You’re Asking the Wrong Question:

The Real Value of the **Digital Product Passport**

apkudo

Contents

Executive Summary

Across the mobile-device industry, a familiar question is being asked: ***What is the value of a Digital Product Passport?***

If the answer stops at *it meets regulatory requirements,* or *it makes sustainability data more transparent,* the conversation is already pointed in the wrong direction.

This narrow view reduces a generational opportunity to a compliance checkbox, stifling innovation and limiting the industry's ability to unlock the billions of dollars in value currently sitting dormant in today's siloed device ecosystem.

At the recent CircularTech Forum 2025 – DPP in Action, one question echoed through nearly every session: *What's the penalty for non-compliance?*

The answer was unclear, but the question itself was revealing: an industry is trying to understand a transformative system through the lens of constraint rather than possibility.

The better question isn't: *What happens if we don't comply?* The better question is: ***What becomes possible if we create a functioning, connected ecosystem?***

What new value is unlocked when device identity, condition, repairability, provenance, and environmental impact can be trusted and shared across every participant in the lifecycle?

What new business models emerge when the data that sits locked inside disconnected systems can finally flow across a unified, verifiable bridge?

What market efficiencies appear when routing, grading, pricing, remarketing, and sustainability reporting all operate from the same source of truth?

The potential value of the Digital Product Passport far exceeds the cost of compliance. It has the power to re-architect how devices move, how partners collaborate, how value is measured, and how circularity becomes economically self-sustaining.

Unlocking that value requires a shift in mindset:

- From compliance-based thinking to margin-based thinking.
- From *What do we have to do?* to *What can we now enable?*
- From fragmented processes to connected intelligence.

This point of view from Apkudo introduces the concept of the Systemic Value Gap, highlighting where value is lost, why the current model is unsustainable, and how the concept of digital product passports, when viewed through a systems lens, becomes the foundation for a high-value, connected, and intelligent device economy.

The opportunity for the industry is not to avoid penalties, but to capture potential. Not to build better silos, but to build better systems.

And the companies that embrace this shift will define the next decade of mobile-device value.

A functioning, connected ecosystem unlocks billions of dollars in value currently sitting dormant in today's siloed device ecosystem.

The Paradox: A $100B+ Market Running on Chaos

A Market Too Big for Manual Processes

The mobile device market is massive and continues to grow.

The global refurbished smartphone market is projected to be valued at $109.7 billion in 2027.[1] An estimated 5-10 billion 'pre-loved' phones are sitting idle worldwide.[2]

Carriers and retailers process hundreds of millions of trade-ins, warranty claims, and Return Merchandise Authorization (RMA) requests every year. Enterprises refresh tens of millions of devices annually, all representing billions in stranded value.

Despite this scale, the industry continues to rely on spreadsheets, manual processes, handoffs between siloed teams, and limited visibility across partners.

The market is also fraught with value drainers—those who handle and move device inventory but add no value to the device.

The paradox is clear: a highly sophisticated industry powered by unsophisticated systems.

Every touchpoint is an opportunity for a device to gain or lose value and/or quality.

[1] IDC, Worldwide Used Smartphone Forecast, 2023–2027, Dec 2023

[2] GSMA, December 2024

The Silo Trap

Each device program within the lifecycle optimizes for its own success metric.

None of these priorities is wrong. Each area is highly optimized—within itself. But because they lack a shared data foundation, each creates local optimization at the expense of total value.

These programs can be managed within a single organization or across different partners and players:

Silos	Primary Focus (What they are measured on)	Blind Spot
TRADE-IN	Attachment rates and customer acquisition	**End-to-End Value Recovery:** They don't verify whether the device actually generates a profit after processing and resale. Their job is done at yes, not at profit.
ENTERPRISE MOBILITY	Device recovery and compliance	**Circular Economics:** They see device return as a compliance task, not a revenue opportunity. They aren't measured on the value lost by letting those devices sit in a closet.
OPERATIONS	Cost-per-unit	**Asset Velocity & Condition:** By focusing only on cost, they use slow, manual processes. They save $1 on labor but let the device sit for 10 days, resulting in a $25 loss in value.
REMARKETING	Sale price	**Trust & Proof of Quality:** They have no verifiable data from the previous silos. They have to say trust me, so buyers bid lower, eroding the final margin.
ESG/ COMPLIANCE	Audit readiness	**Business Value Creation:** They view the passport as a cost to avoid a fine, rather than an asset that can create value for Operations, Trade-In, and Remarketing.

The Consequence: The Systemic Value Gap

The local optimization of each data silo creates a blind spot for the C-suite, hindering growth potential.

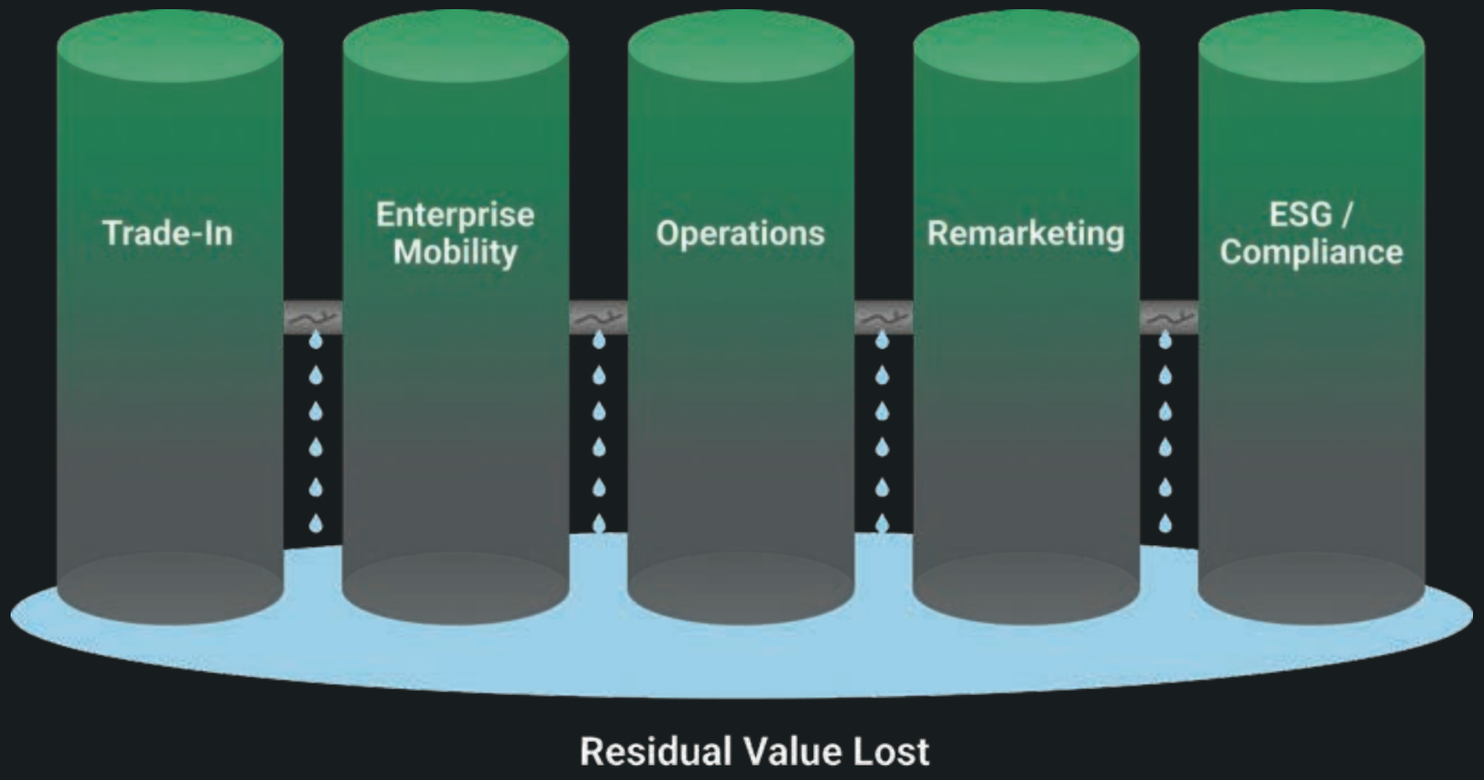
They see the final reports from each of the silos that have been optimized for the criteria on which they are measured, but they overlook the value being lost through leaks between silos.

