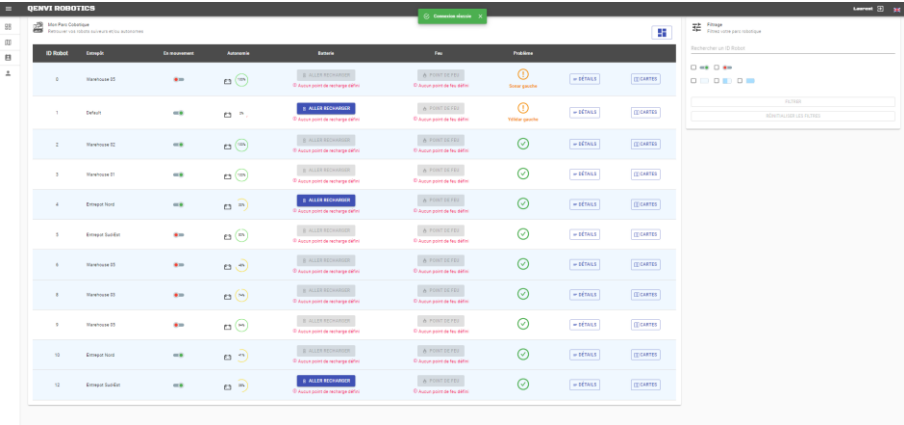
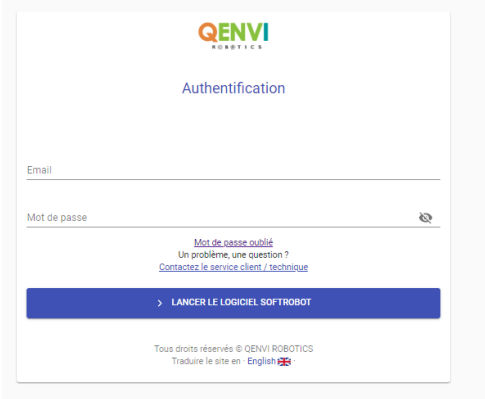


QBOT-300



QBOT-300

Fleet management software



Choose QENVI Robotics:

A high-end partnership for the modernization of your business:

We offer you unique solutions thanks to our tailor-made service.

A high-tech, easy-to-use solution to optimize your product movements and your most recurring tasks.

Substantial return on investment (ROI):

Saving time and reducing costs:

- Reduction in micro-operations (monitoring);
- Liberation of the resource (autonomy).
- Transported loads increased tenfold for the same FTE.
- Increase in the added value of an employee's work.

Your winning partnership with QENVI Robotics

The QENVI Robotics team:

Our team made up of engineers and PHDs in robotics and AI is involved and attentive to your issues with tailor-made assistance and availability.

A Human solution:

Reduction in arduousness and work accidents.

Reduction in MSDs (musculoskeletal disorders) and pain associated with manual work.

The Cobot helps humans, it does not replace them.

Increased employee satisfaction and reduced absenteeism.

A secure and certified solution:

QENVI is an expert in Quality / Safety / Environment support.

QENVI Robotics robots are equipped with emergency stop buttons, Lidars and sensors to detect and avoid obstacles.

QBOT 300

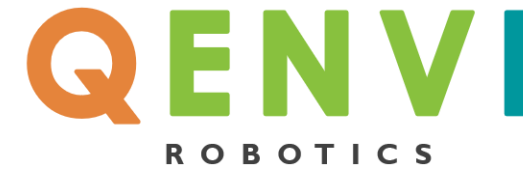
Applicable standards and EU directives

- NF_EN_ISO_3691-4_driverless_handling_truck
 - NF_EN_ISO_12100-2010_principleGeneralConception_risk
 - NF_EN_ISO_13849-1_machine_safety
- +
- European directives: Machine, BT, CEM, Radio

Laurent VAN DEN REYSEN, manager, expertise in quality:

- https://www.qenvi.com/work/bootstrap/images/certificat_IRCA_ISO9001v2015_laurent_VANDENREYSEN.PDF
- https://www.qenvi.com/work/images/qenvi/certificat_IRCA_ISO14001v2015_laurent_VANDENREYSEN27022016.pdf

