

ADIDAS A German company built a “Speedfactory” to produce sneakers in the most efficient way

Sneakers aren't just made in one factory. They're the product of a sprawling network of specialized suppliers, often in different cities or even different countries that make the various components assembled into an athletic shoe. Just one part, such as the outsole, could have criss-crossed large stretches of Asia before becoming part of the sneaker you bought.

“In the one factory you create your rubber, and then the rubber is formed into a certain shape. The midsole is created. In another place, the midsole and the bottom are combined,” explains Ulrich Steindorf, senior director of manufacturing at Adidas.

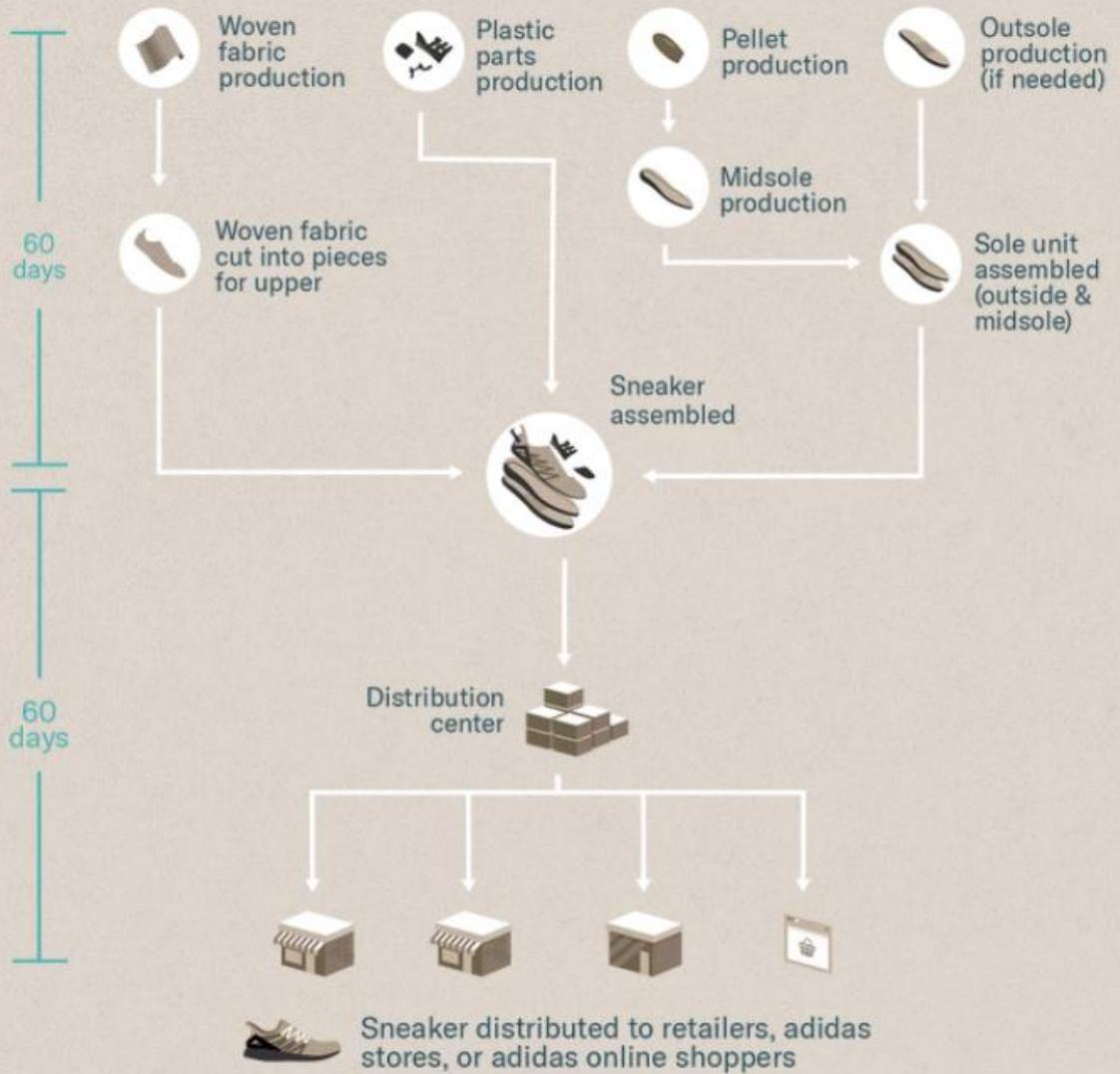
From start to finish, it can take 60 days to make a shoe using this conventional process. Humans still do much of the stitching, gluing, and other labor-intensive processes by hand. Even once the shoe is ready, it takes another 60 days to ship it from Asia, where most sneakers are made, to stores in Western Europe or the US.