At every handoff—between internal departments, external partners, or disconnected systems—data is lost or mistrusted.

Devices sit idle waiting for re-entry into the next silo. Residual value slips through invisible cracks.

This is the **Systemic Value Gap**—and it's costing the industry billions.

Every silo is a fortress of good intent—and a black hole for value.



Identifying the Value Gaps: Where Residual Value Evaporates

Value gaps exist across various processes, programs, and stakeholders in the mobile device ecosystem. Some are internal, while others appear at the interfaces between partners.

The following list isn't exhaustive but represents the most prominent patterns that consistently erode device value. Closing them yields measurable business and sustainability gains.

The four gaps, while distinctly defined, are not mutually exclusive:

- The Trust Gap
- The Velocity Gap
- The Intelligence Gap
- The Sustainability Gap

Trust Gap

Velocity Gap

Intelligence Gap

Sustainability Gap

GAP 01

The Trust Gap

The Trust Gap is the cost of doing business without proof.

The trust gap runs in three directions across the connected-device ecosystem—from consumers to providers, from providers back to consumers, and between partners themselves.

Where Trust is Lost in the Device Lifecycle

Consumers

For consumers, trade-in and upgrade programs often feel opaque and unpredictable.

They receive inconsistent trade-in quotes, unclear grading explanations, and unexpected value reductions once their device is inspected.

Warranty and protection programs can be just as confounding; denials often come without transparent diagnostic evidence.

Providers

Providers face a parallel challenge, but from the opposite direction.

Warranty centers and insurance administrators frequently grapple with inflated or fraudulent claims, as customers misrepresent device condition or causes of failure.

For example, a device returned with a claim of intermittent battery failure may, once tested, show clear signs of liquid damage.

Without trusted diagnostic data tied to the device's verified identity at the moment of claim, providers face an impossible choice: approve questionable claims (driving unnecessary replacement costs) or deny legitimate ones (damaging Net Promoter Scores (NPS) and customer retention).
The economic impact is massive.

According to industry estimates, fraud and unnecessary replacements can account for 10–15% of total warranty costs in some OEM programs, while misdiagnosed failures can add tens of millions of dollars annually in avoidable expense for large carriers and insurers.[3]

Partners

Trust gaps also exist between partners—an often overlooked but highly material source of system-wide inefficiency.

Carriers must trust that repair partners follow OEM specifications. OEMs must trust that logistics partners securely erase data on devices and handle chain-of-custody procedures correctly. Remarketers must trust that grading reports are accurate and free of subjectivity. Recyclers and recovery partners must trust that material streams match what was declared.

In most cases, this trust is assumed rather than verified. As a result, companies layer on redundant audits, mirrored processes, and manual secondary checks that dramatically slow down device velocity.

[3] Industry trade reporting and warranty analytics research, including Warranty Week and warranty fraud analytics providers (2023–2025)

The Cost

When trust cannot be verified, the ecosystem compensates with friction. Fraudulent and inflated claims drive unnecessary replacements and warranty expense.

Subjective or disputed grading forces buyers to discount inventory to protect against downside risk. Partners introduce redundant audits, secondary inspections, and mirrored quality controls—not to improve outcomes, but to protect themselves from uncertainty.

Consumers, sensing opacity or unfairness, disengage altogether; in many markets, the result is chronically low trade-in participation and suppressed supply.

The Trust Gap does not destroy value through poor decisions—it destroys value by slowing the system down, inflating operational cost, and forcing every participant to price defensively.

Margin is quietly drained not because value isn't present, but because it cannot be confidently proven.

GAP 02

The Velocity Gap

The Velocity Gap is the margin tax you pay every time a device sits in limbo.

Velocity in the device lifecycle is often misunderstood. It is not just about how fast a conveyor belt moves or how many units can be processed per hour.

True velocity is about how quickly a device can be understood, decided upon, and routed to its highest-value outcome.

Today, most of the industry still operates on a receive, then decide model. Devices must physically arrive at a warehouse, be unpacked, charged, logged, and manually inspected before anyone knows what they are worth or where they should go next.

By the time a decision is made, value has already begun to erode.

Where Velocity Slows in the Device Lifecycle

Physical Velocity

The first manifestation of the Velocity Gap appears in physical velocity.

Many facilities still rely heavily on manual handling and sequential workflows. Devices are touched multiple times—received, sorted, staged, inspected, and re-inspected—often because upstream data cannot be trusted or does not exist at all.

Automation can accelerate portions of this flow, but without reliable information accompanying the device, even automated facilities are forced to slow down and treat most inventory as an exception.

The result is a paradox: facilities designed for scale that still behave like triage centers, prioritizing caution over speed and throughput.

Data Velocity

The second—and often more damaging—form of the Velocity Gap is data velocity.

Even when systems exist, data frequently lags behind the physical device.

Trade-in partners, logistics providers, repair centers, and remarketing platforms operate on different systems with limited synchronization.

Condition data, ownership history, diagnostic results, and eligibility signals arrive late, incomplete, or not at all. Devices move, but their data does not.

This disconnect forces downstream teams to pause processing while they wait for information, recreate data manually, or simply proceed with conservative assumptions that reduce value.

In effect, the device outruns its own intelligence.

Decision Velocity

The third and most critical component of the Velocity Gap is decision velocity.

Without timely, trusted data, disposition decisions are delayed or made manually.

Devices that could be resold immediately are routed into generic processing queues. Units that are not economically viable to repair consume labor, parts, and time before being written off.

High-value assets miss optimal resale windows because no one can confidently decide what to do with them quickly enough.

Intelligent disposition—deciding in near real time whether a device should be reused, repaired, resold, redeployed, or recycled—remains the exception rather than the rule.

Ultimately, the Velocity Gap creates a state of operational limbo. Devices sit on shelves, on pallets, or in cages—depreciating while waiting for data, approvals, or manual intervention.

The Cost

The cost is significant and measurable. Consumer electronics depreciate rapidly once removed from active use.

