

strategy&

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*Manufacturing's  
new imperative*

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Three strategies  
to boost top-line  
growth



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## About the authors

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# Executive summary



**In one way or another**, operations executives are under pressure these days to make more significant contributions to their company's growth. The days when an operation team's primary responsibility was to run a cost-efficient plant — either through lean Six Sigma within the four walls of the plant or through the careful selection of low-cost plant locations — are coming to an end. Cost and the other usual plant metrics — quality, service, inventory, and safety — are still critical, but to a certain extent, these responsibilities have become table stakes. In addition to ensuring that these needs are met, senior operations executives must increasingly find new approaches and designs that will bolster the top and bottom lines.

Although there are many areas that operations teams can explore for improving performance, several merit special attention. Broadly, they fall into the categories of rethinking the manufacturing footprint, implementing new enabling technology, and configuring the supply chain in a tax-aware way.

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# *New demands on operations*

The bar is being raised again for operations executives. Having overseen the globalization of the supply chain, the push toward plant safety, and transformations rooted in lean processes, these executives are now having to make an even more direct contribution to their companies' top and bottom lines.

This is no easy task. A lot of the measures needed to make a contribution at this new level are outside the executives' direct control. If operations executives are to increase their contributions, they will have to develop new skills and raise their profiles within their organizations. There are three areas in particular where executives should be aware of changes and, in many cases, develop expertise that they can incorporate into their operational strategy: tightening up lead times in geographies where faster delivery can lead to increased market share; introducing time- and cost-saving technologies; and looking for strategies that could lower the company's tax burden.

In this report we discuss these three value creation options, and show how operations executives can get started.

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# ***“Asset-right”: Rethinking the manufacturing footprint***

Most companies receive anecdotal feedback from their customers and use that information to fine-tune their operations. But in forging a new strategy, it's often valuable to do a more formal analysis of what is really essential to a customer — versus what would be nice to have — and to look at the extent to which a change might translate into new sales and increased market share.

This is the exercise a U.S.-based industrial goods manufacturer performed. The manufacturer believed that it could pick up market share in China, Africa, and the Middle East if it could tighten up its delivery times. Customers in these geographies typically had short planning cycles for projects, meaning they got started quickly and were inclined to take whatever product was available, regardless of brand. The key was understanding the relationship between delivery speeds and increased sales. The U.S. company — already the leader in the segment — did a sensitivity analysis and concluded that it could add multiple percentage points of market share if it shortened its delivery times by two weeks. With that much at stake, it set a manufacturing strategy of building stripped-down versions of its products in the U.S. and distributing finishing-touch responsibilities in regions where increased speed mattered the most.

When companies decide to split up the manufacturing of a product in a new way, across more facilities, it often creates the need for a new product design. That was the case with the U.S. industrial goods maker. The core or foundational parts of its product, the company needed to continue to manufacture in the United States. The bolt-on parts or market-specific options could easily be dealt with at customization centers closer to the emerging market customers.

