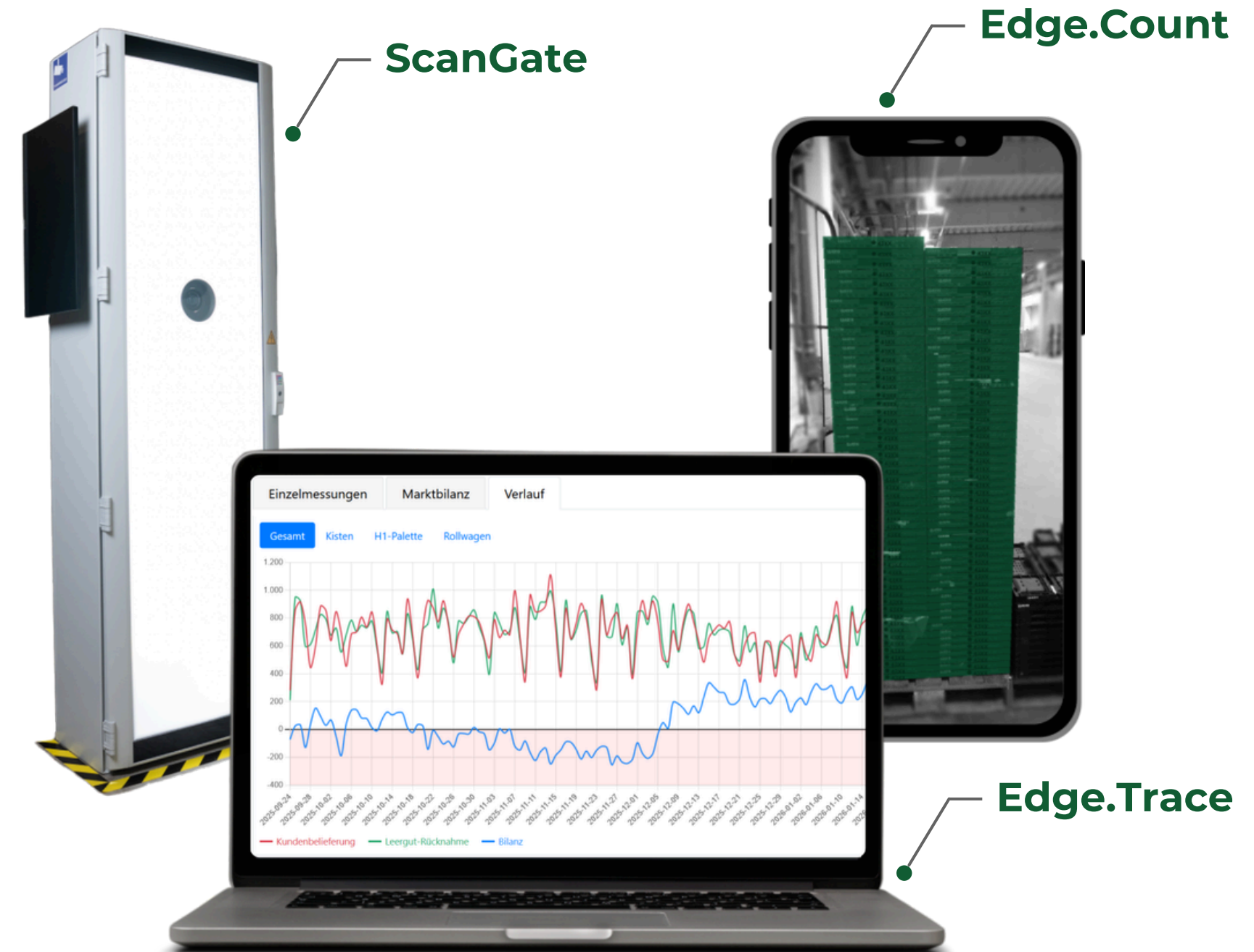


PALLET SYMPOSIUM 2026 · HAMBURG

Load carriers don't disappear. They become invisible.

How camera-based AI makes load carrier losses visible in warehouse operations.



The most frustrating process at the loading dock?

Capturing load carrier data.

HEUTE - KOMPLEX UND FEHLERANFÄLLIG

1

CAPTURE QUANTITIES

Count mixed loads under time pressure



2

IDENTIFY LOAD CARRIERS

Distinguish between crates, pallets and roll cages



3

ASSIGN DEPOSIT VALUES

Know the different deposit values



4

RECORD & DOCUMENT

Enter quantities, assign the transaction and confirm



The process relies on the driver's knowledge.

What can go wrong?

