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Circular City Labs Textbook

A digital guide to building a sustainable circular economy through reusable plastics, innovation, and inclusive collaboration in South Africa.

Circular City Labs
Testing Reusable Packaging Systems in Cities

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by

giz
Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

CIRCULAR
SOUTH AFRICA
Accelerating the Transition

AFRICAN CIRCULAR
ECONOMY NETWORK

Introduction

This digital textbook contains consolidated training materials, based on the Accelerator programme training sessions that formed part of the *Circular City Labs: 'Testing Reusable Packaging Systems'* project.

The purpose of this textbook is to capture and consolidate lessons learned through the project's implementation to reach a wider audience along the circular economy value chain.

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Project Background

The *Circular City Labs: 'Testing Reusable Packaging Systems'* project was commissioned by the *German Federal Ministry for Economic Cooperation and Development (BMZ)* and funded through the *BMZ Initiative for Climate and Environmental Protection (IKU)*.

The project aimed to reduce greenhouse gas emissions through waste prevention, test reusable packaging systems, and strengthen women's participation in local circular economies.

Implemented by *GIZ* in partnership with *Plastics SA*, the project selected *Gcwalisa* as its pilot partner. In addition, three other businesses from the proposal pool were invited to join an accelerator programme designed to build their capacity in circular economy practices, reuse systems, and gender inclusion.

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Piloting Partner

Gcwalisa, a grocery outlet in Alexandra township, Johannesburg, operates on a weigh-and-pay model that enables customers to buy only what they need, helping to reduce the 'poverty tax' often faced by low-income households unable to buy in bulk.

During the pilot phase, *Gcwalisa* introduced reusable plastic packaging fitted with QR barcodes to track return cycles, replacing single-use packaging and promoting circular economy practices. The initiative also created jobs for 4 women through reuse ambassadors who engaged customers and raised awareness; two of the women were retained after the pilot.

With an average return rate of 35%, the project demonstrated strong community participation and delivered both environmental and socio-economic benefits, successfully meeting its intended objectives.

www.gcwalisa.com

GCWALI:SA

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Accelerator Programme

The **ACEN** study on scaling packaging reuse models in South Africa highlighted key challenges faced by reuse initiatives, including limited access to financing, difficulties in adapting supply chains for reuse, and the absence of clear health and safety standards.

Recommended interventions included collaborative learning, innovative funding mechanisms, stronger supply chain partnerships, and the development of operating standards for reuse models.

In response, the accelerator programme, implemented by **GIZ** and **Plastics SA**, was designed to address these barriers by providing targeted training and mentorship to selected businesses such as **Gcwalisa**, **Shix Mineral Ice**, **Reusify**, and **Smartfill**, strengthening their capacity to implement and scale circular packaging solutions across South Africa.

Read more about the **ACEN** study.

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Chapter 5
Building financial models to reuse

Introduction
Fabian Barthel

Dr. Fabian Barthel is the Co-Founder and Managing Director of Vytal, where he oversees Operations, Procurement, Physical Product, and After-Sales Service.

He holds a Master's degree in Business Administration from the University of Erlangen-Nuremberg and earned his PhD in Economic Geography from the London School of Economics and Political Science (LSE). As part of his doctoral studies, he also spent three months at Columbia University's School of International and Public Affairs (SIPA).

Before co-founding Vytal, Fabian spent eight years at the Boston Consulting Group (BCG), specializing in operational efficiency, organizational design, and social impact—primarily within the extractive industries. He has co-authored several peer-reviewed publications on reuse, featured in journals such as the Information Systems Journal and the Journal of Industrial Ecology.