Industry analysts estimate that smartphones can lose 1–2% of residual value per week once they enter secondary channels, with steeper drops around major product launches or seasonal demand shifts.

A delay of even 10–14 days in processing can translate into 5–10% lower resale value per unit, depending on the model and market conditions.

When multiplied across thousands or millions of devices, the financial impact quickly reaches tens of millions of dollars.

GAP 03

The Intelligence Gap

The Intelligence Gap occurs when value decisions rely on judgment instead of knowledge.

Device intelligence means having the right data at the right time—the ability to understand a device's true condition, context, and risk profile, and immediately determine its next best action.

This goes far beyond deciding whether a device should be repaired. It determines how much risk the device carries and how much value it can unlock across its remaining lifecycle.

When device intelligence is fragmented or delayed, operators rely on intuition, incomplete signals, or subjective grading to answer margin-critical questions.

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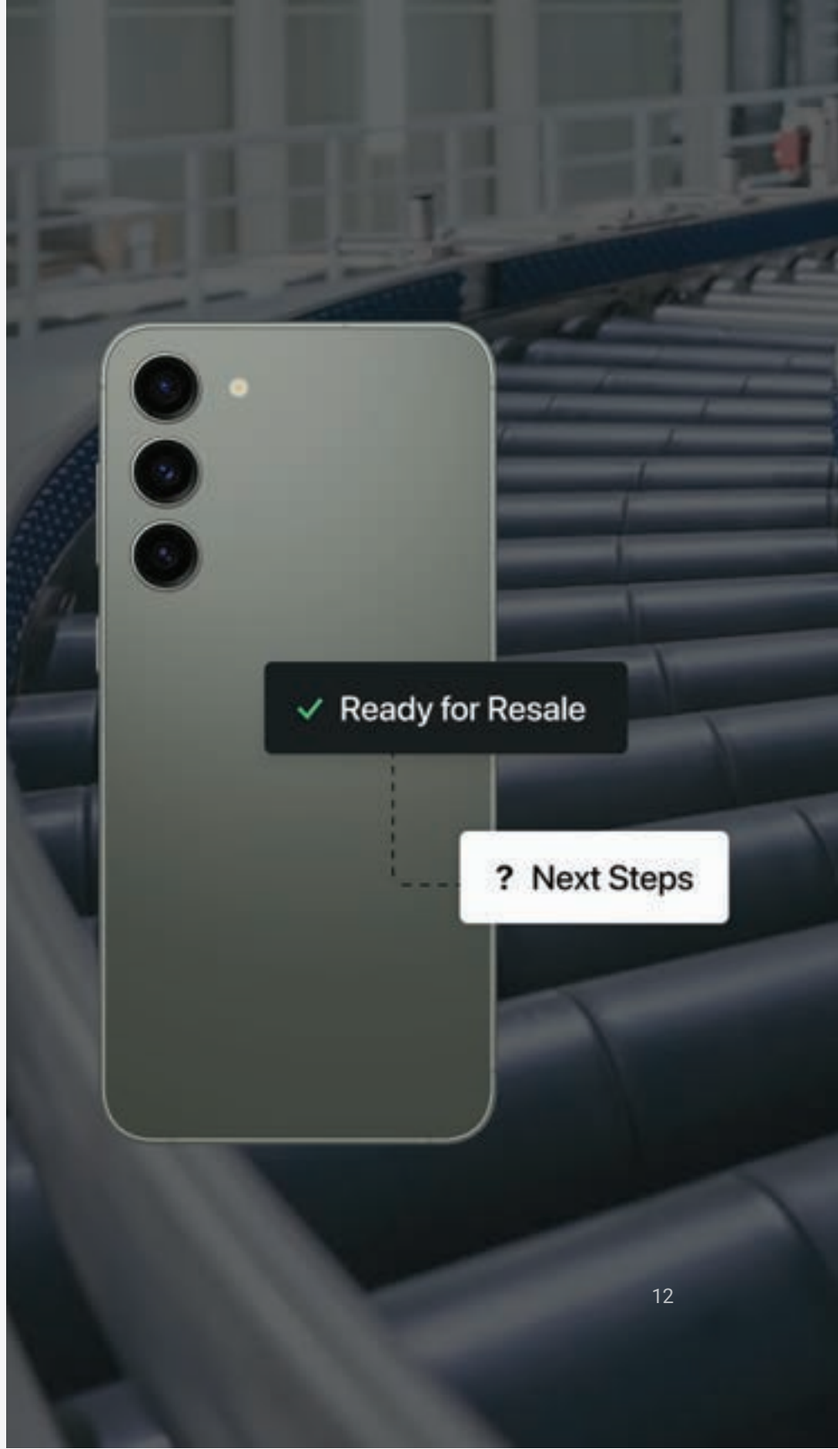
- *Should a traded-in device be routed into warranty stock or sold immediately through a premium resale channel?*
- *Does a customer's device truly qualify for a high-margin protection plan, or does it introduce hidden risk?*
- *Is a device worth repairing, or will the cost of labor and parts exceed its future value?*

These decisions are made daily at scale, often without the intelligence required to make them confidently.



Where Intelligence is Lacking in the Device Lifecycle

Working with Partners

The Intelligence Gap first appears at the ecosystem partner level.

Carriers, OEMs, repair centers, logistics providers, and remarketers all generate valuable data, but the entire data set rarely travels with the device in a unified, verifiable way.

Quality assurance results and repair outcomes are often trapped in partner-specific systems. Downstream participants are forced to trust summaries rather than proof, pricing inventory based on who they are buying from instead of what the device actually represents.

This challenge is especially evident in trader-to-trader markets, where grading standards vary widely, and labels such as A or B have different meanings to different sellers.

Independent, device-level intelligence gives buyers a consistent signal to evaluate quality and value—regardless of the seller.

Over time, buyers will naturally gravitate toward sellers that participate in trusted, passport-enabled ecosystems, while others are discounted or avoided.

Underwriting Coverage

The Intelligence Gap also limits customer-level intelligence, particularly in warranty and device protection programs.

Underwriters face adverse selection when device condition and risk cannot be verified at the time of enrollment.

In response, they either raise premiums to offset uncertainty or avoid underwriting certain devices and channels altogether.

Solving the Intelligence Gap changes this equation.

Objective, real-time device insight enables underwriters to confidently expand coverage into new channels while lowering premiums to maximize participation and profit.

Routing Inventory

At the device level, missing intelligence—such as lock status, UEM enrollment, repair history, or functional health—leads to misrouted inventory.

High-value devices are sold too cheaply.

Eligible customers are denied protection plans, resulting in lost future revenue.

Devices that could be resold immediately are sent for unnecessary repair, losing value with every passing day.

The Cost

When intelligence is incomplete or arrives too late, the device still moves, but it moves suboptimally. High-value devices are routed into lower-margin channels.

