

Embracing the Future of Manufacturing



Richard Savage
Owner

Savage Automation LLC

Interview conducted by:
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CEO CFO Magazine

CEO CFO: *Mr. Savage, what is Savage Automation?*

Mr. Savage: We specialize in building end-of-arm tooling for the injection molding industry, using 3-D printing technology.

CEO CFO: *What made you decide to focus in that particular area?*

Mr. Savage: My background is in injection molding, I have been in injection molding for over sixteen years working for many major medical device manufacturers. While I was working in the molding area, I often interfaced with the automation of the molding process and I was frustrated with the quality of automation that we had.

As I progressed in my career, I started making improvements and changes and things to make my quality of life better with the automation and that progressed on to the thought that, well if nobody else is going to do this I might as well do it and market it.

CEO CFO: *What are some of the challenges in your arena and what are some of the improvements?*

Mr. Savage: Some of the challenges are actually with automation that is not 3-D printed. The automation we build is called an end-of-arm tool. An end-of-arm tool is the hand that goes to the robot arm to do whatever that robot needs to do whether it is picking up and placing parts or handling those parts or packaging those parts. That end-of-arm tool has traditionally been manufactured out of extruded aluminum.

People cut the extrusion aluminum up and they bolt it into a frame and then attach suction cups, grippers or whatever they need to the frame. The problem with that is it is very heavy and not accurate. It is easily worn-out, as you move along those suction cups and grippers in production and as things get adjusted, the threads and aluminum wear-out and it just does not work well.

Another challenge is that there is not a whole lot of people offering this service of building this end-of-arm tool, it has traditionally been where you would order a kit and make your own adjustments.

CEO CFO: *Are your end-customers looking for a better way; how are they recognizing they even exist and how do you help with that process?*

Mr. Savage: I think our customers wish there was a better way but not all of them are aware that there are other options. A lot of our customers are fairly new to automation, or even if they have been using automation for some time it is not their core business, so they do not know about this.

Our customers find out mainly through us, our advertisements and our partners in the robotics industry that recommend us. We help them to see the benefits of what we can do for them, eliminating trouble-shooting on their robots, eliminating excess time setting up their robots.

CEO CFO: *Other than the size of a hand, what might be different from one hand to another?*

Mr. Savage: Every hand that we design is unique because each one is doing a different job especially in injection molding. In injection molding you have a molding machine that has a robot on it and in that molding machine you can place a variety of different molds depending on what you are manufacturing. On Monday, you might run plastic bottle caps and you need a robot hand that matches the shape of the plastic bottle cap and the number. Let us say you are running a mold that is 64 plastic bottle caps, you are going to need a hand that has 64 suction cups and comes in and picks up all of those bottle caps. Then around Thursday you finish up your bottle cap job and you switch to electrical housing and there are only four of these electrical housings and they are a different shape altogether, you will need a different hand that deals with that product.



[Jesse Garant Metrology Center](#)

Companies that are doing the injection molding can have thousands of different molds and each hand is customized to do a specific job for that specific mold.

"I wanted to show the industry and the world that people can accomplish big things even if they do not have a piece of paper from some authority that says that they can; they can still do amazing things by learning and gaining knowledge outside an accredited university setting." Richard Savage

CEO CFO: *What is involved in the interaction with your clients?*

Mr. Savage: The first thing we do is we quote a project. When a customer comes to us for a quote we try to ask for as low-level information as possible because it takes a customer a long time to gather sheets and sheets of data just to get a quote; so for our quoting phase we ask them to tell us how many things we are picking up, send us a drawing of the thing we are going to pick up and then we can quote that project. Then if we get the job can go through with the customer and walk through how the part comes off the mold and what to do with it after we pick it up. Do we place this part on a conveyer or do they want it dropped in a bin, whether there is something special about this part, and if we drop it and it hits another part is it going to mar the part and cause problems? At that point we collaborate to determine all the customers' requirements for this end-of-arm that we are going to build for them.

Once we have determined all of those requirements, we go into our design phase and we design the end-of-arm in our CAD software. Then we go back to the customer and have a design review. At that point we will bring the CAD models of

their mold in their injection molding machine, possibly the robot if we need it, and then this model that we have built and designed of the end-of-arm tool. They are the expert in their process; they know their mold, they know their machines, they understand some of the things we might overlook, so we go through that design together and review the sequence and make sure that we aren't missing any details.

When the design review is finished, we get them to sign-off that they are happy with the design and then we build the end-of-arm tool. The base of the tool that holds all the components is 3-D printed, then the suction cups or pneumatic grippers which do the work of holding the products being molded are attached to the 3-D print. When it is finished, we package it up in a protective case and ship it out to the customer.

CEO CFO: *How long does one of these last?*

Mr. Savage: It should last the lifetime of the mold unless it is crashed or damaged in some way. We have end-of-arm tools that have been running with the mold for over five million cycles with no maintenance required to the end-of-arm.