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A couple of years ago, the top minds at Adidas decided this clunky, inefficient model was too limiting. “That’s why we looked into the technologies available and decided, ‘Hey, if we want to be faster and more flexible in doing what our athletes want and need, then we have to rethink the way we make products,’” says Gerd Manz, the head of technology innovation within Adidas’ Future team, which looks ahead three to seven years to set the company’s course.

The innovations Adidas has since put in place largely converge in the Speedfactory. It’s a pioneering concept that concentrates the sneaker-production process in a single space, and in the market where the shoes are sold. At Adidas’ Speedfactory in Ansbach, Germany, robots do most of the work. Compared to the months it can take to make a sneaker in the traditional supply chain, Speedfactory completes production in a matter of days.

TRADITIONAL SUPPLY CHAIN*





The new factories are just one piece of a bigger shift. For roughly 40 years, sneaker manufacturing had gone largely unchanged. But now experts believe the industry has reached an inflection point, spurred by the spread of e-commerce and social media, which have sped up fashion cycles and taught shoppers to expect instant access to a constant stream of new products. Adidas is testing different ideas as it works to make its operations faster and more flexible to meet the demands of this new era. It's integrating practically every major trend transforming supply chains today, including 3D printing, customization at a mass scale, near-sourcing, and the digitization of its operations.

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And it isn't alone. Adidas is up against its arch-rival, Nike, which is similarly transforming how it works with help from supply-chain and logistics innovator Flex. The two labels are neck-and-neck at the lead of an innovation horse race in how athletic shoes are designed and manufactured. Morgan Stanley estimates they could produce almost 20% of their sneakers at “more automated” factories by 2023.

Technology moves so fast it's hard to guess what even the next few years will look like. But Speedfactory is an attempt to bridge the void.

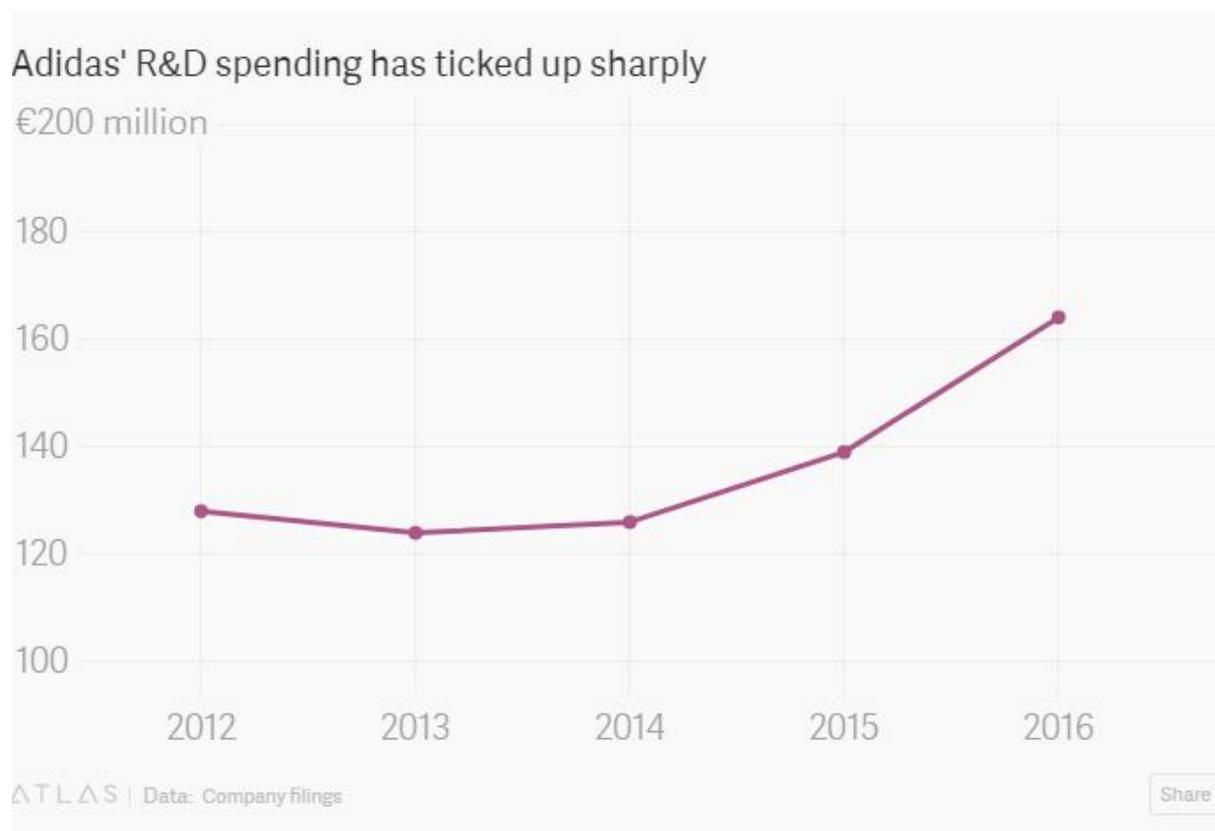
“We wanted to create the factory of the future,” Manz says. “This should be representative of what all our factories are in five to 10 years from now.”

