

# Closing the loop

*Why circular economy programmes depend on data that currently exists on neither side of the transaction*

Gordon Petrie, Indesosa

---

## The ambition and the gap

---

The furniture industry is at a genuinely important inflection point. After decades in which sustainability efforts focused primarily on manufacturing processes and material sourcing, the leading manufacturers are now directing serious investment and strategic thinking toward what happens to products after they leave the factory — and after they leave the customer.

End-of-use recovery programmes, remanufacturing capability, closed-loop material flows, and Furniture as a Service models are no longer peripheral initiatives. They reflect a well-founded understanding that the greatest environmental and commercial leverage in the furniture lifecycle lies not in making products more efficiently, but in keeping them in productive use for longer.

The ambition is right. The challenge is structural. The infrastructure being built on the manufacturer side — to intercept, assess, refurbish, and redeploy assets — depends at its customer end on a quality of asset-level data that most organisations simply do not have. Products leave the manufacturer's custody and become, in effect, invisible. Their location, condition, age, and availability for recovery are unknown — not because the data cannot be captured, but because no systematic mechanism has existed to capture and maintain it.

---

*“The infrastructure being built to recover furniture is only as effective as the visibility it has into the installed base it is trying to recover.”*

---

## What the research shows

---

The academic and industry evidence on furniture lifecycle management is growing, and it consistently points to the same structural constraint.

Research by the Ellen MacArthur Foundation into circular office furniture models found that platforms built around reuse and refurbishment can deliver procurement cost savings of 40 to 69 per cent for buyers compared to purchasing new — and that circulating assets at scale generates measurable carbon reductions. One studied platform tracked the movement of nearly one million pieces of furniture and calculated a reduction of over 22,000 tonnes of carbon emissions across its operating period. These are significant numbers. But they were achieved by platforms that had solved the data problem — by building systems to track assets individually from the point of entry into the circular supply chain.

Life Cycle Assessment work in the sector, including research associated with major manufacturers, consistently identifies that the majority of environmental impact in furniture is embedded in materials at the point of manufacture. The logical implication is that extending product life — through repair, refurbishment, or remanufacture — delivers disproportionate environmental benefit. A 2024 study in the journal *Sustainability* applied decision-support

modelling to office furniture remanufacturing and found that systematic approaches to the remanufacture, auction, or resale decision significantly improve both operational margins and sustainability outcomes. Again, the prerequisite is individual asset-level data.

A systematic review of digitalisation and circular economy in the furniture sector found that while manufacturer interest in remanufacturing and refurbishment is increasing, there remains a substantial gap between what circular approaches can achieve theoretically and their actual implementation in practice. The review identified data availability as a central constraint.

The research is consistent: the barrier is not ambition, investment, or manufacturing capability. It is the absence of asset-level visibility at the customer end.

## Why the retrospective audit is the wrong model

---

The conventional response to this data gap is the periodic asset audit — a team enters a building, walks every floor, identifies every asset, applies a barcode or tag, records location and condition, and produces a register. It is thorough, it is expensive, and it starts depreciating in accuracy from the day it is completed.

Over more than 20 years of furniture asset management, including programmes covering hundreds of thousands of assets across large and complex estates, the same pattern is observed every time. The customer arrives at the audit with a spreadsheet — their existing record of what they own. That spreadsheet is invariably wrong. Assets have moved between buildings and floors without being recorded. Items have been disposed of informally. Equipment has been purchased outside the procurement process and never entered the register. The gap between the official record and operational reality is, in almost every case, substantial.

The audit corrects that gap — but only momentarily. Without a mechanism for maintaining the register in real time, the data begins to drift again immediately. Assets move. Conditions change. People leave and institutional knowledge about where things are and what state they are in walks out with them.

For a manufacturer's end-of-use programme, this creates a fundamental operational problem. To intercept an asset — to know that a chair or desk is approaching end of life, is available for collection, and meets the condition threshold for refurbishment rather than recycling — requires knowing that asset exists, knowing where it is, and knowing its current condition. None of that is reliably available through periodic auditing.

