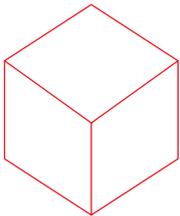
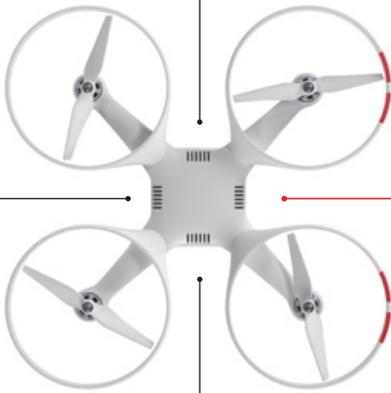




How New Technologies Are Influencing Change Across the Supply Chain

by Jimmy Mitchell and Matthew Ferstle

Digital advances like artificial intelligence, autonomous vehicles, and 3-D printing have generated a lot of hype in the media. While it's easy to focus on the sizzle as disruptive concepts and new ideas come to the forefront, these are more than just fads. They're truly catching on. We'll highlight ways these technologies are influencing change across the supply chain and how each of them are grounded in key customer-centric tenets.



I imagine you're sitting at home and you think to yourself, "I really want to learn how to brew beer." You call out and ask your home automation system to provide some research, and it steers you to order the perfect home brew kit for your needs. Within the hour, an alert pops up on your mobile device: A drone has dropped a package on your doorstep.

Just like that, you're off to the kitchen to start a new hobby.

"Well, shoot," you say, as you wrap up your first batch of brew. "I don't have any bottles." No problem! You head back to the computer, download designs for a bottle and cap, click "yes," and start the 3-D printer. In no time, you've officially packaged your first batch of craft beer and can't wait to share it with your friends.

Although technology hasn't yet found a way to speed up your custom brew's fermenting time, supply chain technologies such as drones and automated delivery, 3-D printing, and artificial intelligence services are quickly becoming realities. Let's examine some of the ways these technologies are influencing change across the supply chain and how each of these new technologies is grounded in key customer-centric tenets.

AUTONOMOUS VEHICLES/ DRONE DELIVERY

By now, it's common knowledge that companies such as Waymo (Google), Uber, and Ford are developing autonomous vehicles. You've probably also heard of the drone delivery tests by Amazon.

Amazon's drone delivery tests have clear implications for the "last mile"—the segment of the supply chain that ends with final delivery to the customer. But the investments in both air- and land-based autonomous vehicles haven't stopped there. Uber recently acquired Otto, which is outfitting existing delivery vehicles with automated driving technology, and successfully delivered 50,000 cans of Budweiser in October 2016.

