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Management Strategies

Behind the Haas Phenomenon

The philosophy of California company has redefined what's successful in a new manufacturing century

By Michael P. Collins

At the same time that America was losing most of its machine tool industry to foreign companies, Gene Haas couldn't get what he needed as a machine tool customer.

Haas' response has proved nothing short of phenomenal. Today, California-based Haas Automation Inc. is one of the largest volume producers of CNC machine tools in the world.

Moreover, the Haas story represents a new chapter in American manufacturing history — a history previously marked by domination and then decline.

From the beginning of the 20th century to the mid-1960s, American manufacturers had a 28 percent share of the world market and 95 percent of the domestic market. But by 1986, "the U.S. share of the world market was less than 10 percent and their share of the domestic market had dropped from 95 to 49 percent. In five short years, from 1981 to 1986, the number of U.S. machine tool plants shriveled by one-third because of bankruptcies, takeovers, and reductions in capacity," writes Max Holland in *When the Machine Stopped* (Harvard Business School Press).

And during this tumultuous time in the early 1980s, Japanese and other foreign machine tool builders began exporting machine tools to the U.S. market. Japanese companies such as Mazak (Yamazaki), Mori Seiki, Kitamura, Okuma, as well as the Korean company Daewoo, grabbed big parts of the U.S. machine tool industry. By 1988, the Japanese had constructed nine machine tool plants in the United States, recognizing that establishing manufacturing plants in close proximity to the customers and markets was the best solution for the long term.



Gene Haas' philosophy is pretty simple: 'Gene builds machines that he would buy, and provides the type of services that he would like to receive.'

Gene Haas started his own machine tool manufacturing business in 1983, and displayed his first CNC machining center in 1988 at the IMTS show. Haas Automation was the first American machine tool company to build standard CNC machine tools, and openly publish the price list. Haas also began focusing on the neglected job shop market, offering very short delivery times, superior parts and service, and lower costs, compared with other American machine tool makers.

By 1997, Haas had shipped its 10,000th CNC machine, making it the largest unit-volume machine tool manufacturer in America. By 2006, Haas Automation had exceeded \$700 million in sales, and in 2007 the company installed its 75,000th machine.

So what happened? How did so many established American machine tool manufacturers lose so much business and the ability to compete? And how did a small entrepreneur start a machine tool manufacturing company in America during this period — and not only survive but grow into a world leader?

The answer to these questions is not only interesting but also instructive, especially for other manufacturers that are either in decline or at risk of losing business to foreign competitors. Globalization has allowed foreign manufacturers to invade most of America's industries and offer low-price products. It also has widened American buyers' options. For manufacturers to compete takes more than cost reduction and quality improvements. It requires an assessment of the market changes, and it mandates changes in most strategies, such as organization, management, marketing, products, and services. In almost every instance, what worked in the past probably will not work in the future.

The Haas Automation story is not only instructive in its lessons; it contains many of the elements that manufacturers in a variety of industries should focus on to compete in the global economy. And it is easiest to tell the story by comparing the original machine tool manufacturers with the start-up in terms of the following critical factors.

New product investment and innovation

One might make the case that designing highly specified custom machines is a continuous investment in new products and innovation. But if the engineering cannot be re-used for similar applications or new markets, the company will never reach a level of commercial success. This was terribly apparent in the R&D invested in machine tools for the military and aerospace industries. The result of this new-product strategy was that American machine tool manufacturers were not ready to compete with foreign-made machine tools during the 1970s and 1980s.

As American manufacturers lost market share, financial troubles reduced their investment in both new products and plant modernization. As the downward financial spiral worsened for most of U.S. manufacturers, very few changed their strategies.



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continuously invested in technology, and has kept its manufacturing operation state-of-the-art.

Haas began his company by designing the industry's first fully programmable 5C collet indexer. He built the first Haas vertical machining center (VF-1) in 1987, and introduced it at IMTS in 1988 for an unheard-of list price below \$50,000. The first Haas horizontal machining center was introduced in 1993 as the HS-1RP. In 1994, the company introduced its first Haas CNC lathe, the HL-1.

Much of Haas Automation's success and growth has come from a continuous investment in new products. Its goal is to have 10 percent of annual sales come from new products. It now offers more than 100 different standard models to service all of the market niches it has discovered.

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Customization and short runs vs. standardization

In the glory days of the 1960s and 1970s, military and aerospace customers purchased highly specified and custom machine tools, which absorbed much engineering and didn't lead to commercially competitive or low-price machines.

Most American manufacturers didn't believe it was possible to compete with a low-price standard machine. They built to order, had long lead times, and sometimes did not even set prices until shipment. It was not uncommon for customers to have to wait for more

To add insult to injury, during the glory days of the American machine tool industry, many of the leading companies offered the Japanese licensing of their technologies. This helped the Japanese machine tool industry master the available technologies and accelerate their growth. They eventually came back and took markets and customers away from the very companies that originally licensed them. (When are we going to learn this lesson? We are doing it again in China.)