[Nano Diagnostics/NanoDX](#)

CEO CFO: *Is there typically maintenance required for the other versions?*

Mr. Savage: Yes there is typically quite a bit of adjustment and maintenance required with a traditional arm. Ours is still going to require some things, like suction cups are going to wear-out, but as far as the main body of the end-of-arm, ours has an indefinite lifetime unless you crash it, where a traditional one is going to wear out overtime from adjusting and even the maintenance that they perform on it, it is going to wear that out.

CEO CFO: *How does Savage Automation stand out at a conference?*

Mr. Savage: Our product is so unique that it's easy to stand out. A customer in our industry will see our product and quickly say "Hey this is really different; this is very new." We often get asked how we made this, even our manufacturing method of 3-D printing really causes our product to stand out. The other thing that helps us to stand out is when someone comes to talk to us, we know injection molding very well.

Some of the competitors in this space that do manufacture end-of-arm tools in more traditional methods, do not have the same background in molding that we do, they service multiple different industries while we are very dedicated to the molding industry so when a customer comes to talk to us we have a lot of depth to be able to speak to their specific issues as injection molders.

CEO CFO: *Are there any challenges today in terms of supply chain, in terms of getting materials?*

Mr. Savage: For our end-of-arm tools specifically no, we are actually pretty insulated from the supply chain disruption because we use 3-D printing, we are not really tied to the disruptions we are seeing in aluminum and steel. We have

several local suppliers that help us out with fabrication and with our components. We really have a robust supply chain even with all this trouble.

The one thing we do see is that when we are asked to help with secondary automation outside the end-of-arm. That space there is seeing heavy supply chain disruption. Therefore, we are seeing things similar to what a lot of automation companies are seeing and having trouble getting a hold of even simple things like circuit breakers or PLCs or things like that.

CEO CFO: *Do many of our customers look to you to go beyond end-of-arm?*

Mr. Savage: Usually not on the first job. Our first job our customers are mostly looking for just an end-of-arm. It is the second job where they come back and say, "You did such a good job on this, can help with the conveyer and the downstream automation."

It is mostly by customer request that we do that and not something where we necessarily advertise as our product offering. We are dedicated to the success of our customers and if our customer is not able to find adequate automation support for the rest of the line, if we just stop at the robot hand, they are still going to be dissatisfied with their automation. That is why, often on the second job we do get asked to help out with integrating the rest of their automation.

CEO CFO: *How is business these days?*

Mr. Savage: Business is doing very well. With the difficulties that I think almost every industry right now is seeing with finding qualified labor, it is really a hot market for automation where it is not just "Hey, we can save money by implementing automation" but more like "If we do not implement automation, we cannot produce the product at all". Our customers just cannot get people to do some of the traditional manual labor repetitive motion tasks anymore.

CEO CFO: *How are you helping your customers with the labor shortage?*

Mr. Savage: The secret is implementing automation and that is the real key. As companies struggle with finding people, we encourage our customers to look at automation because not only will it help you with your labor shortage but it takes over work that is not a good fit for human labor anyways. The robots are taking over jobs that have safety risks like carpal tunnel problems, repetitive motion injuries, poor ergonomics, and reaching into machines. So not only do the customers gain some extra labor time from a robot that runs 24/7, they do not have to subject their employees to issues that come along with these repetitive motion tasks.

Our real solution is to say yes add more automation into your plan, now is for sure the time because the labor shortage is only getting worse.

CEO CFO: *How do you spend your time as CEO?*

Mr. Savage: All over the place. We are a very small business and I wear a lot of hats in the company. I would say that probably 50% of my day is spent on working on end-of-arms designs and working with our other designer to look at the designs and make sure they are up to the standard that we expect.

The other 50% of my day is split up between marketing, communicating with customers, having Zoom meetings with customers who are asking for support with their automation, or to look at a project that has a lot of pieces to it. Then there is our task of daily accounting and invoicing, and I am still wearing most of those hats in the company.

CEO CFO: *You sound like you are enjoying it!*

Mr. Savage: It is a blast every day.

CEO CFO: *Why pay attention to Savage Automation?*

Mr. Savage: Without getting on too much of a soapbox, I believe that Savage Automation is embracing the future of both manufacturing and of higher-level engineering. One of the things I am very proud about our company is that we are actively training the next generation of engineers. I chose to leave university without an engineering degree. I was frustrated with the cost of education, the lack of practicality of the things that we were learning in what is supposed to be an engineering program. Engineering by definition is designing things for the real world and fixing issues and creatively solving problems.

Savage Automation embraces the idea that a university education with a piece of paper and a degree at the end is not required to be successful and it is also not required to be a good engineer, someone who can create things to solve difficult problems. Our hiring method so far has been to hire people that maybe do not have all the education or all the experience, but to hire people who are willing to put in the effort to learn how to do things, to learn to use CAD software, to attend classes at our community college and learn some hands-on robotics training.

We really encourage young people and we do a lot of seminars to get young people early on into manufacturing focused classes and extra-curricular activities and these sorts of things. I think that is what embodies Savage Automation. It is why I started a company and why I set out to run my own business and grow it into something bigger than just an idea. I wanted to show the industry and the world that people can accomplish big things even if they do not have a piece of paper from some authority that says that they can; they can still do amazing things by learning and gaining knowledge outside an accredited university setting.