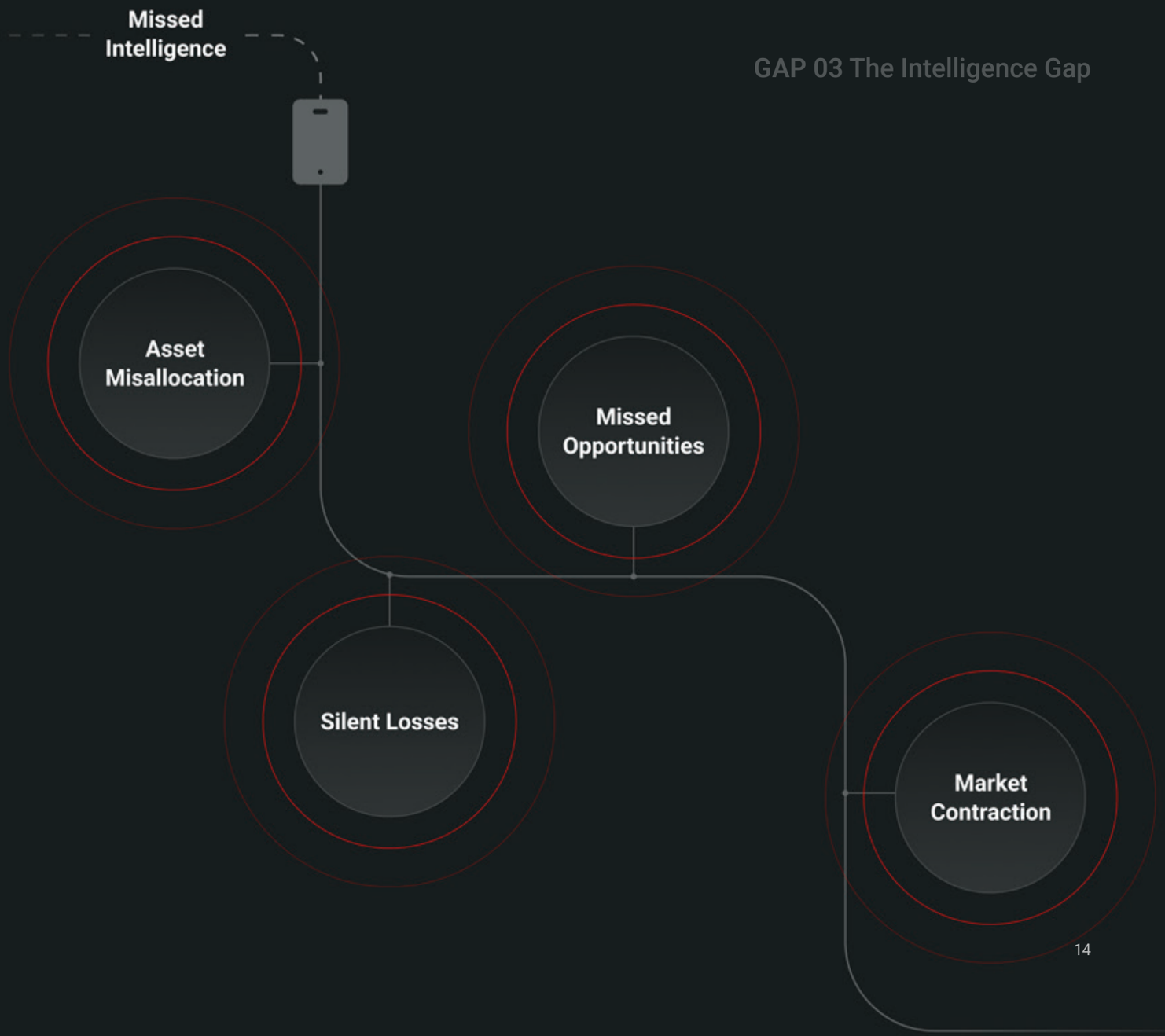
Repairable units consume labor and parts that they will never recover.

Customers are incorrectly excluded from protection plans or insurance products, eliminating future revenue streams.

Underwriters respond to uncertainty by raising premiums or avoiding entire channels, constraining growth before it begins.

None of these losses stems from a lack of activity; they stem from decisions made without the insight required to optimize them.

The Intelligence Gap compresses value by misallocating assets and limiting access to profitable markets, turning what should be revenue opportunities into silent, recurring losses.



GAP 04

The Sustainability Gap

The Sustainability Gap is the cost of claiming impact without being able to prove it.

Sustainability has become a board-level priority, but for much of the connected-device industry, the data required to measure circularity remains fragmented, incomplete, or unverifiable.

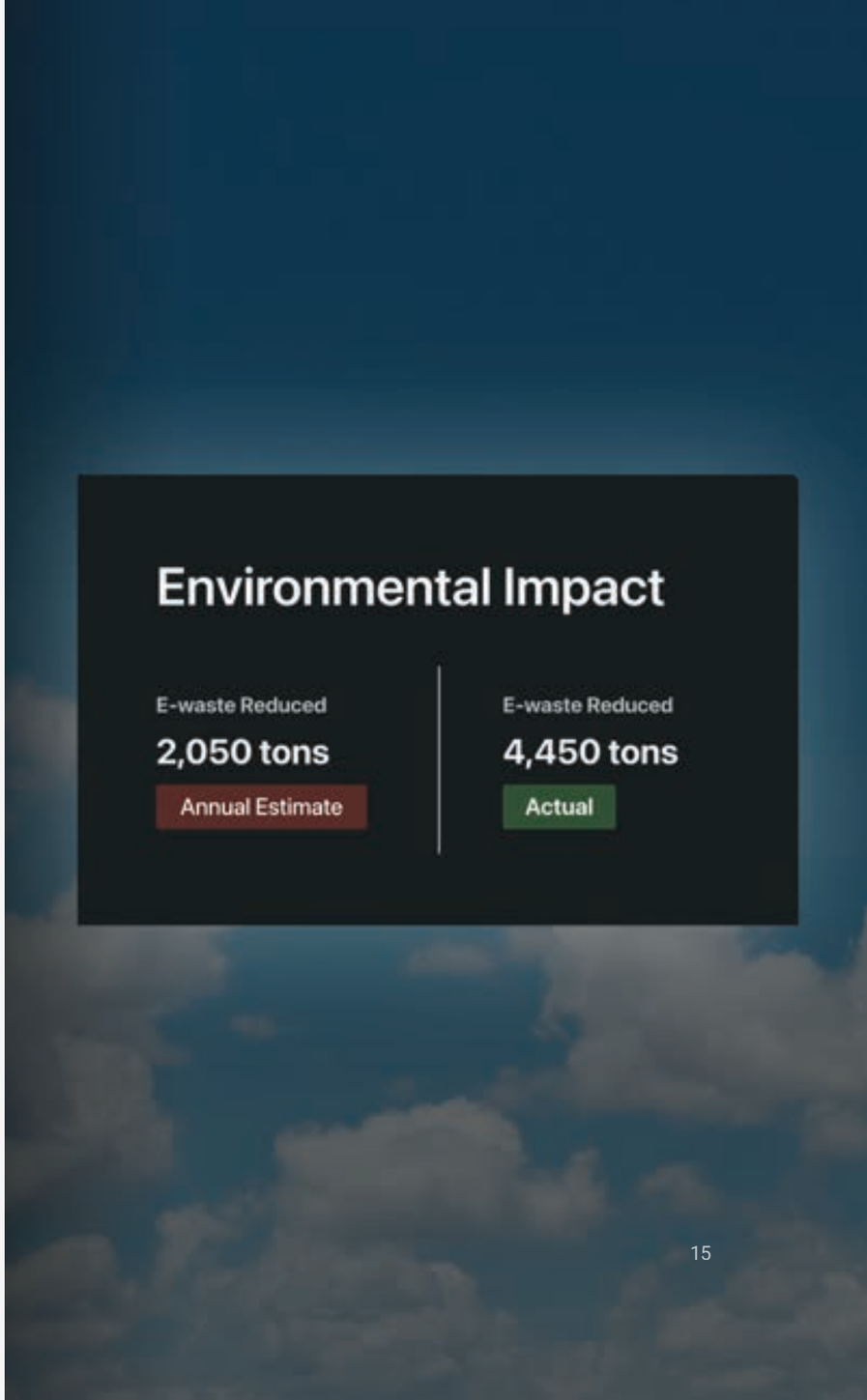
Sustainability information is often tracked manually through spreadsheets spread across departments, regions, and partners.

