State of RaaS

2023 Report

Formant

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The adoption of automation across all industries is accelerating at a rapid pace.

One thing fueling this adoption is the rise of the robots-as-a-service (RaaS) business model, which has emerged as a popular (and capital efficient) way for companies to embrace robotics.

At Formant, we work with scaling RaaS companies every day and we care deeply about the state of the RaaS market. To better understand this market's true impact, we surveyed over 300 robotics professionals across industries about their own companies, the tools they employ, and challenges they presently face. I'm excited to share the results with you in this report.

Best,

Jeff Linnell
Founder & CEO, Formant

Robots-as-a-Service Today

RaaS is becoming increasingly popular as it provides businesses with access to cutting-edge robotics technology without the upfront cost of ownership. Companies like Bear Robotics, Avidbots, and Otto Motors offer a variety of robots for use in various industries, including hospitality, facilities management, and logistics.

LESS THAN 100 ROBOTS

85%

Respondents' companies that have less than 100 robots

LIVE MONITORING

40%

Companies that use a commercial robot management platform for live monitoring

ROS

81%

Respondents who use ROS

Top Industries for RaaS

21%

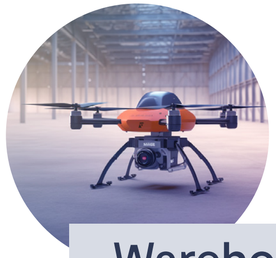
Manufacturing

14%

Facilities Services

8%

Healthcare



18%

Warehouse + Logistics

9%

Agriculture

9%

Construction

7%

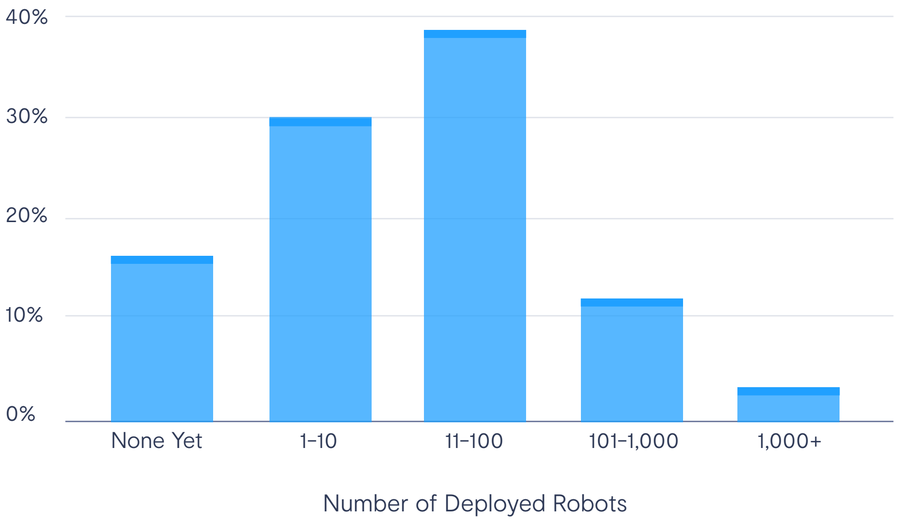
Hospitality

RaaS is a simple cost/benefit analysis exercise. Sprinkle in a few cash flow and investment questions, and companies can arrive at a Yes/No answer.

Executive at a mid-market robotics company

Most common fleet sizes

The most common fleet size is 11–100. Many RaaS providers are still in the early stage of development (45% of respondents had 0–10 robots). 85% of respondents' companies have less than 100 robots.

