cSquaredE

CLIENT
US Market Entry Strategy

Primary Research Readout

Month dd, yyyy

cSquaredE

Contents

cSquaredE

Executive Summary (1 of 3)

Between Month dd – Month dd, primary research was performed to dig deeper into the market for multirobot orchestration software (MO), with 20+ individuals interviewed via Zoom calls

After analyzing the transcripts of the interviews, numerous findings from our secondary research were confirmed:

- Intralogistics leaders at consumer goods manufacturers, retailers, and 3PLs believe they ***will need MO solutions***
- MO is a ***difficult problem to solve***, particularly when dealing with large (100's or 1,000) mixed fleets of robots
- MO is being ***worked on by a variety of players*** in the ecosystem (one person said "20 companies")
- There is ***not an actual market yet*** for MO solutions

Besides the above, a good amount of new information was also discovered:

- There is ***uncertainty around which suppliers will win*** in the MO market, potentially making the industry wide-open for any supplier to establish a leadership position
- MO ***could garner $500,000 - $1,000,000+*** when sold to large customers, given the problems it would solve
- ***SVT Robotics*** and ***Next Generation Robotics*** appear to be the ***most-threatening competitors*** to CLIENT
- In general, robot companies are ***investing more into their software*** to help them differentiate

Executive Summary (2 of 3)

Besides information about the MO market, primary research also uncovered advice for CLIENT's US market entry:

- Hire management team with ***strong intralogistics experience and connections*** in the industry
- Build an ***onshore implementation and service team***, able to handle real-time, onsite support
- Leverage marketing partners / agencies with ***product launch and PR experience***
- Have ***strong reference customers*** and live sites in the US
- Consider joining forces with an ***established robotics integrator***

Lastly, respondents provided a variety of expectations when describing their ideal MO supplier / partner:

- Offers ***expert material handling and robotics professional services***, including up-front consulting, design and implementation
- Offers support for not just the MO solution, but ***also for the robots***
- Offers a sizable ***library of proven robot and WMS integrations***
- Provides ***intuitive software UI/UX***

Executive Summary (3 of 3)

Given the information collected and feedback received, a logical US market entry strategy for CLIENT has emerged:

- Establish ***partnerships*** with ***middle-market systems integrators***, fitting the following profile:
  - Experience with "goods-to-person" AGVs / AMRs[1] in the US
  - Some experience writing software to integrate AGVs / AMRs with host systems (e.g., WMS, ERP)
  - May or may not offer off-the-shelf packaged software, such as WCS, WES, or robot fleet management
  - Seeks to differentiate their services through cutting-edge technology
  - Significant number of employees with intralogistics expertise who can design, implement and support robotic systems
- Offer the partners the ability to ***resell, implement and support*** CLIENT's software applications (WCS, RCS, Simulation)

Therefore, the next steps for CLIENT are to:

- Research the US systems integrator industry, to identify partner candidates
- Develop positioning and messaging that targets partners, as well as end users (i.e., Push+Pull Marketing)
- Recruit and hire 1-2 business development leaders in the US
- Define a business development campaign to solicit integrators and start conversations
- Define month-by-month plan for business development, product development, marketing, and key event promotions (e.g., Promat 2023)
- Set goal for achieving X number of partnerships and Y number of live sites in time for Promat 2023

[1]Likely AGV / AMR vendors include GreyOrange, Fetch Robotics, Vecna Robotics, InVia Robotics, MiR, Geek+, Seegrid, OTTO, HAI Robotics

