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EXPERT INTERVIEW

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Mike Bell, CEO of Miso Robotics, on automating across the value chain of fast casual food

TEAM

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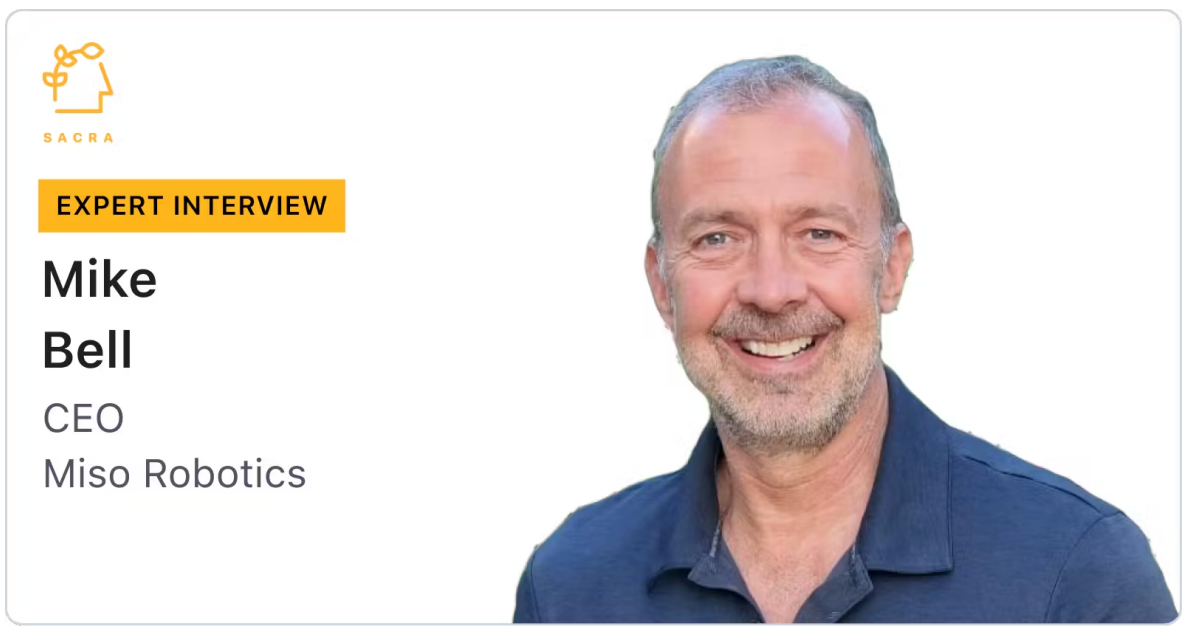
Mike Bell, CEO of Miso Robotics, on automating across the value chain of fast casual food

By **Jan-Erik Asplund**



Background

Mike Bell is the CEO of Miso Robotics. We talked to Mike about the value chain of the restaurant's back-of-house, the changing equation around labor in America's casual restaurants, as well as the crowdfunding strategy that has brought in $60M of investment from the public.

Interview

Can you start by giving us a brief overview of Miso Robotics and the core problem you're solving?

The company is about six years old. Miso spent the first five years of its life in R&D mode, developing underlying technology that we're just now starting to bring to market on a commercial scale. We're at the point, now, that there are robots being manufactured in Ohio, and they're coming off production lines and being installed in real kitchens. Those

robots are serving real food to humans, and we're in the dozens category now, rapidly moving into the hundreds. But what really has been developed is a pretty broad and deep stack of technology that allows AI, computer vision, motion planning, and all types of automation to work together to remove the repetitive mundane tasks in the back of house for the restaurant industry. We're exclusively focused on the restaurant industry and the back of house.

As you transition out of pure R&D mode, what does your sales process and go-to-market look like?

We have a tidal wave of demand—if I gave you numbers you'd find it hard to believe. We're the only one solving the single biggest problem vexing the restaurant industry today. Five years ago, there was a labor challenge.

Today, that is still the number one challenge for pretty much every brand we're talking to. Actually, many of them are referring to it as a 'crisis'. They cannot staff certain locations with the minimum number of people required to open up. That leads to reducing hours and has become an acute problem. It is not being solved any other way other than automation. There's just simply no other scenario where 1.6 million people return to this work economy and start working in restaurants again. This problem predated the pandemic—the pandemic accelerated it and worsened it.