Vytal

OBJECTIVES FOR TODAY

01 Quickly introduce Vytal

02 Discuss the ecosystem for reusable packaging

03 Discuss revenue models for reusables

04 Discuss main cost items for a reusable business
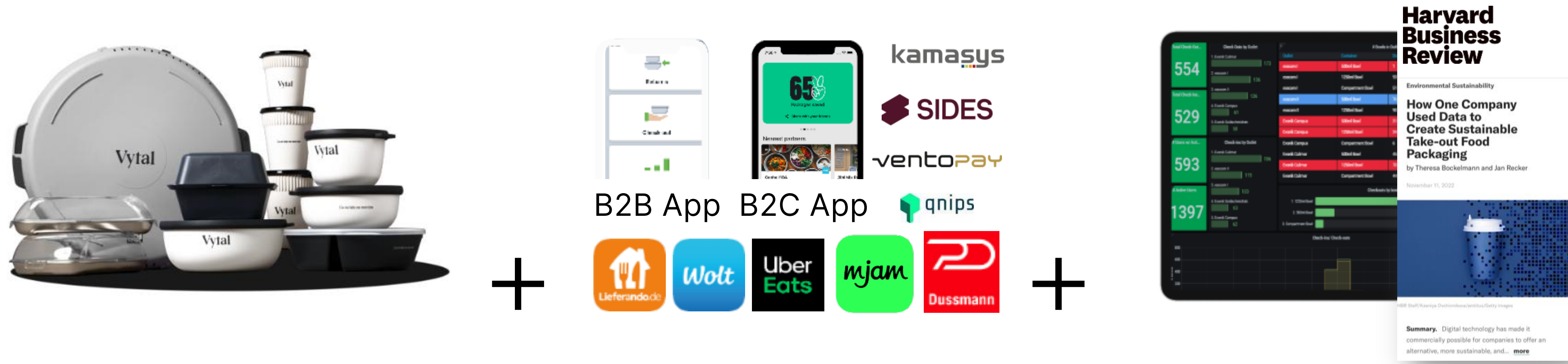
05 Answer your questions

Vy

AGENDA

VYTAL'S TECH PLATFORM USES SERIALIZED CONTAINERS TO UNLOCK ECONOMIC BENEFITS ALONG THE CIRCULAR VALUE CHAIN

B2B App   B2C App
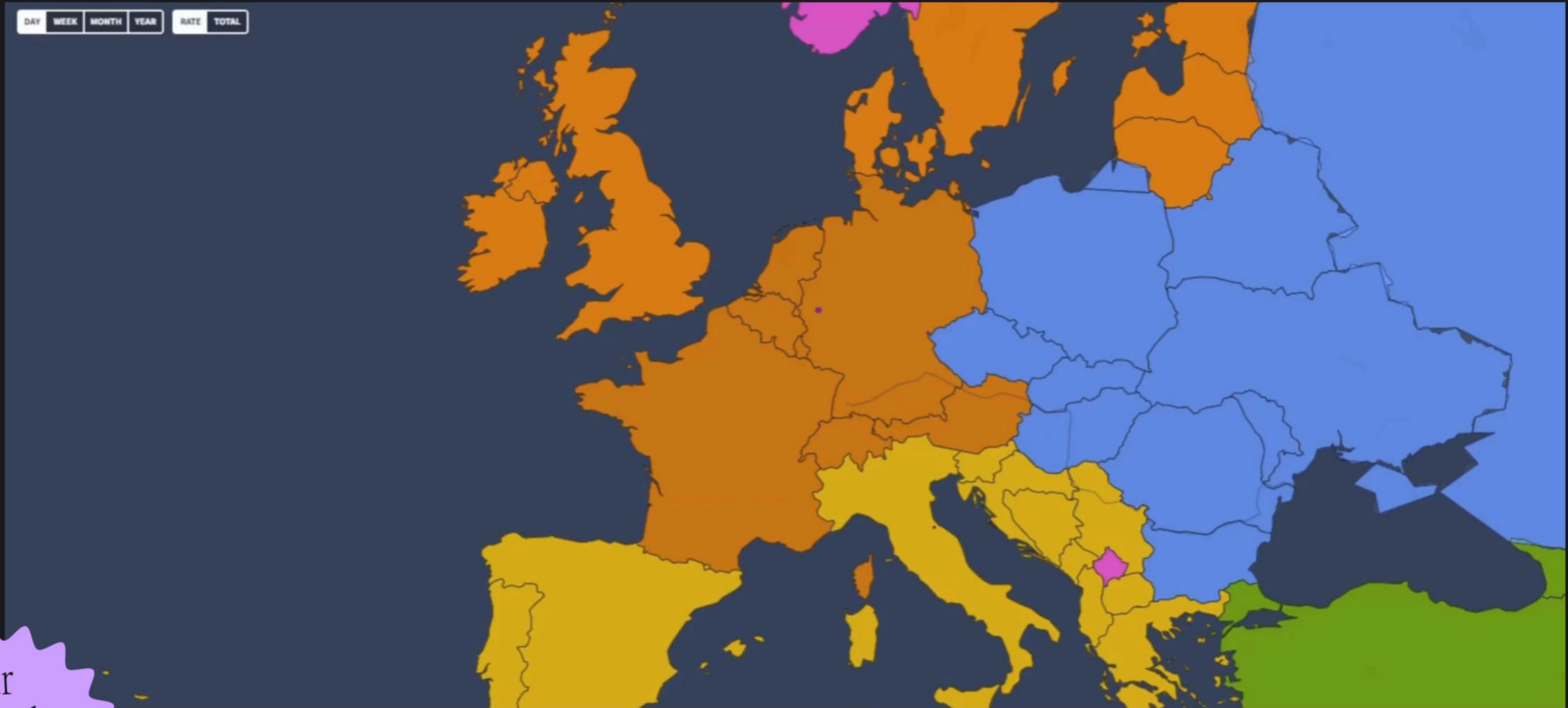

Individual traceability ensures a container return rate of 99% and an average return time <5 days

APIs, partnerships & apps integrate reuse seamlessly into business processes & food consumption habits

Vytal's **unique data and analytics capabilities** optimize cost, impact & consumer engagement

THIS IS HOW WE BOWL

Our network doing its magic!

OPEN SYSTEM FOR RESTAURANTS

- Platform business: Typically decentralized sanitization by partner
- 7,000 outlets in 23 countries
- 800k containers under management
- 12M uses of our reusable containers

CLOSED SYSTEM FOR EVENTS & VENUES
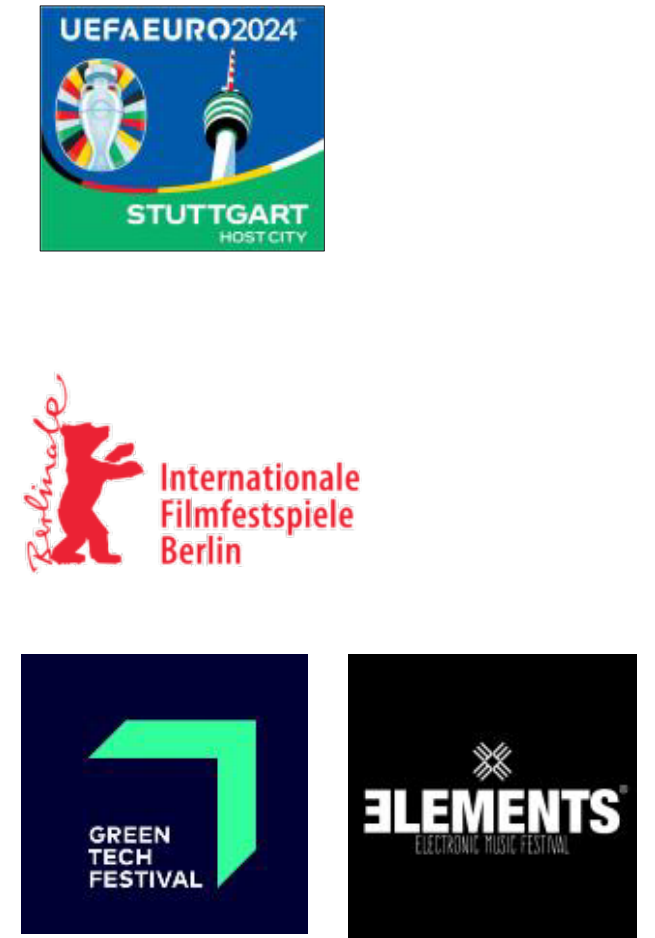
- Typically full-service: Container rental, logistics, on-site operational support, sanitization
- More than 150 events conducted in 2024
- 3.3M containers
- 7M uses of our reusable containers

THINK BIG.

Vytal is the largest digital system for reusable food & drink packaging globally.

■ Vytal own operations   ■ Franchise partners
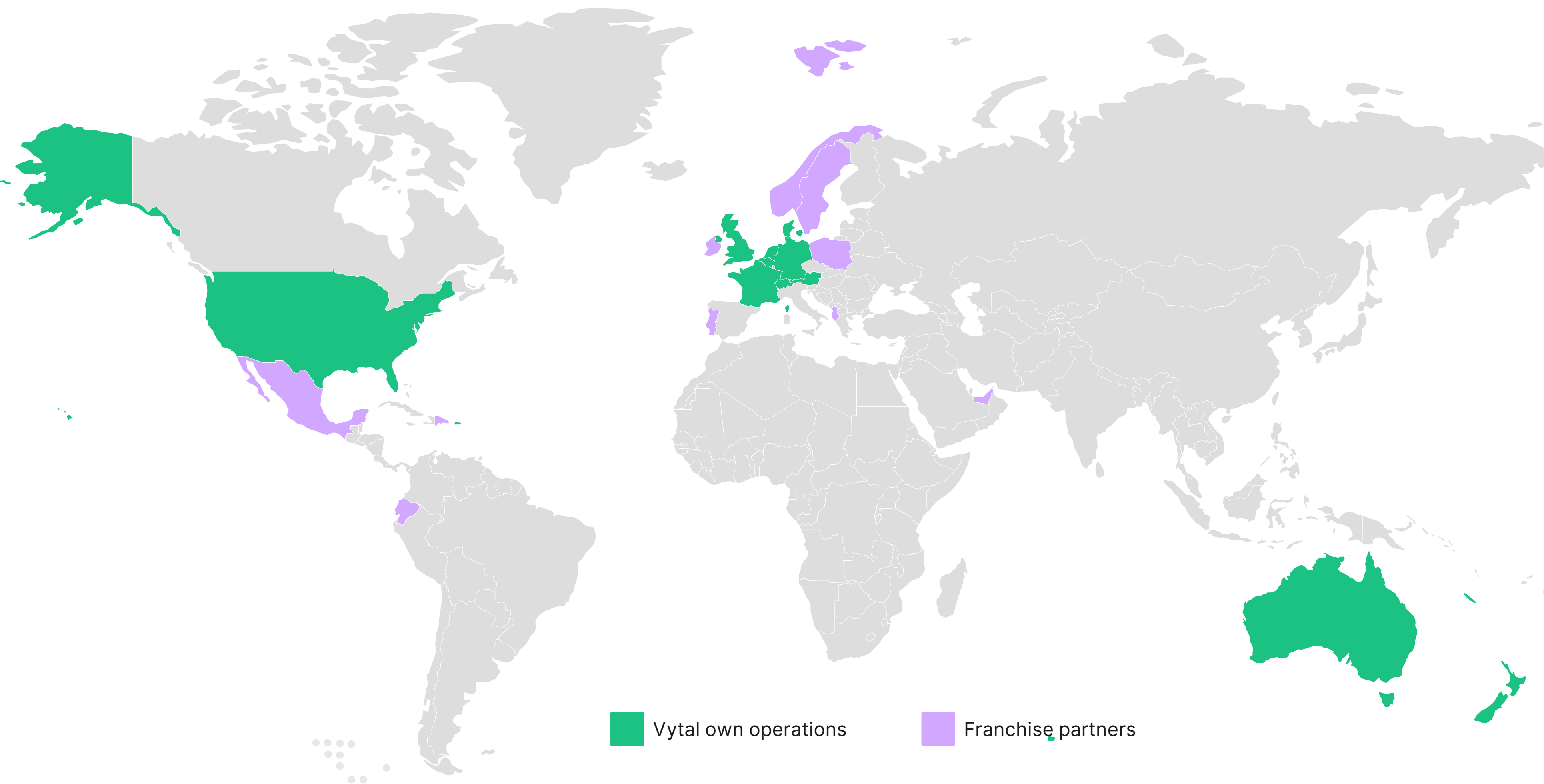
As of May '25