cSquaredE

People Interviewed

#	Name	Title	Organization	Sector
1	Vial, Marcel	Automation Engineer	Amerden AGVS	Systems integrator
2	Hanf, Conrad	Director, Supply Chain & Manufacturing Services	ARC Advisory Group	Analyst
3	Hobkirk, Ian	President/CEO	Commonwealth Supply Chain Advisors	Analyst
4	Easton, Erik	CEO, Principal Consultant	E2 Solutions	System integrator
5	Smith, Alec	Continuous Improvement Manager	E.A. Sween Company	Packaged food
6	Huang, Jeff	Business Development and Sales Management	HAI Robotics	AMR
7	Lee, Sandy		Invata Intralogistics	System integrator
8	Montgomery, Kristi	VP Innovation	Kenco Logistics	3PL
9	Malenke, Mark	Head of Technical Platforms	Kraft Heinz	Packaged food
10	Pagalday, Sophie	Director of Product Marketing	Locus Robotics	AMR
11	Argon, Göner	Secretary of Interoperability	MassRobotics	Industry association
12	Quinn, Matt	Solutions Design Manager	Neovia Logistics Services	3PL
13	Pepper, David	CEO	Next Generation Robotics	Software
14	Raman, Padhu	Chief Product Officer	Project Verte	3PL
15	Jarvis, Dan	VP Supply Chain	Staples	Retail
16	Anderson, Tom	Principal Analyst and Co-founder	STIQ Ltd	Analyst
17	Trebilcock, Bob	Editorial Director	Supply Chain Mgmt Review	Analyst
18	Sutter, Eric	Sales Development Representative	SVT Robotics	Software
19	Oitzman, Mike	Editor	The Mobile Robot Guide	Analyst
20	Lawton, Kevin	Host and Founder	The New Warehouse podcast	Analyst
21	Schmidt, Roland	Director of Software	Viastore Systems	Systems integrator

cSquaredE

Hypotheses Tested during Primary Research

Hypothesis	Result	Evidence
The multirobot orchestration (MO) problem will be urgent and pervasive in the US market, which enterprises will pay good money to solve	**TRUE**	Most end users believe robot interoperability will be needed and that MO is a difficult problem to solve. End users mentioned $1M+ as the potential price such software could command.
CLIENT's solution has unique differentiation/advantages versus other MO software providers	**MOSTLY TRUE**	Only Next Generation Robotics appears to have technology like CLIENT. SVT Robotics is only an integration platform, though they are working with Next Generation Robotics to bring MO to their customers.
CLIENT's go-to-market strategy in the US should be through _____ A) Partnerships with warehouse automation implementation / integration firms B) Partnerships with WMS firms C) A direct sales force and no partnerships D) Joint ventures E) A combination of the above	**STILL ANALYZING**	Given end user requirements for onshore sales, implementation and support personnel, CLIENT needs to determine how to best get "boots on the ground" quickly. The least-likely partners are WMS companies. Systems integrators appear to be good candidates.
No robotics open source / standards (such as MassRobotics) will prevail in the market	**FALSE**	The VDA 5050 standard developed in the EU has strong support from automotive manufacturers and will likely gain wide adoption in the EU. The AMR Interoperability standard from MassRobotics has an uncertain future, but numerous AMR manufacturers have put their names behind the effort. Regardless, the MassRobotics standard does not currently provide MO.

Key Takeaways from Primary Research

After reviewing transcripts from the interviews, the following themes about multirobot orchestration software came up repeatedly:

1. Multirobot orchestration will be a need
2. It is a difficult problem to solve
3. Suppliers are starting to emerge, both startups and established companies
4. The market is not here yet
5. Pricing of $1M+ could be justified for large robot implementations

cSquaredE

1. Multirobot orchestration will be a need

Multiple respondents felt strongly that mixed fleets of robots will be needed in intralogistics, and thus will need to interoperate and have their work orchestrated / optimized.

I think it's a definite need. I do feel like there's a need to probably – also have the capability of having different brands and the same type of dispatch system or something like that in the future. I don't think there's one manufacturer out there that specializes in enough, different branches of the automation that I would want to use them across the board for everything, plus in my type of role, I want to be able to be a bit more vendor agnostic.

Dan Jarvis, Staples

There could be a scenario where you may have constraints of robots being available. Today there are scenarios where if it's peak time, I'm crunching for robots, I may have to hire a different brand of robots to solve my peak problem. Having more and more pre-integration, make that journey simpler, easier and dynamic, is where I'll pay the premium.

Padhu Raman, Project Verte

I think if we could just have one software that you can integrate all of these things into. I don't have to have different platforms to run my AGVs versus my AMRs. You know what I mean? I think we have a future for that. Overall, it's one of the most important things we are looking for, it's a piece of the puzzle.