We have the awareness of the industry—they've known about us and I've personally been in this industry for many years. We have a handful of announced partnerships and upwards of a dozen and a half others that are not yet announced. Those companies are in pilot, and looking to aggressively roll out. We announce them whenever the customers are ready to be announced. We're neutral and support whatever they want to do regarding publicity.

The way the process works is that we literally have no sales people, we have no marketing people. We've got a hundred and ten people here, most of them are engineers. These brands are in ongoing conversations with me or my chief of strategy and head of product.

What usually happens is we'll cook their food at our headquarters with a robot in our laboratory. We have the machine learn and understand the recipes and identify that

food. Then, they'll come out here and see that happen. We'll show them the throughput, the cooking accuracy the cooking precision and they'll taste the food. We'll show them the numbers to illustrate what they can expect in their environments in terms of throughput and accuracy. Typically, a new customer does opt to have one of our robots installed in one of their environments. Some of them have test kitchens, and some of them just put it in a live restaurant, but they'll usually run it in a live restaurant or a test kitchen for about 60 days or so.

From there, they can enter into the adoption phase where they start to roll them out. The pace of rollout can be all over the board. Every brand's a little different with how they're looking at this. That has a lot to do with their staffing, but we're in that pilot stage with upwards of fifteen global brands right now. The robots are performing really well.

Why is automation the path forward for restaurants?

Let's go back to before the pandemic. According to the labor department, there were roughly 850,000 labor positions that were unfilled. Fast-forward to the pandemic and it's closer to 1.5 million.

Not only were these positions unfilled, but they have very high turnover and very high worker dissatisfaction. Looking at these roles, they're pretty straightforward, really repetitive jobs and difficult jobs. These are jobs that don't necessarily serve as stepping stones to better jobs.

One role we're automating is the fry station. That's literally standing over hot burning oil and moving baskets from left to right for hours of the day. In a role like this, they're typically managing between six to ten different baskets of frozen food, and each one has to be cooked for about two minutes. If the food is 10-20 seconds overcooked, it's noticeable, it's overly brown. If it's brought out a little too early—if it's chicken or shrimp, or even if it's French fry—it's super noticeable and even dangerous.

It is a tough job, especially to have someone do that for eight hours a day, day in and day out. It's the first job that restaurants want to automate.

There's a second role they're looking for, but this one is unanimously the first job they're hoping automation can take over.

So when we look at where we should apply the technology that Miso has developed, the answer is: a whole bunch of places. But when we ask where should we apply it first? It's the fry station. Then, it's the drink station, but the fry station is what we're focusing on right now.

Can you talk about the roll out of your drinks station?

We are working on automating the drinks station. That's a product nicknamed Sippy, that's coming out in early 2023. It's the same type of solution. It'll take drinks that a human can produce—maybe 150 cups per hour for the drive-thru (our machine can do 250) - and automatically puts a lid on it, ices it, and marks the lid. That's kind of the next big big solution we're bringing out.

Where are we in the history of restaurant automation? What are the biggest challenges that have kept us from seeing a lot of these solutions out in the real world?

We're super early days and we have no visible direct competitor. There's a lot of automation going on with kiosks and front of house elements, but there's really no one tackling the labor problem for the restaurant industry and automating the way we are. The reason is it's really very hard.

Even if it comes to a highly consistent chain, planning robotic movement around such a diverse, physical location is a real challenge and super hard to do. Chipotle, for instance, is corporate-ownedand there's about 3000 locations today and they are opening about 50 new locations per month. They have dozens of different formats and layouts for back of house and they only fry one particular food, which is chips.

But with chains like White Castle or Burger King—which is at 7,000 locations here in the US—there's hundreds and hundreds of different building formats and dozens of different types of food to cook. McDonald's has poked around with automation when it comes to French fries, and there've been a few companies who looked into automation for preparing drinks.

What others have developed so far, we consider to be automation rather than robotics. Automation is something like a conveyor belt, a machine that moves without a brain or eyes. What we're doing is centered on AI and is reliant heavily upon computer vision. We have seven different cameras on our robot station. We use a robotic arm, which is a humanoid arm that hangs from an overhead rail and moves around and does the things that a human does—that's robotics.

Now, I just rattled through a number of different technologies that have to be in a pretty advanced state *and* work together, and that's a hard thing to do. Miso has some of the smartest engineers on this planet—we're born out of Caltech.

85 out of a 110 people at the company are engineers, and we're adding about five engineers a month. It takes a lot of brain power to get the technology to work together and to do it reliably. It's surprisingly easy to make one robot prototype that does stuff; it's incredibly hard to make a fleet of them that are reliable, that are robust, that work in different lighting with different size fryers,and other inconsistent elements.