QENVI ROBOTICS patent



<https://worldwide.espacenet.com/patent/search/family/059014498/publication/EP3382488A1?q=3382488>

Référence	Titre abrégé	Pays du dossier	Etat du dossier	Date de dépôt	Numéro de dépôt	Date de publication	Numéro de publication	Date de délivrance	Date d'expiration	Titulaire
B03683 FR	CHARIOT ROBOTISE	FRANCE	En vigueur	31/03/2017	FR.17/52774	05/10/2018	3.064.761	17/09/2021	31/03/2037	QENVI ROBOTICS
B03683 EP	CHARIOT ROBOTISE	EUROPE	Validé	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP BE	CHARIOT ROBOTISE	BELGIQUE	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP CH	CHARIOT ROBOTISE	SUISSE	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP DE	CHARIOT ROBOTISE	ALLEMAGNE	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP ES	CHARIOT ROBOTISE	ESPAGNE	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP FR	CHARIOT ROBOTISE	FRANCE	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP GB	CHARIOT ROBOTISE	ROYAUME-UNI	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP IT	CHARIOT ROBOTISE	ITALIE	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP MC	CHARIOT ROBOTISE	MONACO	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS
B03683 EP NL	CHARIOT ROBOTISE	PAYS-BAS	En vigueur	02/06/2017	17174382.6	03/10/2018	3382488	11/08/2021	02/06/2037	QENVI ROBOTICS






Two functions available to choose from or in combination

	“Following” function	“Autonomy” function
Description	Allows your robot to follow you wherever you go.	Allows the robot to move autonomously within the establishment.
Starting the robot	Immediate: A simple button to turn this function on. The robot is operational immediately. It follows a beacon that you hold in all your travels.	Immediate: A simple button to turn on the robot. A device with a touch screen connected to the internet allows you to choose the desired destination in the establishment. When you select the destination on the screen, the robot moves autonomously to the chosen destination.
Infrastructure / preparations to be planned	No infrastructure required. No additional costs.	Intervention of the technical team to analyze your environment and implement the mapping of your establishment. Trips are programmable using fleet management software.
Travel environment	The robot can move indoors and outdoors.	The robot only works within the established map.
Security	A secure system with an emergency stop button and obstacle avoidance.	The robot detects, avoids obstacles and automatically learns them in order to integrate them into the map. Emergency stop button.
Velocity	The movement speed is adjustable and modulates according to nearby obstacles.	The movement speed is adjustable and modulates according to nearby obstacles.

How to calculate the forecast ROI for 1 Robot → LEAN implementation

Value Stream Mapping

ETAPE	Opération	Transfert	Contrôle	Attente	Stock	Description	Distance (m)	Temps (sec)	Commentaire
1	●	→	■	▽		Depuis établi vers stock	3	5	
2	●	→	■	▽		Recherche de 2 membranes, tubes, supports, embouts ...		10	
3	●	→	■	▽		Retour établi	3	5	
4	●	→	■	▽		Dépôt sur établi		1	
5	●	→	■	▽		Découpage		30	
6	●	→	■	▽		Colle/graisse	1	5	
7	●	→	■	▽		Collage/graisissage extérieur		5	
8	●	→	■	▽		Visserie préparée (sous établi)	0	30	
9	●	→	■	▽		Vissage externe	0	10	
10	●	→	■	▽		Dépôt sur établi		5	
11	●	→	■	▽		Etau embouts 2 sur 4		10	
12	●	→	■	▽		Perçage embouts 2 sur 4		10	
13	●	→	■	▽		Changement perceuse		10	Batterie vide
14	●	→	■	▽		Perçage embout		30	
15	●	→	■	▽		Assemblage membrane		300	
16	●	→	■	▽		Air comprimé	3	5	
17	●	→	■	▽		Vissage air comprimé		20	Insuffisant
18	●	→	■	▽		Vissage à la main (fin)		20	Pas de couple
19	●	→	■	▽		Bouchons		30	
20	●	→	■	▽		Etiquettes flèches + Dessalator		20	
21	●	→	■	▽		Collage n° série + membrane		5	
22	●	→	■	▽		Serrage tuyau		10	
23	●	→	■	▽		Vers Stockage	3	20	
24	●	→	■	▽		Mise en stock		1	