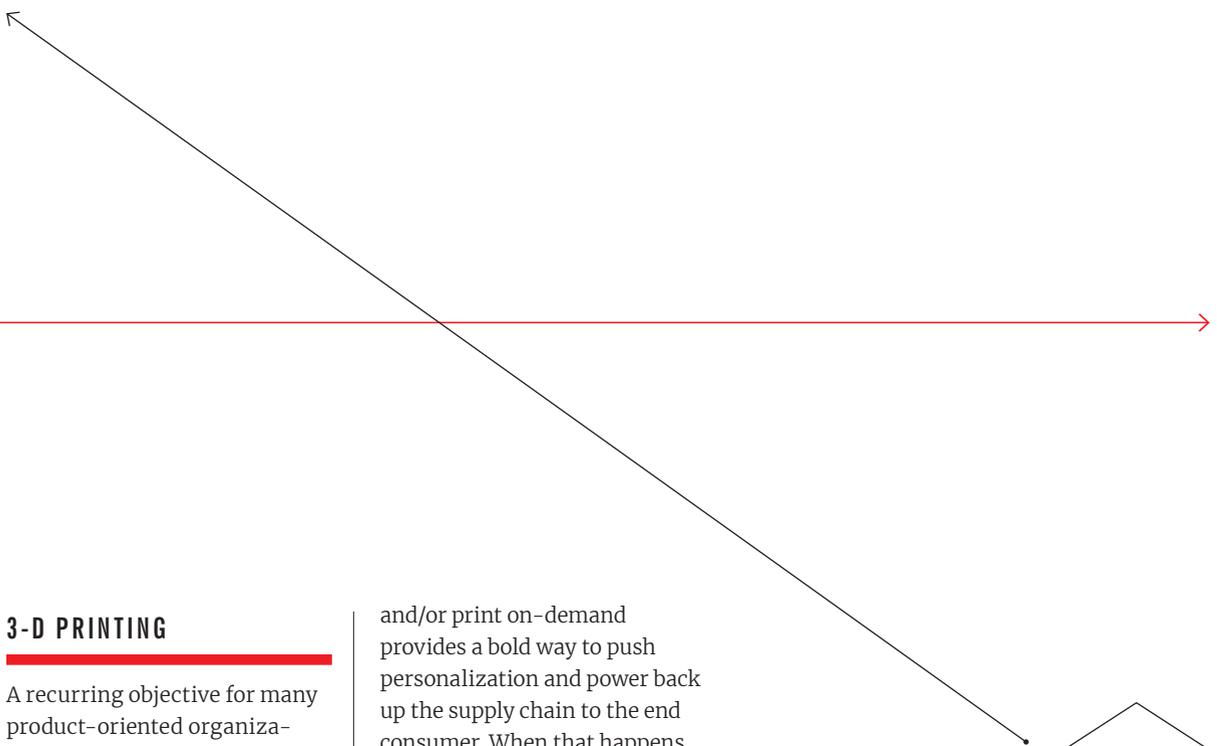
As Otto continues to advance automated driving in the U.S. trucking industry—trucking accounts for 70 percent of national freight volume annually, according to the American Trucking Association—companies in China (TuSimple, Baidu, etc.) are partnering and facing less regulatory resistance than in the United States.

As for drones and other autonomous end-delivery vehicles, Domino's Pizza

piloted a delivery robot (called DRU) in March 2016 that can keep drinks cold and pizza hot all the way to the customer. Amazon, aside from investing and deploying technologies across its massive supply chain, has also developed a patent for floating warehouses.

As this technology continues to amaze and advance, the media has tended to cover developments in the field with either fear or excitement, often uncertain of its applicability or staying power. But there is certainly a key customer focus at the root of this technology: the customer's desire for urgency.

When delivery is automated throughout the supply chain, goods stay in motion and arrive to the customer faster. As you think about your supply chain (or any process you're operating), you may not be able to run out and implement a fully autonomous solution. But are there opportunities to identify and eliminate bottlenecks so you can deliver your product to your customers faster?



3-D PRINTING

A recurring objective for many product-oriented organizations is the quest for more convenient, cost-effective purchasing, manufacturing, and delivery processes. This is where additive manufacturing (AM) or 3-D printing comes in.

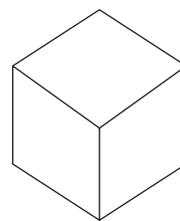
Imagine a world (or even a day) where you no longer order products, but rather order the designs and templates to self-produce them on your own time—nearly akin to the way we consume media today. Remember: not long ago, on-demand television and radio programming were foreign concepts; today we take them for granted.

We are all busy and appreciate instant gratification. Therefore, it is no surprise that the effortless experience of 3-D printing and its many applications have been able to grab the attention of so many consumers and industry partners. Although we're still in a wait-and-see mode, 3-D printing is really starting to shake up the supply chain. This is evident from the multitude of units already being used in industries ranging from automotive and aerospace to government, health care, and retail. The ability to buy

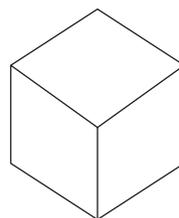
and/or print on-demand provides a bold way to push personalization and power back up the supply chain to the end consumer. When that happens, customers become designers, suppliers, and manufacturers.