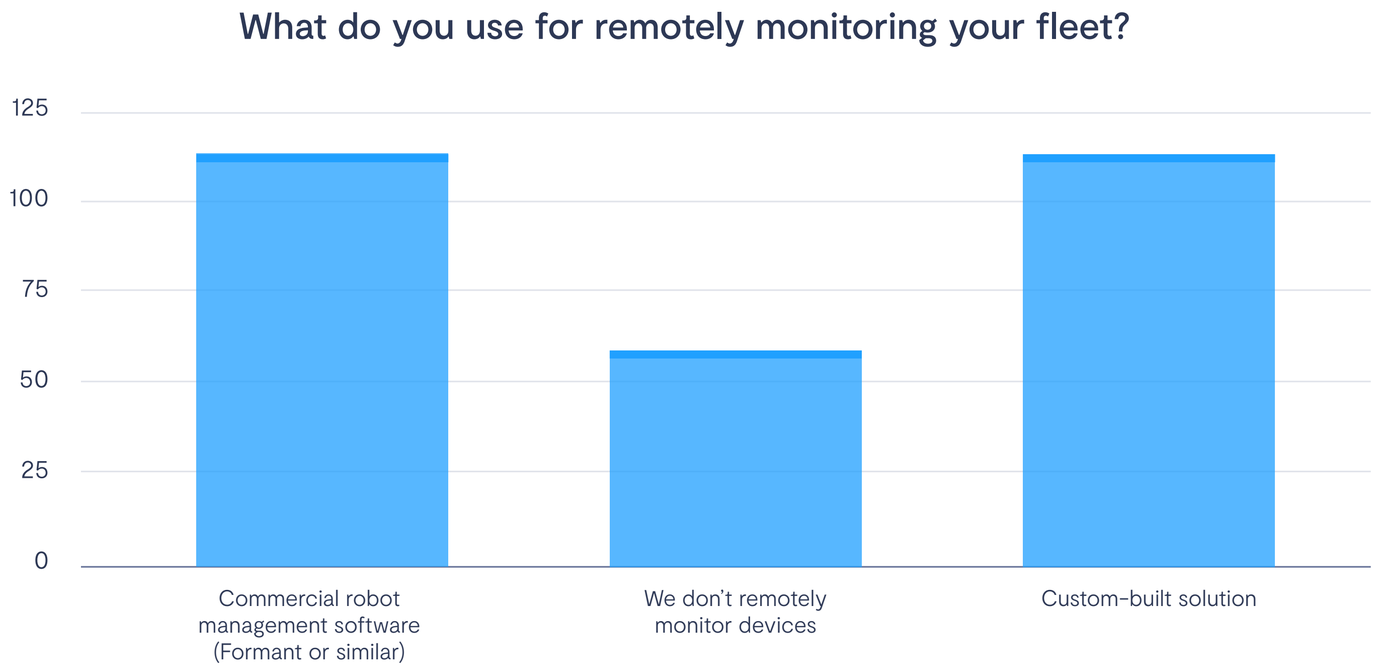


INDUSTRY	AVERAGE FLEET SIZE
Manufacturing	434
Warehouse + Logistics	412
Facilities Services	94
Construction	74
Healthcare	69
Agriculture	54
Hospitality	31

Unsurprisingly, we see larger fleet sizes in more mature industries/use cases (Manufacturing and Warehouse + Logistics). In fact, fleets in those industries are 6x larger than those in emerging industries.

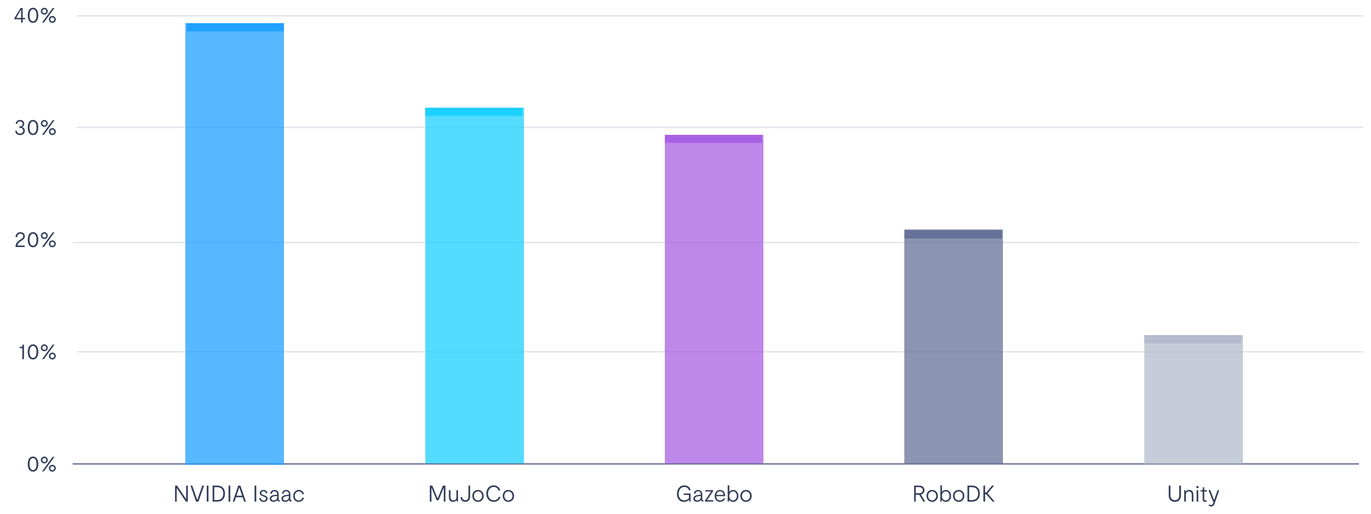
Tools

Tools for robotic development have come a long way,
but still have a lot of room for improvement.