Every manual step is a potential source of error.

- ! Incorrect count**
- ! Wrong customer**
- ! Data entry & transfer errors**
- ! No objective proof**

Today: Time pressure - Training effort - Rework - Disputes

When a simple transaction turns into an investigation.

Load carrier management in the back office.

DIGITAL GEBUCHT - ABER WAS IST WIRKLICH PASSIERT?



Digitizing incorrect data doesn't make it correct.

Where does the effort come from?

Every incorrect data record creates additional work.

- ! Different data versions
- ! Incorrect transactions
- ! Manual follow-ups
- ! Correction & claims handling

Result: Time spent - Rework - Disputes - Unclear inventory

The root cause.

The gap lies between the physical process and the digital record.

PHYSICAL REALITY



What actually happened?

**DATA
GAP**

DIGITAL SYSTEM



WMS



ERP



TMS

What was recorded?



The gap emerges between what happens in the real process and what gets recorded digitally.

What if the process generated the data itself?



See



Understand

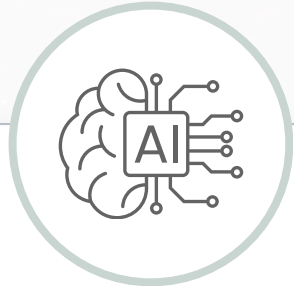


Prove

Don't reconstruct what happened.
Capture it as it happens.

Why Logistics AI?

Because real-world processes are more than isolated scan events.



Understand processes

- Context, not just identification
- Inbound, outbound or exception?
- Mixed loads
- Condition checks



Less label dependence

- Even when labels are missing, obstructed or damaged
- The process remains traceable



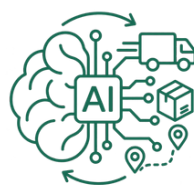
Existing camera technology

- Camera technology is already built into smartphones
- Lower barriers to entry
- Mobile and flexible to deploy



Less infrastructure

- RFID requires consistent tagging across the pool
- Lower infrastructure costs in pooling
- Can be used across manufacturers and pooling systems



Logistics AI connects **physical reality** with **digital processes**.

How does Vision AI work?

Turning camera images into reliable process data.

WHAT WE DETECT & CAPTURE

Containers & Crates



- EPS (Euro Pool System)
- IFCO
- E1 / E2
- Fish crates
- Bread & bakery crates

Pallets & Load Carriers



- EPAL
- CHEP
- LPR
- H1 pallets
- Pallet cages
- Roll cages

Features & Identification



[A B 1 2 3 4 5]

- Color recognition
- Type classification
- Contour / Shape / Size
- Deep OCR / Labels

Process Signals



Quantities & Unit Counts



Direction & Movement



Special Cases & Assignment



WHAT WE NEED



Camera Images

High-resolution images in motion or at rest



Trained Logistics AI

AI specialized in your load carriers and logistics processes



Process Knowledge

Rules, thresholds and mappings based on logistics practice



OUTLOOK: PALLET QUALITY

Future enhancement

In the future, Vision AI could also assess pallet quality directly within the process.



Missing
Blocks



Damaged
Boards



Cracks &
Breaks

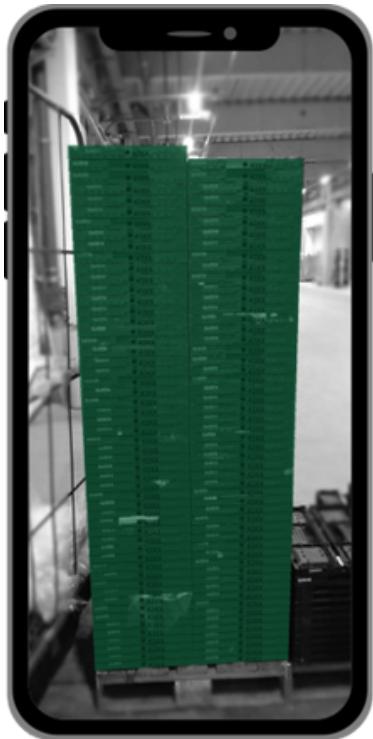


Additional
Quality
Indicators

The Logistics Trilogy

The right solution for every point of capture.

PixieEdge



Edge.Count

Mobile

Take a photo – AI does the counting

For flexible capture points



ScanGate

Stationary

Capture while moving

Ideal for high-volume processes



Edge.Trace

Central

Evidence, monitoring & reporting

Transparency across the entire cycle

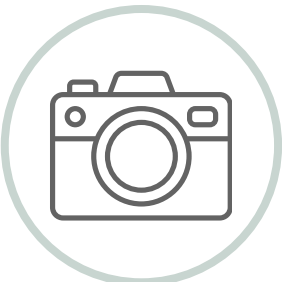
Edge.Count

Turn a photo into a reliable transaction.



