

# Fulfilling the digital business model

Practical possibilities of batch size one

PERFECTION IN AUTOMATION  
A MEMBER OF THE ABB GROUP



# The adaptive machine delivers what digital consumers want

The digital consumer wants what they want, when and how they want it. They want their products personalized, yet affordable – and don't forget sustainable!

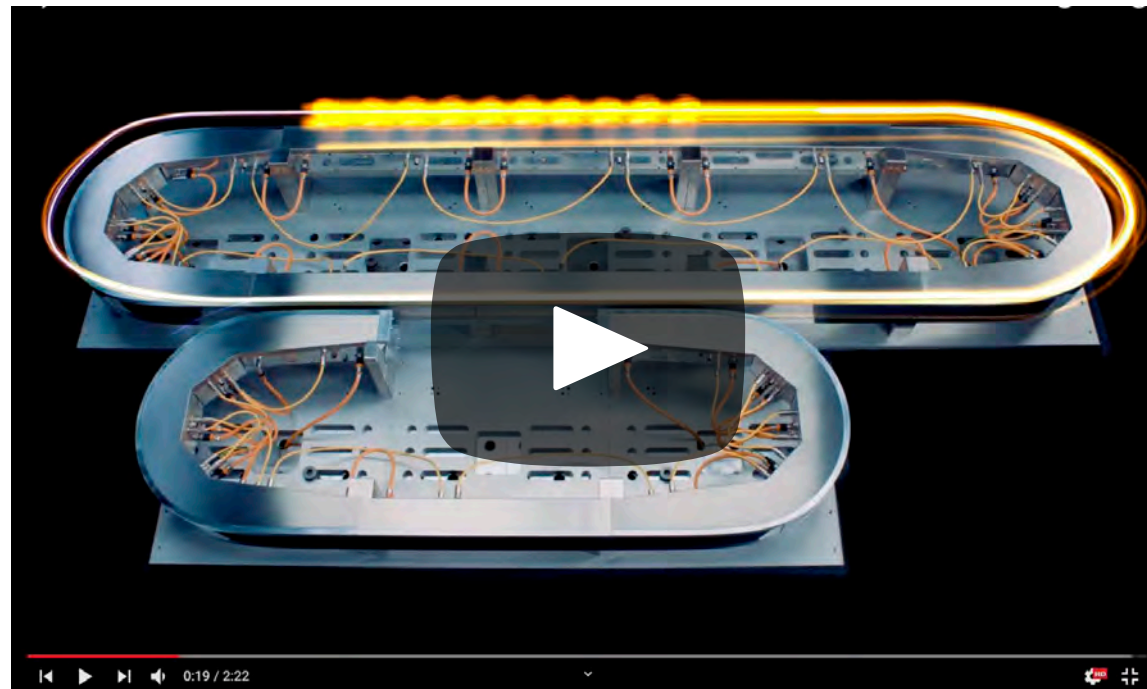
To deliver on these demands, you need true batch-size-one manufacturing. You need an adaptive manufacturing solution free from the rigid constraints of sequential production.

Though it offers the same automated productivity

as a high-volume sequential production line, an adaptive machine is specifically designed to handle on-the-fly customization.

Not just in small batches, but batches of one: one product for one customer.

The question is, what kinds of products are being produced on adaptive machines?



# An inventory consisting entirely of products you've already sold



The adaptive machine changes everything. Instead of make to stock, you can build to order.

That drastically streamlines the supply chain, so that finished goods inventory consists of products that have already been sold.

The inefficiencies of manual labor are eliminated without resorting to offshoring and its excessive shipping leadtimes. And there's never a need for end-of-season clearance sales.

# A new class of machinery

One manufacturer of beverage processing systems, Krones, is working on adaptive machine technology to implement batch-size-one capabilities for filling, labeling and collating – a solution it calls “bottling on demand”.

Imagine ordering beverages for a family outing. For each person, you pick the right bottle size and flavor, even a custom label. When you arrive at your destination, your drinks are right there waiting for you.

This video demonstrates a Krones “bottling on demand” demo featured at a recent exhibition.



# When it has to fit



Orthotics

By their very nature, orthotics and prosthetics are custom-fit devices. Parts are 3D printed or laser pre-cut and then assembled to fit a custom-measured size and shape. Adaptive machines now make it possible to automate these otherwise painstaking tasks -- cutting both manufacturing cost and lead time.

This same kind of adaptability can be applied to custom-tailored clothing, gloves and hats -- even the contour and fill of a pillow. Any product where a precise fit can command a premium price through an advantage in comfort or performance is a perfect candidate.

# Automating the hand-picked experience



Confections

Hand selecting candies has always been a pleasure reserved for those who visit a specialty shop. Thanks to mass customization, consumers can now be just as spoiled for choice from the convenience of their smartphone or tablet. Their orders are fulfilled directly from the manufacturing floor and routed automatically

through packaging to shipping for guaranteed freshness.

Write a love note in icing along rows of candies or atop all sorts of special-occasion baked goods. Or send a one-of-a-kind gift basket with just the right assortment – from savory to sweets to fruit.

# Cosmetics get personal



Cosmetics

Cosmetics companies rely on a palette of delicate nuances in shade, fragrance and formulation to satisfy their customers' unique preferences and sensibilities. And few product categories benefit more from mass customization.

Changes in men's personal care continue to expand the market potential. Shaving supplies were the first on the direct-to-consumer scene, but they are being joined by a growing range of other products.