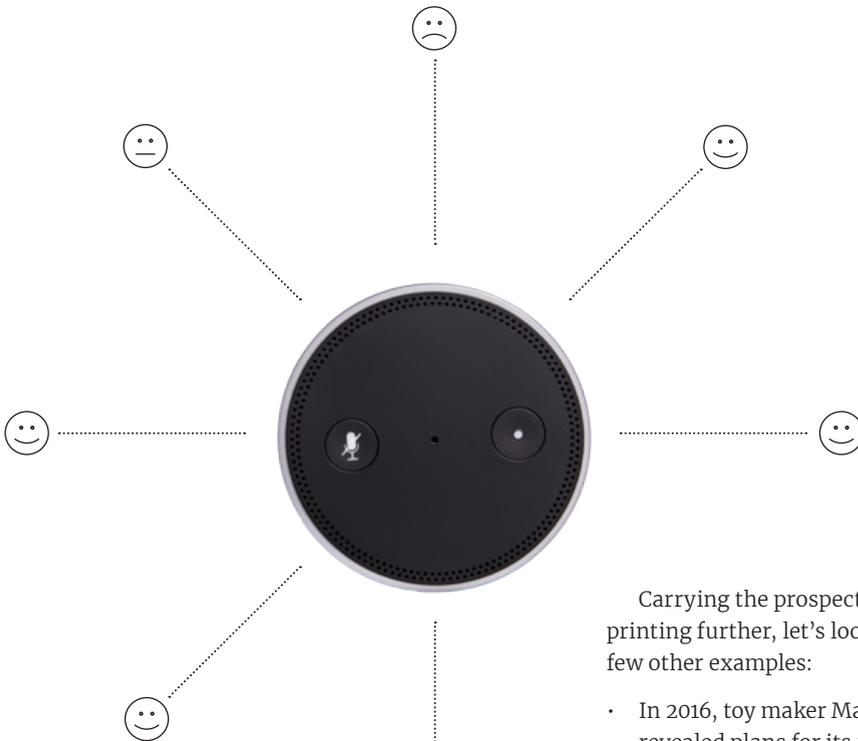
For trade professionals and do-it-yourself craftsmen, 3-D printing offers control and flexibility, and can remove the constraints of local access to products. A local maintenance worker who needs a spare part for a home repair, for example, may find it more convenient to print the part on site than to make a trip to the neighborhood hardware store.

And for designers who want to use 3-D printing to distribute their products, Shapeways is a web-based marketplace where they can upload their designs. Buyers looking for customizable, 3-D printed jewelry, toys, accessories, or gifts can find just the right thing in one of more than 30,000 “shops” on the Shapeways site.



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Carrying the prospect of 3-D printing further, let's look at a few other examples:

- In 2016, toy maker Mattel revealed plans for its 3-D printer, the "ThingMaker," which will allow children to print toys and parts for its branded merchandise at home overnight.
- At the 2015 North American International Auto Show in Detroit, Local Motors unveiled its 3-D printed electric car, the Strati, which can be produced in five days.
- DSW, Louis Vuitton, Nike, Zara, and other textile and apparel brands have all experimented with 3-D printing to improve the customer experience.
- UPS expanded its service portfolio through a partnership with Fast Radius, offering customers the flexibility to 3-D print and then ship products from one of 60 UPS Store locations.
- NASA and the U.S. Army hope to use the technology to customize and deliver healthier food options for astronauts and soldiers on site.

The pace of innovation in 3-D printing will continue to accelerate, reducing the time between order and replenishment, and effectively change many warehouse and distribution models. A shorter, more flexible supply chain with fewer constraints makes additive manufacturing an attractive technology and helps companies with another key customer tenet: responding quickly to customer feedback and input. Therefore, businesses need to continue thinking (if they aren't already) about how they can adapt, embrace, and interact with, or use 3-D printing to improve their supply chain operation and servicing capabilities.

ARTIFICIAL INTELLIGENCE

We've come a long way from Jeeves to Siri, Cortana, Alexa, and Watson. Automation led by artificial intelligence is making a lot of headlines in the form of home automation, but across the supply chain, these technologies are being deployed to support all types of activities.