Data may be segmented by device type, geography, or disposition path, with no consistent structure or ownership. Records become incomplete or irreconcilable, resulting in a patchwork of best guesses rather than a system of record.

Impact is often based on estimates and assumptions or calculated using broad weight-based formulas or outdated environmental models that exclude logistics, processing steps, and real device usage.

As a result, sustainability reporting reflects what organizations believe is happening, not what they can prove.

Without precise, OEM-provided and third-party-verified data, as well as transparency into how devices are manufactured, transported, and processed, sustainability claims remain difficult to defend.



Where Sustainability is Unverified in the Device Lifecycle

Device Recovery

This gap emerges most clearly in device recovery.

Organizations may run trade-in or takeback programs at scale, yet lack visibility into what actually happens to devices after initial collection.

Does the device remain in circulation through reuse or refurbishment, or is it effectively removed from the economy after a single owner?

In many cases, once devices move beyond the initial partner, traceability becomes lost.

Logistics and Transportation

The Sustainability Gap also manifests in the impact on logistics and transportation.

Without a complete record of a device's travel history, including the number of times it was shipped, the mode of transportation, and the regions it traversed, organizations cannot accurately calculate the carbon footprint or savings associated with reuse versus replacement.

Transportation, packaging, and handling emissions are often excluded from Environmental, Social, and Governance (ESG) calculations altogether or estimated using high-level assumptions.

This creates a distorted picture of impact, particularly for global programs where logistics complexity materially affects environmental outcomes.

Refurbishment and Lifecycle Extension

A third manifestation appears in refurbishment and lifecycle extension.

Without verified lifecycle data tied to individual devices, companies default to generic industry averages when reporting environmental benefits.

These averages may rely on outdated models or weight-based assumptions that fail to reflect real-world device behavior.

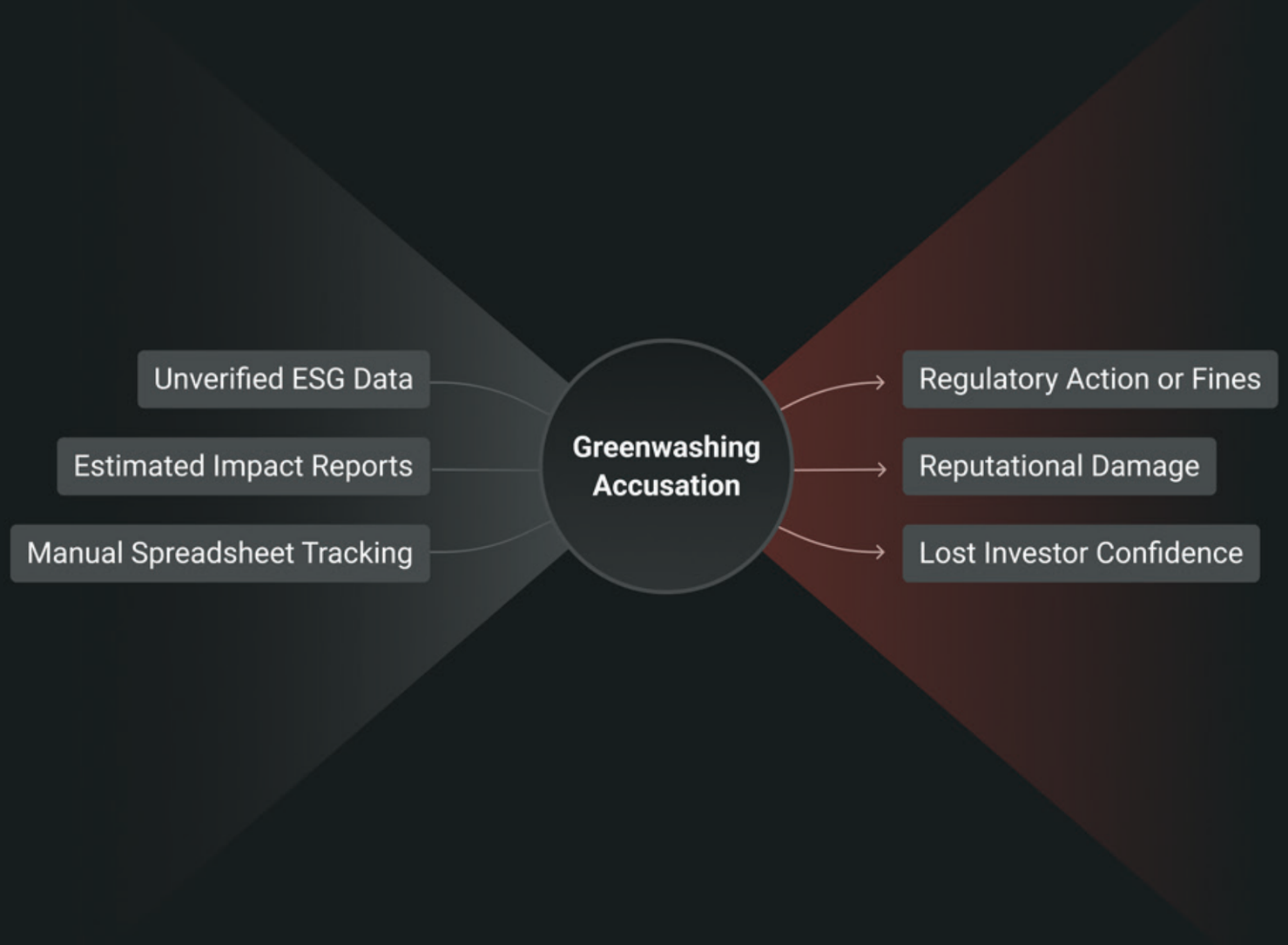
This exposes organizations to reputational risk and potential litigation while preventing them from credibly claiming carbon credits or sustainability-linked financial benefits tied to extending device lifespan.

The Cost

Organizations risk regulatory penalties, accusations of greenwashing, and lost investor confidence.

The absence of verified ESG data renders sustainability a cost center rather than a growth lever.

The UN Global E-Waste Monitor estimates $62B in recoverable value lost annually. Most of it is lost due to data—not devices.



Trust lost at the first touchpoint
compounds across the lifecycle.

The False Solution: The Compliance-Only Passport

The European Union's Ecodesign for Sustainable Products Regulation (EU ESPR) will soon require Digital Product Passports for electronics.