Nature	Purpose of transformation	ASME Symbols
Physical	Difference between raw form and form suitable for use	
Spacial	Location difference between provider and user	Transfert 
Temporal	Difference between date of acquisition and period of use	Stock  Waiting 
Control	Difference between a reference (standard) state and the actual state	
	Use value	External / Internal

Calculation of **TAKT Time** = cycle time

Calculation of **TRANSFER** costs (T or HJ, KM, KG, €)

→ replacement by ROBOT (autonomy)

→ implementation MONITORING

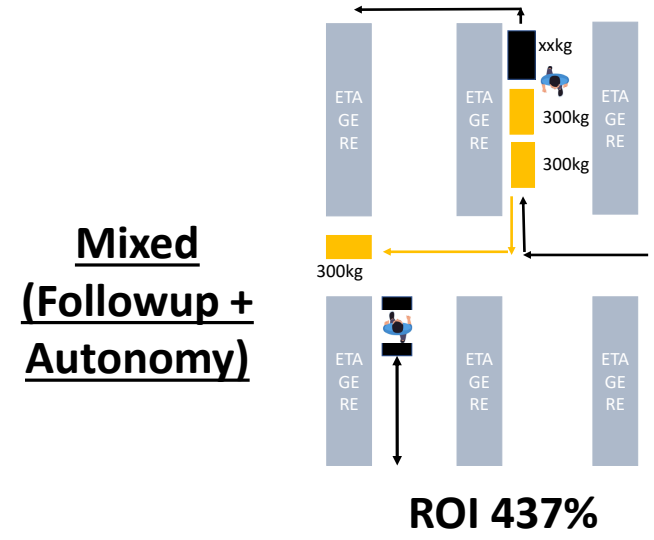
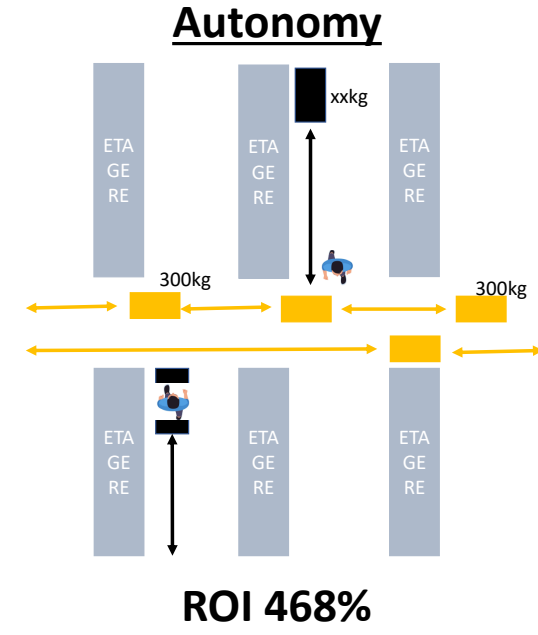
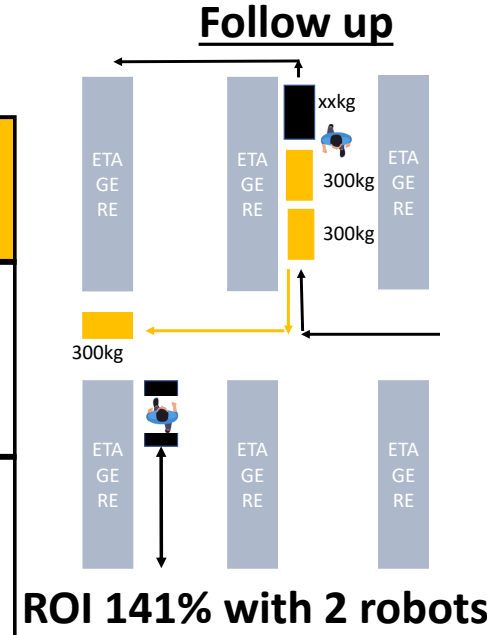
→ Calculation of AT (work accidents)

Calcul du ROI



WHAT IS OUR SOLUTION?