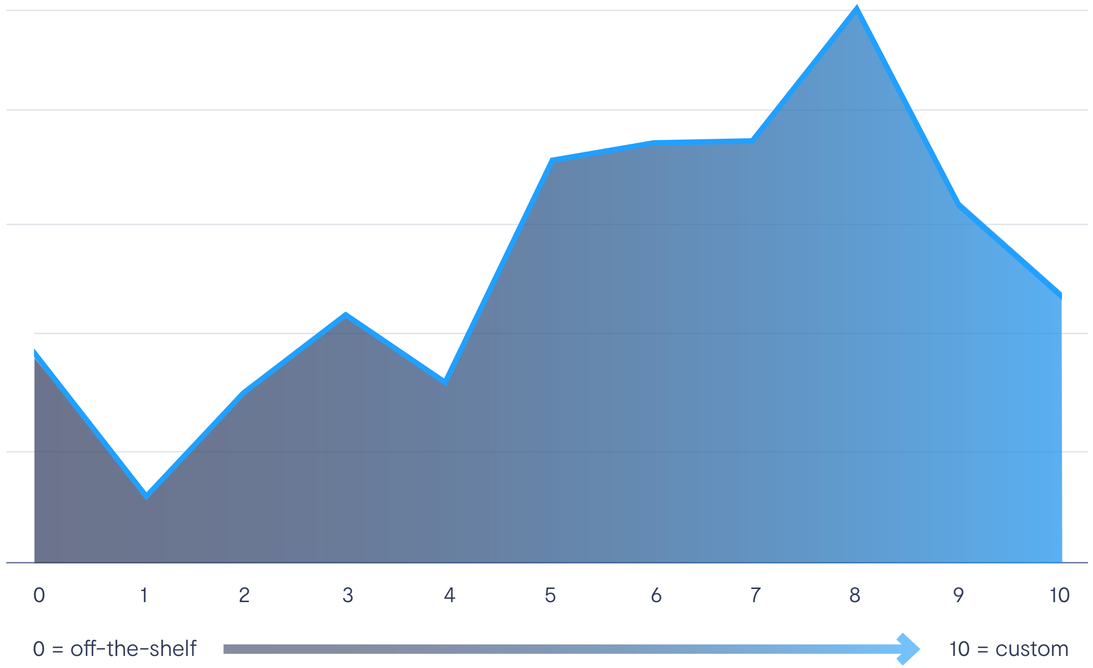
Most popular simulators

Simulation tools are crucial for RaaS companies because they provide a relatively easy and inexpensive way to develop and test robots prior to launch.



NVIDIA's Isaac was the most popular simulator, with many respondents also indicating that they used multiple simulators.

If you are a hardware company, how much of your hardware is off-the-shelf vs custom built?



- **6%** of companies report using all **off-the-shelf hardware**
- The most common situation is to use ~ **80%** **custom hardware**
- **61%** of companies report that their **hardware is more than 50% custom**