INSIDE ADIDAS' FACTORY OF THE FUTURE

Two years ago, when the company conceived of the idea for Speedfactory, the patch of land Adidas wanted to build on was a potato field. Today, it's the site of a nondescript, white building bearing the name of Oechsler, the German firm Adidas partnered with to build it.

Oechsler was instrumental in building the robots and production set up within the roughly 4,600-square-meter building (about 49,500 square feet), tasks beyond Adidas' particular expertise. The partnership, in fact, is an example of one of the sneaker maker's new guiding principles, which it calls “open source.” It means sharing ideas, and when necessary, teaming with outside experts. Oechsler actually started in the mid-19th century as a maker of horn buttons, but now specializes in the decidedly more modern field of plastics injection molding. It develops and produces parts for automotive,

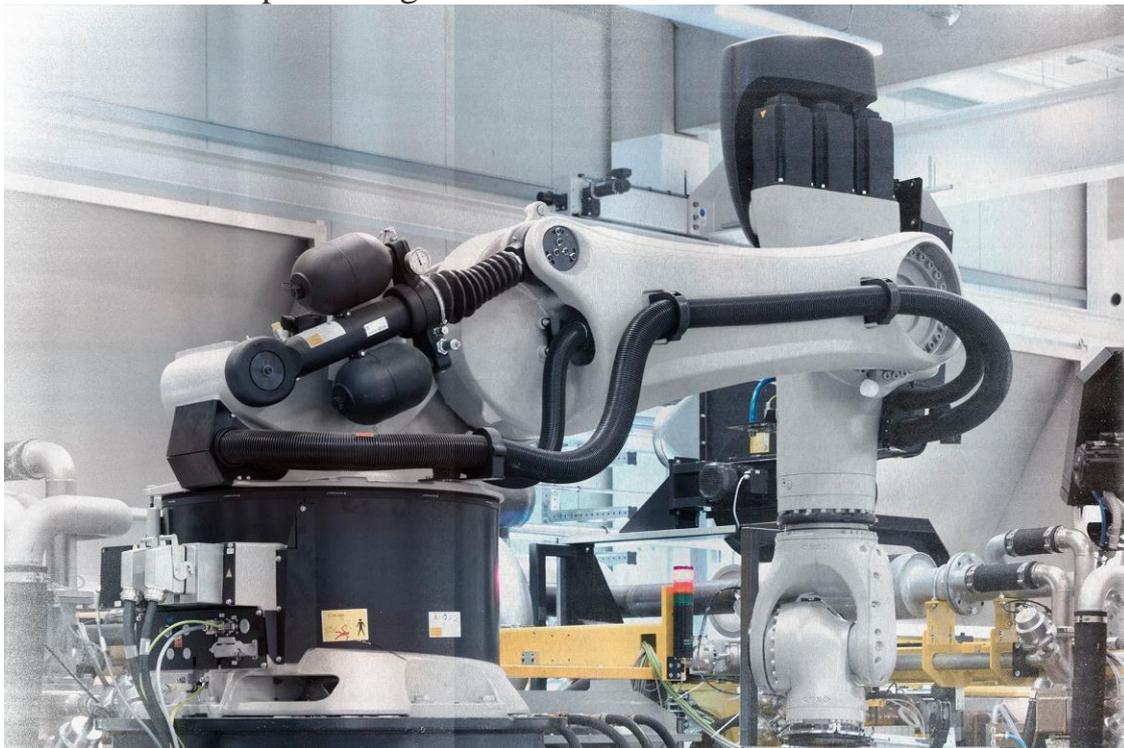
medical, and industrial companies around the world, and has worked with Adidas for years. Adidas says it had the expertise and commitment to innovation Adidas wanted in a partner to build its automated factory. It was undoubtedly an expensive endeavor, though neither company has said how much it cost to build Speedfactory. (They shared the expense.) Adidas would only point to the €164 million (about \$173 million at the time) it spent on R&D in 2016. Speedfactory is part of that amount, which represents a sharp rise in R&D costs over previous years .