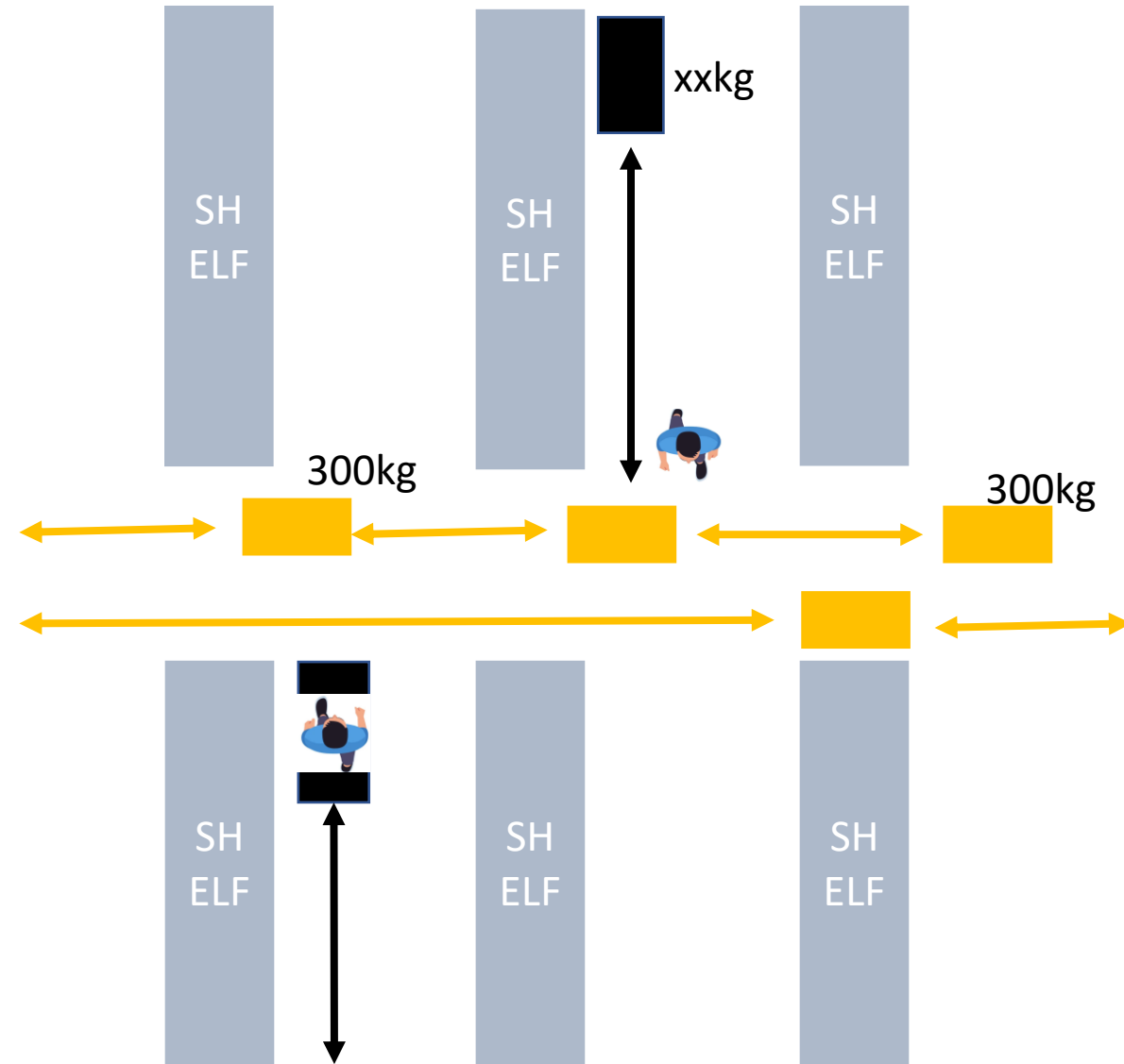
	WAREHOUSE - STABLE MAPPING	WAREHOUSE / NON-MAPPED AREA	ZONE WITH QENVI BEACON (EXTERIOR/INTERIOR)	OUTDOOR or "ALL TERRAIN"
REPETITIVE PROCESS	AUTONOMY	FOLLOWING	AUTONOMY	FOLLOWING
PROCESSUS UNITAIRE	AUTONOMY OR FOLLOWING	FOLLOWING	AUTONOMY OR FOLLOWING	FOLLOWING
MISSION	FOLLOWING	FOLLOWING	FOLLOWING	FOLLOWING
TRAIN	AUTONOMY OR FOLLOWING	FOLLOWING	AUTONOMY OR FOLLOWING	FOLLOWING



