

The End of Mass Production?

Economic and environmental conditions demand a new approach. What will it be?

Robert W. Hall

The Model T changed the world because it ushered in high-volume production on a big scale; then mass marketing profoundly transformed life, beginning in the United States. Until automobiles could flock to parking lots, Sears was only a catalog operation (its first store opened in 1925). Wal-Mart would never have been so much as a dream. As Will Rogers summarized Henry Ford, "It will take a hundred years to tell whether he helped us or hurt us, but he certainly didn't leave us where he found us."

A hundred years later in *Time* magazine, auto writer Dan Neil listed the Model T among "The 50 Worst Cars of All Time." His reason, pioneering mass production: "A century later, the consequences of putting every living soul on gas-powered wheels are piling up, from the air over our cities to the sand under our soldiers' boots."¹ A statement like

that from an auto writer symbolizes a new era in our century-long love-hate relationship with vehicles — and maybe with high-volume production in general.

America quickly became automotive dependent; without a vehicle most people can't get to work or run errands. In the United States, vehicle demand grew until it has about 1.2 registered vehicles per licensed driver, burns about three percent of all motor fuel in traffic jams, and builds new houses with a two-car garage as standard. An annual sales rate of 12 million vehicles only replaces those annually scrapped (about five percent). Around 1990 automotive companies began pumping growth in other countries; since then the number of registered vehicles in the world has doubled. It was headed for a billion vehicles in 2010 until global financial collapse took the air out of this expansion.²

A century after Henry Ford, Ratan Tata of India dreamed of another car for the masses, the \$2500, 60 mpg. Nano, designed for emerging economies, but its travails illustrate the problems of mass production today. Tata sunk \$2.9 billion in a new plant at Singur, in West Bengal. The state displaced many farmers to make room for the assembly plant and some supplier plants, but in October 2008, farmer protests became so violent that Singur was aban-

In Brief

The history of Ford is used as a vehicle to illustrate why large-scale production and large-scale consumption are increasingly questioned on economic grounds as well as environmental ones. Something different has been struggling to be born from today's debacles, but it is not easy to foresee what it may become.

done (such protests are not new in India). While small-volume production continues at Pantnagar, near New Delhi, a second new plant is being built at Sanand, with a capacity of 350,000 per year after it opens in 2010; with other plants planned. Sanand will cost an estimated \$3.9 billion. Financial skeptics note that if all \$2500 of the Nano's selling price were profit margin, Sanand alone would still take over four years at full capacity to break even. Other critics question the Nano's crash-worthiness and pollution potential, but on this the Nano beats millions of cycles now crowding India's streets. Tata's back-up plan is to upgrade Nano features to convert it into fodder for advanced economies' global consumption machines. By Western standards, Tata has low labor rates and is "somewhere" in lean conversion.³

Sizing up such matters in the land where lean began, Japanese have increasingly questioned the long-term viability of high-volume production of commodities, no matter how efficient. For example, an offshoot of a group once known as JAPICS (Toyota senseis were active members) still promotes continuous improvement; it's a basic necessity. However, high costs plagued Japan's high-volume exports before the global financial system locked up, but during the downturn sales and profits kept rising at smaller Japanese companies based on technical know-how and niche markets. Maybe this is where Japan's future lies.

The world has changed since Henry Ford's heyday. It demands much better performance than when Taiichi Ohno and his cadets created the base for the Toyota Production System too. Most products and processes were less complex; most of our environmental issues, unknown. A precise roadmap for this journey is impossible; we can only prepare for dramatic change. It may help to briefly review the source of a few of our legacies, most of which we have to escape. To do this, the history of Ford is a good vehicle, paralleling that of many other industries.