Just the idea to build a factory in Germany was a bold move for Adidas. Sneaker brands generally handle the design, marketing, and a share of the sales, but leave the actual manufacturing to someone else. That someone else is almost always in Asia, where it became the norm to outsource laborious manufacturing work in the 1980s, since labor costs are low and there's now a massive infrastructure set up, particularly in China. Adidas sourced 97% of its footwear from Asia in 2016, according to the most recent numbers

available from the company, and that's where the bulk of production will stay for the foreseeable future.

Speedfactory is almost a complete reversal of that standard. Adidas still has to import raw materials, and outsource certain processes, such as knitting the textile for the upper. Otherwise, all the work happens in Adidas' factory, right here in Germany and now the US, where it recently opened a Speedfactory in Atlanta. Adidas also says processes that aren't currently part of the set up, like knitting the fabric for the upper, or 3D printing midsoles, could be easily integrated. It makes Adidas dramatically faster and more flexible in producing shoes.



One of the robots in the Ansbach Speedfactory. (Adidas)

FROM IDEA TO REALITY

A sneaker in Speedfactory comes together so simply that it can be tough to understand why no one tried the concept before. But Adidas had to work hard to make it a reality. “A lot of these processes don’t exist [in sneaker manufacturing],” Manz says.

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The robots it uses may already be common in other industries, but they had to be adapted to put sneakers together. To manufacture cars, electronics, or semiconductors, robots might use magnets, vacuums, or mechanical pinchers to handle the parts. But the materials in those industries tend to be rigid or fairly uniform. Those methods don’t work well when dealing with a variety of soft, flexible textiles. Adidas and its partners had to create new ways for the machines to handle its materials and solve other basic problems. (Faced with the same challenge, Nike recently started installing robotic technology at some contract factories that use electro-adhesion—basically static cling—to handle sneaker parts.)

Digital technology was also integral in making Speedfactory possible. Adidas partnered with technology company Siemens to build a virtual replica of the Ansbach factory. “We can simulate every aspect down to a machine level of how we can optimize the setup and the layout within the factory and therefore the production flow, which ultimately should help us on the one side to cost-optimize, but on the other side to have the quality of the product as well,” says Michael Voegele, Adidas’ chief information officer.

As Speedfactory cranks away, each part it makes is tagged with a scannable QR code. During quality control checks, if there’s a problem, they can trace the part back to the machine that made it, and know what the settings were on the machine. As Speedfactory makes more and more shoes, Adidas will be

able to continuously refine its processes, reducing the waste from parts that aren't up to standard and ensure that it's making a better final product.