Matt Quinn, Neovia Logistics

I would like to have a vendor, at least this is the way we see it, that is not trying to sell me a robot. They are agnostic as to what their platform - what type of hardware's going to plug into their platform. They're very much about making everything work together well with your execution systems in your logistics group

Kristi Montgomery, Kenco Group

cSquaredE

2. Multirobot orchestration is a difficult problem to solve

People familiar with robot technology validated that orchestrating mixed fleets of robots is not easy.

Oh yes, orchestrating multiple types of robots in the same warehouse is difficult. That's why we want to focus on our kind of smaller scope rather than bigger because it gets really complicated real fast.

Göner Argon, MassRobotics

And so I think the same thing here is that, essentially, we're right now in a situation where I think it's still true that not all warehouses need interoperability, they don't all need to run different kinds of robots. But even if they get to the point where they start wanting to, it's very hard to do.

David Pepper, Next Generation Robotics

I would say that I think there's this idea that like, there can be a software that is going to manage your mixed fleet. It's incredibly hard to do. It is incredibly hard. And I'll tell you, we're learning this too, because we're integrating these new form factors that we acquired from Waypoint Robotics, and they had two robots that we need to integrate into our solution. And for them to be able to work together in an intelligent way to actually drive the workflows, it takes a lot to integrate that into software. It's not easy.

Sophie Pagalday, Locus Robotics

There could be a scenario where you may have constraints of robots being available. Today there are scenarios where if it's peak time, I'm crunching for robots, I may have to hire a different brand of robots to solve my peak problem. Having more and more pre-integration, make that journey simpler, easier and dynamic, is where I'll pay the premium.

Padhu Raman, Project Verte

3. Multirobot orchestration suppliers have emerged

Not surprisingly, vendors from across the material handling spectrum have begun to develop MO solutions.

There are quite a few. This kind of the software layer, I would say, there's probably 20 or so companies.

Tom Anderson, STIQ, Ltd.

Some of them are already starting to look toward this and try to figure out how they analyze in this. I know like Körber has talked about developing their own platform that does this. Because they've recently kind of invested in a robotics group, that they're now selling robotic solutions across their WMS. I have to believe that the system integrators are going to hop on board quickly [also]. They already have software that is there. With AMR becoming so popular, and flexible, [they could] incorporate that into their warehouse control systems and warehouse execution systems.

Kristi Montgomery, Kenco Group

There are the WMS companies doing this. There are the robot companies doing this and there's some middle there with independent companies like SVT that are going to be supplying the algorithms.

David Pepper, Next Generation Robotics

[AWS RoboRunner sounds] good. That way many companies, even three or four developers, will create a package and supply. Because the demand is going to be expanding. There are 100 plus WMS [today], so similarly there'll be another 100 plus robotic connectors.

Padhu Raman, Project Verte

3a. It is unclear which players will win in MO

Despite MO being introduced by some vendors, there is no consensus which of them are best positioned to win in the market long term.

And who's best placed to sort out that between Geek and Auto Store? That is always a tricky position. The customer does not want to pay for it. The robot maker does not want to pay for it. The system integrator thinks they already sold it.

Tom Anderson, STIQ, Ltd.

I do [think that] integrators would be a segment of the market that would be logical developers of this multi-robot orchestration. I think really that would be – we've used a couple of different integrators in the past for some similar type stuff like this. I think that works well just because they're not, as I mentioned before, married to a certain type of hardware.

Dan Jarvis, Staples

Definitely, big players like Manhattan are going to play a big role in it. If you think about it, if SVT or GreyOrange, or Geek Plus does, what is the role of Manhattan in the long term? I'm talking about five years. Even 10 years. Manhattan's a big company. They have a big client base. All are not going to change their entire warehouse operations overnight. They'll start losing all the greenfield facilities because end-to-end will be robotics, then where does Manhattan fit in? They already are doing a lot of changes in research and releasing a lot of capabilities.

Padhu Raman, Project Verte

So that's when I said the question is who's going to own it. We don't know.

Bob Trebilcock, Supply Chain Mgmt Review

4. Multirobot orchestration is not a market yet

Despite the start of MO supplier presence, there are not many sales happening.

But the fleet manager and all these software's like warehouse execution systems, remote control or deploy like SVT as well, they're trying to come 2018 2019, they started appearing 2020, they did a bit better. The premises that they want to sell into people who have several different types of robots or a certain type of vendors, but the market is not there yet.