Example: AUTONOMY scenario

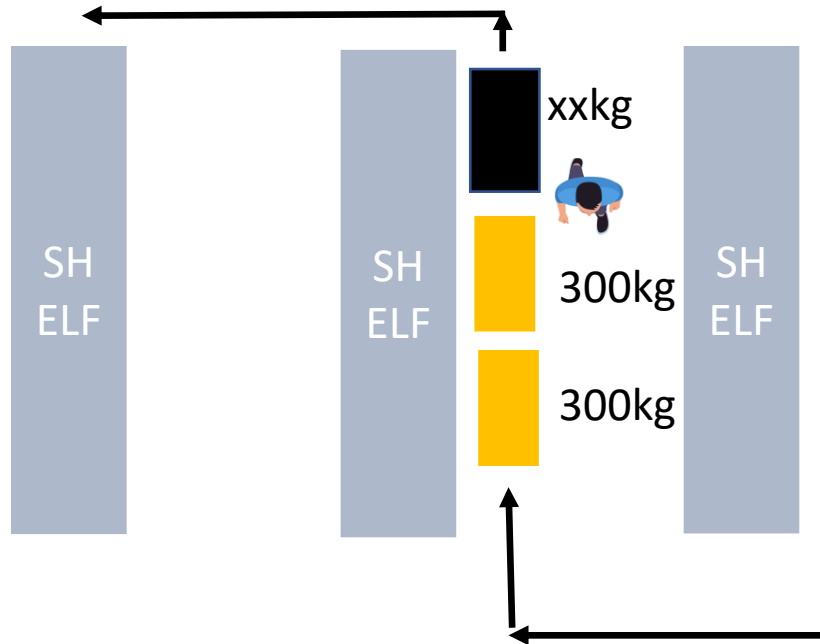
A robot moves in a work area if a minimum clearance of 0.5m wide for a height of 2.1m is provided on both sides of the circuit (see ISO3691-4)

- In black:
 - QR carts or robots carrying xxkg circulating in the aisles
- In Orange:
 - QR robots circulate from meeting point to meeting point. Points previously described in the fleet management software
- The transfer of objects is done at each meeting point
- Autonomous robots could have these structures augmented with scissor systems:



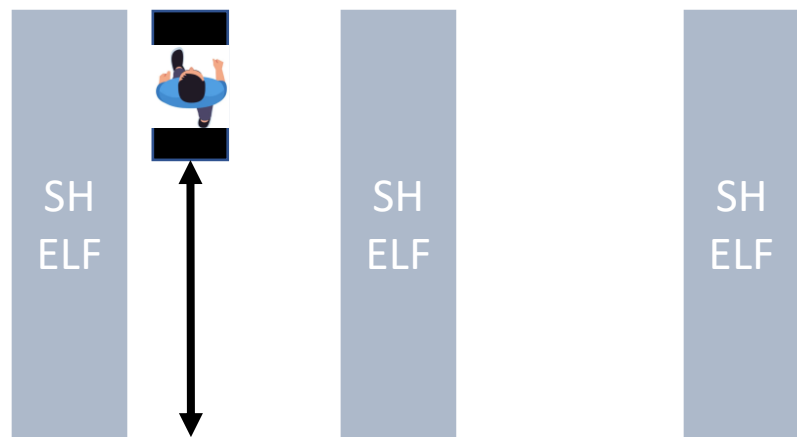
Example: FOLLOW-UP scenario

A robot moves in a work area if a minimum clearance of 0.5m wide for a height of 2.1m is provided on both sides of the circuit (see ISO3691-4)