One of many digitized processes in Speedfactory. (Adidas)

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Nobody else in the industry is doing anything like this, according to Manik Aryapadi, a principal in the retail practice of A.T. Kearney, a global strategy and management consulting firm that works with some of the biggest players in the sporting-goods industry. Footwear and clothing brands frequently have their suppliers embed RFID tags in finished goods so that if they spot defects they know the factory responsible. But doing it at the component level is the sort of practice you see in high-tech industries, such as semiconductors. No other brand has so fully embraced automation either, or digitally replicated a factory to optimize for it. “Adidas is at the cutting edge,” he says.

Automation has advantages beyond speed; it offers mechanized accuracy too. James Carnes, Adidas' vice president of strategy, said during the tour of the Speedfactory that in the average footwear factory in China, the sole and upper are joined with glue by hand. "The process is basically somebody stands there and goes—" he says, mimicking someone trying to line up the sole and upper by eye. "It's a really imprecise process." Adidas also avoids using glue wherever possible. It's messy and slow, needing time to dry, which is why Adidas prefers fusing pieces when it can.

Because so much of the work is automated, Adidas needs fewer workers than you would find in many sneaker factories in Asia. There are 160 employees at the Ansbach location. At factories in China and Vietnam, it's common for footwear factories to have more than 500 workers, or even well over 1,000 . The Ansbach employees also tend to be workers of a very different sort. The job profiles Adidas and Oechsler used for hiring were common in other industries, such as automotive manufacturing, where automation is common, but new to the sneaker world, Steindorf says. Oechsler, which works in the automotive industry, helped with recruiting. Many of the applicants were Oechsler employees eager to try something new.

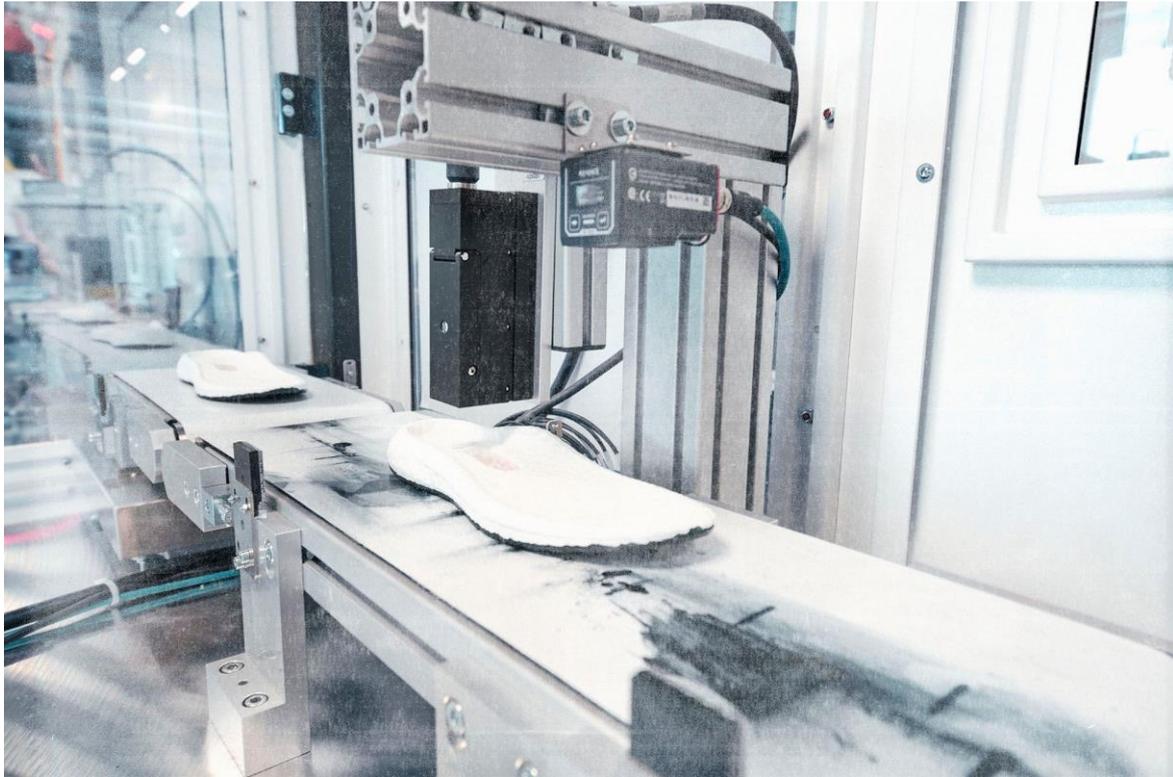
THE REAL INNOVATION ISN'T PRODUCT, IT'S PROCESS