The regulation's intent is noble: transparency and traceability.
Yet the first reflex is to assign the task to ESG teams and check the box.

When created solely for regulatory purposes, the passport becomes static—a digital document that is uploaded and then forgotten.

It records but doesn't connect. It adds cost without unlocking value.

The industry risks solving for the next mandate
instead of the next opportunity.

Compliance without connection simply digitizes the chaos.

The Real Mandate: The Passport as a Systemic Data Bridge

The Digital Product Passport should not be viewed as another reporting form but as the catalyst capable of uniting a fragmented ecosystem.

A Living Record, Not a Report

When appropriately designed, the passport becomes a dynamic, evolving record—created at launch, enriched at recovery, verified in operations, and monetized in remarketing.

This isn't science fiction—it's the blueprint for a connected, verified ecosystem.

A New Mental Model

The goal isn't to build passports but to build the systems that produce them naturally.

When silos share standardized, verifiable data, the passport emerges as proof of a healthy system, not an administrative burden.

**Stop thinking about the passport as a form to fill out.
Start thinking about it as proof that your system works.**

Closing the Gaps: **Turning Compliance into a Profit Engine**

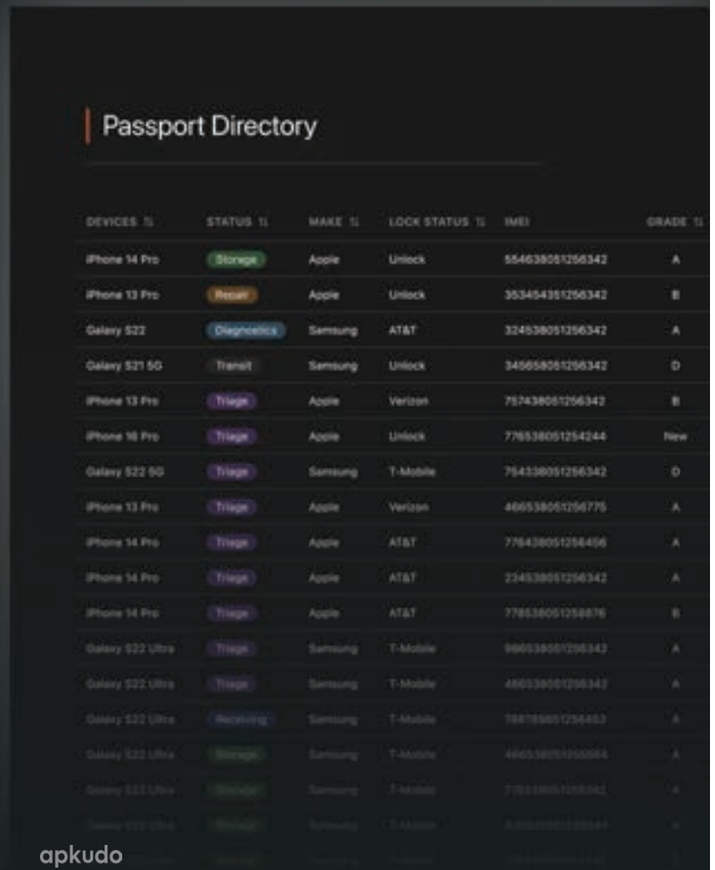
A connected, data-driven system doesn’t just meet regulation requirements—it creates measurable business value.

Here’s how a systemic approach closes each gap.

CLOSING GAP 01

The Trust Gap

From inefficient and unpredictable to automated and transparent



How a passport system closes the gap

A device passport system closes the Trust Gap by establishing a shared, verifiable record that follows the device across every interaction and handoff.

Instead of relying on assumptions, declarations, or partner-specific reports, trust is built on objective evidence tied directly to the device itself.

Condition data, diagnostics, repair actions, and chain-of-custody events are captured once and reused across stakeholders, reducing ambiguity at each decision point.

For consumers, this means transparent outcomes they can understand and trust. For providers and partners, it replaces blind faith with proof—enabling confidence without friction.

Value unlocked by closing the gap

When trust becomes verifiable, participation increases and defensive processes fall away.

Trade-in attachment rises as consumers gain confidence in fair valuations.

Fraud and unnecessary replacements decline as claims are evaluated against objective evidence.

Partner relationships improve as audits, rechecks, and redundant workflows are reduced.

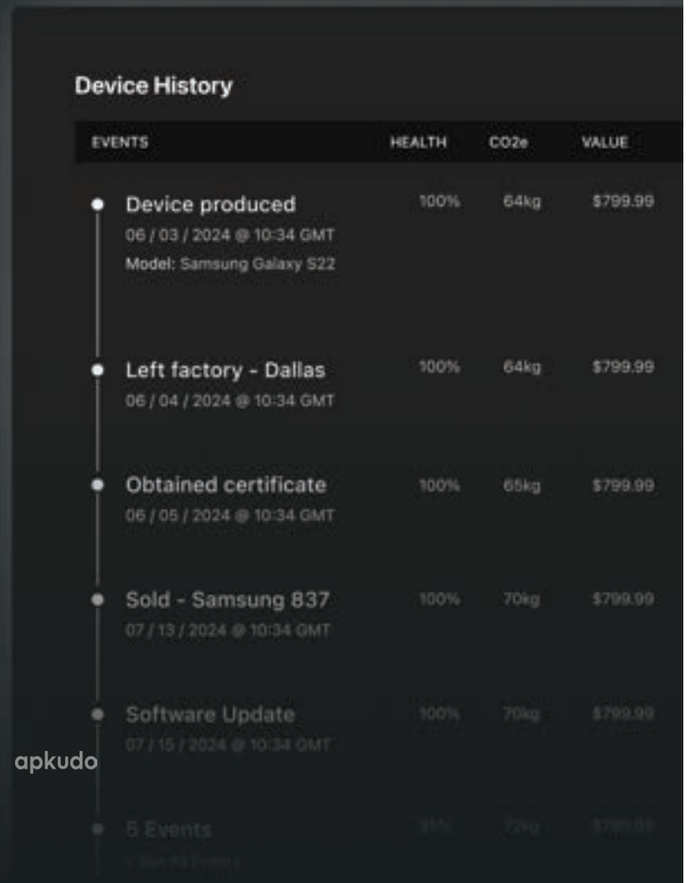
Most importantly, value is no longer discounted to compensate for uncertainty.

Devices are priced and routed based on what they are—not on who handled them last—restoring margin that would otherwise be lost to risk buffers.

CLOSING GAP 02

The Velocity Gap

From delayed decision-making to pre-informed, real-time execution



How a passport system closes the gap

A device passport system closes the Velocity Gap by shifting decision-making upstream—before devices physically arrive, rather than after they are unpacked and inspected.

By linking verified condition, history, and eligibility data to the device in advance, routing and disposition decisions can be made immediately upon receipt or even pre-arrival.

Data moves at the same speed as the device, eliminating the lag between physical processing and informational readiness.

Automation then accelerates execution, but only after visibility removes uncertainty from the flow.

Value unlocked by closing the gap

Faster decisions translate directly into higher recovered value.

Devices spend less time idle, depreciation is minimized, and high-value units reach optimal resale windows sooner.