Tom Anderson, STIQ, Ltd.

I would give you an example, but I don't think to any degree the end user market is there. I think the end user market is still at the point solution place. Because for all the activity, I think the actual implementations, other than somebody like DHL that's got 2,000 Locus robots, I think most of the implementations are modest.

Bob Trebilcock, Supply Chain Mgmt Review

I don't know. [Multirobot orchestration] is not something customers are screaming about.

Ian Hobkirk, Commonwealth Supply Chain

5. Multirobot orchestration pricing could be $1M+

For large robot implementations, some end users thought they'd pay $1M+ for MO software.

I would imagine that a software for a layer like that could be for a player like us worth well over half a million to a million bucks easily.

Dan Jarvis, Staples

It would not surprise me to see and the, you know, six figures at least annually on that software ticket.

Alex Smith, E.A. Sween Company

You might fall off your chair, but I think that anywhere between one to 1.2 million is the number that we look at just based off what we have to create in-house.

Matt Quinn, Neovia Logistics

Findings on SVT Robotics

Numerous interviews included conversation around SVT Robotics, and CLIENT now knows a fair amount about this competitor. The main findings from the research include:

1. Provides 80 end-points of integration, across AMRs, WMSs, and other automation equipment
2. Integrates using the APIs provided by each vendor
3. Uses robot optimization technology from Next Generation Robotics
4. Charges $20,000, per integration point, per warehouse / DC, per year
5. Can be implemented on-premises or in the cloud
6. Offers a drag-and-drop UI for setting up integrations
7. Can have a customer up-and-running with an integration in a matter of weeks
8. Offers material handling strategy/design services to help customers choose which robots to use
9. Handled numerous companies visiting them at MODEX, asking to be added to their platform

Advice for CLIENT

When asked to provide advice for a Chinese technology company considering a US market entry, respondents' answers centered around five main thoughts:

- Hire a management team with strong intralogistics experience and connections in the industry
- Build an onshore implementation and service team, able to handle real-time, onsite support
- Leverage marketing partners / agencies with product launch and PR experience
- Have strong reference customers and live sites in the US
- Consider joining forces with an established robotics integrator

cSquaredE

Advice for CLIENT

I think really getting a management team in place for the US. So there's plenty, you know it yourself as well. I try not to be stereotypical here but to have a Chinese team is really, probably no, no, you need to get someone who's got really good connections in the US first of all.

Tom Anderson, STIQ, Ltd.

I think joining forces with an integrator in the US is probably the advice that I would give the Chinese companies because here's the other thing that Chinese companies aren't good at. For example, Guozi is great at building robotics but they don't know crap about fulfillment or distribution.

Dan Jarvis, Staples

They should have some good marketing guys and make their presentation. They have to, so they have to get some good audience, good presentations of their software. It's different, it's not selling hardware and also the marketing is also it's very good, it's very important, it's very important.

Sandy Lee, Invata Intralogistics

The biggest concern for us always in the logistics space is no downtime. I don't care where you're necessarily located, but if I need boots on the ground because something is just not getting fixed over the phone, I need you to have resources that can get there. Not 24 hours later, I need them to be there within - a lot of our high volume, high throughput facilities have SLAs around at a four-hour mark.

Kristi Montgomery, Kenco Group

Something sort of personally that I've experienced with a bunch of Chinese robot companies, and my role as a journalist, is they don't understand how to launch products in the US. The whole- lining up a product launch, get earned media, what's the role of PR agents? How that whole process works leading up to getting visibility and market exposure for the solutions. It's definitely worth investing in, I would say in an experienced and qualified PR firm that can help build the noise and get visibility out.

Mike Oitzman, The Robot Guide

Expectations of Multirobot Orchestration Suppliers

When asked what their expectations would be of providers of MO solutions, respondents' answers centered around four main thoughts:

- Offers expert material handling and robotics professional services, including up-front consulting, design and implementation
- Offers support for not just the MO solution, but also for the robots
- Offers a sizable library of proven robot and WMS integrations
- Provides intuitive software UI/UX

Expectations of Multirobot Orchestration Suppliers

Again, it always scares me when I get a group of really smart PhD students building something when they've never walked into a warehouse. Having that expertise of supply chain somewhere in their back pocket, it doesn't have to be the exact people but at least within their organization, and then understanding the complexities when orders drop. All of the things that go along with managing that set of orders, whether it's priorities, or it's carrier-based, or it's type of product, or its product constraints like temperature or HAZMAT or something like that, it's really having a deep understanding of the deep complexities involved in managing in order.