Gene Haas knew what it was like to run a machine. So, from the start, Haas machines were designed from the operators' and the programmers' points of view. The company has

than a year before their machine was shipped, and then be faced with many quality and service issues during the installation. They had set themselves up to get knocked off by competitors that could offer high-quality machines at economical prices, and deliver them quickly.

Gene Haas did just the opposite. He started his company with three primary goals:

- To compete with anyone, anywhere in the world who manufactures standard machine tools,
- To provide the highest quality and most reliable product available, and
- To improve productivity in all things they do.



Haas Automation has made extensive use of just-in-time production, lean- manufacturing techniques, automation, and robotics to keep costs low. The company continually reviews its processes (both machining and assembly) to simplify them and take out time and waste.

Haas could see the need for a low-price standard machine, and built a company and the processes to make it happen. The irony is that the same approach was used by Asian manufacturers to gain market entry into many of America's largest industries.

New customers and markets

The larger machine tool manufacturers had ignored small shops. Seeing the need for a product for the job shop market, Gene Haas avoided the customers and markets that wanted highly specified machine tools. Haas

knew that his market required a simple, compact machine at a very economical price, that could be delivered in a very short time. After Haas Automation's initial success in the United States, it believed that it could compete in foreign markets with machines made in America. The approach to foreign markets was the same.

China is a very good market for Haas machine tools. China is the largest consumer of machine tools in the world, and will continue to be so long into the future. The factors that make Haas products attractive in the China market are:

- Its distribution system and growing network of Haas Factory Outlets,
- The idea that U.S. quality of manufacturing still carries a lot of weight in most countries, and
- The fact that Haas parts availability and service are superior to those of most other machine tool makers in China.

How did so many established American machine tool manufacturers lose so much business and the ability to compete? And how did a small entrepreneur start a machine tool manufacturing company in America during this period — and not only survive but grow into a world leader?

In 2005, 44 percent of Haas shipments went to Europe or Asian markets. By 2010, it expects to be exporting 65 to 70 percent of its factory output, with as many as 4,000 units going to Europe and 3,000 units to China.

Monitoring customers and markets

This is one of the most important yet overlooked strategies in American manufacturing: A great deal of Haas' success in marketing is because it is very good at monitoring its customers' wants and needs.

From the very beginning, Haas and his company could see the value of monitoring customers. Here are just a few examples:

- **Distributor reports** — Haas diligently collects service reports from every distributor. The reports are mandatory and part of their distributor agreement. These reports reveal quality or customer satisfaction problems, and are a terrific tool for the Haas quality program. Information from these reports is also used for developing new products.
- **90-day monitoring** — In addition to distributor reports, the Haas factory also monitors all newly installed machines for the first 90 days of operation. The company has determined that if there will be any failures, most will happen in the first 90 days of operation. Monitoring gives them the ability to jump on the problem before it causes much downtime.
- **Adopt-a-Mill** — Another unique method of monitoring is for a manager and an engineer to select a customer and call them once a month for one year to find out how the customer's machine is performing, and what he likes or dislikes about the machine. This is direct feedback to management, and also more input to the quality program.

In addition to these programs, most Haas managers visit both distributors and end users. This is in keeping with Gene Haas tradition of what he would like if he were a customer.

Monitoring customers and markets is now a matter of survival. In fact, to survive and grow in the new economy, manufacturers need good external information to know where to find new opportunities. And they need real-time information to be able to change their products and services as fast as the customers demand.

Support services

In the 1970s and 1980s, most American manufacturers did not consider support service a high priority. In fact, quality became so bad that the recession of the early 1980s ushered in a whole new quality religion based on W. Edwards Deming's ideas of Statistical Process Control, TQM, and eventually ISO 9000. But until this happened, quality and service had been lousy, compared with Japanese and other competitors.

The machine tool industry was no exception, and as the manufacturers lost market share and financial problems increased, quality and service got proportionally worse. As foreign products had more success in the American machine tool markets, customer service deteriorated. The emphasis, particularly in larger companies, shifted to the shipment schedule and cash flow to survive.

An example is Houdaille Burgmaster. Toward the end of the Burgmaster story, the company was shipping machines with two-page lists of items to be "fixed by field service," and its machines became known for excessive downtime. Clearly, shipments and cash flow became more important than customers. In the short term, the quarterly results became more important than the long-term health of the company or its share of the market. In 1979, Houdaille underwent a leveraged buyout (LBO). Debt became more profitable than equity, speculation more lucrative than enterprise. The LBO destroyed what was left of the company.

