Choosing Scope Over Focus

Advances in manufacturing technology are about to change the rules of competition and unleash a sleek new version of the old-school conglomerate. Call it the “pan-industrial.”
A Data-Driven Approach to Identifying Future Leaders

(Continued from page 21)

Since the 1980s, Western business strategists have preached focus. To capture economies of scale, move quickly down the learning curve, and develop core competencies, it’s best to operate in only one industry, or perhaps a few adjacent industries. Diversifying into unrelated industries is dangerous, the thinking goes, because it leads to complexity and unmanageable size without yielding economies of scope and other operational synergies. Indeed, Wall Street has frequently penalized multi-industry companies with a “conglomerate discount.”

Since the 1980s, Western business strategists have preached focus. To capture economies of scale, move quickly down the learning curve, and develop core competencies, it’s best to operate in only one industry, or perhaps a few adjacent industries. Diversifying into unrelated industries is dangerous, the thinking goes, because it leads to complexity and unmanageable size without yielding economies of scope and other operational synergies. Indeed, Wall Street has frequently penalized multi-industry companies with a “conglomerate discount.”

Choosing Scope Over Focus

Advances in manufacturing technology are about to change the rules of competition and unleash a sleek new version of the old-school conglomerate. Call it the “pan-industrial.”

BY RICHARD A. D’AVENI

Since the 1980s, Western business strategists have preached focus. To capture economies of scale, move quickly down the learning curve, and develop core competencies, it’s best to operate in only one industry, or perhaps a few adjacent industries. Diversifying into unrelated industries is dangerous, the thinking goes, because it leads to complexity and unmanageable size without yielding economies of scope and other operational synergies. Indeed, Wall Street has frequently penalized multi-industry companies with a “conglomerate discount.”

Since the 1980s, Western business strategists have preached focus. To capture economies of scale, move quickly down the learning curve, and develop core competencies, it’s best to operate in only one industry, or perhaps a few adjacent industries. Diversifying into unrelated industries is dangerous, the thinking goes, because it leads to complexity and unmanageable size without yielding economies of scope and other operational synergies. Indeed, Wall Street has frequently penalized multi-industry companies with a “conglomerate discount.”

Since the 1980s, Western business strategists have preached focus. To capture economies of scale, move quickly down the learning curve, and develop core competencies, it’s best to operate in only one industry, or perhaps a few adjacent industries. Diversifying into unrelated industries is dangerous, the thinking goes, because it leads to complexity and unmanageable size without yielding economies of scope and other operational synergies. Indeed, Wall Street has frequently penalized multi-industry companies with a “conglomerate discount.”
Those dynamics, however, will soon go into reverse. New digital technologies are changing the rules of competition by expanding the boundaries of what a company can handle and introducing new sources of advantage. Big data analytics, cloud-based mobility, 3-D printing, and machine learning are combining to make complexity manageable and generate economies of scope. Entering multiple industries will no longer be a drag on operations — it will bring competitive advantage. Digital technology has already upended the media and information sectors. It’s about to do the same to the manufacturing economy and pave the way for what can be called the “pan-industrial” strategy.

The Pan-Industrial Advantage
A pan-industrial company may look like a conglomerate on the outside, but it will run quite differently. It will be driven by a software platform that monitors, facilitates, and optimizes operations, from product development to customer delivery, across a disparate product line. Although pan-industrials will need a certain level of focus — unlike the sprawling conglomerates of the 1960s — they will be able to operate in much broader areas than today’s more targeted manufacturers. One could imagine, for example, “General Metals,” a company with underlying expertise in metal 3-D printing, which would be something like a combination of General Electric Co., General Motors Co., and General Dynamics Corp., competing in a range of industries such as medical equipment, cars, and airplanes.

Armed with the software platform and these new manufacturing technologies, pan-industrial companies will gain several advantages not currently available to either conglomerates or focused companies.

Boosting Efficiency
Most traditional conglomerates exert little control over their operations. Each division has its own research and development (R&D), factories, and distribution network, and tends to share few suppliers with the rest of the conglomerate. Headquarters gets involved primarily in finance, management development, and expansion decisions because it simply can’t know enough to make more specific decisions responsibly in such diverse industries. Pan-industrials will be very different because they’ll rely on sophisticated software platforms that coordinate most steps in the value chain. Conventional supply chain software can’t handle such diverse operations — it would be overwhelmed by the myriad potential options — but platforms with advanced cloud-based analytics can. They’ll integrate the value chains of the various business units and generate savings in purchasing, production, distribution, and overall risk management.