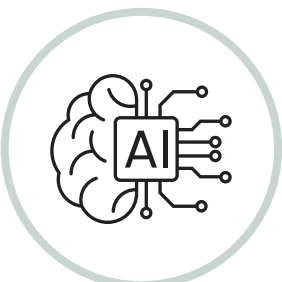
AUTOMATIC CUSTOMER ASSIGNMENT

Reduces incorrect allocations



TAKE A PHOTO

Automatic counting and classification



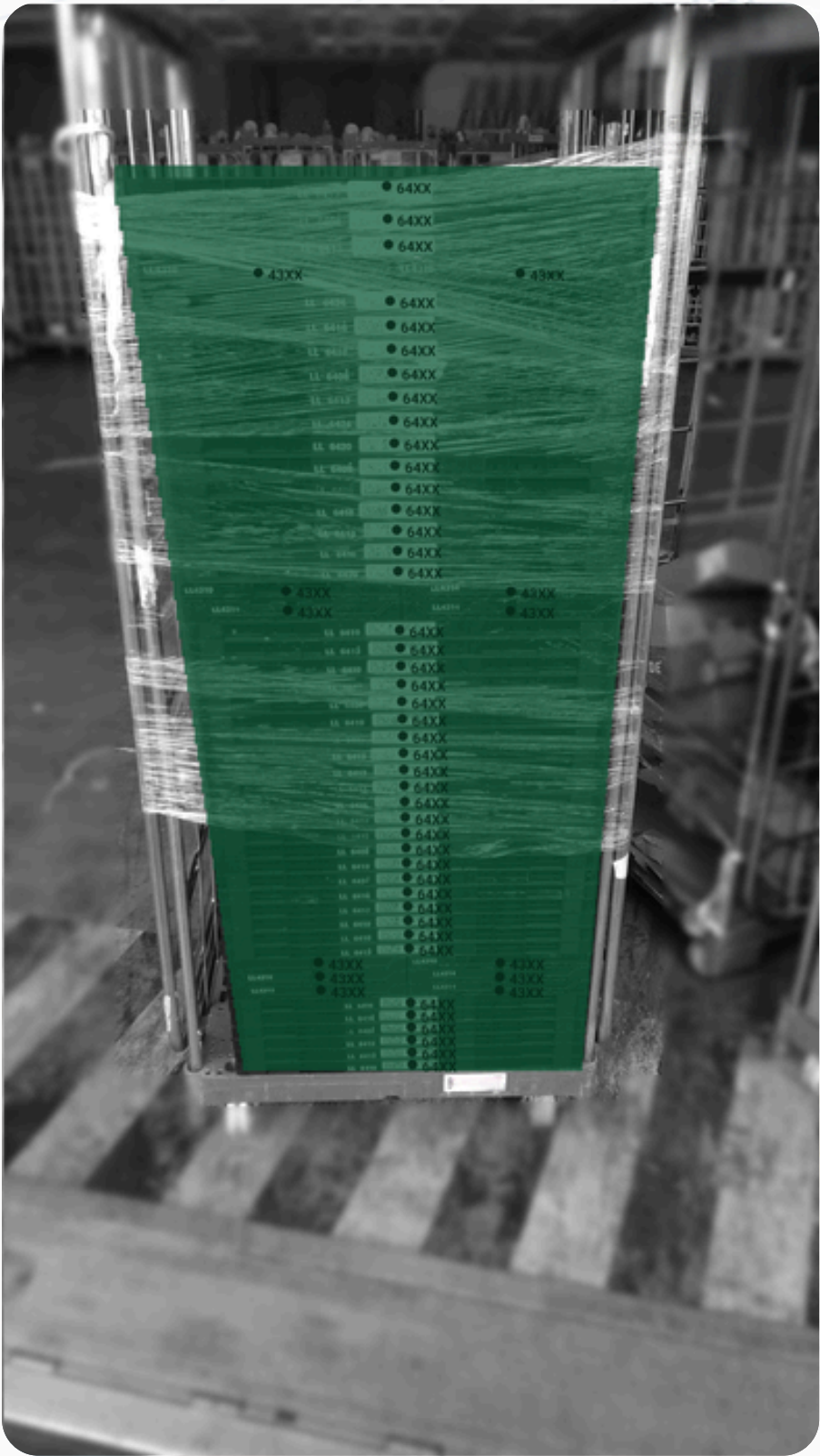
AI DETECTS QUANTITY & TYPE

Crates, pallets and roll cages are automatically identified and counted.