U.S. Vehicle Production Tanks

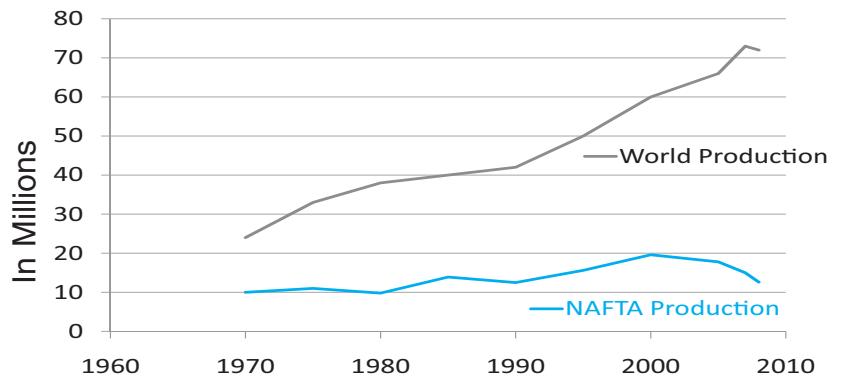


Figure 1. Data from International Organization for Motor Vehicle Manufacturers. NAFTA production is the United States, Canada, and Mexico combined. According to Chinese and Taiwanese sources, Chinese production exceeded American for the first time in January, 2009; and if its production goal of 10 million vehicles is reached this year while American production remains in a slump, China's vehicle production could exceed American production for the full calendar year 2009.

The Innovative Stage

Always obsessed with automobiles, Henry Ford tested his first engine in the kitchen sink, but he progressed from tinkerer into a superb entrepreneur, inspiring a small band of inventive people to combine their "wild" ideas into the design of the Model T. And he was persuasive. For example, Henry had to promote financing for a mill to produce the new vanadium steel for the Model T before the first car was built. To succeed where most dreamers failed, Ford excelled selling himself and his dreams; self-confident to a fault.

For 15 years after its founding in 1903, Ford Motor Company was as innovative as any company on the planet. The assembly line was only one part of Ford's grand visions largely delegated to others to execute — always with "input" from Henry. But with success, he became distracted with political issues and globe trotting. His promotional instincts made him a breakthrough innovator, but not a good leader of a big organization, a common problem with imaginative entrepreneurs.

Beginning in 1920, GM assembled a multidivisional organization that threatened to run Ford into a ditch. The Rouge did not become fully operational until around 1926, just as the run-up of the

Chevrolet shriveled Model T demand to a fraction of its planned capacity.⁴

Second Fiddle to GM

After passing Ford sales in the 1920s, GM never looked back, and by 1940 it was recognized as the way to run a big corporation. For example, Peter Drucker's first management book described GM as "an essay in federalism."⁵ GM's multidivisional organization promoted a balance of innovation, production efficiency, and marketing in each operating division. Early on, its corporate staff consisted of people with line experience advising and coordinating divisions, while operational responsibility for results remained directly on divisional line managers. Whatever technology GM could not develop internally, it bought. Its budget guidelines provided considerable freedom to innovate in plants, vehicle designs, and marketing. The cash throw-off from this system made GM the world's biggest corporation for decades.

Henry Ford's fiefdom could not keep pace with this machine. It nearly collapsed because of infighting and chaotic financial systems (accounts payable were estimated by weighing representative samples of invoice piles). Parts of the company degenerated into "smash mouth" management, and it barely hung on through World War II, maybe because Ford's tooling engineers were regarded as tops, and operations retained the early simplicity of flow-through production.

Henry's concept of management typified his era, only a couple of generations removed from slavery, when self-made tycoons founded company towns and directed people for their betterment. Only skilled workers and office staff escaped this legacy. When physical labor was hard or dangerous, the way to get it done was still to force someone to do it. No agricultural society had escaped involuntary labor in some form, and in Henry's day, outside work groups were still called "gangs," meaning unruly louts that had to be physically intimidated to do the hard work. "John Wayne" contests to establish the real boss

of a "gang" were common.⁶ Today it is hard to realize that Henry's behavior toward workers was relatively enlightened, and professional management, as at GM, was a step up in civility.

The Whiz-Kid Era

At the end of World War II, Henry Ford II assumed the presidency of Ford; young, inexperienced, and much aware of his father's weaknesses. He hired Ernie Breech from GM to be his mentor and actually run the company; plus some "Whiz Kids" just out of the Army Air Force Office of Statistical Control, convinced that if quantitative rigor helped win the war, it could one-up GM at its own game. The best-known whiz kid is Robert McNamara, who became president of Ford, then Secretary of Defense during the Vietnam era. Thus began management by the numbers.

