

Newcomers on the Grid

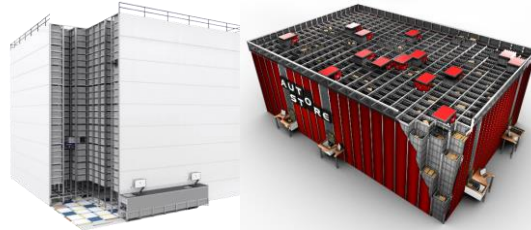
Disrupters in the Autostore market

The world of warehouse robotics

ASRS



cASRS



AMR-Shuttle (Totes)

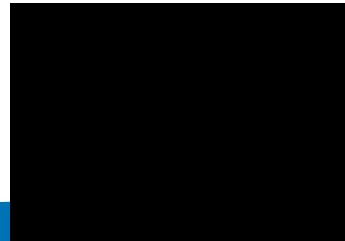


HAI ROBOTICS

G2P-AMR (Pods)



P2G



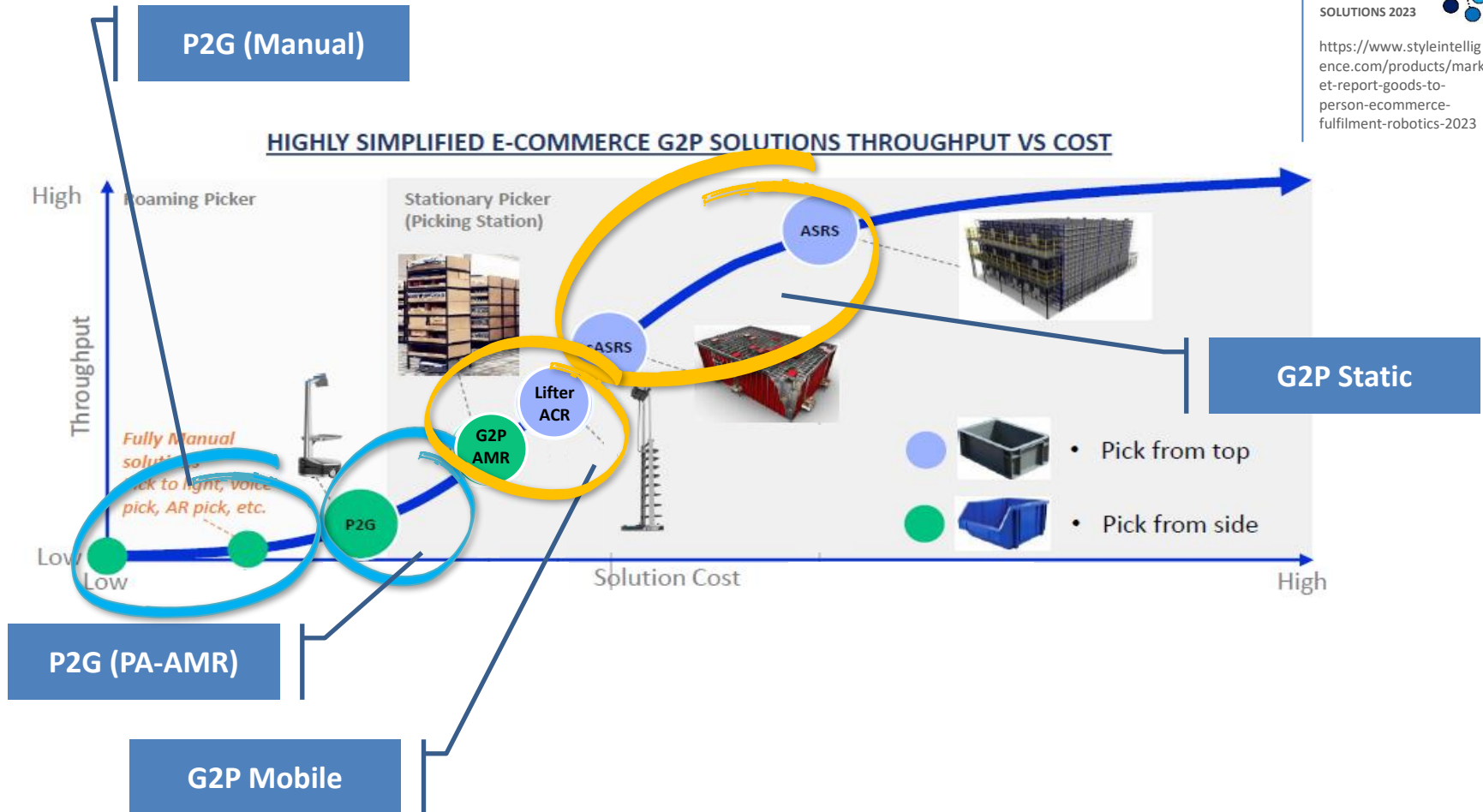
Intro G2P mobile robotics framework

Source:
STIQ Report
GOODS TO PERSON
SOLUTIONS 2023



<https://www.styleintelligence.com/products/market-report-goods-to-person-ecommerce-fulfilment-robotics-2023>