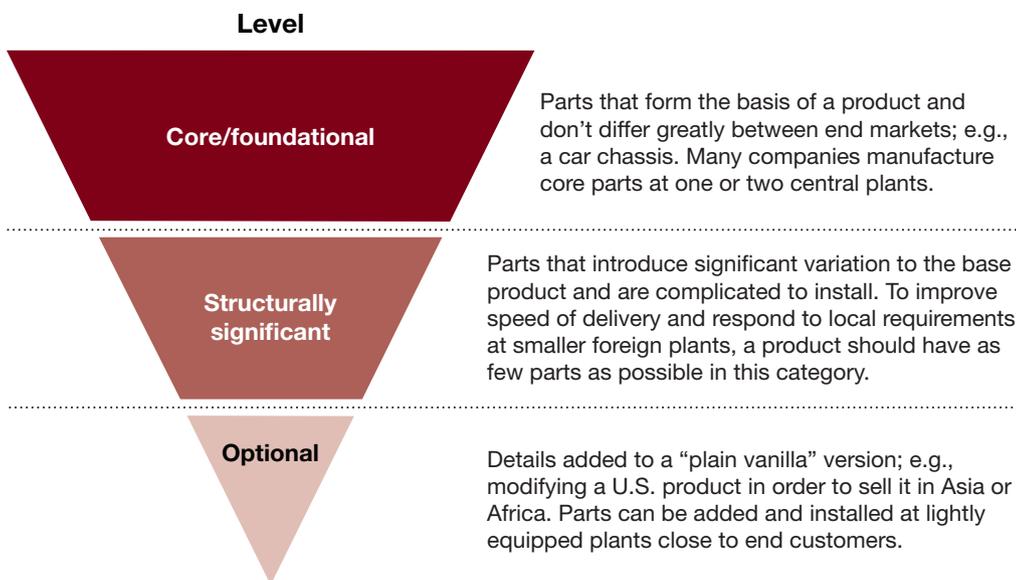
The hard part was a set of components that were too structurally significant to leave for the customization centers but that were not quite standard either. Over the course of many months, a cross-functional team at the manufacturer — engineering, commercial, and sourcing in addition to operations — came up with an altered product design that allowed these components to be added at the main U.S. factory and that increased

the company's ability to do late-stage, region-specific customization. (Exhibit 1 shows an example of a hierarchy of product customization.)

In making these changes, the U.S. equipment maker was joining an expanding group of manufacturers, from industries such as automotive, consumer products, and life sciences, that have rethought their manufacturing footprints (and sometimes their product designs) in order to meet customer demands and get an operational advantage. It's akin to the multinational beverage company that ships its products in bulk containers, arranging for the bottling and labeling to be done in smaller facilities in countries with high consumption levels or distribution advantages. Or the toy manufacturer that makes the basic versions of its figure toys in a large, capital-intensive plant in the U.S. but then handles the final painting and dressing at lightly equipped overseas plants. These plants are asset-right production nodes — some of which do no more than painting and adding country-specific parts — that allow the company to reduce the complexity that their core manufacturing plants have to manage while avoiding unnecessary capital investment. In addition to those benefits, an asset-right footprint also simplifies procurement and inbound logistics, allowing local options to be procured and managed in the region instead of overseen by the operations team back at headquarters.