And they need to work with different kinds of food in environments that change all the time, because people might scoot an oven over this way, or pull the fryers out and not put it back in the exact same place. We're now in a place with the technology where it's approachable, affordable, reliable, and we're just stamping them out.

What is the difference between automation in the front of the house and the back of the house?

It's definitely easier technology. There's been a lot of kiosk stands and vending, and a lot of voice-activated ordering—these are helpful and great. But that technology is in a different class than having a computer eye in a dimly lit, smoky environment be able to understand that the fryer is tilted a little bit to the left, and to set the basket down precisely, at that right angle and do it reliably. It's a harder problem to solve, and frankly, it's a bigger problem. The restaurant industry, conservatively, has 250,000 quick-serve restaurants just in the US, and it's closer to 800,000 worldwide. And those are just quick-serve restaurants. Every single one of those has a bank of fryers and a human being—or a place where they're hiring a human being to stand—and move food through those fryers.

Is Miso gearing up to replace humans? Or is it closer to an Amazon model, where there's a robot doing 95% of the work, and a human steps in at certain points?

What happens in every single restaurant we deploy is that no humans are sent home. There just simply aren’t enough humans to go around.

They're redeployed into other areas of the operation and allow that entire restaurant to have more capacity, more productivity, and therefore sell more. And that is, across the board, the truth of what’s happening today.

For a human, timing eight or ten baskets, and standing over it, and getting that stuff right every single time, truthfully, they're not really good at it. It's hard to do that and it's hard to get right. However, it's actually really straightforward work for a machine to perform.Now, when it comes to ordering food with another human? Robots aren't very good at that. And maybe they will be sometime in our lifetime, but they're not very good at it now.

Humans are superb at that. We're not building and we don't envision a human-less restaurant. We’ve instead realized that up until this point, humans have been doing machine work. When you free humans up, it's really easy.

People want to go work with other people, and they want to help with delivery orders, take orders, and do things that are more appropriate human work. The last thing they want to do is move baskets left to right, for eight hours a day, over a hot fryer.

Do you have a roadmap in mind for how many restaurants could be using your technology? Are there restaurants where it doesn’t make sense?

Our offerings include Flippy, an overhead rail robot that works over three, four, or even five fryers. Then we have Flippy Light, sometimes called Chippy, which works over only one fryer. Looking at that product footprint, there's almost no restaurant that isn't a fit. The ones that wouldn't be a fit would be really small volume restaurants, or maybe food trucks. But every one of these restaurants has the same problem.

We've made this technology super affordable, and super approachable, and we made the robot very compact. Quite honestly, we like to say, there should and will be one of our robots in virtually every normal restaurant in North America, and then eventually the world.

What does the break-even period look like for restaurants?

What we're building is a robot for all restaurants, franchisees, corporate-owned, big ones and small ones. We can't succeed in our mission if it requires a bunch of capital up front.

Even if we sold it with a 12-month break even period, some franchisees simply don't have the capital to put to work — even if it does get paid back relatively soon. We've taken all of that out of the equation. We provide our robots like a SaaS model, only it's a robot service, it's a RaaS model.

It costs about $3,000 a month to put a robot in, and we charge a little bit upfront for shipping and for installation, but customers generally break even in month one. $3,000 a month is approximately what it costs for a human being to work in a month for one shift.

Our robots work three shifts, including weekends, and they don't call in sick. So it's super simple math for a restaurant operator to understand. This is a no-brainer and that's one of the reasons the adoption is so high.

Have you looked at ghost kitchens and dark stores as customers for Miso?

We get that question all the time from ghost kitchens themselves. We're actually in a ghost kitchen for Kitchen United here in Santa Monica, California. We're familiar with the setup. They have special size constraints, and ultimately they have the visions of maybe having multiple brands out of one setup, even a central fry station or a central oven. Ghost kitchens are generally pretty eager technology adopters, so they're easy to work with. We're talking to a bunch of them.

Can you talk a bit about the customer education challenge?

Yes. The customers tend to self-identify. I'm not going to name brands, but you can use your imagination. There's certain upstart brands who've grown like crazy, and they're young brands. They may have people who are actually part of innovation teams, and their job is to help automate and make operations more efficient. There are other brands that have been around for a very long time.

