How One Company Used Data to Create Sustainable Fast-Food Packaging

A German company's efforts have prevented the use of more than 4.7 million disposable packaging containers. **by Theresa Bockelmann and Jan Recker**

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Traditional food packaging and delivery faces a serious sustainability problem. Consumer beverage packaging accounts for between up to 48% in urban solid waste and up to 26% of marine garbage, and the ineffectiveness of traditional recycling and reuse schemes via cash deposits that lead to perceived higher prices, are cumbersome to

handle for food providers, and do not incentivize customers to return containers quickly or at all.

Digital technology and AI have made it commercially possible to offer an alternative, more sustainable, and deposit-free recyclable packaging system. Suppliers rent their packages to restaurants and end users simply pick up their desired take-out and then return the packaging within a specified period free of charge. The restaurant cleans the used packaging and then reuses it.

One of the pioneers of this new approach is the German company Vytal, which sources its food containers from partner suppliers that manufacture the packaging to Vytal's material and design specifications and rents them to take-out food providers on a pay-per-use basis. We'll look at how Vytal makes the system work and offer five lessons from its experience.

Leveraging the power of data

The key to Vytal's success is that its packaging containers are imprinted with machine-readable QR codes, which allows Vytal to gather data on the product all along the supply chain. Vytal uses the data to train a machine-learning algorithm that forecasts container-needs for each partner in the network and creates load-balancing routes for exchanging and delivering needed packaging between partners.

This allows Vytal to manage pull by partner restaurants and optimize logistics planning. The algorithm predicts how many bowls and boxes of each type of container each partner will need over the next seven days, which then automatically generates an operations order in Vytal's system. The order then enters the route planning system and is automatically sent to the cargo bike drivers responsible for delivery on the day of execution.

Accurate and timely forecasts of the amount and type of required packaging and robust predictions of consumer return behaviors reduces the need for spare products, optimizes storage, avoids ad-hoc transportation, minimizes manual labor at the partner's locations, and maximizes the utilization rates of containers and hence lowers their environmental impact. Moreover, it allows Vytal to optimize transportation planning. Ad-hoc deliveries and redistributions by Vytal drivers are significantly reduced whilst the utilization of Vytal's cargo bike fleet is maximized.

Customers benefit from reduced trash production without incurred costs and at little effort since used containers can be returned without washing at any participating partner site. Partner restaurants benefit from a reduced need for plastic packaging, lower packaging costs, and from insights on consumer behavior provided to them via Vytal's online platform.

Vytal's growth path

To be able to grow this model Vytal needed to invest in three core dimensions of their business — *their user base* (the number of end consumers and restaurant partners), their *online platform and data* (the functionality of the smart reusable system and the ability to track product and customer behavior data), and the *production of their offline product* (different kinds and volumes of food containers).

Vytal's initial platform technology offered only the ability to check-in and check-out food containers through QR-code scanning. But it was user-friendly and quick to use, which Vytral reckoned would help adoption. Cologne, Munich, and Berlin were the first three local markets of choice, selected based on offline partner density and potential for online data network effects. Although consumers were easily convinced of the advantages of Vytal's online-to-offline platform, it was initially

more difficult to onboard restaurants because these often lacked the digital infrastructure to connect to an online platform such as smart devices, QR code scanners, or POS systems.

That changed during the 2020 pandemic, which accelerated digitalization in the restaurant sector as well as demand for home restaurant food delivery. Vytal increased the distribution of its online platform to restaurants in its key cities, and consumers saw a rapidly increasing availability of Vytal's service at restaurants of their choice. At the same time, it struck a partnership deal with the largest food delivery chain in Germany, which further propelled adoption by consumers and provided additional leverage in convincing further partner restaurants to join forces with Vytal.

The rapid increase in users provided large amounts of data, and the ability to leverage this now became the prime focus for the Vytal management team. The acquisition of a team of digital engineers allowed Vytal to develop new functionality for their online platform, and the inception of an operations team allowed Vytal to engage seriously with big data analytics, allowing them to rethink their product strategy, which now includes new food container types and the recruitment of external container producers as suppliers.

Today, Vytal counts more than 3,500 partners all over Germany and has delivered more than 320,000 items of usable packaging for exchange between partners and consumers. That alone has prevented the use of more than 4.7 million disposable packaging containers. Impressed by the rapid uptake from supply partners and the high adoption rate of consumers, a popular fast-food chain is currently planning the Germany-wide roll-out of Vytal's online-to-offline platform after a successful pilot.

Key lessons

The Vytal experience offers five key lessons in scaling online-to-offline platforms:

1. *Start simple.* Two-sided platforms usually attract consumers before they attract suppliers. As Vytal found, a simple functionality makes it easier to sign up consumers, which in time increases the pressure on partners to join the platform.
2. *Ensure reliable quality of offline products from the get-go.* Since building an offline product capability is capital intensive, doing it right matters. An initial key requirement for Vytal was to guarantee bowl usability for up to 200 return cycles. Likewise, a decision was made to imprint bowls with microwave and dishwasher safe QR codes instead of digitally more powerful but less robust RFID chips. This helped establish proof of concept.
3. *Get big data fast.* By starting off in three high-density offline market environments (Cologne, Munich, and Berlin) Vytal quickly gained user data in volumes that were sufficient to analyze user behaviors and adapt their online and offline product components to better serve the needs of consumers and partners. This led to the addition of new container types and the redesign of the check-out function of the app to improve usability and ensure user satisfaction leading to consumer loyalty.
4. *Avoid being the middleman.* Platforms don't necessarily have to act as a supply chain intermediary. In Vytal's case, most handling processes are direct consumer-restaurant interactions, which means that the company requires less than eight full-time equivalent staff to manage its 3,500 partner food providers.
5. *Jump on your opportunities.* By proactively increasing its access to production capacities at the start of the pandemic Vytal was able to position itself to benefit from restaurants' transition to take-out food

delivery models. In 2020 it realized a week-on-week growth of 12% in the usage of its containers.

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The past two decades have seen the rise of third-party platform giants such as Alphabet, Microsoft, or Amazon, that act as outlets and delivery orchestrators for multiple categories of goods. But as companies like Vytal recognize the potential of digital to add value to their specific product categories, they will increasingly need to develop tailored platforms tailored to their supply chain needs. Vytal's approach suggests how they can be successful in doing that.

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