The first sneakers to come out of Speedfactory hit the market in September 2016. Called the Futurecraft MFG, as in "Made for Germany," since they were exclusive to the country, they were a sort of public beta test of just 500 pairs. Adidas' has since released pairs designed for London and Paris, the AM4LDN and AM4PAR, with more cities to come.

Right now, Speedfactory is focused on premium performance shoes like those. The AM4 line, in fact, was designed to be made in Speedfactory's automated set up. The shoes have just a few components, and can be assembled in a minimal number of steps. At present, Adidas is still ramping up production, but it expects the factories in Ansbach and Atlanta to soon be making 500,000 pairs of sneakers each annually.

Those quantities, however, show one of the limits of Speedfactory. One million pairs of sneakers is a small fraction of the roughly 360 million pairs of shoes(pdf, p. 69) Adidas' suppliers produced for the company in 2016. Though that number will probably be bigger still in 2018 when the Speedfactories finally hit full production volume.

Speedfactory also can't produce many of Adidas' other sneaker styles, such as its popular retro models, which were its biggest sellers over the last few years. "If you use an example of a Superstar or a Stan Smith, it's a rubber outsole," Steindorf says. "It's a different kind of joining process behind it where we just don't have a solution yet." The infrastructure that already exists in Asia for creating these types of sneakers also just makes it more advantageous to produce them there. At present, the Speedfactory in Ansbach is only set up to make Boost soles. Soon it will also add the "digital light synthesis" 3D-printing process developed by Carbon.



Soles coming down the line at Speedfactory. (Adidas)

Despite everything Adidas is doing with Speedfactory, sneaker manufacturing is also not likely to move back to Europe or the US in any large scale. “I do not believe, and it’s a complete illusion to believe, that manufacturing can go back to Europe in terms of volume,” Adidas CEO Kasper Rorsted publicly stated on a recent trip to Asia (paywall). “And that goes for the entire industry, I’m not speaking just for Adidas.”

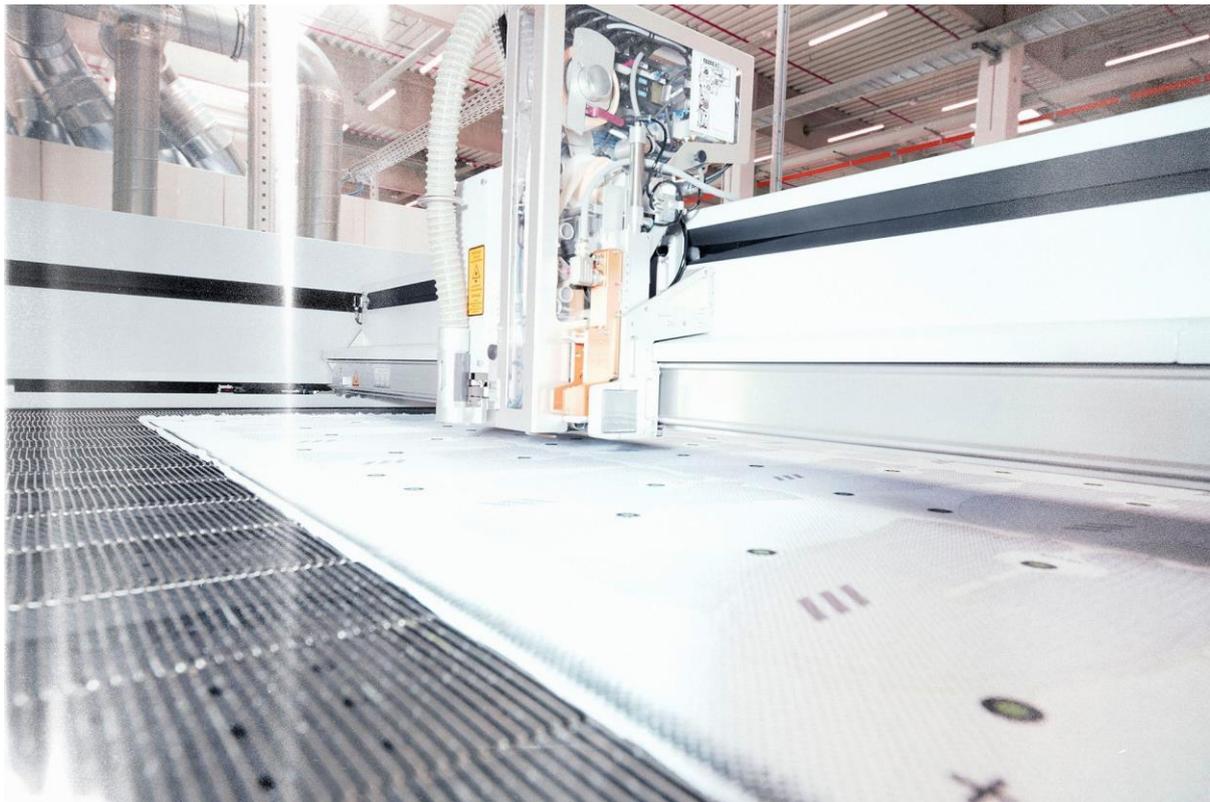
So can Speedfactory really have a major impact on Adidas’ business?