*Some plants do no more than painting and adding country-specific parts.*

*Exhibit 1*  
**Elements of a manufactured product**



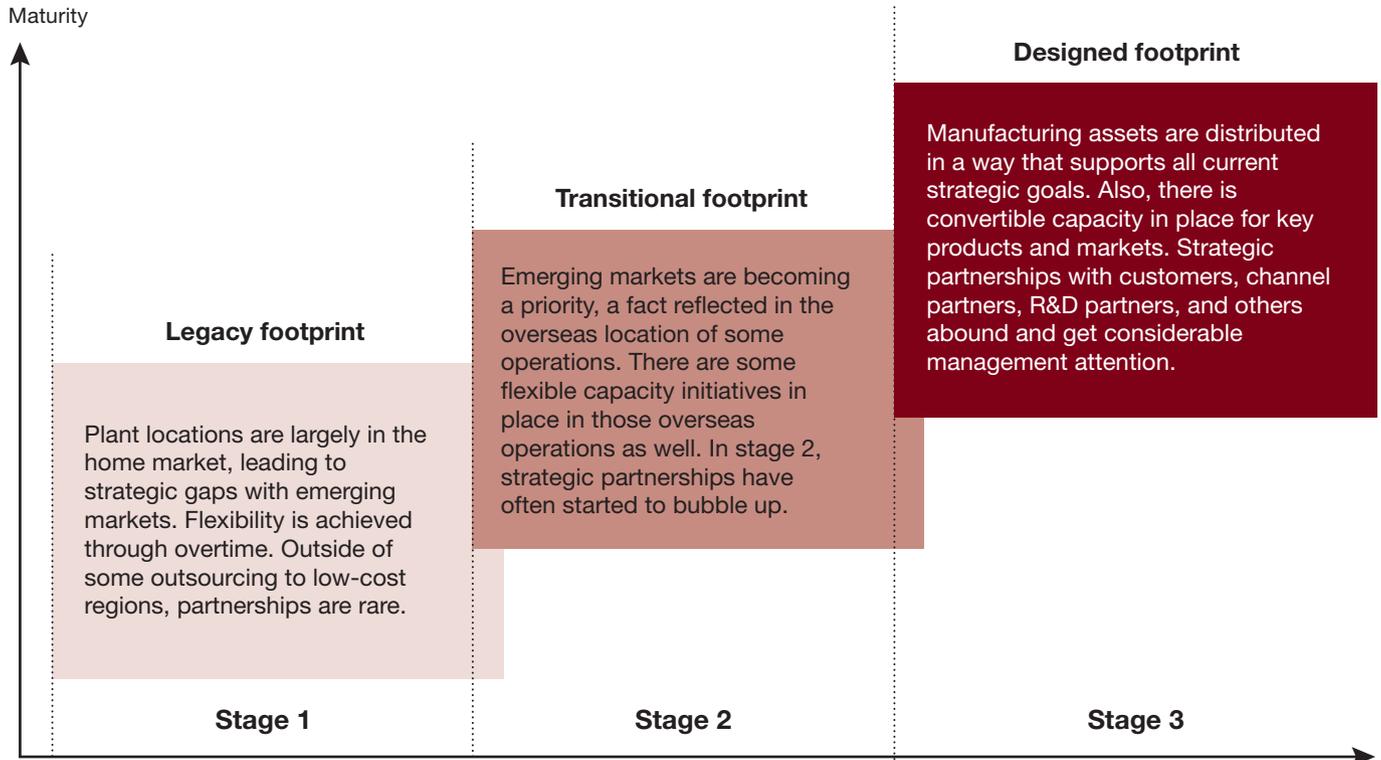
Source: Strategy& analysis

Companies that set up asset-right regional facilities have moved into what we consider the most advanced stage of the operational maturity model: “the designed footprint” (see *Exhibit 2, next page*). This is a stage at which scale is achieved by setting up convertible capacity in key markets, rather than trying to manage end-to-end complexity through a central manufacturing facility. Customization is done in the region, leading to a streamlined process of incorporating unique customer preferences by those closest to the end customer.

### ***Manufacturing self-assessment questions***

- Do you understand why end customers are buying your products instead of the competition’s, including the trade-offs they are willing to make in terms of product configurations and the importance they place on delivery times?
- Have you segmented your customers and markets based on demand variability and used this segmentation to build a differentiated supply chain?
- Do you understand what is “core” to your product — and what characteristics can be added at a later stage?
- When you sit down with your product development teams, in addition to looking for ways to reduce materials costs, do you consider design changes that would give your products an advantage in the supply chain?

Exhibit 2  
The operational footprint maturity model



Source: Strategy& analysis

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# *Implementing new technology*

Plant equipment is not perfect. It wears down or malfunctions, increasing overtime costs and wreaking havoc on production schedules. Increasingly, however, companies have access to technologies that can help them deal with these imperfections and increase their uptime — and, with it, their competitiveness.

A case in point is a Tier One automotive supplier that did a high volume of business around one part and set an aggressive production plan for it. Unexpected problems with the machining line, however, meant production had to be halted at frequent intervals to allow for emergency maintenance. In its desire not to disappoint its customers, the supplier was maintaining 24/7 operations and airfreighting parts at considerable cost to its own profitability.

After the company installed a predictive analytics system, it was able to spot production-threatening problems while they were still developing and do proactive maintenance to minimize their impact. The analytics system has helped the company increase its output by 20 percent and its revenue potential by US\$14 million a day —through both increased sales and the avoidance of expedited delivery costs.