## The point-of-sale opportunity

---

The insight that emerges from large-scale audit experience is that the data problem has a far more elegant solution than retrospective auditing — and that manufacturers are uniquely positioned to deliver it.

Every asset that leaves a manufacturer carries with it a body of data: product type, specification, dimensions, weight, material composition, imagery, supplier reference, warranty terms, and purchase date. That data exists within manufacturer systems. What it lacks is an individual identifier — a unique tag that distinguishes this specific chair from the ten thousand others of the same model — and a location record linking it to the building and floor where it was delivered.

Both of these can be assigned at the point of sale or point of delivery. The incremental cost is minimal. The operational consequence is transformative. An asset that enters a customer

estate individually identified, with its full specification data pre-loaded and its location registered, does not need to be audited. It is already in the system. Its lifecycle tracking begins on day one, not years later when a problem surfaces or a recovery programme tries to find it.

- Condition monitoring becomes possible from a known baseline rather than an assumed one
- Warranty tracking is automatic rather than manual
- End-of-life forecasting can be built from actual age and usage data rather than depreciation schedules
- Recovery programmes can identify eligible assets proactively rather than reactively
- Remanufacturing decisions can be made on condition data rather than visual inspection alone

For manufacturers, this represents a natural extension of existing data infrastructure — and a significant differentiator in a market where customers are under increasing pressure from their own finance and sustainability functions to account for what they own and demonstrate responsible end-of-life management.

## The FRAME© model in practice

---

Indesosa's FRAME© system — Furniture Review, Audit and Management Engine — was developed directly from the experience of large-scale audit programmes. Its founding insight is that an audit should not be a sunk cost. It should be the baseline from which ongoing management becomes practical, accurate, and affordable.

FRAME© operates in two modes. In audit mode, experienced project managers capture digital images of asset types, apply individual barcodes, and record location and condition at building level, delivering a complete and accurate baseline register. In lifecycle mode, the same platform is reconfigured for day-to-day operational use — enabling any level of operator to record moves, condition changes, repairs, removals, and new additions against individually identified assets. The attributes tracked — dimensions, cost, supplier, warranty, condition, location — are fully configurable, and the data can be synchronised with formal CAFM systems where these are in place.

FRAME© is currently being deployed for a major European bank covering approximately 15,000 furniture assets across multiple locations, with the Lifecycle module being introduced post-audit to provide ongoing management capability. It is a working example of what the transition from reactive auditing to continuous asset visibility looks like in practice.

The relevance to manufacturer end-of-use programmes is direct. A customer estate managed through FRAME© is an estate whose assets are individually identified, location-tracked, and condition-monitored in real time. That is precisely the visibility that makes asset interception, refurbishment triage, and closed-loop recovery programmes operationally viable at scale.

## A partnership worth exploring

---

The challenges described in this paper are not insurmountable. They are, in large part, a coordination problem — the manufacturer holds product data that the customer needs, and the customer holds usage and condition data that the manufacturer needs. Neither party currently has a mechanism to bring those data sets together across the lifetime of an asset.

What would be most valuable now is a practical conversation between those building end-of-use and circularity infrastructure on the manufacturer side, and those with experience of asset management at scale on the customer side. There are specific questions worth exploring: how point-of-sale identification could be integrated into existing manufacturer processes; how FRAME© lifecycle data could inform recovery programme planning; and what a shared data model for the full furniture lifecycle might look like in practice.

Indesosa brings to that conversation 20 years of audit experience, a proven operational system, and a perspective on the customer-side data problem that has been tested across programmes of significant scale. The ambition of the manufacturers investing in circular economy infrastructure is one we share. The gap we are describing is one we believe we can help close.

*I would welcome the opportunity to discuss this further.*

**Gordon Petrie**

Indesosa | [g.petrie@indesosa.co.uk](mailto:g.petrie@indesosa.co.uk) | 07855 743209