Matt Powell, vice president and sports industry analyst for market-research firm NPD Group, is a well-known sneaker expert, and notoriously skeptical of the value of hyped but limited-scale endeavors. But he believes Speedfactory, in combination with the other innovations Adidas is working on, particularly its partnership with innovative 3D-printing firm Carbon, could provide huge benefits.

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“Right now it takes 18 months from concept to retail for a product to get to market, if everything goes well—and it never goes well,” he explains. “And what we have seen over the last few years is the fashion cycles are really compressing. I use performance basketball as an example of this. [It] took off really at the beginning of 2012, and the trend was over by the middle of 2015. If you think about it, in an industry where the fashion cycles only last three years, and where it takes 18 months to bring product from concept to retail, those two things are really in opposition to each other.”

Powell says the Speedfactories should help Adidas to adapt to this shortened cycle in ways that will matter even if they aren’t churning out tens of millions of sneakers a year. First, they let Adidas create and test new products quickly. (That’s also where 3D printing helps: It lets Adidas simply print soles for prototypes and eliminate tooling, the costly and time-consuming step of building the metal mold used to make soles in conventional sneaker making.) Second, they will soon allow Adidas to respond quickly to the way people are shopping in the markets where Speedfactories are located.



Laser cutting the knit uppers. (Adidas)

Because Speedfactory allows the company to swiftly experiment with new sneakers, Manz describes it as an “innovation platform.” Adidas doesn’t necessarily need to produce 50,000 of a single style and have an entire marketing and distribution plan in place 18 months ahead of time. It can come up with a concept, create a few hundred or a few thousand pairs, and see how it goes.