Labor efficiency improves as unnecessary handling, inspection, and rework are eliminated.

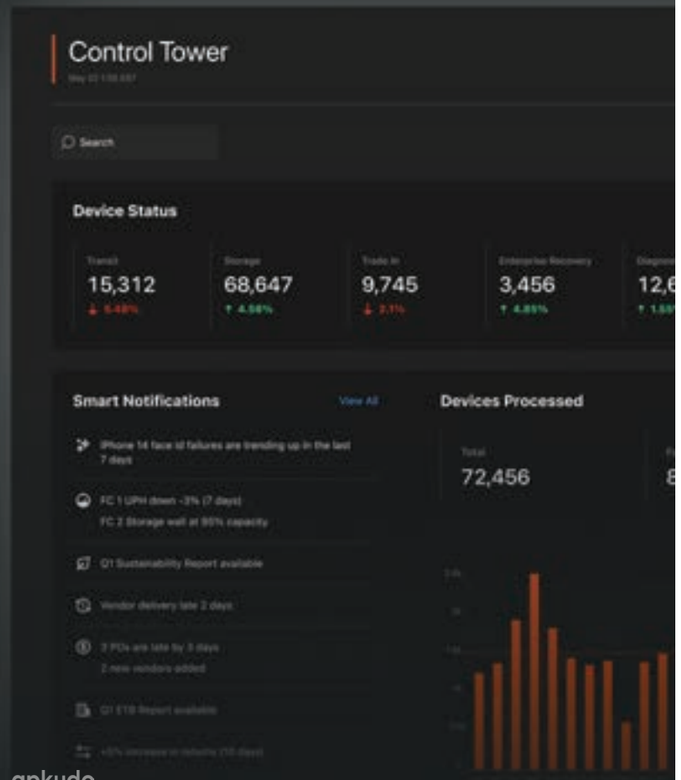
Facilities shift from reactive triage to predictable, high-throughput operations.

At scale, even small reductions in dwell time yield substantial financial benefits—transforming time from a source of value erosion into a competitive advantage.

CLOSING GAP 03

The Intelligence Gap

From reactive guesswork to objective, real-time decision intelligence



How a passport system closes the gap

A device passport system closes the Intelligence Gap by unifying ecosystem, customer, and device-level data into a single, objective source of truth.

Intelligence is no longer fragmented across partners, spreadsheets, or subjective grading standards. Instead, every stakeholder accesses the same verified insight, enabling consistent decisions regardless of the channel or counterpart.

This independence is critical: intelligence does not come from the seller's claim or the buyer's intuition, but from the device's documented reality as it moves through the system.

Value unlocked by closing the gap

Objective intelligence unlocks markets that were previously constrained by risk.

Underwriters can confidently expand coverage while reducing premiums, improving both participation and profitability.

Buyers can price inventory accurately without relying on personal experience or defensive discounts.

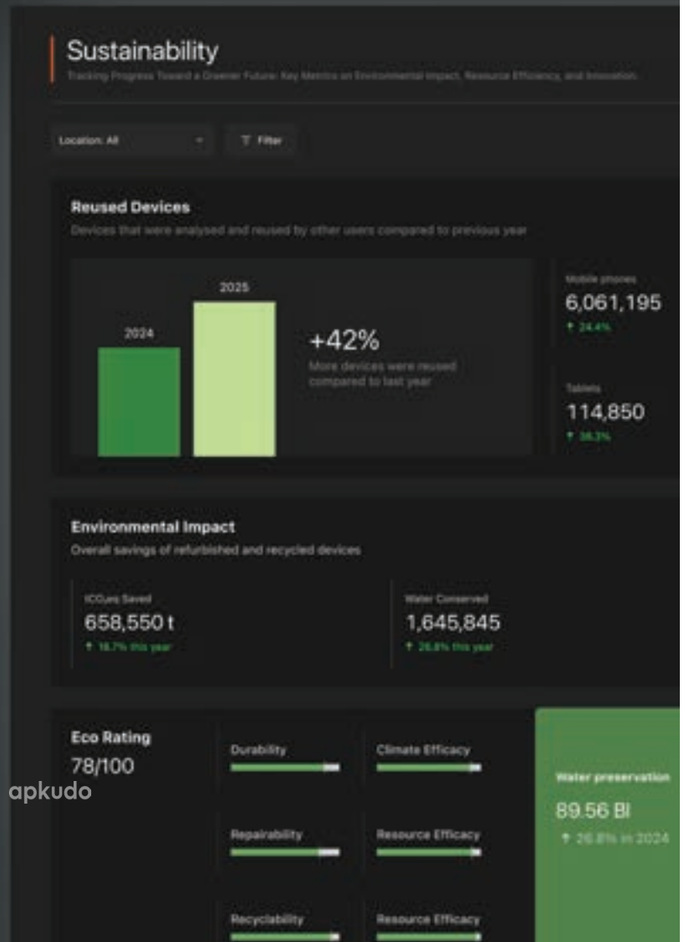
High-margin channels are utilized more effectively as devices are matched to their best economic outcome.

As intelligence becomes standardized and trusted, participants naturally gravitate toward ecosystems that provide it—reinforcing network effects and concentrating value among those who operate transparently.

CLOSING GAP 04

The Sustainability Gap

From risk exposure to verified impact



How a passport system closes the gap

A device passport system closes the Sustainability Gap by replacing estimates with evidence.

Recovery, logistics, refurbishment, and end-of-life outcomes are captured as verifiable lifecycle events rather than inferred through averages or manual reporting.

Environmental impact is calculated using precise, device-level data that includes movement, processing, and reuse, creating a transparent and auditable record.

Sustainability performance becomes traceable across partners and geographies, independent of individual spreadsheets or institutional knowledge.

Value unlocked by closing the gap

Verified sustainability transforms ESG from a reporting obligation into a strategic asset.

Organizations can confidently substantiate circularity claims, reducing regulatory and litigation risk while strengthening investor credibility.

Accurate lifecycle data enables eligibility for carbon credits and sustainability-linked incentives tied to device reuse and lifespan extension.

Most importantly, recoverable value that was previously lost to opacity becomes measurable and monetizable—allowing sustainability to drive growth, not just compliance.

A connected system doesn’t just comply—it compounds value.

Building the Bridges:
The System Behind the Passport

From Fragmented Processes to Shared Infrastructure

A connected device passport platform forms the backbone of this transformation. It unites trade-in systems, warehouse automation, diagnostics, and remarketing through a common, unified data layer.

Each process enriches the same record.

Every stakeholder—OEM, carrier, logistics partner, buyer—interacts with a single source of truth.

That does not mean every stakeholder can or should have access to all data. Business process requirements inform role- and attribute-based access.