Like this Tier One automotive supplier, more and more manufacturers are looking at ways to monitor their machines through new technology. These companies are retrofitting their core equipment with sensors and meters to capture high volumes of machine data. The idea is that these systems, when combined with analytical algorithms, may give companies new control of, and insights into, their operations. If machines are being overworked to the point of failure based on specific job characteristics — batch size, job type, time of day, ambient temperature — the companies can make changes. The software can also help companies rethink production flows to better utilize other equipment and reduce the risk of bottlenecks. The result can be a step change in capacity, higher service levels, lower costs, and avoidance of new capital equipment.

In addition to machine performance, many companies are seeking to implement new technology across the supply chain to manage materials, flow, and labor. This is a move toward the ideal of just-in-time

*Software can help companies rethink production flows to better utilize other equipment and reduce the risk of bottlenecks.*

manufacturing, many decades after that concept came into vogue. Indeed, without some of the new technologies, it's hard to see how companies could cut back on their inventory levels and move toward asset-right manufacturing. Operations leaders need real-time supply chain visibility and remote monitoring abilities to ensure efficient progression across production stages. This includes track and trace technologies, in the form of dashboards enabled with the Internet of Things (IoT), plus other control tools that supply chain and production personnel can use to enable the asset-right strategy.

This potential has not been more widely realized because many companies haven't known where to begin. With all the sensors, cloud systems, analytic tools, and smart solutions being hawked — and with the sky's-the-limit promises being made about them — it's not surprising that many manufacturing companies have been slow to make investments.

Even if some aspects of the IoT have been overhyped, the benefits are real — and many of them pertain to manufacturing plant changes that affect speed and quality. A case in point is an electronics manufacturer that, in the coming years, wants to reduce its defect rate by 70 percent and increase its production capacity by eight times without adding any additional floor space to its plant. To do this, the company is embarking on an aggressive digitization program in which every existing machine will be connected and real-time data will flow into the same “data pool.” The hard part will be the application of predictive and diagnostic analysis using Fourier and other techniques. Once completed, the company will have a true “feed-forward” way to run its operations — an aspiration of any plant manager who has ever woken up to bad production news from the overnight shift.

### ***Technology self-assessment questions***

- Does all the data that matters to your operation flow into the same database, allowing you to monitor it in real time?
- If yes, are you using that data to do predictive analytics?
- Have you assessed the value potential associated with a next-generation manufacturing solution — for instance, what a 30 percent reduction in waste or a 25 percent improvement in uptime would be worth?
- Have you established a dedicated team to manage your transition toward digitally enabled manufacturing capabilities?
- Has your team identified the right “jumping in” points — including the initial investments that will lay the foundation for your business to remain competitive in an era of digital operations?

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# *Taxes and value chain planning*

Multinational corporations don't always have tax consequences on their list of things to consider when deciding where to build a plant, or where to carry out various activities. Sometimes, indeed, these companies think about taxes only after incurring costs that could have been avoided by better planning or after losing bids to more tax-savvy competitors.

The truth is, making operational decisions that will pay off on an after-tax basis has never been more complex. The fight by governments to keep jobs and economic activity on their own shores has produced a complex set of tax rules, tariffs, and trade agreements that has made these calculations far from straightforward.

Although taxes are rarely the main driver of a decision about where to situate an operation (as they should not be), they can be a material factor. Take the example of two companies identical in just about every respect — products, target customers, gross margins. If one of the companies sets up its manufacturing plant in a free trade zone, and the other sets up its plant in a country with heavy import duties, the more advantageously situated manufacturer will have higher after-tax profits and will be able to use them to fund its expansion into new markets or to pressure the other manufacturer on prices.

