



WHITE PAPER

HOW ARE AI AND 3D REINVENTING CATEGORY MANAGEMENT AND MERCHANDISING?

From national planograms to Store-Specific



"Roll out this Cola planogram
across 13 bays + header POSM"

STORE-SPECIFIC PLANOGRAM



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A/ DEFINITIONS AND CONTEXT

Merchandising is going through a disruption comparable to the one e-commerce experienced fifteen years ago. Personalized shelf layouts, long out of reach, are becoming possible thanks to the convergence of 3D, generative artificial intelligence and computer vision. Before measuring their benefits, let us look back at how the profession has evolved and at the technology building blocks involved.

1/ The evolution of merchandising: from national planograms to Store-Specific

For decades, the rule in mass retail relied on **national planograms**, rolled out across broad store tiers (clusters A, B, C). This generic approach, designed to simplify production and execution, is now **obsolete**.

The diversity of catchment areas, **pressure on sales per square meter** and shrinking backroom space now make it necessary to design layouts specific to each point of sale: this is **Store-Specific** merchandising. A hypermarket, an urban commuter store and a seaside resort store have neither the same shopper profile nor the same shelf geometry.



The problem is one of scale. Tailoring the shelf case by case across a network of 500 or 2,000 stores creates **combinatorial complexity**: every category, every fixture format and every customer profile multiplies the number of versions to produce. **Without automation and an AI engine, this level of personalization is an operational impossibility.**

2/ The reality of CatMan & Merch: the burden of data and Excel

There is a major gap between the strategic ambition of Category Management and the day-to-day reality of the teams. Today, a merchandiser or category manager spends **up to 70% of their time on manual tasks** with little added value.

Spreadsheet hell

Manually extracting and cross-referencing heterogeneous files: POS sales data, average weekly sales (AWS), market share, panel data. Every category review starts with days of consolidation.

Time-consuming visual data entry

Placing products one by one, manually adjusting facings and calculating capacities in traditional space planning software.

Endless iterations

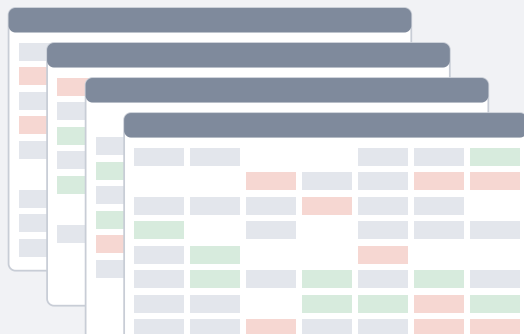
Rebuilding each planogram for 10 different fixture formats during category reviews or trade negotiations, then starting again with every new decision.

Up to 70% of CatMan & Merch teams' time is absorbed by data preparation and data entry.

Time taken away from analysis, strategy and the brand-retailer relationship.