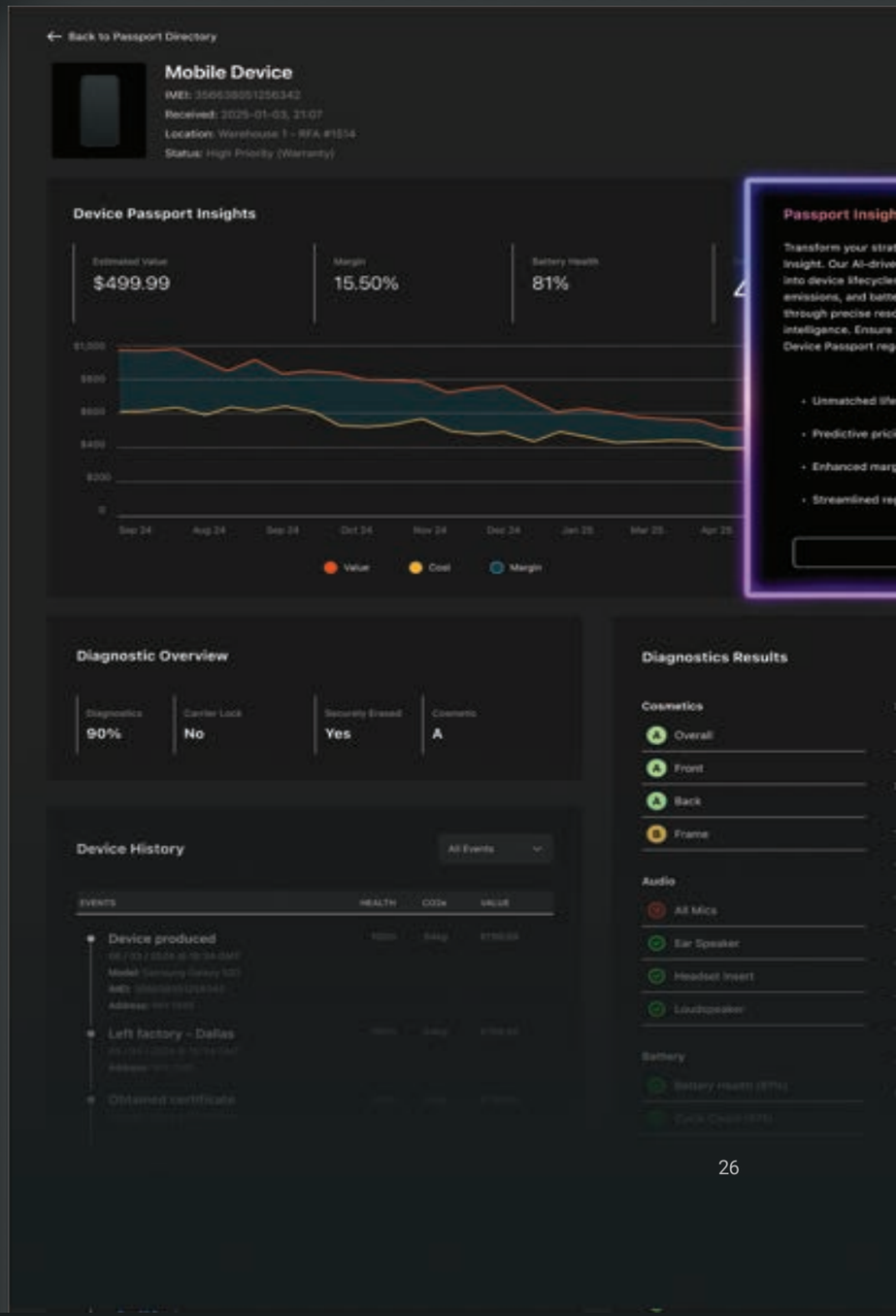
Think of it as the device's digital DNA—a persistent record of identity, condition, and history that follows it through every lifecycle phase.

From Transactional Thinking to Systemic Intelligence

In a connected system:

- Trade-in data predicts volume and quality.
- Warehouse intelligence optimizes routing.
- Verified diagnostics feed dynamic pricing.
- Sustainability metrics aggregate automatically for reporting.

The entire lifecycle becomes intelligent, circular, and self-improving.



Stop Building Better Silos; Start Building Bridges

The mobile device industry stands at a crossroads. The transactional, siloed model that once fueled growth now leaks trust, efficiency, and billions in value.

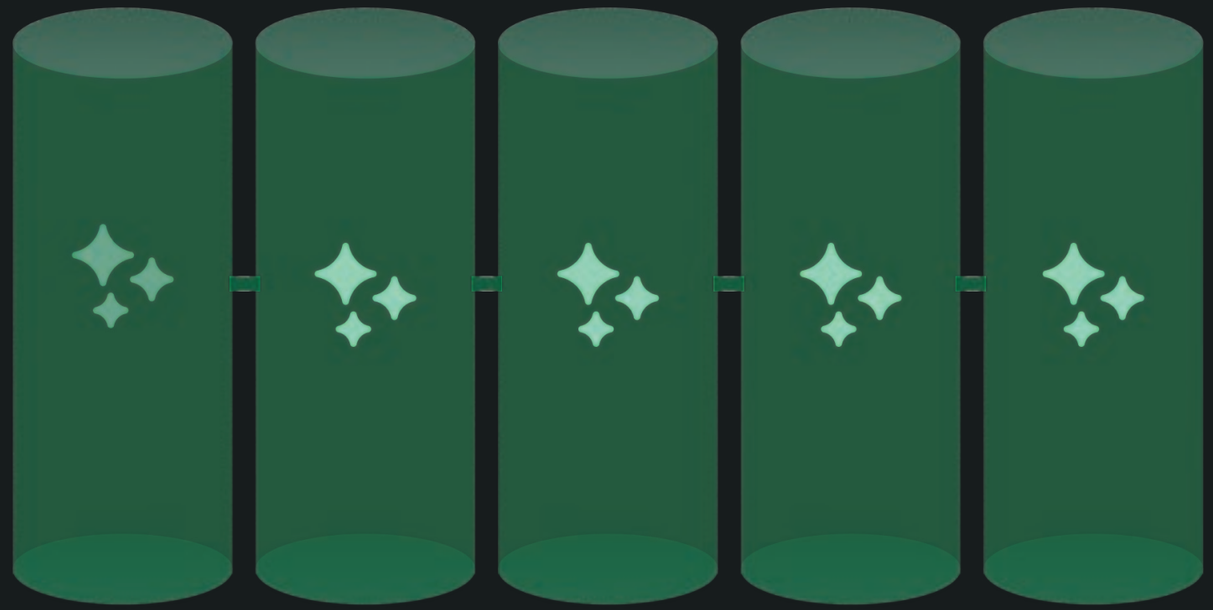
The Digital Product Passport is not just another compliance task; it's the catalyst forcing the industry to think systematically. The leaders of the next decade won't just have passports—**they'll build the systems that produce them:** connected, intelligent, and verifiable.

The future belongs to those who connect the data, close the gaps, and capture the full value of every device.

At Apkudo, we're building the foundational device passport platform—the operating system for this connected, high-value future.

Our mission is to help the industry stop building better silos and start building bridges that unlock the true potential of every device.

We invite you to architect this future with us.



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About Apkudo

Apkudo helps companies that manage, sell, or buy connected devices make smarter decisions, operate with absolute confidence, and maximize the financial potential of every device. Our device passport platform captures and aggregates data from disconnected device programs and transactions across the entire device lifecycle to create a single, trusted Device Passport™ for every asset. Our unique integration of precision automation robotics and software captures more objective data than any other company in the industry.

Learn more at **apkudo.com**