81%

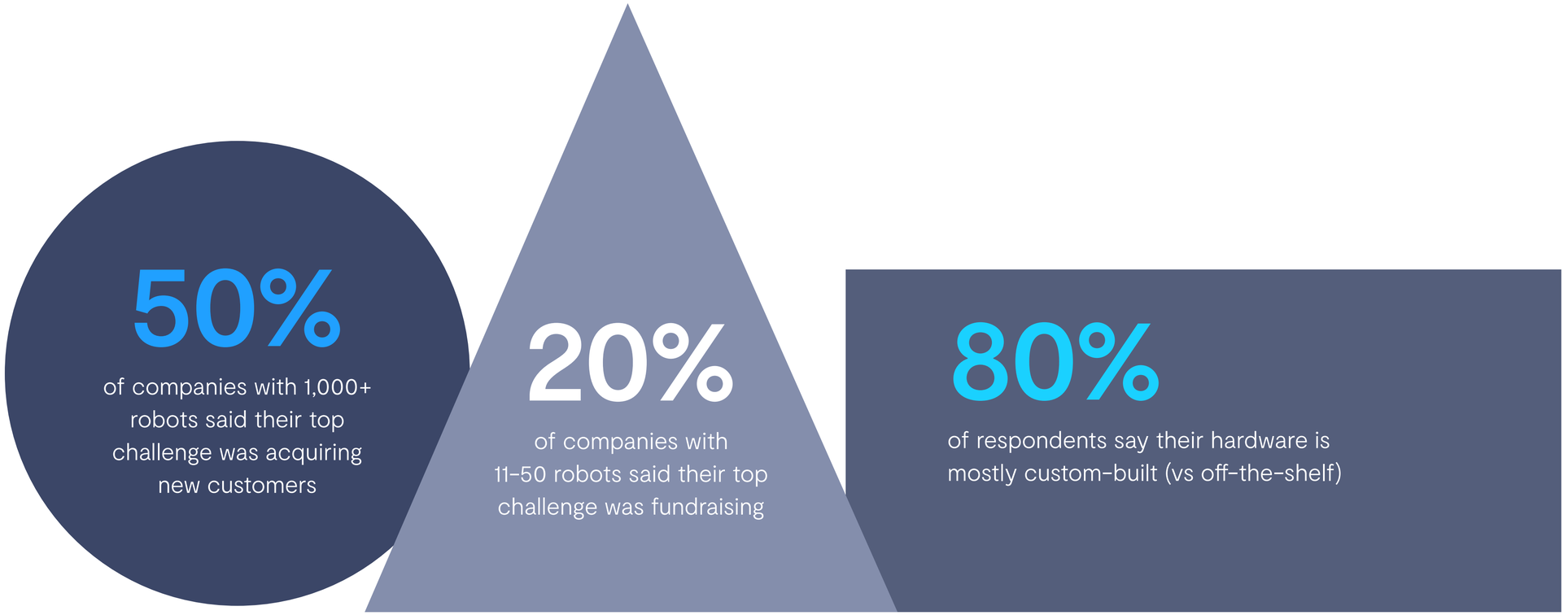
of survey respondents use ROS

We need more shared solutions and open source tools (adoption of things like ROS).

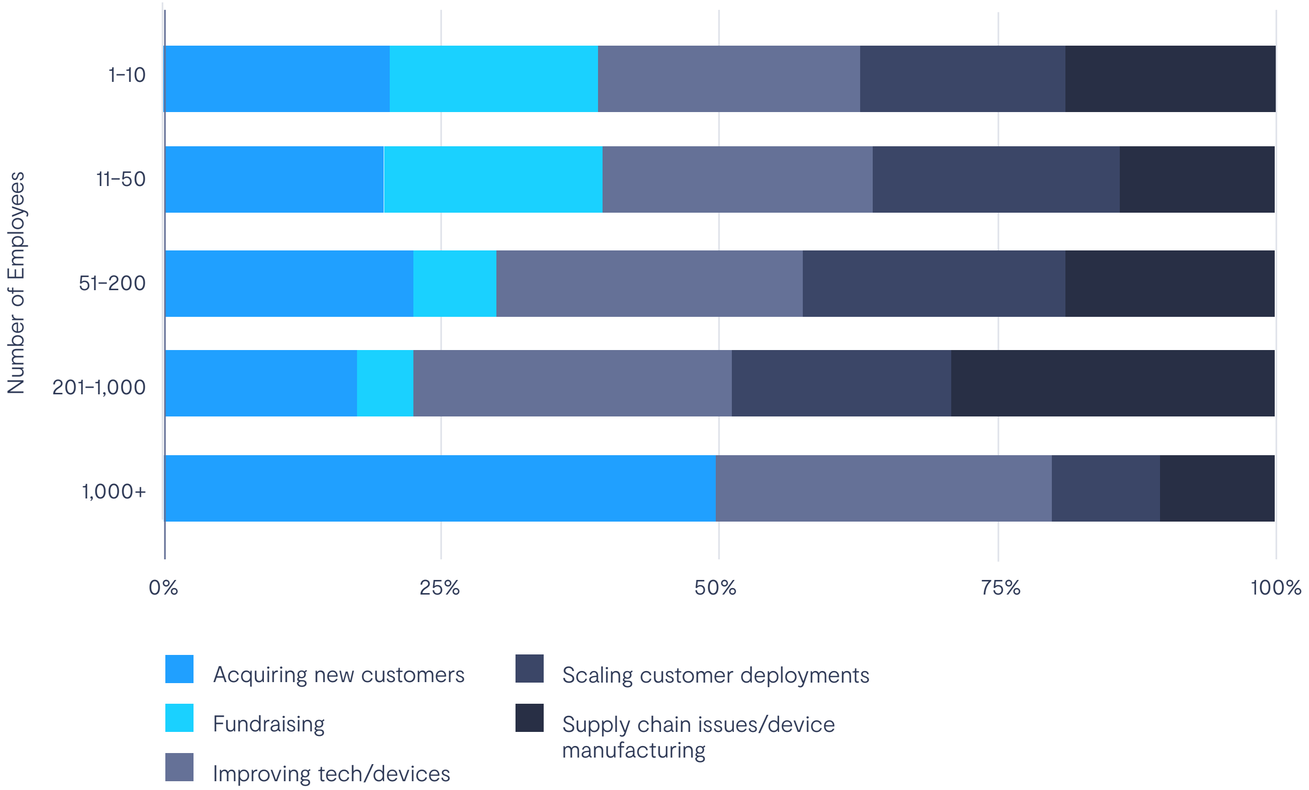
Software Engineer at a mid-sized warehouse/logistics robotics company

Challenges

Although the RaaS industry has gained traction over the last 3-5 years, there are significant hurdles that the industry faces. These include fundraising, the cost of development (both hardware and software), and resistance to adoption of robots in more “low-tech” industries such as agriculture or construction.