+7,000
gastronomy partners

23
countries

+720K
registered users

+4.1M
containers under management

+19M
avoided disposables

99.2%
return rate in digital system

TECH–PLATFORM GENERATES LIVE–DATA ON USAGE AND RETURNS

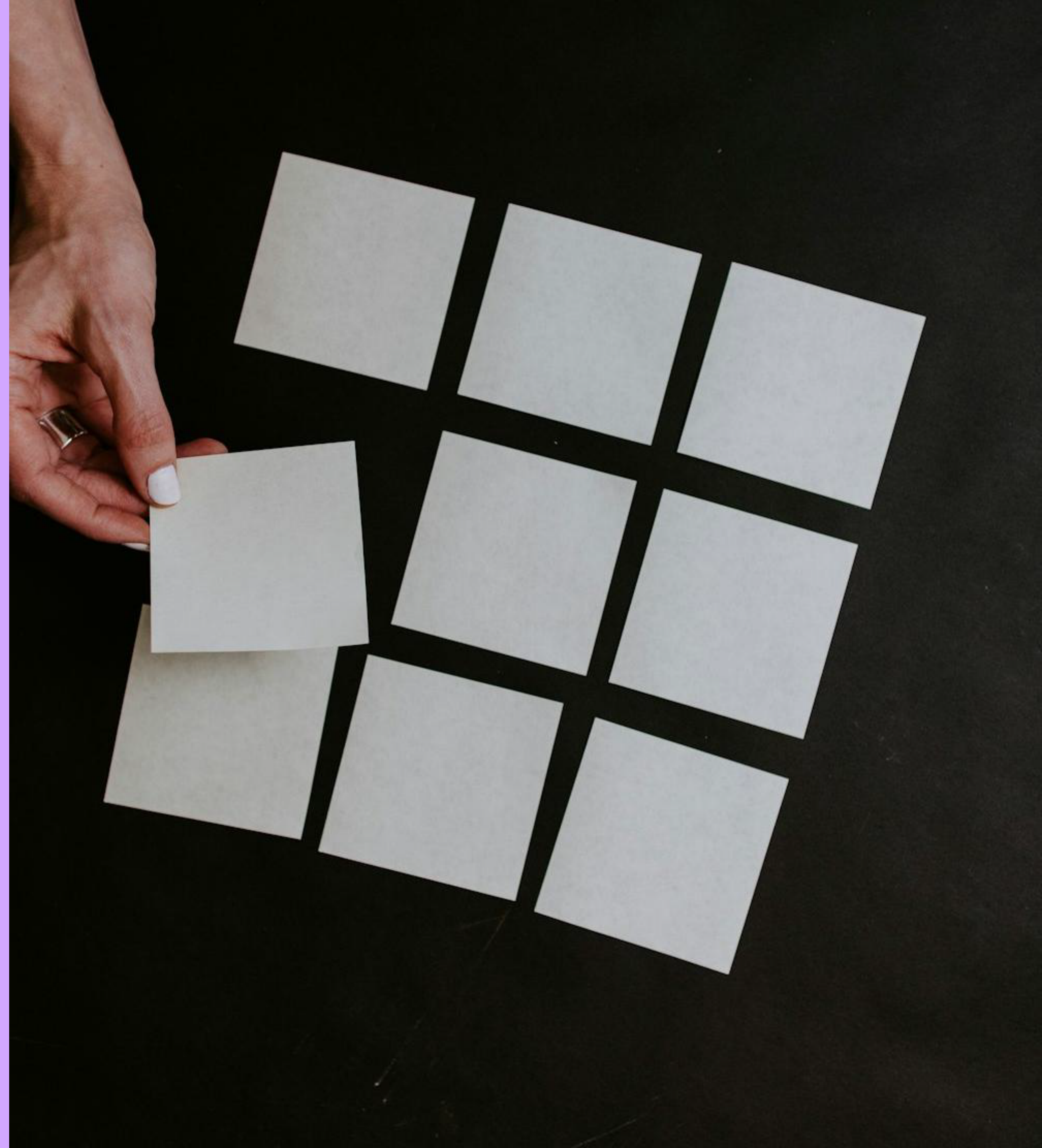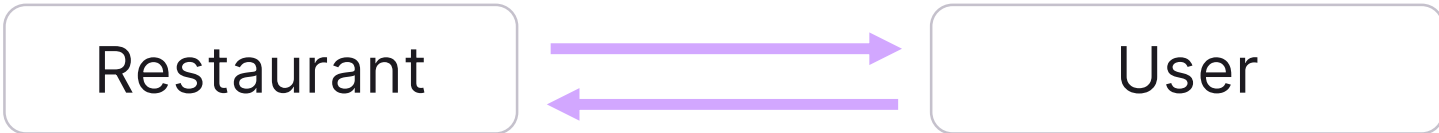Example: Evonik canteens in Germany