Any individual action will be more valuable because the platform will have more options in carrying it out efficiently. As for production, flexible 3-D printers will increasingly replace inflexible, scale-intensive injection molding, and the platform will direct factories when to switch from slow-moving products to the hot sellers. Factories will enjoy higher rates of utilization than are possible now, which is key to manufacturing efficiency.

Continuing with the “General Metals” example, headquarters would use the platform to centralize most of the supply chain decisions, and eventually the production decisions as well. Managers of the individual divisions would have less and less to do. Over time, the company would organize less around industries and more around geography, with smaller plants and supply chains located close to customers in order to boost responsiveness.

Spreading Out Platform Costs
The software platforms we are discussing in this article — those capable of managing the complexity of real-time optimization — are expensive. Besides the up-front software and hardware costs, there’s also the implementation and training time required, as well as the work of converting supply chain and production data into a consistent format readable by the platform. Pan-industrials will be able to spread those costs across multiple industries. They’ll be able to move faster down the platform learning curve in each industry because of what they’ve learned and developed elsewhere. They will automate the routine transactions and build out a richer
Choosing Scope Over Focus (Continued from page 23)

menu of options to handle new kinds of activities. They’ll have the heft to invest in machine learning to speed things up as well. So they’ll realize the efficiencies, quality improvements, and innovation from digitization a good deal faster than smaller, less diverse companies.

After all, digital integration is not a onetime decision. It’s a gradual process of installing the software platform ever deeper into operations. Pan-industrials will gradually remove legacy structures that get in the way of realizing the new capabilities. They’ll develop entirely new ways of organizing production, much as manufacturers did when they electrified their plants in the early 20th century. At first, the factories simply replaced their central steam engines with electrical equivalents, but eventually they gave each machine its own electric motor and created a much more efficient layout.

An even better analogy is from the 1950s and 1960s, when new accounting and management methods gradually spread through the U.S. economy. Conglomerates that had already perfected these methods bought up smaller operations and whipped them into shape. The marketplace eventually caught up, and now consultants and private equity companies provide this service better. But for decades, conglomerates had a decided competitive advantage. A similar process will play out with the digitization of manufacturing.

Fostering Innovation We tend to think that big companies inevitably suffer from the “innovator’s dilemma” — the tendency of successful companies to focus on their high-margin customers and dismiss innovations that (initially) fall short on quality standards. Pan-industrials won’t be so susceptible for two reasons: (1) Digital manufacturing is lowering the cost and complexity of experimentation, and (2) 3-D printers can generate new products at low cost, and the software platforms provide rapid feedback from distributors and customers. Chasing after new ideas won’t be such a risk.

That’s going to help all big companies in the future, but pan-industrials have a special advantage with innovation. Because they will operate in multiple industries, they won’t be caught up financially and culturally in serving a specific customer base. Having invested so much in a platform, they’ll be more flexible on what goes into that platform than a focused rival. They’ll be committed to economies of scope, so they’ll have a bias toward adding new nodes on the platform’s network, not expanding their existing operations.

A company like Ford Motor Co., after all, is not likely to build minifactories in dozens of cities or stray into a variety of nonautomotive products. It’s too deeply invested in a vertically integrated, assembly line-based manufacturing system with a long supply chain feeding its main customers: the dealerships.

It’s true that pan-industrials may suffer from not having any single customer base. They won’t have the customer intimacy that a focused company can achieve. Ford is investing in 3-D printing, but even with this technology, it’s likely to face the innovator’s dilemma. By contrast, a pan-industrial emerging from, perhaps, a newer motor vehicle manufacturing company, such as Tesla Inc., based in Palo Alto, California, or Local Motors Inc., based in Chandler, Arizona, will be much more open to new kinds of products and factories.

It’s true that pan-industrials may suffer from not having any single customer base. They won’t have the customer intimacy that a focused company can achieve. Their platforms will connect them tightly to the marketplace, so they’ll see substantial changes in customer preferences, but they may miss out on the more subtle developments that digitized information can’t convey. That’s why it will be essential for pan-industrials to eventually organize geographically so that they can be physically close to their customers.

That said, a pan-industrial approach may actually foster some kinds of innovation: those that happen at the boundaries of industries. With so many industries starting to converge, pan-industrials will avoid traditional industry-centered thinking and be open to new possibilities.