Siemens is operating its Amberg Electronics Plant with the ability for products to tell production machines what

75%

OF ACTIVITIES IN SIEMENS' AMBERG ELECTRONICS PLANT ARE AUTOMATED.

the next manufacturing step is (instead of having human oversight). In this facility, more than 75 percent of the activities are automated.

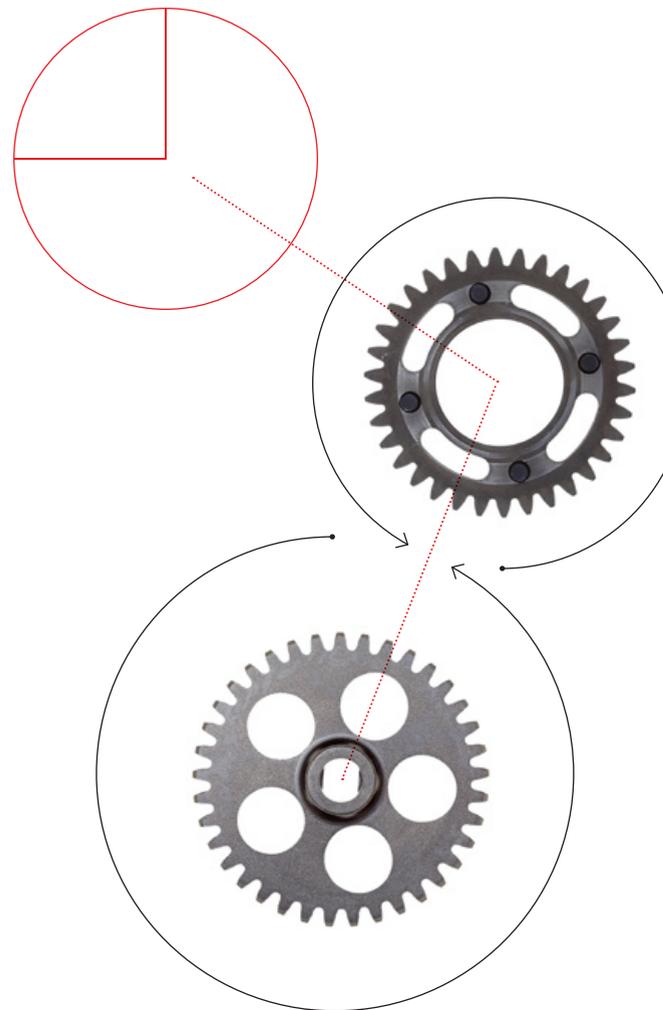
IPSoft, Google, Microsoft, and others have deployed AI solutions within the virtual world that leverage language and inflection interpretation. For example, they have developed fully functioning chat agents that learn from each customer question and experience. They have also developed the ability to identify irate customers. KLM partnered with DigitalGenius to support its (human) call center agents. They implemented a solution that offers call center representatives the best possible responses to customer questions, based on learning from thousands of previous call center contacts.

Historically, people have viewed the advancement of AI as a scary proposition. Look no further than Hollywood's interpretation for the general perception of ever more intelligent technologies. In the service space, however, AI advancements aren't about conquering the world, they're about trying to capture one of the hardest things to earn: customer trust. Trust is both imperative and elusive—and

the phrase “your call is important to us” evokes a feeling very, very far from trust. One of the biggest hurdles AI will need to overcome is differentiating from those never-ending call queues and truly focusing on customer satisfaction.

CLOSING

The reality is that supply chains are becoming much more varied and interconnected. And this complexity is fueling a need to be more creative at each stage of the product life cycle. In response, industries are testing and deploying a wide variety of exciting technology solutions. However, if these advancing technologies are to continue to exist beyond a fad or a cool news article, they must address core customer principles. If they can meet customers' urgent needs for shorter feedback loops, trust, and simplicity, some of these awe-inspiring technologies may be here to stay. ←



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