Within a few years, Ford had transitioned to a centralized, numbers-oriented organization: data driven — mostly cost data-driven. Numbers funneled up to Detroit; directives funneled down from Detroit. Before the whiz kids, nobody at Ford knew or cared how much a steering wheel cost; not in design; not in production; not anywhere. At the time, this shored up Ford's weak spots.

In the plants, increasing numbers of women helped suppress excess testiness, meaning that intimidation was limited to verbal abuse, even on the most unskilled workers. However, remnants of this legacy of this era are still with us, evident in verbal alpha contests to establish primacy or to win points in a hierarchy.

In Ford plants, the technology changed from Model T days, but not its operational basics. Ford managers soon learned to fudge performance definitions and to deflect numerical inquisitions by feeding Detroit whatever analysts preferred to see, for few whiz kids knowledgeably visited the gemba. Later, combat commanders in Vietnam did the same — as with the infamous body count reports.

In the 1950s, Ford and other companies became so profitable managing by the num-

bers that by 1959 a couple of reform reports on collegiate schools of business recommended beefing up quantitative skills training. They did. But it was a time of complacency too; meet your numbers and all was well. Some economists declared the problem of volume production solved; all we had to do was market the stuff.

Quality is Job #1

After domestic American oil production peaked in 1970, rising dependence on OPEC set up the oil embargo of 1973. That, in turn, gave the Japanese a toe hold in the American auto market because American auto makers had few gas sippers to compete with them. To buyers' surprise, Japanese quality wasn't bad, and kept getting better. The Japanese quality invasion surged during a second oil crunch in 1979, giving Ford a then-record loss in 1980. Soon scrambling to catch up, Ford's quality improvement initiatives were symbolized by "Quality is Job #1" signs hung in production areas.

Quality techniques spread throughout the company. By 1986, J.D. Power surveys showed Ford narrowing the quality gap with Toyota, but two decades later, it still hasn't closed. Ford began to promote a "New Corporate Culture" featuring employee involvement, working toward a new Ford Production System based on lean and quality. By 2002, Ford plants had won nine Shingo Prizes.

The 1986 Taurus was designed using Quality Function Deployment and design for experiments. It won car-of-the-year awards with a rounded body style copied by the rest of the industry, and rose to become the best selling car in America from 1992-1996. Then sales slowly wilted, a story that came to symbolize the foibles of Ford. No factor sticks out among the alleged reasons for slippage: Were too many buyers turned off by the 1996 oval-body design? Did Ford neglect Taurus going for higher mark-up SUVs? In 2006 Ford removed the slow-selling Taurus from showrooms, relegating it to fleet car sales; then ended production in October, replacing it with the 500 and the Fusion, while Toyota Camry consistently vied for the

top-selling sedan. When the sales of the 500 refused to take off, Ford gave it a face-lift to re-launch as the 2010 Taurus. By contrast, Ford F-series trucks, dating from 1948, have been the top-selling truck line in the United States since 1976. Analysts figured that F-series trucks accounted for at least half of Ford's profits.

Trapped in the System

William Clay Ford, Jr., great-grandson of Henry Ford I, became CEO of Ford in 2001, succeeding Jacques Nasser, a profit-first executive. A do-the-right-thing executive and environmental advocate, Bill Ford presented his vision to a Greenpeace conference, "The day will come when the notion of car ownership becomes antiquated. If you live in a city, you don't need to own a car."⁷ To get moving, he challenged engineers to improve Ford truck and SUV fuel economy by 25 percent by mid-decade; revved up hybrid and fuel cell programs, and scraped up \$2 billion to redo the Rouge as a green manufacturing facility. But too many buyers chose more towing capacity over less filling at the pump, and Ford kept feeding them. When environmentalists carped about hypocrisy, Bill Ford responded that to have money to change anything, Ford had to give customers what they wanted.