REVIEW & CONFIRM

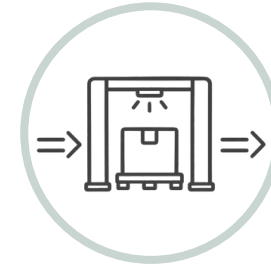
The overlay shows the operator exactly what was detected.



ScanGate

Drive through. Detect. Document.

PixeEdge



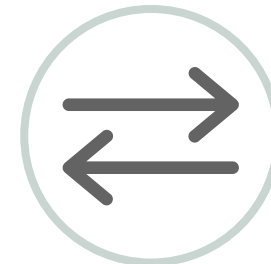
DRIVE THROUGH

No manual item-by-item scanning. No need to stop the process.



AUTOMATIC DETECTION

1D and 2D codes, quantities and load carriers.



DIRECTION & CONTEXT

Detects inbound and outbound movements, returns and exceptions.



SHIPPING LABEL DETECTION

Relevant shipping labels are automatically identified and the required data is extracted.

No stopping. No scanning. Just drive through.

Edge.Trace

Connects data capture, existing systems and exchange partners.

PixeEdge

Data Sources:

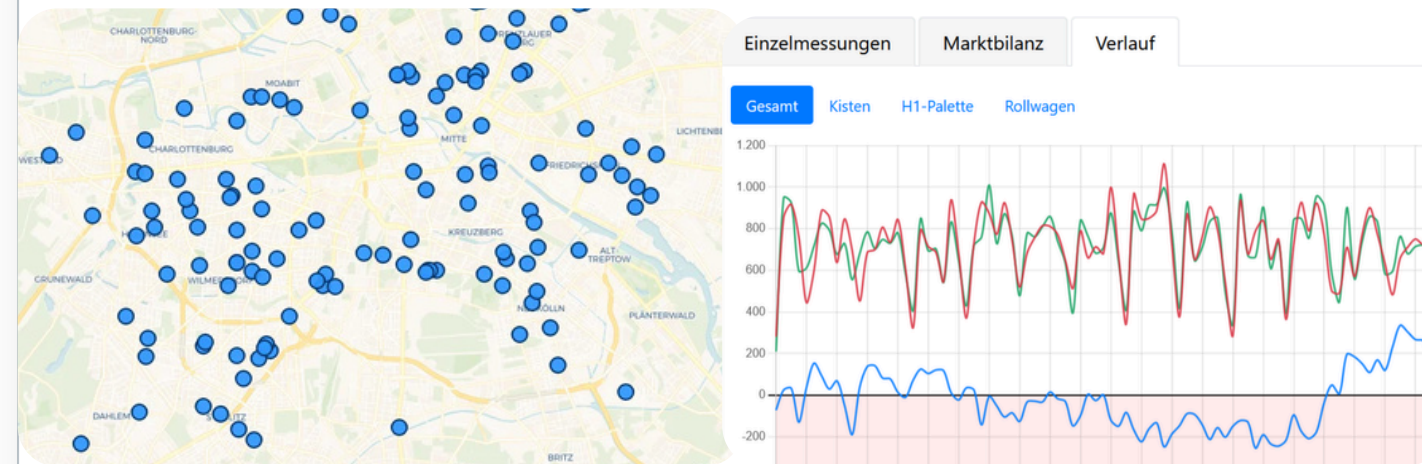
Edge.Count

ScanGate

ERP / WMS / TMS

Edge.Trace

- ✓ Bring capture data together
- ✓ Centralize transactions
- ✓ Provide evidence



Folgeprozesse:



Backoffice



Customers & suppliers



Exchange partners



LESS COORDINATION EFFORT

Everyone works with the same evidence.



FULL TRANSPARENCY

Keep inventory, movements and history in one central view.



FASTER RESOLUTION

Fewer follow-ups when discrepancies or claims occur.

CASE STUDY

Automated Loading Verification

At the ScanGate, exactly one relevant shipping label per load carrier is automatically identified and documented.



**1 Label per
Load Carrier**



**AI Selects Relevant
Shipping Labels**



**Automated Loading
Verification in Real Time**



Not every label is relevant — the system automatically identifies the correct shipping labels during loading.



Detected Shipping Labels



The load carrier cycle should document itself.

See. Understand. Prove.

Thank you.

Markus Weber • PixelEdge GmbH