Generating Information With Network Effects Over time, this may be the biggest pan-industrial advantage of all. Once they develop a reliable, feature-rich platform to handle their own activities, pan-industrials will gradually bring outside suppliers, distributors, and customers directly onto their platform. Those outsiders will be motivated to join: to have better access to the pan-industrial company’s products and technology or to partner with the pan-industrial company as a preferred supplier or pooled purchaser. They’ll also appreciate how the platform will help improve their own activities. The more transactions on the platform, the better the software can optimize production flows for everyone. Some pan-industrials might eventually decide to spin off manufacturing and focus on their platform, making it the centerpiece of a broad ecosystem.

Because it will “see” all this activity across several industries, the pan-industrial company will know more about overall business activity than a focused company, which sees within only a single industry. It will become aware of emerging trends in product
development, supply and demand, and inventories. A big focused company could still use a platform to optimize its supply chains, but it won’t have the breadth of information of a pan-industrial.

Over time, the insights provided by the platform will help the pan-industrial predict and optimize its activities even more, further boosting its attractiveness to partners. The more companies join, the greater the knowledge, and this network effect will give pan-industrials a powerful advantage over smaller rival platforms.

Managing Complexity
Let’s see how these advantages are already starting to develop at real companies. Jabil Inc. (formerly Jabil Circuit Inc.) is based in St. Petersburg, Florida, and is one of the largest contract manufacturers in the world, with more than $18 billion in revenue. It has 102 factories in 28 countries, and its 138,000 employees make products in dozens of industries. The company originally treated its thousands of job orders as separate projects. But in recent years, it has developed an “intelligent digital supply chain” platform that integrates the activities across its system, from product concept to distribution.

The cloud-based system tracks the flow of materials and products and sends orders on what to do at each step. Jabil developed the platform to give it better visibility into its diverse activities. But as the platform improved its data collection, Jabil added analytics around optimizing those operations. No longer a mere dashboard, the platform has become the centerpiece of an integrated industrial enterprise.

An old-style conglomerate would be overwhelmed by the challenges of managing the broad diversity of its combined multi-industry operations. Conventional supply chain software would break down if confronted by the thousands of possible choices of materials, suppliers, volume levels, and timing. That’s why conglomerates separate their myriad activities into largely isolated divisions. But Jabil’s platform puts everything in the same mix. It can pool procurement across multiple supply chains to get better prices, as well as schedule production to keep factories running at a high level without missing delivery deadlines.

Thanks to Jabil’s broad reach, it has relationships with thousands of suppliers of hundreds of thousands of parts and materials — far more than a company focused on one or two industries. When a customer comes with a job, Jabil’s platform selects the combination of suppliers, logistics, factories, and timing that best meets the customer’s priorities on cost, speed, quality, and risk. Using predictive analytics, it optimizes not just production but even product development — designers can know instantly if a certain choice of material will add expense or risk to the production process. And Jabil is now starting to introduce 3-D printers to many of its factories, which will eventually complete the circle of digitization and further improve optimization. As it increasingly integrates its operations and expands its capabilities, it will gain more of the pan-industrial advantages, even without actually owning the products it generates. Jabil has now taken steps to license its supply chain platform technology to other companies.

Achieving Production Synergies Across Industries
General Electric, having invested heavily in a digital platform and 3-D printing, is also moving along the pan-industrial path. Whereas Jabil’s platform started with a supply chain and logistics, GE’s began in the factory. Predix, GE’s manufacturing software platform, continually monitors plant equipment and production flows, crunches the data with artificial intelligence, and recommends improvements. The manufacturing process is expressed digitally, monitored via the internet of things, and optimized with analytics.

Although GE sells a wide variety of products across its various divisions, it is not yet a true pan-industrial — Predix still operates mainly within each division, so it doesn’t achieve the economies of scope Jabil is achieving by integrating supply chains and production across multiple industries. But GE is much further along than Jabil in another key element of pan-industrialism: 3-D printing. The company has already invested $1.5 billion in advanced manufacturing and additive manufacturing for its aviation and medical device businesses. In addition, in 2016, GE put up more than $1 billion to buy majority stakes in two European metal 3-D printing companies: Arcam AB, based in Mölndal, Sweden, and Concept Laser GmbH, based in Lichtenfels, Germany, whose technologies will boost the quality and speed of GE’s existing processes. It also built a $40 million 3-D printing research and training center in Pittsburgh. Because 3-D printers work purely from digital files, they mesh well with digital platforms to turn information into physical goods in a pan-industrial structure.