The market began shifting from big vehicles in 2006. Bill Ford handed Alan Mulally the CEO job to spearhead "The Way Forward," the latest in a series of restructuring plans, but sales and profits continued to slide. Ford redoubled its effort to improve production efficiency and product development (the Global Product Development System), but after the 2008 financial meltdown, had to double down closing plants and trimming the total workforce. With a little more cash to burn and a faster plan to convert to small vehicles, Ford was only a little further from death's door than GM and Chrysler; all major players in the automotive industry were trapped in financial collapse, global in scope. Worldwide sales had dropped by 20-50 percent. Even Toyota had its bond rating cut and asked for a loan from the Japanese government.

Dealers are closing, and even rental car companies, the market of last resort, can no longer soak up automotive overproduction (the most serious of the classic seven wastes); their buy is down about 65 percent — fewer renters and overstuffed lots. Most rental companies are also highly leveraged; their crisis will come when major payments to debt holders are due.

The auto industry feared collapse of suppliers too. Even the leanest, best-operated ones had to shrink. The companies in the greatest peril either had big legacy cost obligations they could no longer support, or they were highly leveraged, or both. In all cases they bet on growth to pay off debt — much like homeowners who suddenly find their income cut just when the market value of their house plunges to half the remaining balance on the mortgage. Operationally, they could still perform, but their financial wells dried up.

Long-range industry visions are trapped in this system. Like Bill Ford earlier, Fujio Cho of Toyota in 2002 promoted Toyota's Global Vision 2010, noting that the era of large-scale production, large-volume consumption, and large-scale disposal should draw to a close. Such sweeping visions were swept under the financial rug.

Now What?

In a financial crisis, turnaround managers concentrate on cutting costs and raising revenue — restoring positive cash flow. It's seldom pretty, and with little extra cash or time to experiment with major changes to a business model, many “do what we always did,” only with greater cash efficiency (not necessarily “lean” efficiency). Doing something too different seems risky.

Because of this, major business model changes are more apt to come from upstarts than old companies. For example, Bill Ford's quip on non-ownership referred to “car-sharing,” a decades-old idea in European cities. Zipcar pioneered car-sharing in American cities in 1999; when it progressed beyond a hobby business, Hertz and Enterprise became competitors. Car-

sharing companies maintain the vehicle. If the value proposition gives customers a better ride for less bucks, and if variations of this business model catch on for suburban or rural areas — two big ifs — it's not hard to see these companies influencing vehicle design, seeking “environmentally sustainable” vehicles, and managing vehicle life cycles — maybe even re-manufacturing the things at intervals. The auto industry could transform from what we see today into networks of small to medium “service companies” integrated by databases. (Variations of this scenario have been around for 20 years, waiting for entrepreneurs to bring one to life.⁸) Boot up your shared car anyone?

For all of us, not just the car companies, the goal is not to “bring back” manufacturing. It cannot be what it once was; we would not want it to be. Rather our challenge is to learn from our debacles and determine what we must become. And for that a lot of old legacies have to be left behind.

Robert W. Hall is editor emeritus of Target and a founding member of AME.

1. “The 50 Worst Cars of All Time,” *Time* Special Report: www.time.com/time/specials/2007/0,28757,1658545,00.html
2. From Infoplease, the Federal Highway Administration, and *Wards Automotive*.
3. “Tata's Nano and the Price of a Dream,” Just-Auto.com, Mar. 17, 2009; and Mar. 23, 2009. Figures on the Nano are not consistent between reports.
4. According to The Henry Ford (adjunct of the Henry Ford Museum), the Model T was never assembled at the Rouge. The well-known ore-to-car time estimates were for the Model A, beginning in 1927.
5. Peter F. Drucker, *Concept of the Corporation*, John Day Co., 1946.
6. The term “gang” frequently appears in the writings of Frederick Winslow Taylor, Frank Gilbreth, and other early management methods pioneers.
7. Terry Slavin, “The Motown Missionary,” *The Observer* (UK), Nov. 12, 2000.
8. One of these was in *Manufacturing 21*, AME publication, 1990.