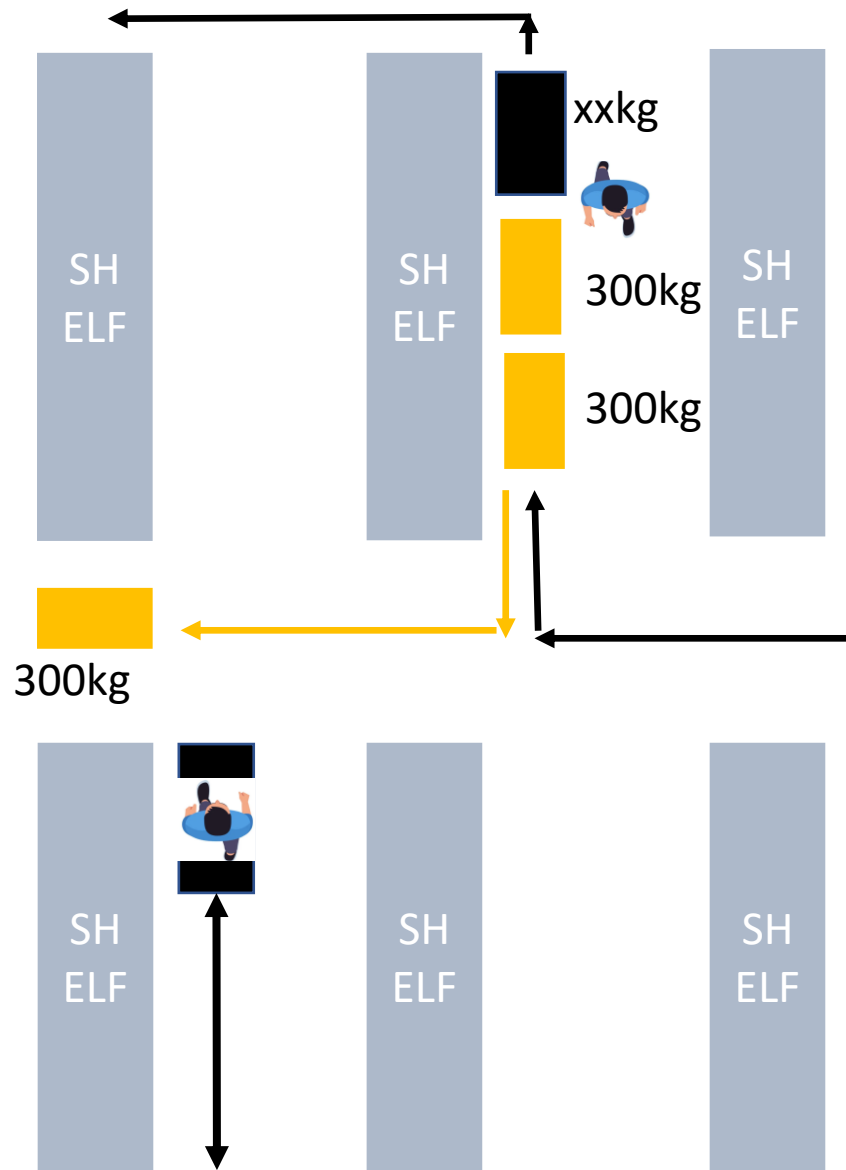
- In black:
 - QR carts or robots carrying xxkg circulating in the aisles
- In Orange
 - QR robots follow the nacelles alone or by train
- The transfer of objects is done gradually

- Autonomous robots could have these structures augmented with scissor systems:



Example: MIXED scenario

A robot moves in a work area if a minimum clearance of 0.5m wide for a height of 2.1m is provided on both sides of the circuit (see ISO3691-4)