Most important for the pan-industrial story is GE’s $200 million factory in India’s Pune district. Unlike other GE factories,
which focus on just one of the company’s divisions, the Pune plant, which opened in 2015, serves multiple divisions. It takes advantage of 3-D printing’s flexibility to make parts for airplanes, locomotives, and gas turbines. If jet orders are falling but railroads are booming, it can switch over the production lines and keep the factory running at a high level. Pune has conventional injection-molding equipment as well as 3-D printers, but it has enough of the latter to gain significant flexibility. So far those switchovers are still slow and difficult, but as GE moves down the learning curve with 3-D printing and expands Predix to handle the complexity of possible options, the switchovers should get easier and cheaper.8

A higher utilization rate isn’t the only advantage of plants like Pune. GE’s divisions generally rely on a few big specialist factories, with their economies of scale, to supply the entire world. Because it produces for several industries, Pune can achieve volume from only a regional customer base. Besides putting the plant closer to its customers, a regional approach also offers a timely political boost. As GE CEO Jeffrey Immelt recently pointed out, rising protectionism around the world is pushing manufacturers to localize. Once it integrates the divisions with the software platform and 3-D printers, GE will stop being a conglomerate and become something much more integrated and cohesive: a pan-industrial company. The old GE captured synergies in financing and in management development. The emerging GE, with an integrated manufacturing platform and 3-D printing, will have synergies in supply chains, production, and distribution. And as its Predix software gets ever more capable, GE may extend it well beyond its existing operations. Already, the company is licensing Predix externally, and Immelt announced in 2015 that GE hopes to become one of the 10 largest software houses in the world by 2020.9

Manufacturing Back in the Center
In recent decades, finance has been the driving force in most Western economies. But with the world awash in capital, we can expect power to shift toward those most able to harness the power of data. Wall Street may benefit in the short run from the wave of acquisitions and alliances driven by the pan-industrial strategy. But the result will be platform players with both operational efficiencies and access to aggregate information that further cement their strategic advantages and ability to create value.

Not every company should become a pan-industrial, and some industries may never switch over to 3-D printing, which is a central component of the pan-industrial strategy. But as costs continue to fall and capabilities rise, it’s likely that many industries will see at least some product areas move heavily to digitally coordinated manufacturing systems. Companies that stay devoted to focus will eventually lose out to large, broadly diversified, efficient pan-industrials that thrive on economies of scope and network effects. Pan-industrials will be large, agile, and aggressive competitors playing by different rules. They’ll overwhelm rivals that continue to follow today’s conventional wisdom.

We won’t see full-fledged pan-industrials for at least a few more years, as Jabil, GE, and other companies continue to work on filling out their digital manufacturing infrastructure. But it’s not too soon to start preparing for pan-industrials as dominant competitors — and to consider how you’ll seek advantage in such a competitive landscape. These newly agile giants are going to lead the digital manufacturing revolution — and absorb those that fail to adjust to the new industrial order.

When digital manufacturing first emerged, proponents predicted a democratized economy of small “makers” with customized products and markets. The opposite is now more likely. Because of economies of scope, the world will be ruled by behemoths managing proprietary networks to achieve impressive gains. Current constraints on company size and scope are disappearing. After all the attention splashed on media giants such as Google Inc. and Facebook Inc., the industrial digital economy is finally poised to take off.

Richard A. D’Aveni is the Bakala Professor of Strategy at the Tuck School of Business at Dartmouth College, in Hanover, New Hampshire. He is the author of a number of books on strategy, including Hypercompetition (Free Press, 1994). Comment on this article at http://sloanreview.mit.edu/x/58413, or contact the author at smrfeedback@mit.edu.

REFERENCES

Reprint 58413.  
Copyright © Massachusetts Institute of Technology, 2017. All rights reserved.
Articles published in MIT Sloan Management Review are copyrighted by the Massachusetts Institute of Technology unless otherwise specified at the end of an article.

MIT Sloan Management Review articles, permissions, and back issues can be purchased on our Web site: sloanreview.mit.edu or you may order through our Business Service Center (9 a.m.-5 p.m. ET) at the phone numbers listed below. Paper reprints are available in quantities of 250 or more.

To reproduce or transmit one or more MIT Sloan Management Review articles by electronic or mechanical means (including photocopying or archiving in any information storage or retrieval system) requires written permission.

To request permission, use our Web site: sloanreview.mit.edu
or
E-mail: smr-help@mit.edu
Call (US and International): 617-253-7170 Fax: 617-258-9739

Posting of full-text SMR articles on publicly accessible Internet sites is prohibited. To obtain permission to post articles on secure and/or password-protected intranet sites, e-mail your request to smr-help@mit.edu.