Biggest challenges facing robotics companies at different stages



Key Takeaways

- Fundraising becomes less of a challenge once companies are larger than 50 employees
- Acquiring new customers is the biggest challenge facing large companies with 1,000+ employees
- Companies with 201–1,000 employees face supply chain issues when scaling up their fleet

As an EU-based company, none of the issues listed above hit us as hard as the strict regulations. Many of these regulation agencies don’t even allow for RaaS, and many policy makers don’t know how to deal with it.

It’s frustrating and the biggest reason we haven’t been able to truly deploy the robots (without us standing next to it to adhere to the local regulations….).

Founder at a robotics startup

Other Challenges

“Networking for large scale RaaS deployments is a big challenge when deploying mobile non-stationary deployments. Integrating with cellular could have some benefit on adding IoT level support in RaaS.”

Hardware Engineer at a robotics startup

“I think the biggest thing we’re missing for an explosion is cost. Things like the Burro have a spectacular cost to return ratio, but things that are more complicated tend to be an order of magnitude more expensive.”

Executive at a mid-market robotics company

“It’s hard to introduce in stable and big state companies, which prefer traditional methods of cooperation eg. robotic system delivery. Hopefully, it’s changing.”

Founder at a robotics startup

“The development of robots is in great need of financial support from the government.”

Operations Manager at a mid-market robotics company

Opportunities

One of the biggest takeaways from our survey data is that the RaaS industry is still very much in its infancy. With small average fleet sizes and minimal traction in emerging industries, companies in the robots-as-a-service space have only begun to scratch the surface of addressing common challenges with robots.

As we look ahead to the growth of the RaaS market, there are a few areas that RaaS companies will need to get right in order for the industry to continue to flourish.

- **Fundraising:** In this fundraising environment, early-stage RaaS companies will live or die based on whether they can solve a real-world challenge with decent unit economics.
- **Interoperability:** Interoperability between robot vendors is key for adoption within enterprise organizations, where their myriad of challenges will never be solved by robots from a single vendor.
- **Overcoming adoption hurdles:** Traction in industries like agriculture, construction, and healthcare requires education, persistence, and repeated value delivery.

Highlights

56%

56% of respondents have a very positive outlook for the RaaS market

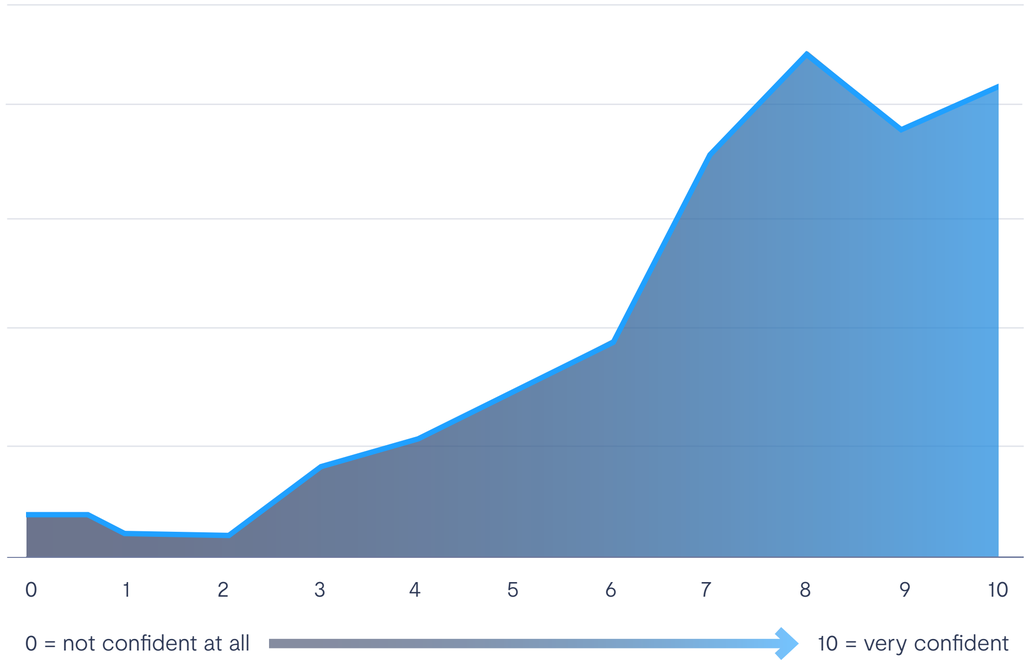
67%

67% of companies plan to fundraise within the next 12 months

> RaaS subcontracting for agriculture, construction, and landscaping will be huge.