AGENDA

Vy

THE ECOSYSTEM FOR REUSABLE FOOD & DRINK CONTAINERS

THE REUSE ECOSYSTEM

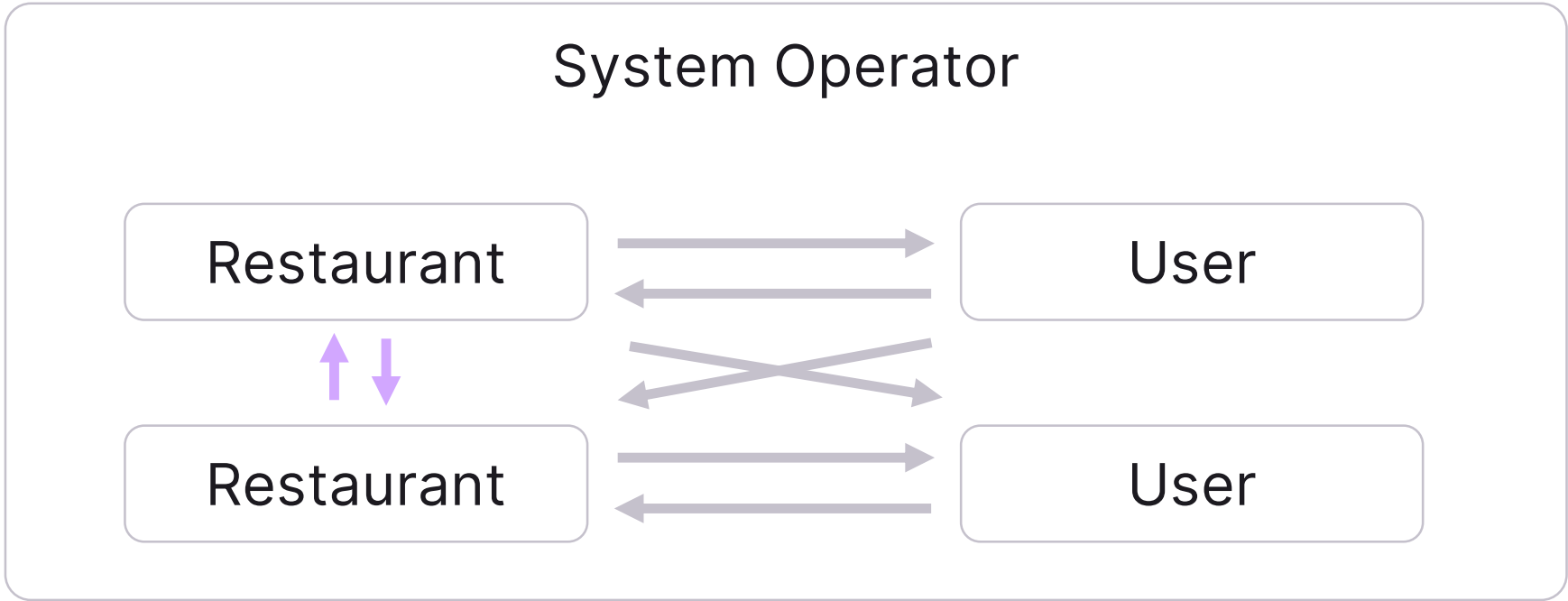Reusable packaging is basically an interaction between restaurants and users

| Restaurant | → ← | User |

THE REUSE ECOSYSTEM

More restaurants can join the reusable packaging scheme to form a system

| Restaurant | → ← | User |
| Restaurant | → ← | User |
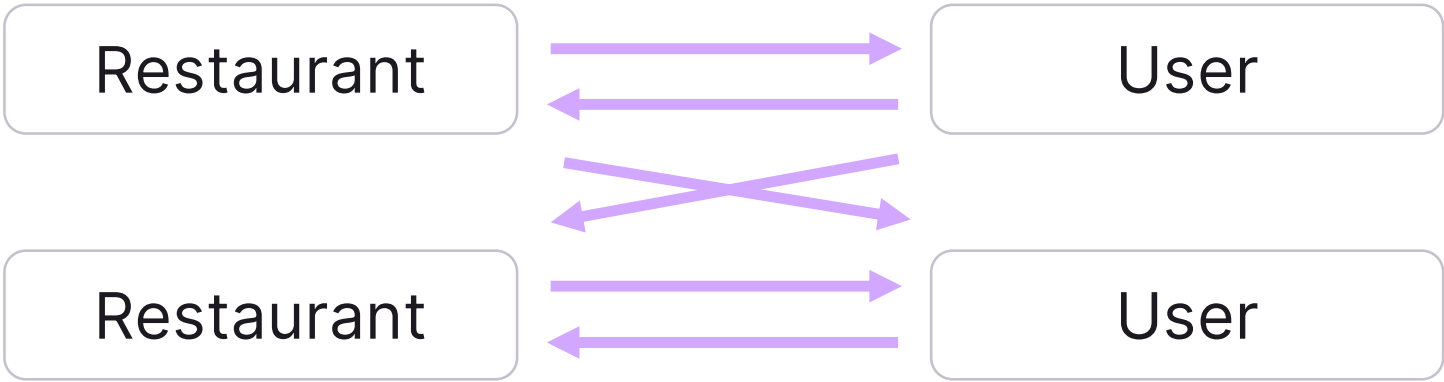
THE REUSE ECOSYSTEM

A system operator can manage the reusable packaging scheme

Reusable
packaging
system

THE REUSE ECOSYSTEM

There can be more than one reusable packaging system — but will split the network and reduce the convenience and scale effects
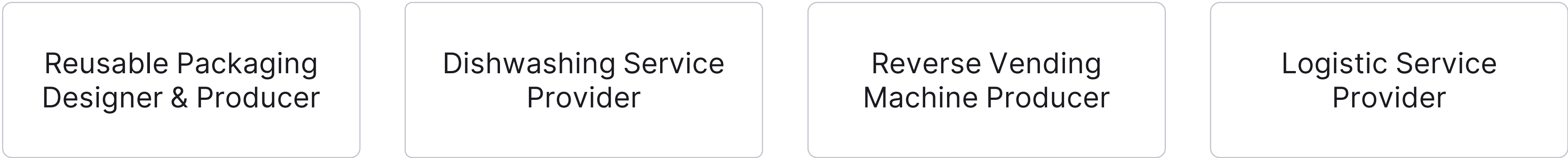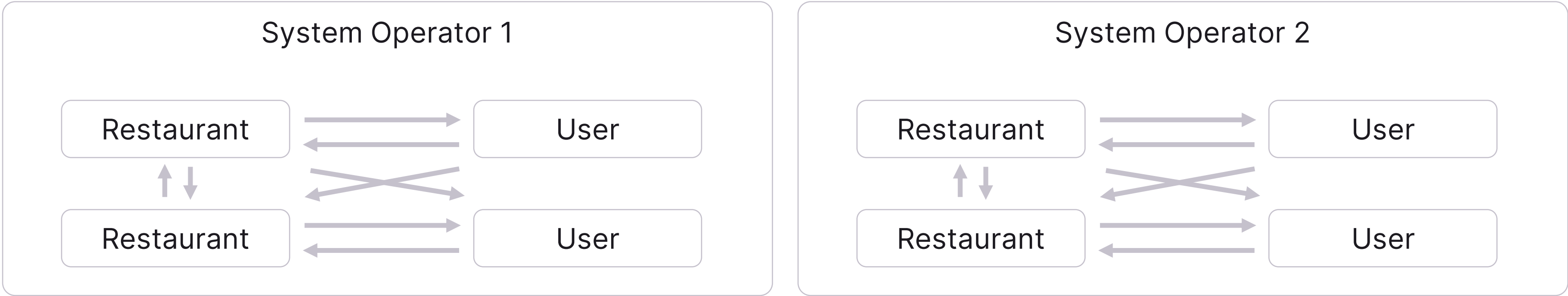
Reusable
packaging
system
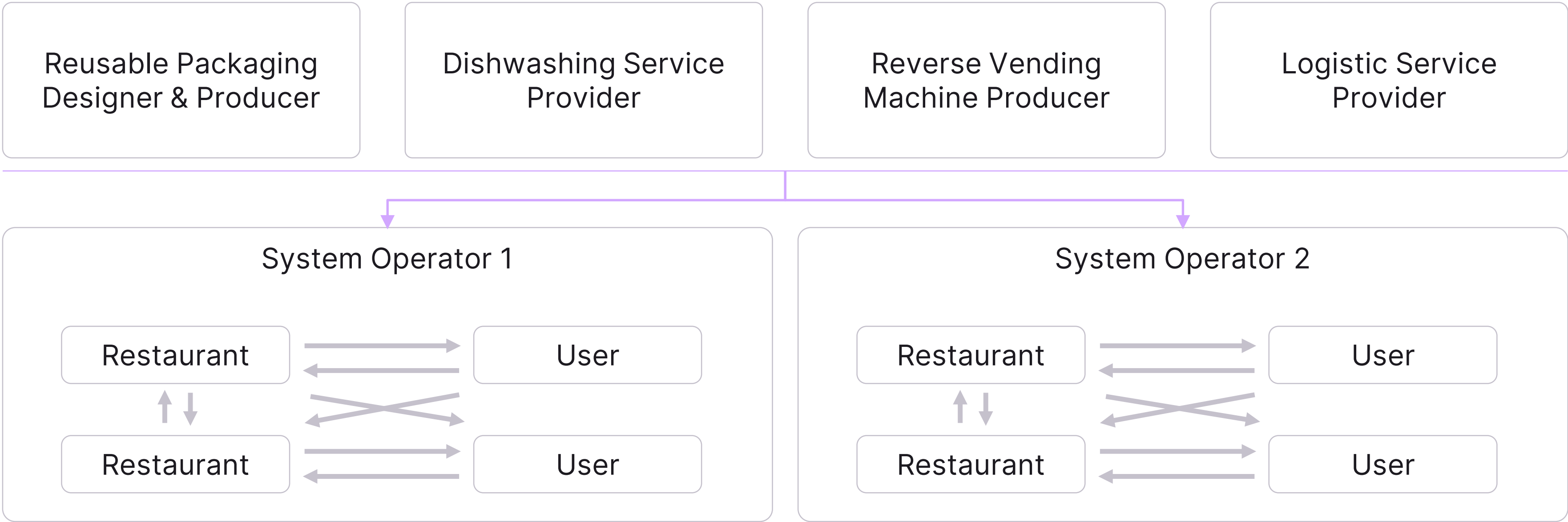
THE REUSE ECOSYSTEM