HIGHLY SIMPLIFIED E-COMMERCE G2P SOLUTIONS THROUGHPUT VS COST



P2G and G2P solutions compared



		Fulfillment Profile Factors			Orderline Throughput per Day								
Piece Pick	P2G/G2P	SKU's	Rate/Hr	Pick-Pack	0-1000	1001-5000	5001-10000	10001-15000	15001-20000	20001-25000	25001-50000	50001-100000	100000+xxxxxx
Paper Pick List	P2G	<1000	25-75	No	Green	Yellow	Red	Red	Red	Red	Red	Red	Red
RF Scanning	P2G	<5000	50-75	No	Green	Green	Yellow	Red	Red	Red	Red	Red	Red
Pick-to-Cart	P2G	<20000	100-200	Yes	Green	Green	Green	Yellow	Red	Red	Red	Red	Red
Zone Pick	P2G	<5000	125-250	Yes	Red	Yellow	Green	Green	Yellow	Red	Red	Red	Red
Pick & Pass	P2G	<10000	150-300	Yes	Red	Red	Yellow	Yellow	Green	Green	Yellow	Red	Red
Batch Pick to Putwall	P2G	<50000	360-480	Yes	Red	Yellow	Green	Green	Green	Yellow	Red	Red	Red
Miniload	G2P	<50000	360-480	Yes	Red	Red	Red	Yellow	Green	Green	Yellow	Red	Red
Pouch Sorter	G2P	<10000	480-600	Yes	Red	Red	Red	Yellow	Green	Green	Yellow	Red	Red
G2P-AMR (Shelf to Picker)	G2P	<100000	360-480	Yes	Red	Red	Red	Yellow	Green	Green	Yellow	Red	Red
AMR-Shuttle (Bin to Picker)	G2P	<100000	480-600	Yes	Red	Red	Yellow	Green	Green	Green	Green	Yellow	Yellow
cASRS (Autostore)	G2P	<100000	480-600	Yes	Red	Red	Red	Yellow	Green	Green	Green	Yellow	Yellow
ASRS (Shuttle)	G2P	<100000	480-720	Yes	Red	Red	Red	Red	Yellow	Green	Green	Green	Green

- Autostore as mentioned in the above table stands for cASRS (cube ASRS)
- By far is Autostore the largest supplier with over 1.000 installations worldwide
- As we will see, within the cASRS domain, multiple solutions are available
- All solutions have there own characteristics, pro's and cons

source: Dematic

Intro cASRS system suppliers

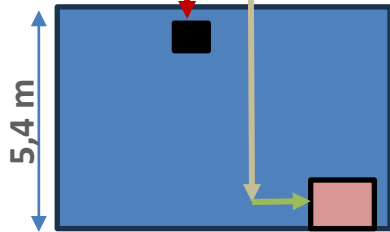
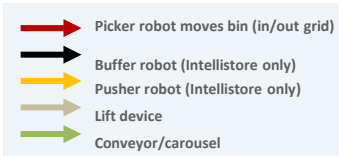


- Autostore has firmly established itself worldwide over the last two decades with its robust and time-tested technology
- Expiration of patents on Autostore's technology has given opportunities to new players in the field
- Besides Ocado, which is the most comparable "top load" cASRS to AutoStore, there have been some new entrants worth noting
- These players either bring up more or less similar solutions or enter the market with more disruptive technologies
- Besides Autostore three suppliers are presented who got quite some attention (Attabotics, Jungheinrich, Intellistore) and these will be positioned in a more detailed way
- Furthermore we present six suppliers of partly disruptive cASRS solutions, including two gantry robot based solutions (as totes are stored in stacks)

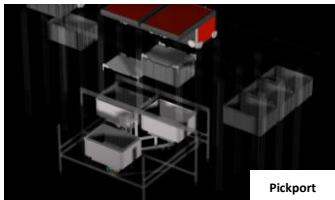
Main cASRS solution competitors



Robots drive on the grid and dig



Superflat floor required



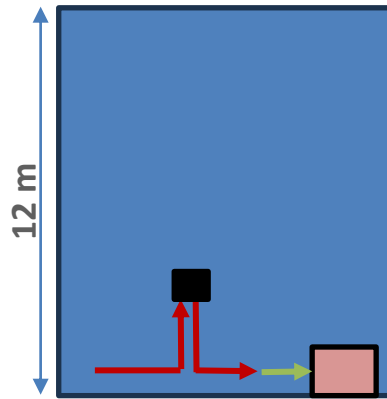
2 handling components
(robot/carousel)