- In black:
 - QR carts or robots carrying xxkg circulating in the aisles
- In Orange:
 - QR robots follow the nacelles alone or by train
 - QR robots return autonomously to a meeting point
- The transfer of objects is done gradually
- Autonomous robots could have these structures augmented with scissor systems:



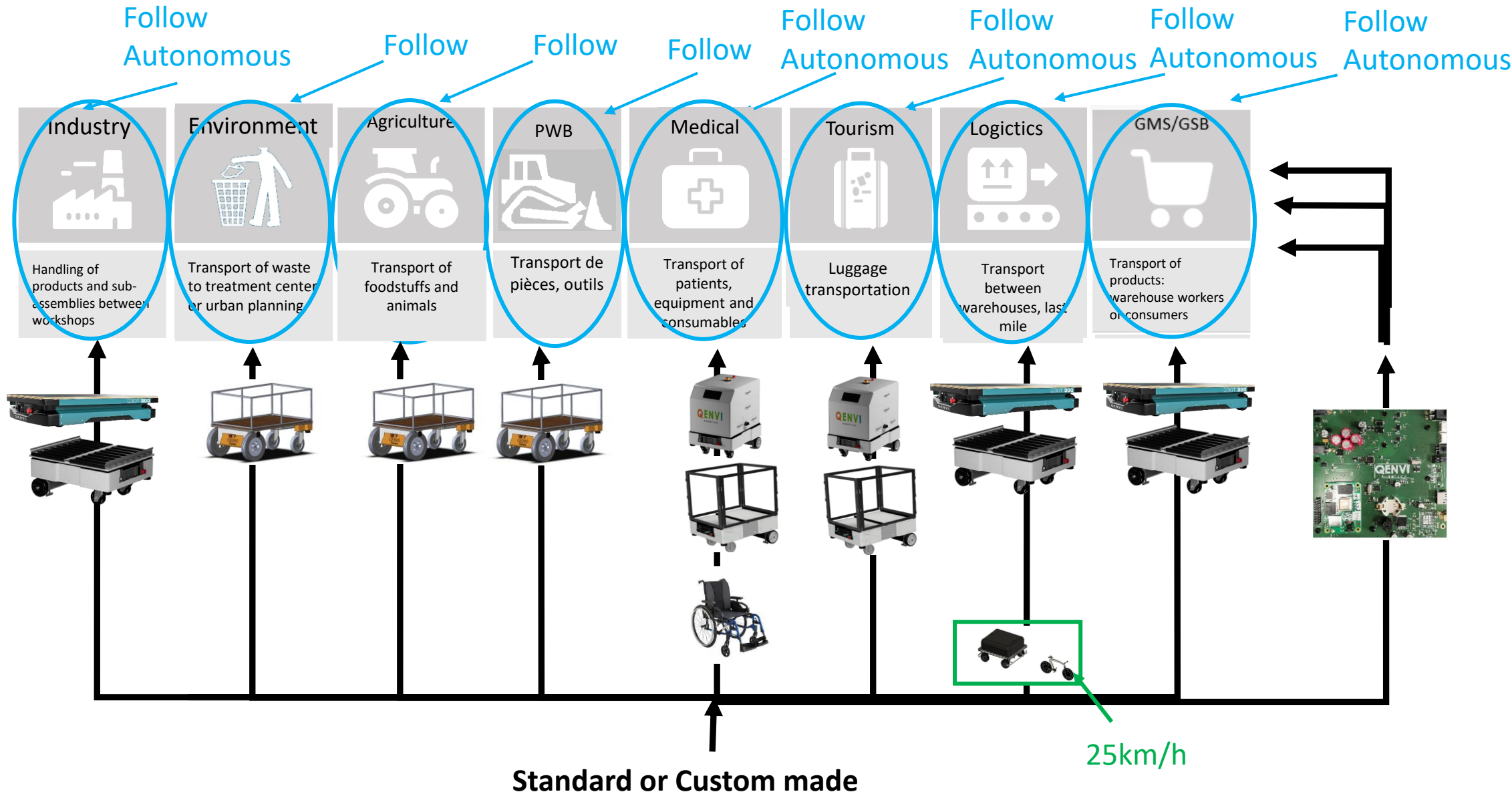
How to calculate the forecast ROI for 1 Robot → LEAN implementation