Third-party companies provide products and services

THE REUSE ECOSYSTEM

System operators require reusable packaging producers and potentially other services

**Product & service suppliers**

| Reusable Packaging Designer & Producer | Dishwashing Service Provider | Reverse Vending Machine Producer | Logistic Service Provider |

Reusable packaging system

System Operator 1

| Restaurant | → ← | User |
| Restaurant | → ← | User |

System Operator 2

| Restaurant | → ← | User |
| Restaurant | → ← | User |

THE REUSE ECOSYSTEM

Facilitators support the transition to a circular economy for to-go food and drink packaging
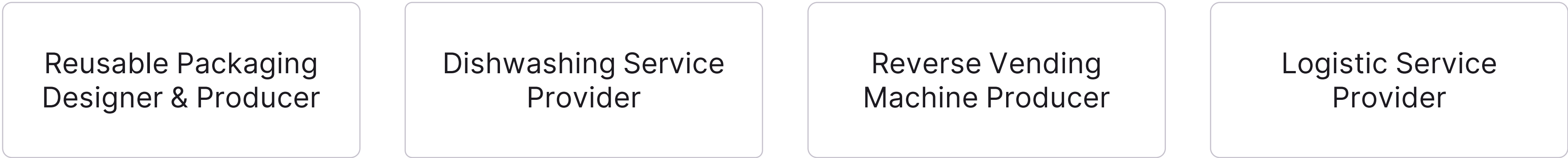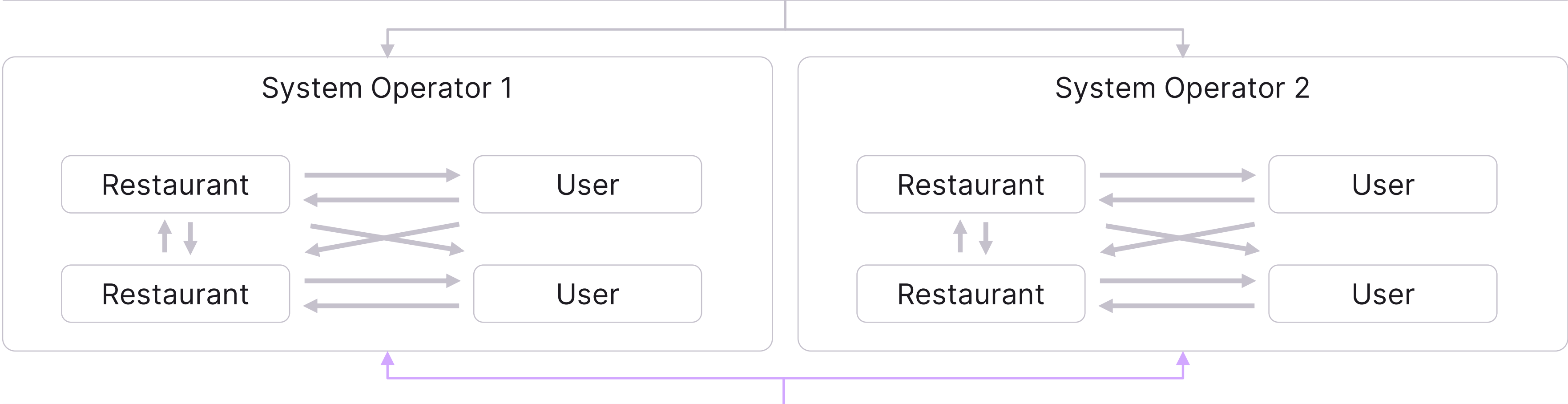
A BROAD VISION FOR REUSABLE PACKAGING

Canteens
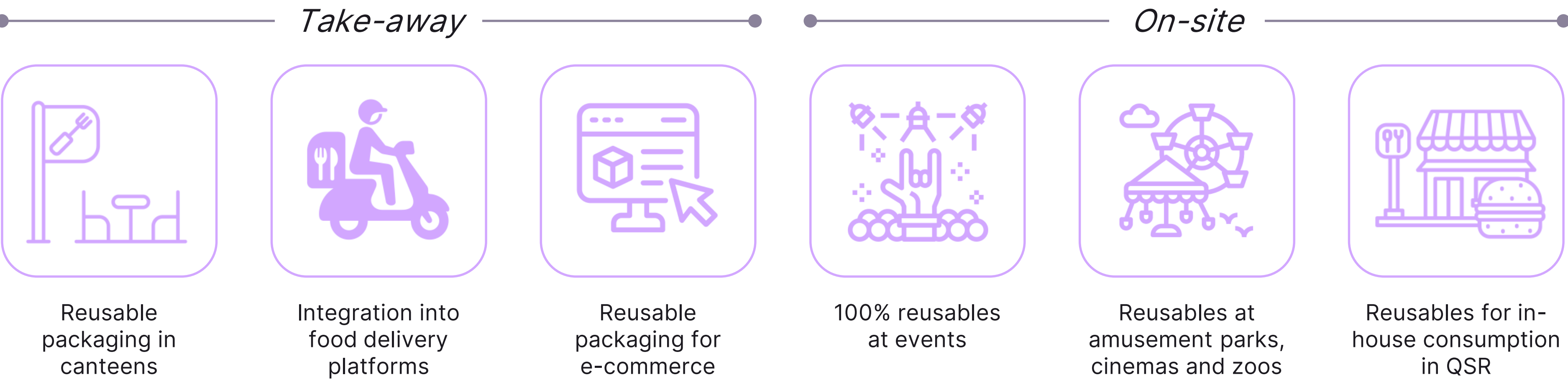
**Restaurants**

QSR industry

Events

E-commerce

BUILDING A REUSE ECOSYSTEM: PACKAGING USE

Reusable packaging can be used in (staff) restaurants, for in-house consumption and for e-commerce