Gene Haas must have known of these failures because, from the beginning of Haas Automation, he emphasized quality and customer service. Gene is a machinist who ran his own job shop. He knows what it's like to have a machine break down and have to wait for repairs. He also knows what it's like to run a machine. Gene's philosophy is pretty simple: "Gene builds machines that he would buy, and provides the type of services that he would like to receive."

The emphasis on quality, uptime, parts, service, training and fast response to keep customers up and running has carried on since the founding of Haas Automation. The Haas culture is built around supporting and servicing its customers better than anyone in the world.

Training and education

Haas Automation has long been aware of American manufacturing's need for skilled workers, and the looming skills gap resulting from the decline of manufacturing training programs. As part of its service offering, Haas invested in training programs both at the factory and in their Haas Factory Outlets. Haas pays for skills training and education classes for its factory employees.

But getting more people interested in working for manufacturers that use machine tools is a big challenge. Haas is addressing the challenge with its Haas Technical Education



For many years, Haas Automation marketed its products through independent distributors that sold multiple brands of machine tools. But Gene Haas found that there were too many inconsistencies in terms of sales, service, and customer support. To reach the next level of customer service and satisfaction, Haas Automation developed specific guidelines for its distributors, which led to the development of the Haas Factory Outlets (HFOs).

Center program. The company has developed partnerships with all types of learning institutions to offer students a way of gaining production floor experience before entering the real world. Nationally, more than 200 technical centers, community colleges, and colleges participate. These programs not only help train skilled workers for today, but also develop the future owners and supervisors of operations who will buy Haas machine tools. Haas has enlisted 636 different schools that use 1,500 Haas machines to train students.

Even as the Japanese and other foreign firms continued to take market share, the leading American machine tool manufacturers did not respond. Gene Haas did just the opposite.

Developing new sales channels

The machine tool industry had relied on independent distributors as its primary sales channel. But as financial and service problems worsened, manufacturers began selling direct, and distributors began representing foreign companies. This, of course, led to enormous customer service problems and customer dissatisfaction.

Gene Haas could see this happening and was determined to offer better customer service and high-quality machines to customers. For many years, Haas Automation marketed its products through independent distributors that sold multiple brands of machine tools. But Gene Haas found that there were too many inconsistencies in terms of sales, service, and customer support. To reach the next level of customer service and satisfaction, Haas Automation developed specific guidelines for its distributors, which led to the development of the Haas Factory Outlets (HFOs).

HFOs are an excellent example of developing a new sales channel to best serve the customer. They all conform to the same guidelines and best practices, and sell and service only Haas products. They are required to have fully stocked service vehicles, maintain extensive spare-parts inventories, and present a uniform Haas corporate look. Each HFO has a state-of-the-art showroom in which customers can test machines.

Haas Automation has created a worldwide distribution system of HFOs that offer comprehensive services, particularly if a machine is down. If a machine goes down, the HFO has the experience and knowledge to get it up and running – often by helping the customer over the phone. If this doesn't work, the HFO sends out a service van that is fully equipped with all of the parts, tools, and specialized equipment necessary to get the machine back into production – on the first visit, more than 90 percent of the time. This is referred to as Platinum One-Call Service.

Management and organization

After the machine tool industry enjoyed 20 years of solid growth and profits, the companies became targets for acquisitions by corporate conglomerates. Later, some of these new conglomerates were also targeted by experts for leveraged buyouts. Max Holland makes the point over and over that many of the original manufacturers changed from the original founder's philosophy to a "business school" philosophy — from innovation and customer service to profit centers and return-on-investment formulas.

This trend over a decade or so was a huge factor in the demise of the American machine tool industry.

Entrepreneurial managers were replaced by financial or legal managers. The emphasis went from innovation and investment in the plants to quarterly profits. The willingness to take chances and innovate changed to a conservative management driven by financial statements. These new companies acquired new layers of management, and showed more interest in the manufacturing-process fads than in the workers.

The typical manufacturing organization is what I call the Defender Organization. A "functional" type of organization, it worked very well for a long time, when customer demands and markets were stable and the manufacturer could focus all of its efforts on internal efficiencies. But when foreign competitors invade any industry with new technologies and lower prices, the dynamics of the industry are permanently changed. That requires a different type of organization to compete. According to Raymond E. Miles and Charles C. Snow's classic *Organizational Strategy, Structure and Process*, Defender Organizations:

- Typically direct their products or services to a limited segment of the total potential market;
- Allocate only a small amount of administrative time and personnel to monitoring other organizations, events, and trends;
- Develop a relatively high degree of formalization, including the codification of job descriptions, and operating procedures that specify appropriate behaviors for organization members;
- Depend on a centralized command-and-control system that normally restricts information flow to vertical channels: directives and instructions flow down the hierarchy, and progress reports and explanations flow up; and devote few resources to new products, new services, or finding new market niches.

