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Global EPC Repository for Verification

Item-level RFID tagging has scaled faster than the industry's ability to answer one basic question: outside the four walls that scanned it, who does this tag actually belong to? This paper sets out why that gap is now costing retailers and brands real operating money, why the standards needed to close it are only now in place, and how a neutral, cross-organization repository resolves it — for retailers, tag manufacturers, and everyone between them.

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The Problem

Every stocktake or cycle count now turns up EPCs that don't match the expected list. Resolving one today means a manual floor search — physically locating the item to work out whether it's genuinely misplaced stock, a unit that belongs to a neighboring store, or something that was never properly encoded at all.

- Replenishment runs on inventory counts that stay wrong until every variance is resolved by hand
- Store staff time goes into floor searches for units that, in many cases, were never theirs to find
- Unresolved variances quietly erode confidence in RFID accuracy itself — a cost the whole industry bears, not just the retailer holding the reader
- No single organization — retailer, brand, or tag issuer — can tell these cases apart on its own

Why Now

The infrastructure to answer this question at scale did not fully exist until recently.

- GS1 published Tag Data Standard 2.3 in January 2026, giving RFID tags a resolvable web address by default — the addressing layer the industry needed is now standardized.
- GS1's EPCIS and Core Business Vocabulary standards already define how organizations describe and exchange event data about a tagged item — the vocabulary layer already exists.
- What hasn't existed is a cross-organization layer that resolves ownership using that vocabulary — every implementation to date has stayed inside one organization's own systems.
- That gap is open right now because most tag issuers and integrators haven't yet built anything on top of the new addressing standard.

How Verification Works



Contributors feed anonymized issuance and event records into an independently governed core. After a stocktake, a requesting party submits every EPC it can't account for and gets back where each one actually belongs — never another contributor's raw data.

- 01 A contributor — a tag issuer, integrator, retailer, or brand — donates anonymized issuance and scan-event records to the Repository.
- 02 After a stocktake or cycle count, a requesting party submits every EPC that didn't match its expected stock list — as a batch, not one at a time.
- 03 The Repository resolves each EPC against every contributor's records and returns one of three outcomes: **yours** (misplaced, reconcile it), **theirs** (often an RF cross-read from a neighboring store, ignore it), or **unknown** (not GS1-encoded or not yet contributed).
- 04 No contributor can see another contributor's raw data. The Repository only ever answers the questions it was asked.

What This Is and Isn't

This is

- A pull-based verification service — you ask, it answers
- Built on open standards: GS1 serialized global trade item numbers and EPCIS event records
- Free for one-way retail verification lookups
- Governed independently of any single tag manufacturer, retailer, or brand

This isn't

- A tracking or surveillance platform
- A real-time alerting or monitoring service
- Owned or controlled by one contributor
- A store of full custody trails open to anyone who asks

Governance

- Held by an entity independent of any single tag manufacturer, retailer, or brand — including the organizations that seed it
- Seeded with anonymized issuance and event records donated by founding contributors, to give the Repository useful coverage from day one
- Access is compartmentalized by design: a contributor's raw records are never visible to another contributor, or to the Repository's own operators, beyond what a single query needs to answer
- Built on GS1 identification and event standards, so participation never requires licensing a competitor's proprietary technology
- Governance decisions — who joins, what a query can ask, how disputes are handled — sit with the independent entity's own board, not with any one contributor

For Retailers and Brands

- Turn a stocktake variance into a batch lookup instead of a floor-wide search
- Separate genuine diversion or theft from ordinary RF cross-read noise, so loss-prevention effort goes where it's real
- A verification layer for inventory pledged as loan collateral, so financing against tagged stock doesn't rest on one lender's own paperwork
- A fast authenticity check for resale and recommerce listings

For Tag Manufacturers and Integrators

- Your existing GS1-compliant EPC base becomes more valuable, not more exposed — contribution is anonymized, and your commercial relationships stay yours
- No proprietary lock-in: this runs on open GS1 standards, not a technology you'd need to license from a competitor
- A credible, independently governed ownership layer grows retailers' confidence in RFID broadly — that grows the addressable market for every tag manufacturer, not only the ones who joined first
- Participation is opt-in by data type: contribute issuance records, event records, or both — nothing is shared beyond what you choose to donate

Participation

REQUIREMENT	DETAIL
EPC encoding	GS1-compliant serialized global trade item number (SGTIN)
Non-compliant encoding	Contributor shares its own encoding logic, or those EPCs stay outside the Repository's resolution
Data shared	Issuance and event records only, anonymized at the organization level
Cost	Retail verification lookups: free. Collateral and authentication attestations: priced per query

Roadmap

PHASE	FOCUS	STATUS
Phase 1	Verification — stocktake and cycle-count reconciliation, batch on demand	LIVE
Phase 2	Collateral attestation — confirming inventory pledged for financing is genuine and not pledged elsewhere	IN DESIGN
Phase 3	Authentication & compliance — resale authenticity, warranty transfer, export and Digital Product Passport records	PLANNED

Frequently Asked Questions

Does contributing data expose our customers or commercial relationships to competitors?

No. Contributions are anonymized at the organization level, and access is compartmentalized — no contributor, including a founding contributor, can see another contributor's raw records.

Who actually controls the Repository, and can that change later?

An independent entity, governed by its own board — not by any single tag manufacturer, retailer, or brand. That structure is the basis for participation, not a phase-one arrangement subject to later revision by one contributor.

What if our EPCs aren't encoded to the GS1 SGTIN standard?

Two paths: share your own encoding logic so the Repository can resolve against it, or those EPCs stay outside what the Repository can answer for. Non-compliant EPCs are never a barrier to using the Repository for everything else.

What does participation cost?

Retail verification lookups are free. Collateral and authentication attestations — the paid tier — are priced per query, and that revenue funds the Repository, not the free lookups that build its coverage.

Why would a tag manufacturer join a repository a competitor helped start?

Because the alternative is a credibility gap that hurts every tag manufacturer's pitch for RFID, not only the founding contributor's. A shared, independently governed layer is a smaller ask than trusting one competitor's data directly — which is exactly why it isn't run by one.

References

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