Companies newly expanding into developing markets should always do a top-down tax analysis, including an assessment of indirect taxes, when selecting a location for a new overseas facility. Occasionally such an analysis points to one country as having an unmistakable edge, from an economic perspective, as a location for a given set of activities. This was the case with a U.S.-based maker of recreational vehicles that was trying to figure out where to add manufacturing capacity. Asia was at the top of the list because the company was growing quickly in the region — the only question was in which country to make the investment. An analysis showed that manufacturing the products in Thailand would be best from an indirect tax perspective since those goods would trigger the least amount of import duties when exported to the company's key commercial markets in Asia (*see Exhibit 3, next page*). Several of the other countries under consideration had advantages —

*Companies newly expanding into developing markets should always do a top-down tax analysis.*

Exhibit 3

Comparing import duties by location of manufacturing facility

	Indonesia	Vietnam	Thailand	Malaysia	India	...and selling in these countries
<b>Indonesia</b>		5%	60%	0%	5%	
<b>Vietnam</b>	0%		60%	0%	75%	
<b>Thailand</b>	0%	5%		0%	5%	← Best tax choice
<b>Malaysia</b>	0%	5%	60%		5%	
<b>India</b>	44%	54%	60%	15%		
<b>U.S.</b>	50%	54%	60%	30%	60%	← Worst tax choice

Source: Strategy& analysis

for instance, India was already a manufacturing site for the company, and Vietnam offered the chance of lower wage rates — but these advantages didn't come close to matching the economic value of low or nonexistent import duties (which in Thailand's case had already given rise to an ecosystem of suppliers). The company decided to locate distribution and some manufacturing in Thailand.

Today's most sophisticated operations executives don't limit their geographic footprint analysis to finding the best location for their brick-and-mortar plants. In part because of income tax considerations, they also examine the optimal global footprint for each link in their entire value chain, which could include the R&D, procurement, and executive management functions connected to their manufacturing. A separate after-tax analysis of the best location for each of those value-driving activities should be performed to ensure that a company is delivering the optimal cost efficiencies — which seldom are realized by locating all of those functions and activities in the same place as the plant.

### ***Tax self-assessment questions***

- Do you know the total indirect tax costs borne by your manufacturing operations compared with what they would be in other locations?
- Do you have a strategy for mitigating any tax advantages that your competitors have because they are in lower-tax regions or locations?
- Have you looked at the possibility of relocating value-driving components of your operations that don't actually touch the product to more cost-effective states, regions, or countries as measured on an after-tax basis?

## ***Additional resource***

Research from PwC's Performance Measurement Group (PMG) finds that operating more distribution points closer to the customer is a characteristic of leading companies. PMG data shows that Best-in-Class Supply Chain Companies (BICC):

- Have **20 percent higher profitability** than bottom-tier supply chain companies
- Have a strong focus on ensuring that their supply chains are driving

forward revenue growth; their sales growth outpaces bottom-tier supply chain companies by almost **50 percent**

- Have almost **two times as many** distribution centers as bottom-tier supply chain companies, indicating that increasing the distribution network in a strategically managed fashion can result in greater operating efficiency

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# Conclusion

The new “ask” for operations leaders — after a few decades in which they have focused on the cost, process efficiency, and safety of their plants — is to find additional ways to help their companies increase their revenues and grow profitably. They have a few tools to help them do this. One is to reconfigure their manufacturing operation in a way that adds some important attribute — often speed or flexibility — to their company’s product or service portfolio. This is the asset-right option. The second tool is to use sensor, monitoring, and cloud technologies to create a step change in productivity. This is related to the efficiency pushes of the past, the difference being that the risk and reward — at least for the moment — are higher. And the third tool is to apply a layer of tax awareness to plant investment decisions. In some cases, the tax filter can highlight geographic options that are so clearly superior that the benefit becomes a dividend that can be reinvested in the business.

There’s nothing trivial about figuring out how and when to make these changes, which all require discussion with other departments and with experts outside operations. But it’s worth spending the time to think through the different possibilities. The returns from making the right decisions, and from the right investments, can be huge. Only operations executives who understand the market, technology, and taxes will reap the benefits.

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