The primary disadvantage of this model is that it has little or no defense for a declining industry that is being lost to progressive and low-price competitors. Once the competitors begin to take market share, defenders usually don't react — because they do not have the people or the systems to locate and exploit new markets. The priority of important things to do always favors the internal, tangible, and process things, rather than the external, intangible, and customer things.

But getting more people interested in working for manufacturers that use machine tools is a big challenge. Haas is addressing the challenge with its Haas Technical Education Center program.

A new type of organization was needed to monitor and exploit the new opportunities in a fast-changing market — a Prospector Organization (a term also invented by Miles and Snow).

From the beginning, Gene Haas knew he wanted a fast, responsive and flexible organization. In its first two decades of operation, Haas Automation has been able to retain the entrepreneurial spirit of a small and flexible company. Haas has avoided hiring

mid-level managers that are so common in the traditional functional-type manufacturing organizations. From a management point of view, Haas has thrived because of innovation, and the fact that Gene Haas values the workforce. The philosophy is called the Haas Way.

Haas Automation has invested heavily in methods to monitor customers, and continuously scan the environment for potential opportunities. The Haas Way utilizes a low degree of structural organization, since it would not be economically feasible to codify every job description and every operating procedure in an organization that wants to move fast and be flexible.

When a deviation in unit performance is detected, this information is not channeled to higher management for action, but rather is fed directly back to the unit for immediate corrections. This is truly an example of pushing responsibility and authority down to the people who do the work. This type of organization gives them the ability to respond quickly to customer demands.

Haas Automation has been successful in keeping an entrepreneurial culture despite its current size. As the workforce continues to grow, it becomes more difficult to propagate the Haas culture, but management has been charged with teaching new employees the Haas Way. A monthly bonus program (essentially a profit-sharing plan) helps keep employees inspired. The senior managers have a "mentor program" for up-and-coming managers to teach them the Haas Way and the secrets of their success.

Lean manufacturing methods and continuous improvement

Lean manufacturing and Six Sigma methods were not being used during the demise of the American machine tool industry in the early 1980s. Companies were just beginning to explore quality improvement through TQM, Statistical Process Control, and the Deming methods. Instinctively, Gene Haas focused on the idea of continuous improvement, and used many common-sense methods that eventually were codified under the expression of Lean Manufacturing.

Haas Automation has made extensive use of just-in-time production, lean manufacturing techniques, automation, and robotics to keep costs low. The company continually reviews its processes (both machining and assembly) to simplify them and take out time and waste. Haas Automation is vertically integrated, and does all critical operations in house, which provides great control and quick deliveries. Haas still outsources certain processes, such as sheet metal, heat treat and castings, but it does as much in-house as possible to control cost, quality, and delivery.

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Haas Automation is ISO 9001:2000 certified. It also collects service reports from distributors, and its service guarantee is the best in the industry. To ensure that the factory employees are involved in the quality program, Haas Automation has created an incentive program that pays them a bonus. A quality goal is set each month, and when the

goal is met, the employees are paid a bonus that represents 20 to 25 percent of their monthly salary.

Growth plans

Haas Automation's growth plan has a goal of reaching \$1 billion in revenue by 2010. It passed \$700 million in sales in 2006, and is well on the way to reaching that goal. It does not use strategic-planning techniques or any of the academic approaches. It uses simple sales forecasts, with spreadsheets and minimum of paperwork. For a \$700 million company, I think this approach makes a practical statement.

What can we learn?

The American machine tool industry is not unique among industries. America has witnessed the decline of many other industries, such as lift truck, semiconductor, metal forming, and plastic injection molding, when foreign competitors invaded the industries with lower price products. What is interesting is that the reactions are generally the same, regardless of the industry. The first reaction is usually one of panic and denial. After the foreign competitors gain significant market share, there are usually cries of unfair practices, and an appeal to the government for protection or subsidies. This is usually followed by grim acceptance, and then a mercurial effort to lower costs and compete on price using one of the many three-letter-acronym manufacturing processes. The strange thing is that most manufacturers see the answer to foreign competitors as remedial corrections based on internal changes, or some kind of off-shoring approach.

What happened from 1970 through 1986 is that the whole machine tool industry changed because the customers had all changed. As foreign competition came in to exploit the new opportunities, most American manufacturers in the industry couldn't or wouldn't change to meet the new customer needs. It took a small, entrepreneurial company and a completely different approach to gain back a fair share of the industry and compete. What then happened to the American machine tool industry is instructive in that it suggests what American manufacturers can do to compete and grow.

This is the premise of my new book, *Saving American Manufacturing* (First Flight Books). It describes all of these strategies in great detail. The last chapter of the book is about the manufacturers that are competing, and sometimes dominating their industries, such as Haas Automation – despite the pressures of globalization. I call this group the new stars of manufacturing, and I would certainly include Haas Automation in this group of very progressive manufacturing companies. [Haas Automation Inc.](#)

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