Hardware Engineer at a construction robotics startup

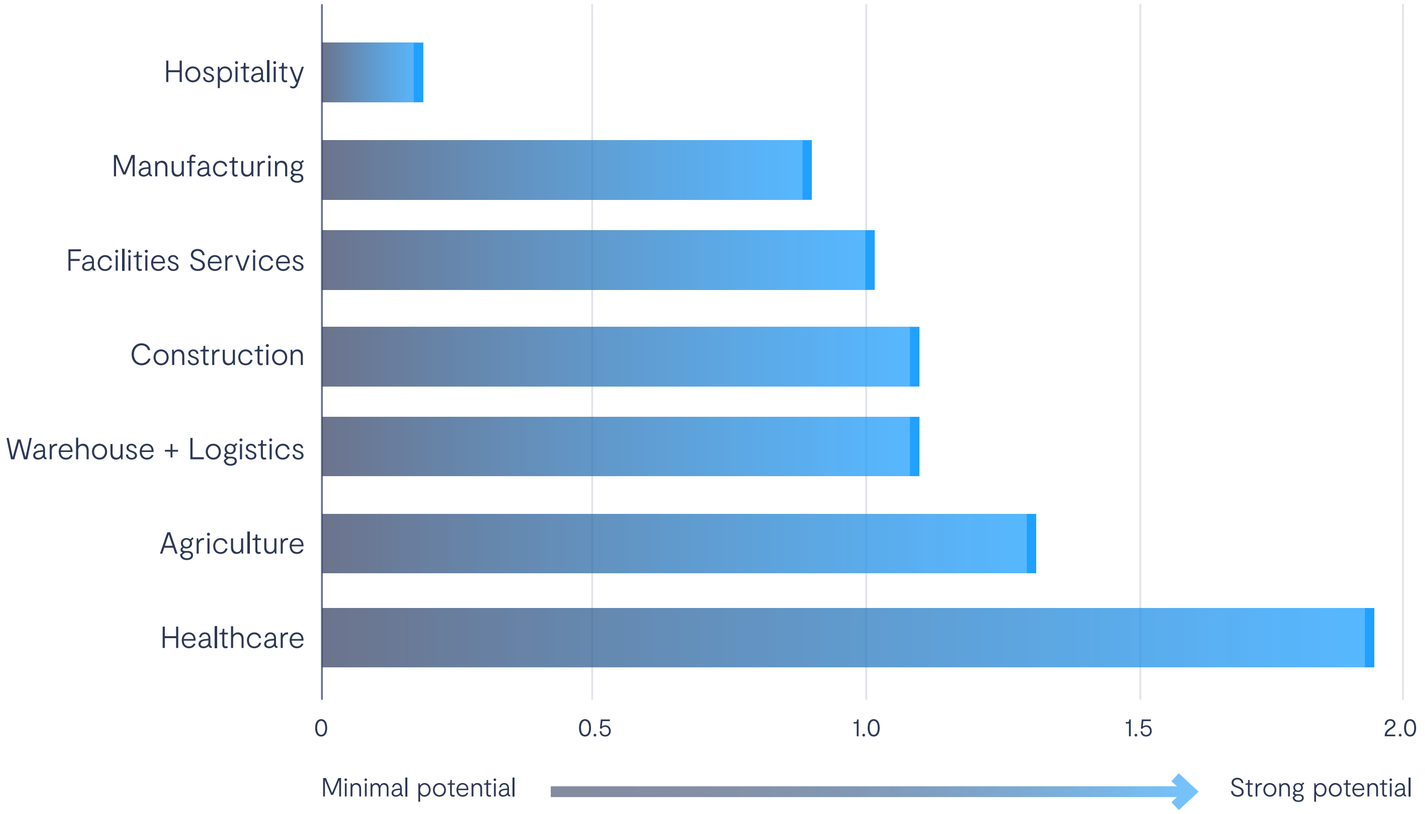
What is your confidence level in the outlook of the RaaS market?



RaaS seems to be the way forward. VC's are more willing to take on long term investments than customers.