Take-away

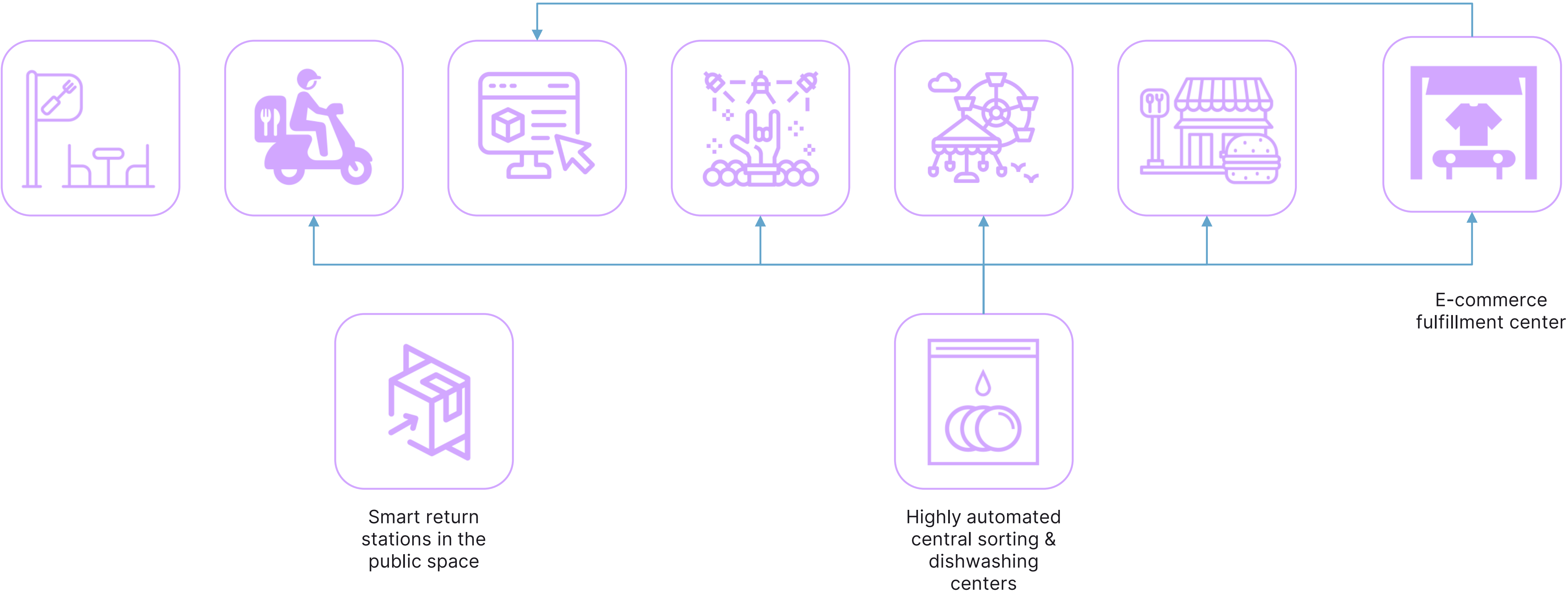
Reusable packaging in canteens

Integration into food delivery platforms

Reusable packaging for e-commerce

On-site

100% reusables at events

Reusables at amusement parks, cinemas and zoos

Reusables for in-house consumption in QSR

BUILDING A REUSE ECOSYSTEM: RETURN & CLEANING

Return via a public return stations for take-away food & drinks and e-commerce

Smart return
stations in the
public space

Highly automated
central sorting &
dishwashing
centers
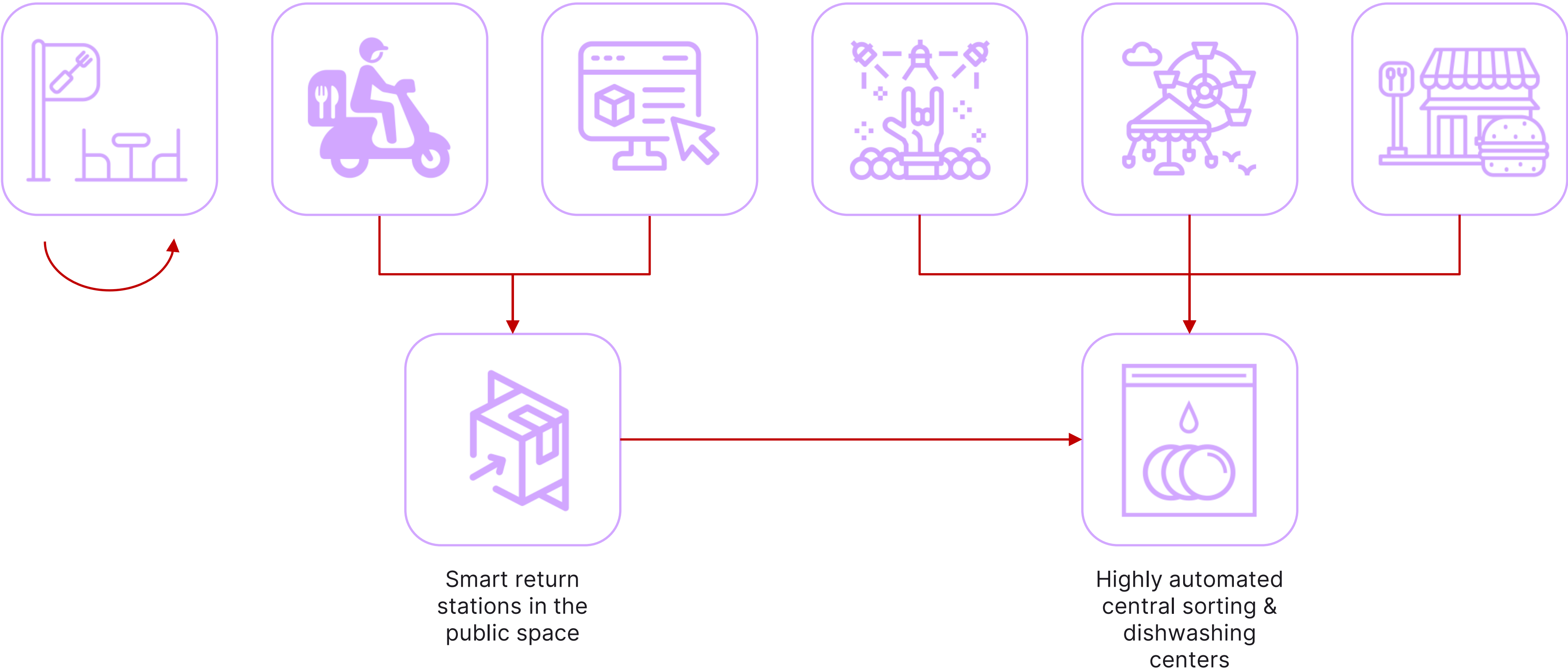
→ *Used packaging*

BUILDING A REUSE ECOSYSTEM: REDISTRIBUTION

Digital systems allow to redistribute the packaging according to demand

Smart return
stations in the
public space

Highly automated
central sorting &
dishwashing
centers

E-commerce
fulfillment center

→ Clean packaging

AGENDA

01   Intro

02   Ecosystem

03   Revenues

04   Cost

Vy

BUILDING A "FOR PROFIT — FOR IMPACT" COMPANY

To be sustainable, a company has to be profitable, i.e. revenues have to be larger than cost

WHOSE PROBLEM ARE YOU SOLVING?

WHO SHOULD PAY FOR YOUR SOLUTION?

User

- Receives sustainable and high-quality packaging

Restaurant

- Saves cost for single-use alternative
- Saves garbage fees
- Acts more sustainably
- Is compliant with regulation

We monetize both the user and the restaurant

Vy

USER MONETIZATION: HOW (NOT) TO INCENTIVE RETURN?