These customers split down the middle a tale of two cities. Some of them think it's great, they want to look at the data, do the analysis and then go big. They're trying to see how quickly they can get as many of these into their chain as possible.

Others look at it and decide they're not so sure about all this new-fangled stuff. They think it might be a fad, so they want to keep an eye on it. Those customers are definitely moving a lot slower. No one has well-founded objections that are based on real data.

The fact of the matter is that robots are more affordable than humans. They cook better and more accurately than a human. The only occasional objection we get, sometimes, is that it's going to take up a little more space than they would like it to take up.

But a lot of customers come in as skeptics, and when they look at the data and see the throughput, and see everything they're producing, it's not a religious debate. There's no debate at all. We just put the numbers on the table and let the customer go where they will at the pace they'll go.

It sounds like there's two main technical challenges here: the machine learning/computer vision side, and then the scaling up production side. What are the challenges with the factory and mass production side of this?

Looking at any of these chains—and I'll list the companies that we're public with—White Castle has 350 locations, Chipotle has 3,000, Buffalo Wild Wings has almost 2,000, and Jack In The Box has over 2,000.

As an example for illustration's sake, if these chains are going to adopt Miso Robotics to 75% of their locations in the next five years, that's when we will be one of the largest users of robotic equipment on planet earth. As far as robotic arms, we will be

the largest customer of robotic arms in the years ahead, given even conservative estimates of rollout.
That brings up all kinds of supply chain challenges. We also sell as part of our solution, if the customers want, a refrigerated dispenser that dumps fries into the basket for the robot. Some customers want that too.

When we look at that, then the numbers get challenging really fast. The restaurant industry is incredibly large. We'll have a lot of challenges in the years ahead. We're focusing on it now, and we've got an incredible supply chain team. We hired a team, that helped Fitbit get up through their supply chain challenges and they've seen this rodeo before. We're doing all the right things, but we're going to be pushing the boundaries for the industry.

You mentioned the fry station and the drink station being wedge use cases. Where else do you see this going? What other jobs does Miso want to solve?

We get questions like this all the time about what else we can help restaurants do. We look at it as the lowest hanging fruit equation. What is the biggest problem that's easiest to solve? We're progressing through the opportunity this way.

We look at what goes on in the back of the house at any fast food location and understand that so many of those tasks are very repetitive. For example, putting pepperoni on pizza is something that should be relatively easy for a robot to take over. But something like shelling oysters or mussels? Yes, but not for a while. That's really hard. Then there are things in the middle like making guacamole or scooping ice cream.

If you ask an engineer? Yes, absolutely, all these things can be done by a robot. But they may not be able to be done economically.

You may not like the price, or the throughput, or the size. We're looking at it through the eyes of the customer—what is the customer ROI that we can produce? It's a target rich environment, and there are a whole bunch of activities that we can and will take over with automation in the years ahead.

Miso has been one of the most prominent companies to raise money through equity crowdfunding. Why has

raising via equity crowdfunding been an important part of the strategy for Miso?
I've spent my professional career raising venture capital, private equity, and institutional capital. The short answer is you go crowdfunding, if you can. And we can, we're really fortunate to have a story—we have a picture that tells a thousand stories.

When people look at Flippy, moving and frying food, they don't need white paper or any kind of analysis to understand that's the future. There will be a point in time when humans are longer doing this and machines will and they believe in that enough to invest in it and to buy into our vision. We're really fortunate.

We're approaching 20,000 shareholders—we're one of the largest crowdfunded companies in history. We're bringing in close to $60 million dollars in crowdfunding total when we close our Series E round. The answer is it's a terrific and efficient source of capital and it works really well.

We don't have to traipse around Sand Hill Road pitching venture capitalists. My management team stays focused on the business. Today, there are investors choosing to put money into Miso and capitalize us, that allows us to continue to hire more engineers, to tackle bigger problems faster. It's a really efficient path.

Because it's all under the Reg A guidelines, we have audited financials. We conduct ourselves as if we're a public company. We have annual shareholder meetings and everything's transparent and we believe we're on a path to ultimately have a public offering and be a public company. In the meantime, this is a really good source of capital for us.

Do you feel that operating as if you were a public company has helped Miso operate better?

Absolutely. First of all, we think about it all the time: We have about 20,000 owners, and counting. It brings out discipline, we have to think about being a public company someday. In that case, let's just do it like this because we might as well get the practice.

We also feel that everything we do could and should be examined, and should be transparent. We think of ourselves as a public company. That's really good for private companies. It introduces good stuff into the company's DNA..

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