# Custom-fit lifestyle gear



Ski boots

Pro athletes and high-end enthusiasts know the added comfort and performance of made-to-order gear. Adaptive machine technology can be paired with traditional craftsmanship to bring custom equipment to a broader range of

consumers. With a rapidly growing selection of wearables – like ear buds, hearing aids, mouth guards, eyeglasses, oxygen or diving masks – the possibilities are endless.



# Made to spec, regulated, serialized



Surgical kits

Batch size one is more than just an answer to the demands of today's consumers – it also fills an important role in industries that require customized products, such as surgical kits, implants, medical devices and related documentation.

In these highly regulated industries, batch-size-one technology lends itself more to serialization, track-and-trace and verification than to marketing imperatives.

# Mail-order pharmacy fulfillment



Pharmaceuticals

Both mail-order and hospital pharmacies need to combine multiple medications to match patient profiles. Orders can include a mix of blister packs, bottles, tubes, jars, applicators, parenterals, swabs, patches, leaflets and more.

Automation is needed to print patient information and instructions on packs. The system should automatically confirm the correct products, dosages and medication schedules. The equipment may be required to operate in a sterile environment and provide secure access for controlled substances.

# Manufacturing cost as a market-maker



Fitness bands

A certain millennial wristwatch company has advertisements that boast nine different models at modest prices – possible because they have taken control of manufacturing.

An adaptive machine could turn those nine models into virtually infinite combinations of case and face shapes, finishes, bands and engravings. The same holds true for fitness bands, smartwatches and other wearables.

# Menus, made to order

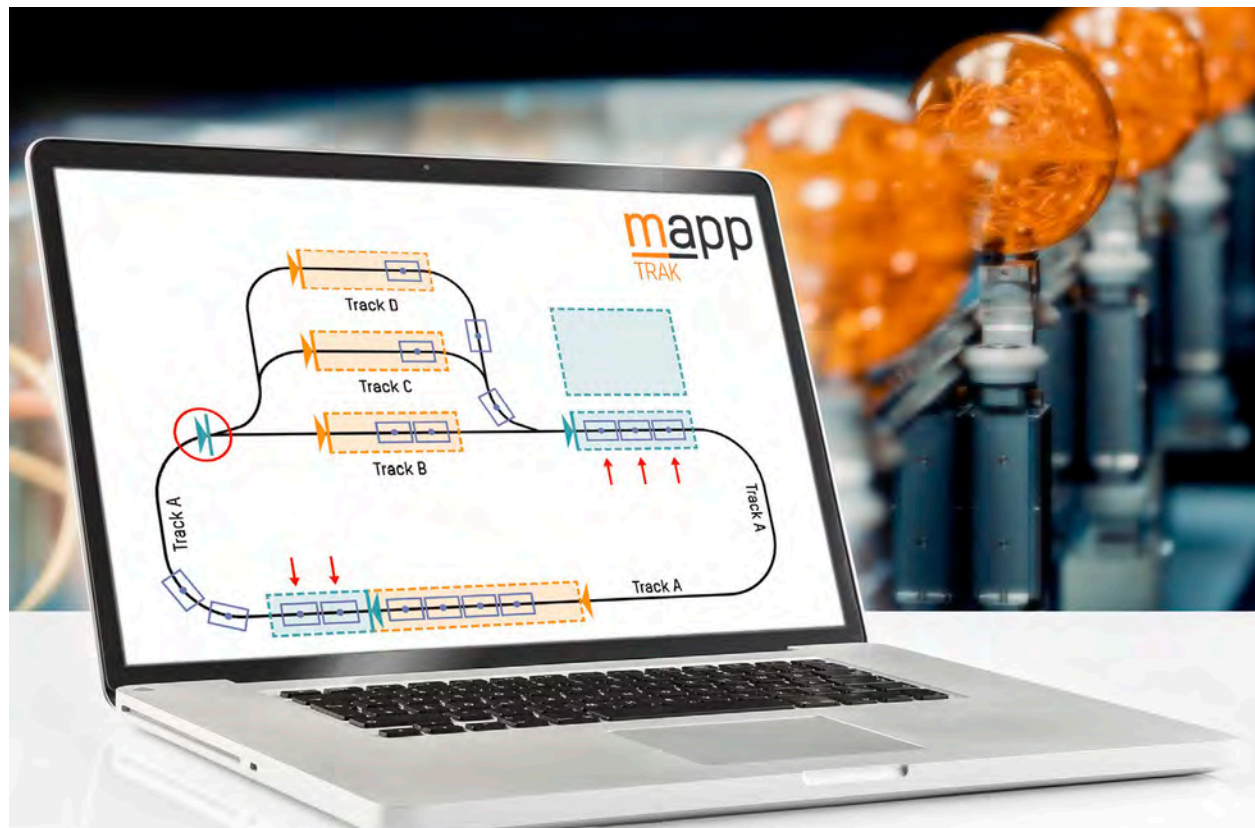


Meal kits

The adaptive machine can transform traditionally labor-intensive business models such as meal kit assembly into highly automated, highly profitable operations. Locally grown, organic, seasonal, non-allergenic or featured ingredients can easily be substituted on a per-order basis.

Sophisticated human-track collaboration technology allows tasks that require manual dexterity – such as trimming cuts of meat – to be performed safely, directly alongside the track.

# Maximum performance with minimal risk



Simulation and digital twin technology for the adaptive machine

Adaptive machines are modular by nature, and that building-block design lends itself particularly well to simulating different configurations before committing any capital expenditure.

The simulation software tells you what layouts and speeds are possible, and exactly how many shuttles to use for optimum throughput.

Later, the same software serves as a [digital twin](#) that can be used on an ongoing basis to simulate new products in an automated batch-size-one manufacturing environment.



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