Non-returned containers can be a significant share of the revenues

Analog deposit

- If deposit is high: low acceptance (and high return rates and high margins)
- If deposit is low: higher acceptance (and lower return rates and low margins)
- No incentive for quick return
- Revenues from deposit has to be kept separately, because customers can bring back containers even after years and get deposit refunded

Digital penalty model

- Allows to set high penalties without reducing the acceptance
- You can set a return deadline and "sell the containers" at the end – no need to keep revenues
- Additional revenues from possibility to extend the return deadline

There is a conflict between sustainability and profitability

PARTNER MONETIZATION: FLAT-FEE OR PAY-PER-USE?

Non-returned containers can be a significant share of the revenues

Flat fee

- Monthly subscription fee, independent of the number of uses of the containers
- Safe revenues, not taking over the acceptance risk - But: no upside potential at high usage
- Does not require a digital model
- At low usage, cost per use are very high for restaurants – and get very low at high usage

Pay-per-use

- Charge per use of a reusable container
- High revenues at high usage – but taking over full acceptance risk: no revenues if containers are not used
- Requires a digital model to track usage
- Constant, easy to calculate cost per use for restaurants (like with single-use)

We employ a hybrid model: Pay-per-use with minimum-offtake agreement

ADDITIONAL REVENUE STREAMS TO BUILD A VIABLE BUSINESS

Products

- (Smart) Return boxes
- Dispenser
- Mini-return scanners
- Mobile phones
- Usage data
- Serviced return stations to offices
- ...

Services

- Logistic
- Sanitization
- Training of staff
- ...

AGENDA

01   Intro

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THE CORE ASSET: REUSABLE CONTAINERS

- Purchasing reusable containers is more expensive than single-use alternatives – but reusables are significantly cheaper per use than single-use

- Reusables depreciate over use, e.g. through stains, scratches, burning marks from using them in the microwave

- Cash-flow is a challenge as return comes over the lifetime

ONE REUSABLE BOWL CAN REPLACE 200 SINGLE-USE CONTAINERS

1

200
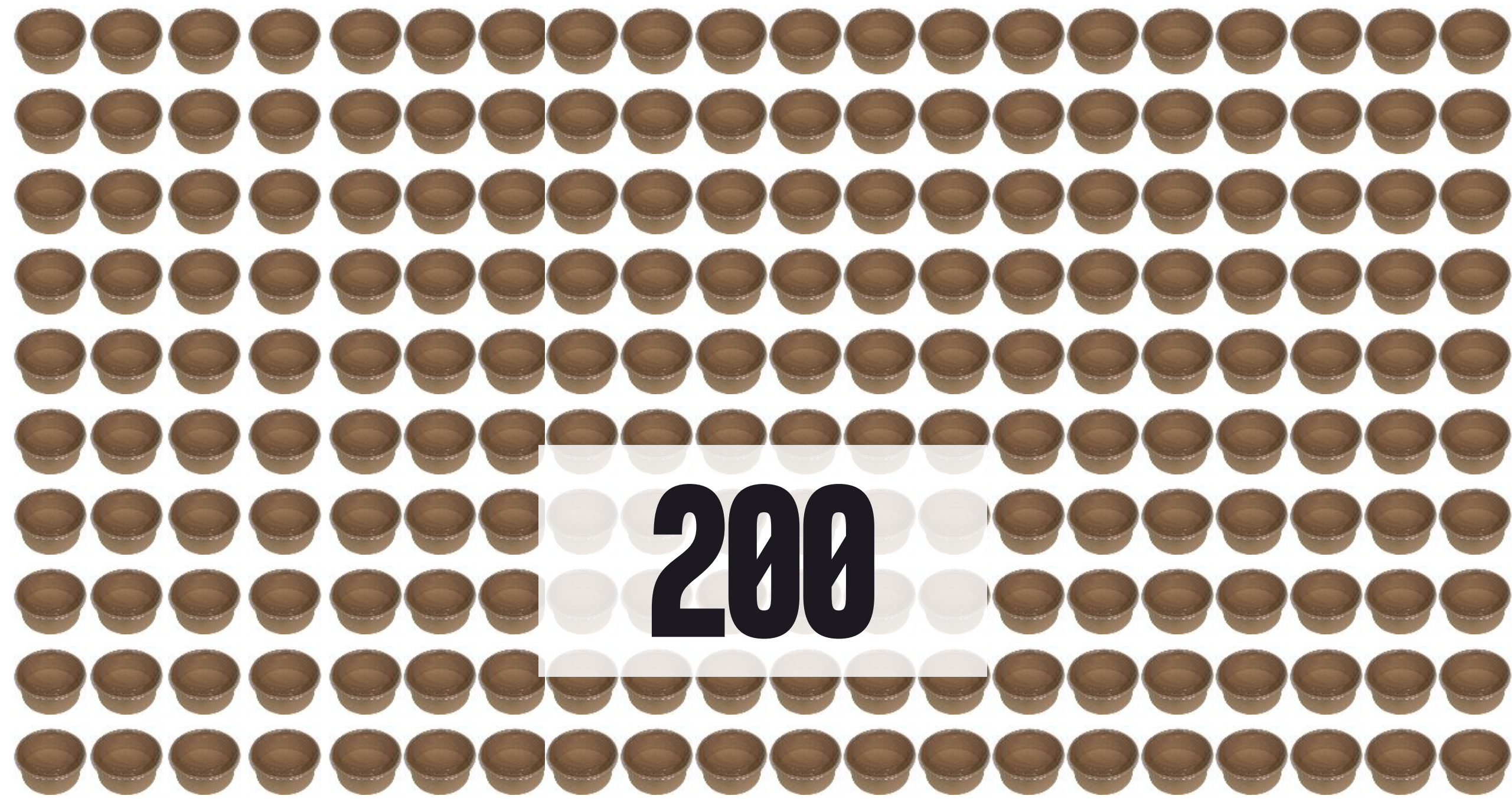
	Reusable	Single-use
Purchasing cost	4.50 €	96.00 €
Cost per use	0.03 €	0.48 €