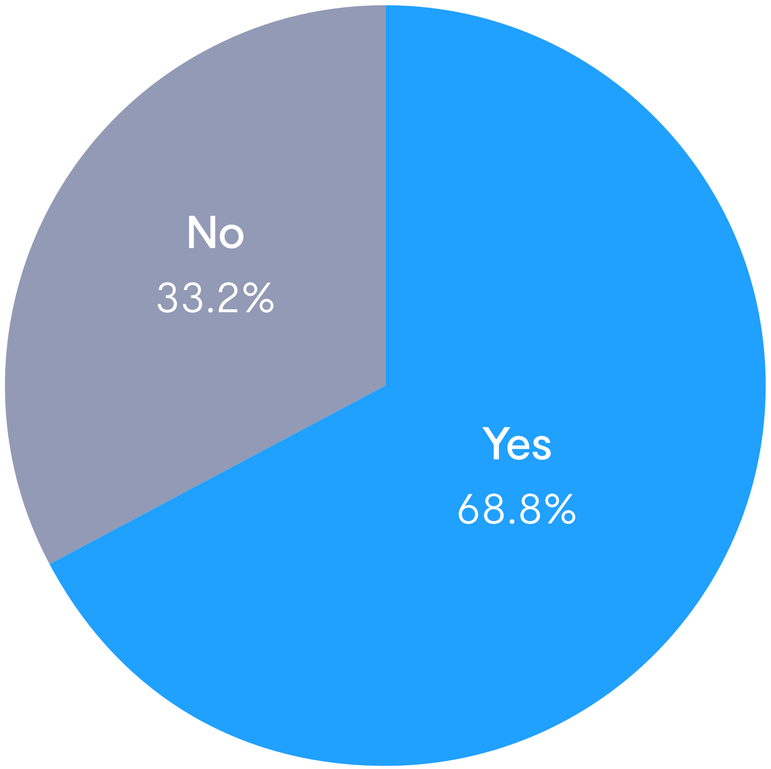
-Software Engineer at a mid-sized warehouse/logistics robotics company

Potential Impact of RaaS by Industry



> The industry is still developing at a high speed.

Executive at a robotics startup in the manufacturing industry



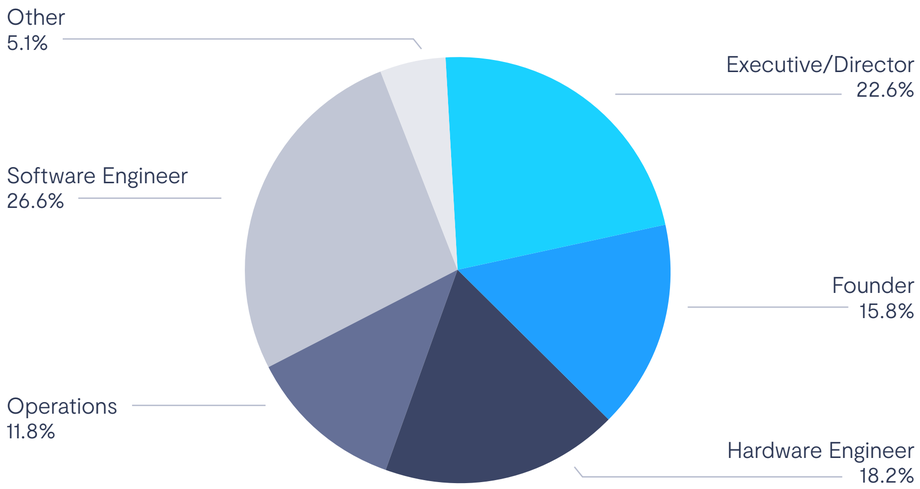
Is your company planning to fundraise in the next 12 months?

Report Methodology

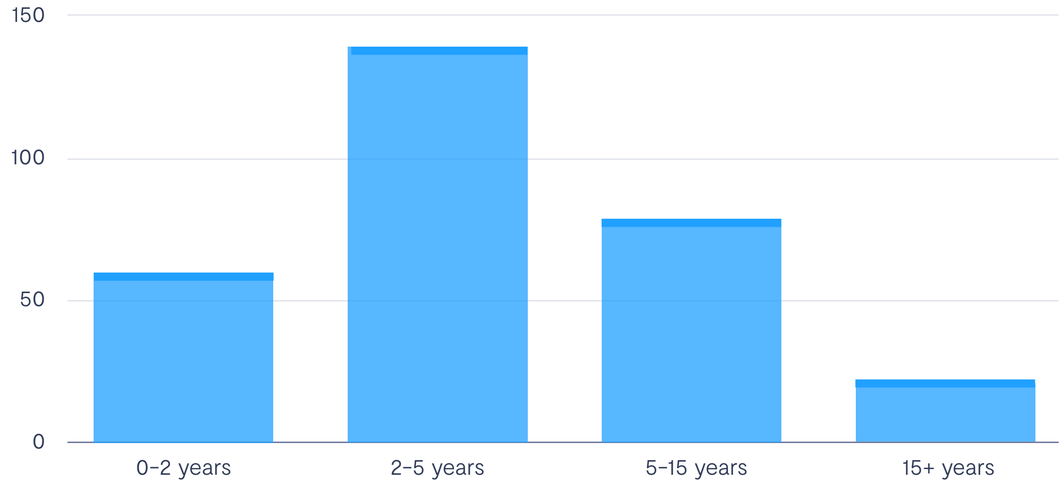
Formant's State of RaaS survey ran from February 1–28, 2023. It was sent to Formant's community of over 15,000 roboticists, in addition to popular robotics communities on Reddit, LinkedIn, Twitter, and more.