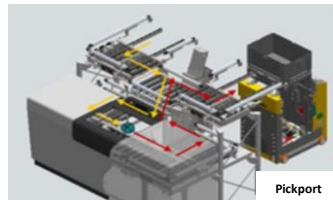
3 binsizes, 1 binsize per system
 Dim. Intern: 603 x 403 x 202 (l x b x h)
 Dim. Intern: 603 x 403 x 312 (l x b x h)
 Dim. Intern: 603 x 403 x 402 (l x b x h)
 Max fillweight/bin: 30 kg



Robots drive under the grid and dig



Flat floor required



2 handling components
(robot/conveyor)

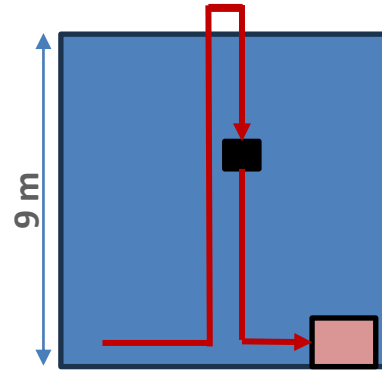


1 binsize
 Dim. Intern: 605 x 450 x 290 (l x b x h)

Max fillweight/bin: 50 kg



Robots drive on and under the grid and change levels



Flat floor required



1 handling component
(robot)

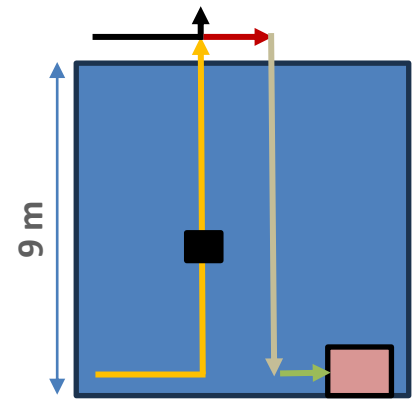


2 binsizes, 1 binsize per system
 Dim. Intern: 571 x 571 x 259 (l x b x h)
 Dim. Intern: 571 x 571 x 405 (l x b x h)

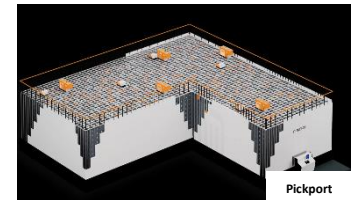
Max fillweight/bin: 45 kg



Pusherrobots drive under, Picker-/
Bufferrobots drive on the grid



Flat floor required



4 handling components
(pusher-, buffer- & pickerrobot, lift)



3 binsizes, multiple binsizes per system
 Dim. Intern: 605 x 450 x 130 (l x b x h)
 Dim. Intern: 605 x 450 x 290 (l x b x h)
 Dim. Intern: 605 x 450 x 450 (l x b x h)
 Max fillweight/bin: 30 kg

Two disrupters in more detail



Instock

- Instock's solution requires some conceptual bending as the robots have the ability to travel on the ground or invert using magnets while still maintaining a payload of 30kg
- The layout and configuration flexibility are unprecedented, while AutoStore allows you to alter the general footprint, it does not accommodate variable heights within the same system
- Despite these advantages, it does not offer the same storage density and cube utilization as Autostore or Intellistore and fire protection compliance could pose another concern

Gridstore

- Gridstore, a newcomer bears the closest resemblance to AutoStore, but with key enhancements that could make it a real game-changer
- Gridstore uses a structural plastic bin similar to Autostore's bin (in three sizes), seems more rigid and potentially more expensive than an Autostore bin
- Gridstore differentiates itself with two robot types operating in tandem within one system where the first robot (Ace), akin to an AutoStore R5 or B1, performs simple pick-and-move tasks and where the other robot (Switch) mirrors the functionalities of the Ace but with the added ability to swivel the boom portion around the robot
- Within Autostore robots have a pre-determined "orientation" for bin access, where certain storage bins are inaccessible to robots facing a specific direction, but Gridstore's "Switch" robot solves this problem
- Furthermore, Gridstore offers two different types of port workstations, reminiscent of Autostore conveyor port and carousel port

Disruptive cASRS solutions



Concept

- Gantry robot system
- Robot handles bin by bin (single bin handling)
- Suitable for slowmoving (and small operations)
- Hardly any space above system required (as robot takes one bin at a time)



Concept

- Cubic system
- Robots work per layer
- Multifunctional robots (with turnable liftdevice)
- Robots on all layers drop bins directly on transportconveyor (at bottom), no dedicated shafts are required
- Max 3 bins stacked per layer
- Multiple layers per system