				EUROPE		1 hour	1 day = 7h	1 year	3 years	profit	robot cost HT (following)	Autonomy (software)	maintenance cost (3 years)	Average accident cost (France)	ROI for 3 years
	maximum authorized weight (kg)	weight transported in 1 hour (kg)	meters covered (m) / hour	Average hourly cost Europe	walking speed (km / h)	walking transport cost	walking transport cost	walking transport cost	walking transport cost				200 €		
pedestrian man	80	714	1 429	33,0 €	1,43	33,00 €	231,00 €	50 820,00 €	152 460,00 €						
pedestrian woman	25		1 429	33,0 €	1,43	33,00 €	231,00 €	50 820,00 €	152 460,00 €						
	poids maximum(kg)														
robot	155	1384	3 500	33,0 €	3,50	6,95 €	48,66 €	10 705,99 €	32 117,97 €	120 342,03 €	18 000 €	2 000 €	7 200 €	3 000 €	353%
robot	300	2679	3 500	33,0 €	3,50	3,59 €	25,14 €	5 531,43 €	16 594,29 €	135 865,71 €	23 000 €	2 000 €	7 200 €	3 000 €	331%
woman															
robot	150	1339	3 500	33,0 €	3,50	2,24 €	15,71 €	3 457,14 €	10 371,43 €	142 088,57 €	18 000 €	2 000 €	7 200 €	3 000 €	433%
robot	300	2679	3 500	33,0 €	3,50	1,12 €	7,86 €	1 728,57 €	5 185,71 €	147 274,29 €	23 000 €	2 000 €	7 200 €	3 000 €	367%
	https://www.lsa-conso.fr/comment-ameliorer-les-conditions-de-travail-en-entrepot,270647														
	https://www.insee.fr/fr/statistiques/4501675?sommaire=4504425														
	Average distance traveled by preparers in a day					10km	1429 m / 1 hour						300kg	Following earni	98 142,03 €
	Average weight transported per day					5 tonnes	714 kg/ 1 hour							ROI for 3 years	64%
	Average hourly cost					14,60 €									
	Average hourly cost EUROPE					33,00 €									
	SMIC horaire brut non chargé					11,07 €									

With a robot, carrying 300kg: 1kg carried for 1 hour costs €2.89 excluding purchase price

- In autonomy, the ROI is 300% over 3 years
- In follow-up, a person can have 2.39 times more transport capacity (ROI > 79%, 150% if 2 QR robots), fewer accidents, more acceptance and we are doing COBOTICS

QR positioning - Robot type by use



QR invites you to robotize the structure of your choice!

Make the structure of your choice follower and/or autonomous.

For loads up to 2 tonnes.

1- Send us your request and request a quote

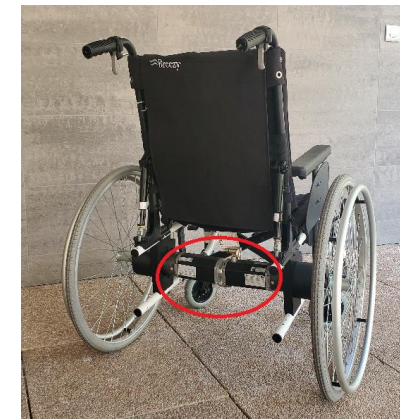
2- QENVI Robotics studies your request

3- Send your structure to QENVI Robotics

4 – QENVI Robotics robotizes then returns your new machine to you when it is ready.



QENVI Robotics has already robotized: wheelchairs, a hydraulic machine carrying 650kg.



Do you have other ideas? We can integrate the robotic modules of your choice



Example:

→ Extension: Robotic Arms

We can integrate the ROBOTIC ARMS of your choice onto your robotic platforms following a study:

- Analysis of the carried load and arm length
- Several degrees of freedom of the arm
- Type of grip required
- Resistance and adaptation of the trolley to tilting



Thank you

contact@genvi.com

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