Having a robust library of connectors is one. The major AMR players must be on the platform, I think as well as your major WMS players. All of your tier one, tier two level WMSs have to be there.

Kristi Montgomery, Kenco Group

Keep the change management simple because now if a customer has to go figure out issues in Geek Plus, why it's not operating, 6 River is not operating, another system not operating, the customer has to build three levels of support. Make that support seamless. Technology integration, seamless. Change management and support process seamless. You take care of working with all the partners. Making that change management simple that, "Hey, you need robots?" You have a partnership agreement with them, you get robots. It doesn't matter which robot but you know how you manage it, and not the customer.

Padhu Raman, Project Verte

A lot of software that I've seen ported from Chinese original development to English, just ends up being a little kludgy in the UI. Just in terms of screen real estate and language and terms, and workflow sort of expectations in terms of how people interact with that.

Mike Oitzman, The Robot Guide

US Market Entry Recommendation

Given the information collected and feedback received, a logical US market entry strategy for CLIENT has emerged:

- Establish ***partnerships*** with ***middle-market systems integrators***, fitting the following profile:
  - Experience with "goods-to-person" AGVs / AMRs[1] in the US
  - Some experience writing software to integrate AGVs / AMRs with host systems (e.g., WMS, ERP)
  - May or may not offer off-the-shelf packaged software, such as WCS, WES, or robot fleet management
  - Seeks to differentiate their services through cutting-edge technology
  - Significant number of employees with intralogistics expertise who can design, implement and support robotic systems
- Offer the partners the ability to ***resell, implement and support*** CLIENT's software applications (WCS, RCS, Simulation)

Therefore, the next steps for CLIENT are to:

- Research the US systems integrator industry, to identify partner candidates
- Develop positioning and messaging that targets partners, as well as end users (i.e., Push+Pull Marketing)
- Recruit and hire 1-2 business development leaders in the US
- Define a business development campaign to solicit integrators and start conversations
- Define month-by-month plan for business development, product development, marketing, and key event promotions (e.g., Promat 2023)
- Set goal for achieving X number of partnerships and Y number of live sites in time for Promat 2023

[1]Likely AGV / AMR vendors include GreyOrange, Fetch Robotics, Vecna Robotics, InVia Robotics, MiR, Geek+, Seegrid, OTTO, HAI Robotics

Where to Find Systems Integrators?

The following sources provide good lists of potential system integrator partners for CLIENT:

- Warehouse Automation Directory: https://www.warehouseautomation.co.uk
- LinkedIn Search result: link
- OTTO Motors Partners[1]: https://ottomotors.com/partner

[1]While some AGV / AMR vendors have reseller and implementation partners, a quick scan of vendor websites did not uncover publicly available lists of partners, other than OTTO Motors

cSquaredE

Appendix

Interview Guide

Interview Questions

Why is there a future for multirobot orchestration software in intralogistics?

- Why will users of warehouse robots ”hit a wall” and need MO?
- How much will buyers pay for such a solution? How will that price compare to other solutions they pay for (e.g., robots, WMS, implementation services)?
- How are current MO solutions priced? What level of ROI are they driving?
- Which vendors in the ecosystem are best-positioned to deliver a multirobot orchestration system?
- How big of a threat are open source interoperability standards, like the one developed by MassRobotics? Why is that being developed, and does it negate the need for MO products?

What are the critical success factors for an independent MO software vendor?

- What capabilities and/or intellectual property would be necessary to build unique differentiation?
- How important is it to orchestrate 100's or 1000 robots in one facility? Have multiple robots work together in the same field?
- How important are design, implementation and maintenance services to the MO solution?

Which players in the ecosystem should a Chinese-based provider of MO consider partnering with as it contemplates pursuing customers in the US?

- What other factors should a Chinese-based provider consider as it pursues business in the US?