Concept

- Cubic system
- The most obvious Autostore look-a-like, but with additional features
- Three binsizes possible, one per system (as with Autostore)
- Use of carousel- and conveyorports, input/output via shaft (in stead of elevator within Intellistore)

Disruptive cASRS solutions

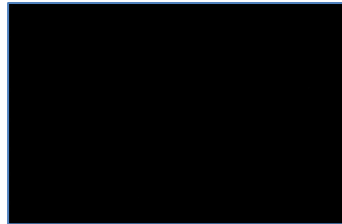

EXTOR



Concept

- Cubic system
- Robots drive under grid and dig
- Storage and handling of larger carton totes (not bins)
- Limited height possible (due to weight per stack of carton tote)
- Suitable for slowmoving operations using voluminous items

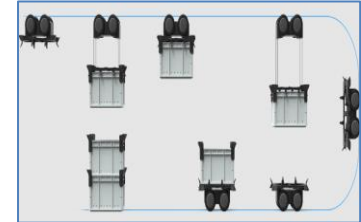
CIMCORP



Concept

- Gantry robot system
- Combination of lift device and transport device
- Fast access to required bin as liftdevice takes multiple bins at once from stack
- Suitable for high performance operations
- Empty space above system is required

INSTOCK 



Concept

- Cubic system
- Any robot can complete any task
- Identical robots either transport bins (on ground) or retrieve bins (from ceiling!)
- Cost-effective solution as low-cost sandwichpanels are used for storage
- Easy and fast (de-)assembly and installation

Disruptive cASRS solutions (add-on)



New Kid on the Grid, URBX TOWERBOT...and it's parents are AUTOSTORE & ATTABOTICS

This week there have been 3 new G2P systems released (HAIPick, Libiao and Urbx). HAIPick and Libiao have been discussed in previous posts.

Looking at Urbx TowerBot one can not miss the mix of cubic systems Autostore (lifting device) and Attabotics (shafts within the system from where bins are put/picked).

What makes Urbx unique (according to their info):

- Staggering Height: Up to 125 feet (35 meters?) according to Urbx' info
- Double-Deep Density: Within the shaft the device can pick/put bins double-deep
- Always Powered: TowerBot powers up while working, eliminating any downtime.
- Heavy Bins: Up to 45 kg per bin
- Large Bins: Sizes are 610x610x315 mm
- Multiple Bintypes in one system: As far I can see it's possible to store two bintypes (with different binheights) mixed in one system

Looking at TowerBot one cannot ignore similarities with Attabotics. This is due to the use of shafts. At Attabotics, AMRs climb up and down within shafts to pick/put bins. At Urbx TowerBot, robots drive on the grid (as with Autostore) and the handling device is brought to the desired depth where the device is pulled out (double-deep) to pick/put bins. After picking the bin is transported all the way down, put on a conveyor to be transported to a pickstation.

Urbx has it's operational advances mainly on dimensions and weight. I doubt whether speed and flexibility is in favor. The use of Autostore like robots, the double-deep handling doesn't maximize fast handling.

Using staggering heights neither has positive impact on handling speed. So in my opinion, using a standard warehouse of appr. 12 would do the job both in storage density as well as in required productivity.

If that's the case, than the system can be compared more or less with Attabotics. Within Attabotics all robots have direct access to all bins in the system and doesn't need expensive conveyors on groundlevel. And as one can see in the picture below, there is not that much difference in required number of shafts within both systems.

Conclusion so far when Urbx TowerBot and Attabotics should be compared from a functional point of view. If focus is on storage capacity, Urbx seems to be fofarite, if focus is on handling capacity Attabotics is most likely the favorite.



cASRS solutions compared

	Autostore	Jungheinrich	Attabotics	Intellistore	Blue Robot Company	Volume Lagersysteme	Gridstore	Extor	Cimcorp	Instock
System performance	Green	Green	Dark Green	Green	Red	Green	Green	Red	Yellow	Yellow
Track record	Dark Green	Red	Yellow	Red	Red	Red	Red	Red	Green	Red
Implementation time	Yellow	Yellow	Red	Yellow	Green	Green	Yellow	Yellow	Green	Dark Green
Impact FM-Global	Yellow	Red	Red	Red	Green	Yellow	Yellow	Red	Dark Green	Yellow
Storage density	Yellow	Dark Green	Yellow	Green	Green	Yellow	Yellow	Yellow	Red	Yellow
System scalability	Green	Green	Yellow	Green	Red	Green	Yellow	Yellow	Red	Yellow
Product accessibility	Red	Red	Dark Green	Yellow	Red	Yellow	Red	Red	Green	Yellow
Infrastructural conditions	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Yellow	Green
Investment level	Yellow	Yellow	Red	Yellow	Green	Yellow	Yellow	Green	Yellow	Green