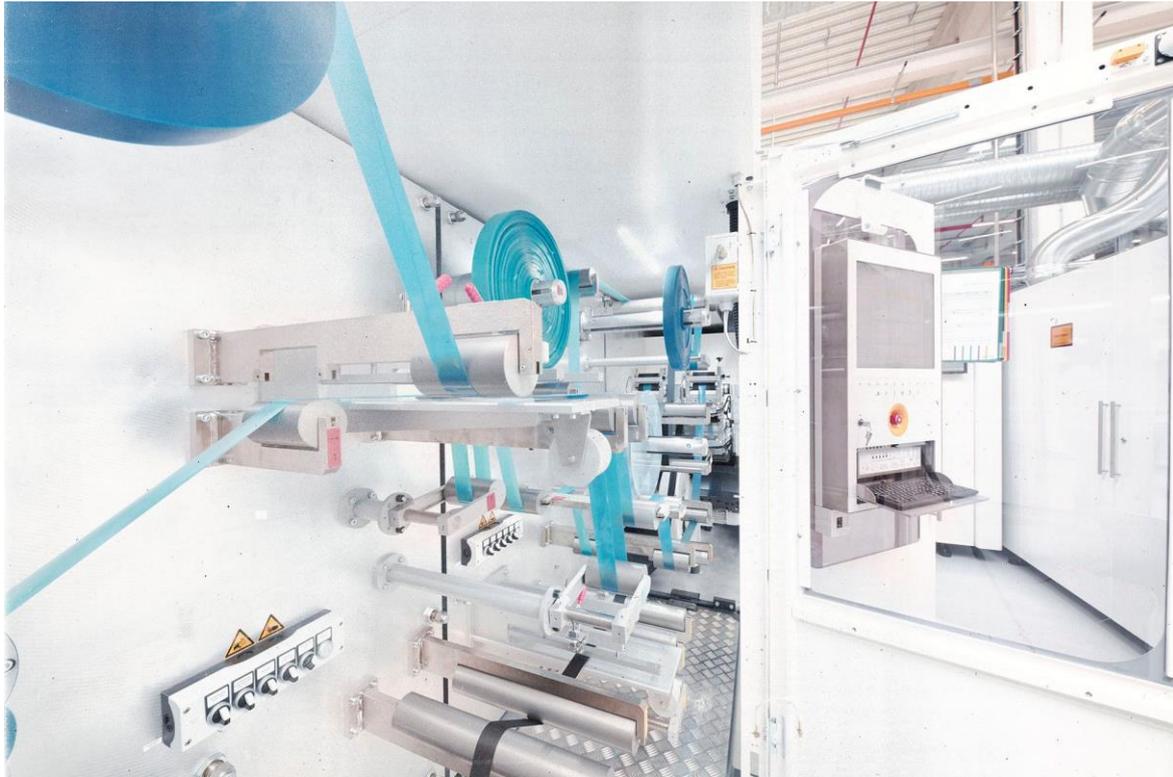
Scaling Speedfactory isn’t just about building more of them.

Scaling Speedfactory isn’t just about building more of them either. They can test and optimize production methods there, and then institute what they’ve learned in the contract factories they use in Asia, improving their sustainability and productivity. They’re working on installing certain processes overseas already.

Just as important, the Speedfactories will soon be able to rapidly replenish stores in Western Europe and the US. That ability would let Adidas restock styles or sizes in just weeks or days, rather than months. It could also mean Adidas wouldn't need to produce a huge volume of inventory up front and sink money into stock without certainty that it will sell.

That business model has helped fast-fashion brands dominate and transform the rest of the clothing industry, and it could give Adidas' business a significant bump. In its report on sneaker companies speeding up manufacturing, Morgan Stanley estimated that shifting toward this production model could offer brands an extra 15% rise in sales growth, and there are all sorts of logistical benefits. Adidas has said it plans to get 50% of its sales from "speed-enabled" products by 2020.

"The business model, I think that's the thing I get excited about," says Carnes, the strategy VP. If a company can get to the point of producing a sizable share of the products it sells on-demand, he explains, rather than producing them ahead of time, "it has completely different business-model implications in terms of delivery time, cash flow, setting up your business, how you're able to manage inventory."



Automation in action. (Adidas)

These sorts of advantages are why Powell believes Speedfactory can make a real difference to Adidas' bottom line, even if the numbers aren't yet near a commercial tipping point.

Eventually, Adidas's goal is to be able to make individually tailored shoes, where 3D printing may be indispensable again. If Adidas doesn't have to build the tooling for a sole, it suddenly becomes feasible to customize a sneaker to a customer's foot. The sneaker would be expensive, and not likely a mass-market product. But for athletes with specific needs, it could be worth the cost.

The shift to the Speedfactory model gets to the very heart of how innovation itself is evolving.

For Adidas, this shift gets to the very heart of how innovation itself is evolving. "Innovation has completely changed," says Manz, who marked his 20th year at Adidas in November. "It completely changed—and that's also probably representative of the industry, which we're trying to lead in

innovation—from really ingredients through products, more towards processes and business models.”

In other words, making a better product today is less about whatever the hot new cushioning material of the moment is, and more about having the entire business set up to quickly identify what customers want, and get it to them fast.

SOURCE : ANSBACH, GERMANY IN QUARTZ