ONE REUSABLE CUP CAN EVEN REPLACE 500 SINGLE–USE CUPS

1
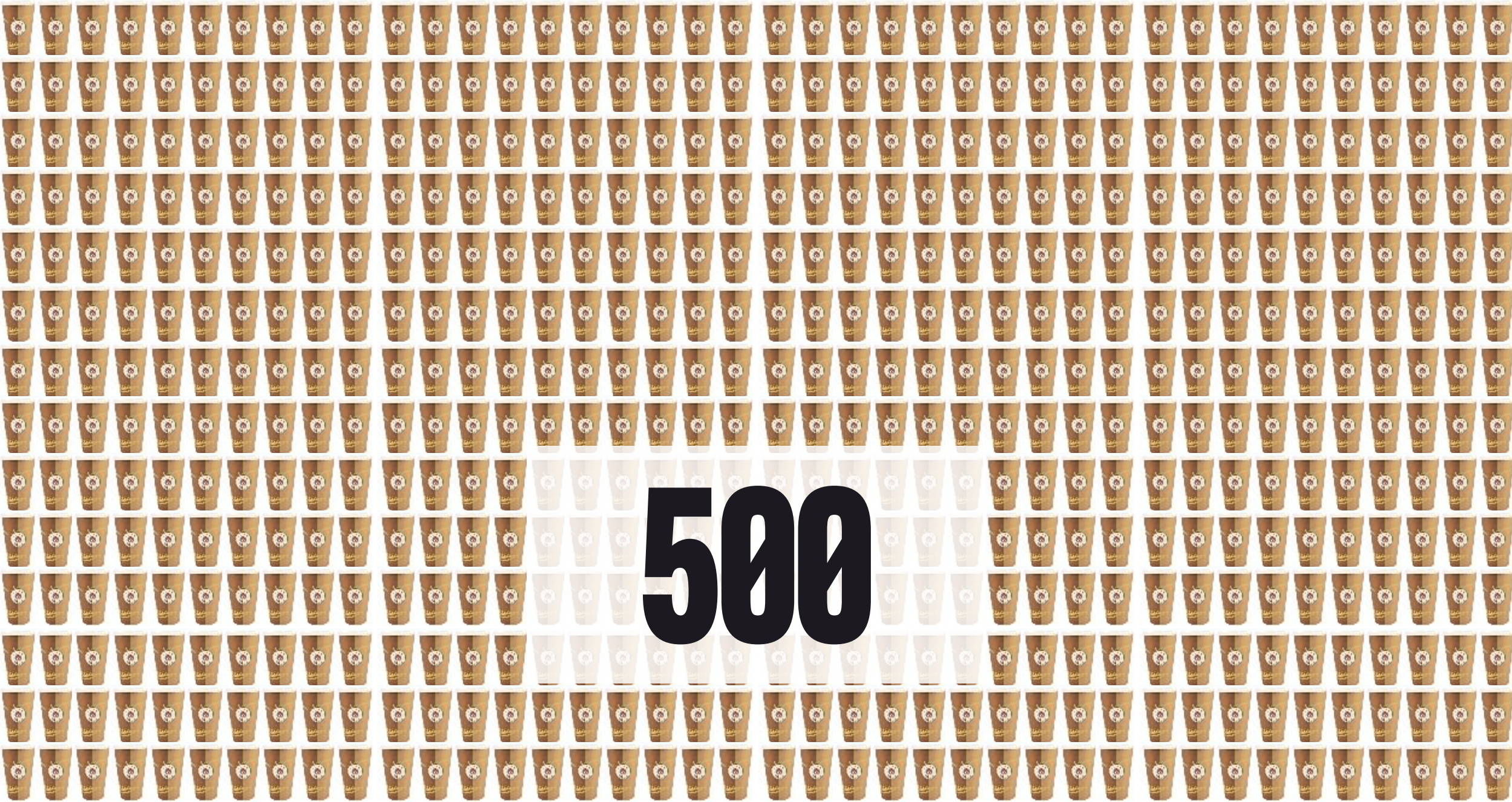
500

Purchasing cost	1.50 €	70.00 €
Cost per use	0.003 €	0.14 €

HOWEVER, THERE ARE MORE COST TO REUSABLES

- Returning packaging (either pick-up service or cost borne by customer)
- Costs for return infrastructure (if any)
- Cost for handling deposit or scanning containers (in a digital model)
- Washing (no matter whether done by system operator or restaurant)
- Rebalancing of container stocks between partners
- ...

Competing against single-use on a pure cost basis is a real challenge!
Especially since single-use costs only reflect the "private" costs and not the social costs

REUSABLE PACKAGING IS A LOW–VALUE BUSINESS

Low value

- Revenues per use between 0.10 and 0.30€ (excluding washing)

Fixed cost

- Staff cost
- Tech development and maintenance
- Rent
- Insurances
- ...

Reusable packaging is a volume-driven business!

WE APPLY A CONTRIBUTION MARGIN LOGIC TO ASSESS PROFITABILITY

Revenues (user + partner)

- Container cost (loss, depreciation)
- Washing cost
- Equipment cost (return stations, mobile phones etc)

CM 1

- Key Account Management
- Customer Support
- Logistic costs

CM 2

- Central operations cost (warehouse)

CM 3

- Business development cost

CM 4

- Product & Tech
- Marketing
- HR, Finance

CM 5

COLLABORATION CAN INCREASE USAGE AND REDUCE COST
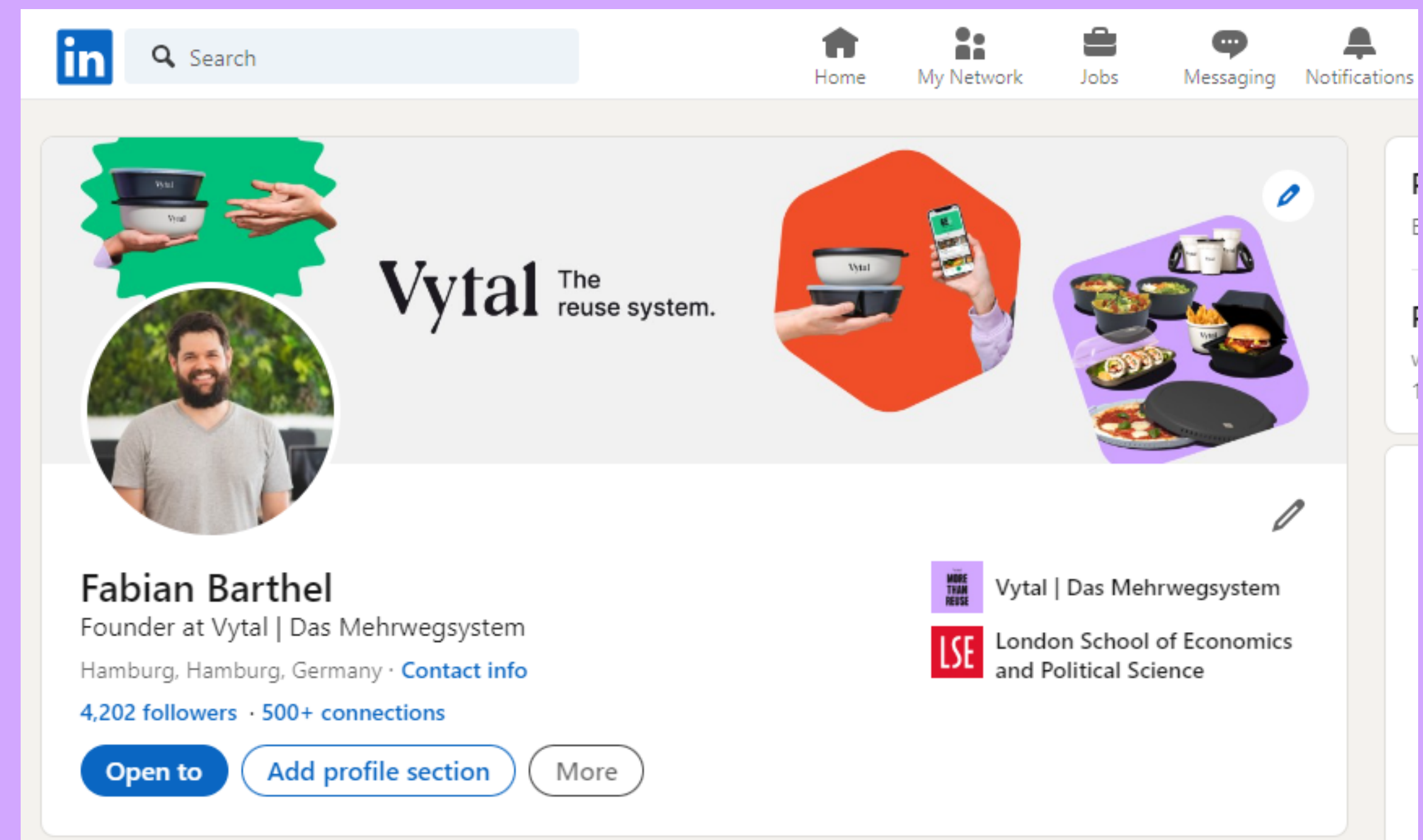
• Reduce cost and increase convenience for users by establishing a shared return infrastructure

• Reduce cost by using the same tech platform (if applicable)

• Reduce cost by bundling volumes in logistics and washing

THANK YOU

BE IN TOUCH!

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www.plasticsinfo.co.za