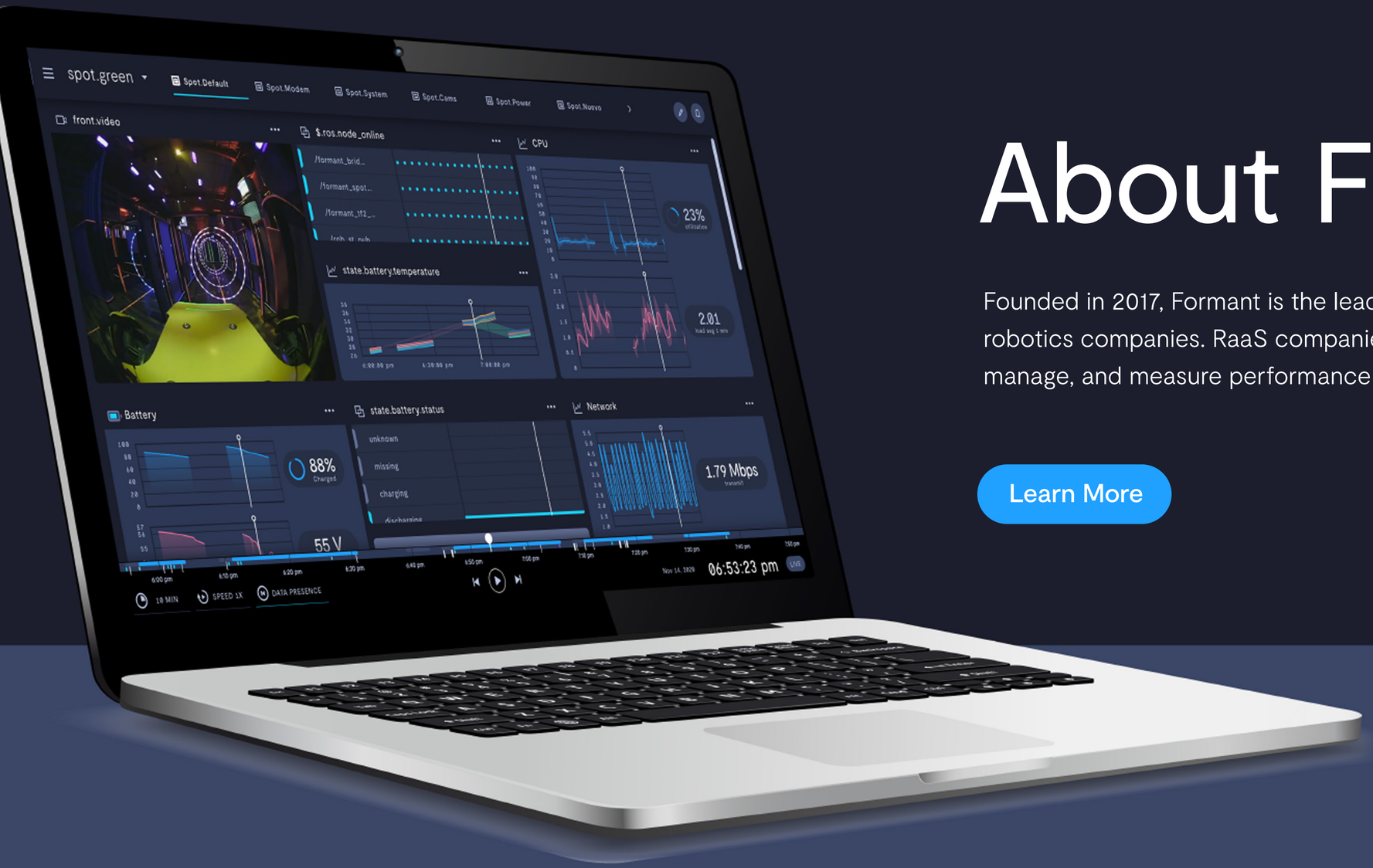
The survey received 304 verified submissions. Respondents represented a variety of experience levels, roles, and company sizes.

Which role best describes you?



How long have you worked in robotics?





About Formant

Founded in 2017, Formant is the leading data platform for modern robotics companies. RaaS companies leverage Formant to monitor, manage, and measure performance of their robot fleets.

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