BEFORE

Manual entry and spreadsheets



3 to 6 weeks per review



AFTER

Retail VR AI platform

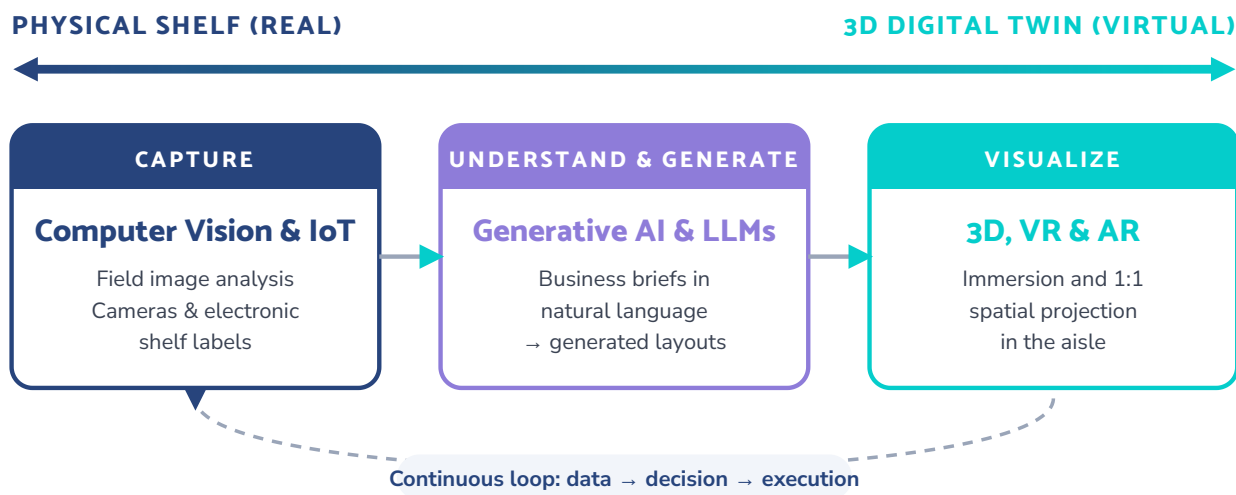


Generated in a few hours

From 3 to 6 weeks of manual production to generation in a few hours.

3/ The technology continuum: from 3D to LLMs and Computer Vision

Much like the **reality–virtuality continuum** described by Paul Milgram, which links the real environment to the virtual one, the modern retail technology ecosystem brings together several complementary building blocks. Taken in isolation, each solves part of the problem; combined, they cover the entire chain, from the physical shelf to its digital twin.



3D

3D and VR/AR

For **visualization**, immersion and 1:1 spatial projection. They make a planogram tangible before it is implemented — on screen, in a headset or directly in the aisle.

AI

Generative AI and LLMs (e.g. Claude, GPT)

To **interpret business briefs written in natural language** and generate layouts. The category manager states an intent; the model translates it into rules, zoning and planograms.

CV

Computer Vision and IoT

For **automated analysis of in-store images** and on-shelf stock monitoring through cameras or electronic shelf labels. They close the loop by measuring what is actually executed.

It is the combination of these three blocks — **capture, understand and generate, visualize** — that makes it possible to move from batch merchandising to continuous, personalized merchandising.

B/ 3D AND AI: WHAT NEEDS DO THEY ADDRESS?



Retail Staging: 3D digital twin of a beverage aisle, with POS materials and promotional pallets.

1/ Needs in assortment strategy and Category Management

Category Management aims to **match the offer to customer needs** in order to maximize margins and revenue. It relies on close collaboration between brands and retailers, and on decisions that commit the scarcest space in the store: the shelf.

1

Test before investing

Validate the visual impact of a new packaging design or a range reset with consumers, **without relying on lab stores** that are costly and slow to set up.

2

Optimize share of shelf

Calculate the theoretical shelf space each SKU needs based on **average weekly sales (AWS)**, and make objective trade-offs between categories, brands and private labels.

2/ Needs in volumetric optimization and planogram creation

1

Absorb the mass of data

Link sales data — including data from space planning tools such as **NielsenIQ Spaceman** — directly to the visual rendering, to guarantee **safety stock** levels and avoid both overstocking and stockouts.

2

Shorten cycle times

Go from **4 weeks of manual creation to a few hours**, to respond faster to market trends, product launches and seasonal events.

70%

of team time absorbed by manual tasks

4 wks

to create a planogram manually

2,000

stores to address individually in a large network

3/ Needs in Trade Marketing and in-store execution

1

Close the Execution Gap

Make sure that the commercial agreements negotiated between brand and retailer — **Share of Shelf**, promotional locations, end caps — are actually applied on the shelf. The gap between the theoretical planogram and in-store reality remains one of the leading sources of lost value.

2

Remove the sales force's admin burden

Enable sales reps to **visually validate a layout directly in store** with the department manager, instead of reworking proposals on their laptop in the evening.

In short

These needs span the entire value chain: **understanding** the shopper, **designing** faster and more precisely, **convincing** in the field and **measuring** execution. This is exactly what the combination of AI and 3D addresses.

C/ THE ANSWER: AI AND IMMERSIVE TECHNOLOGIES

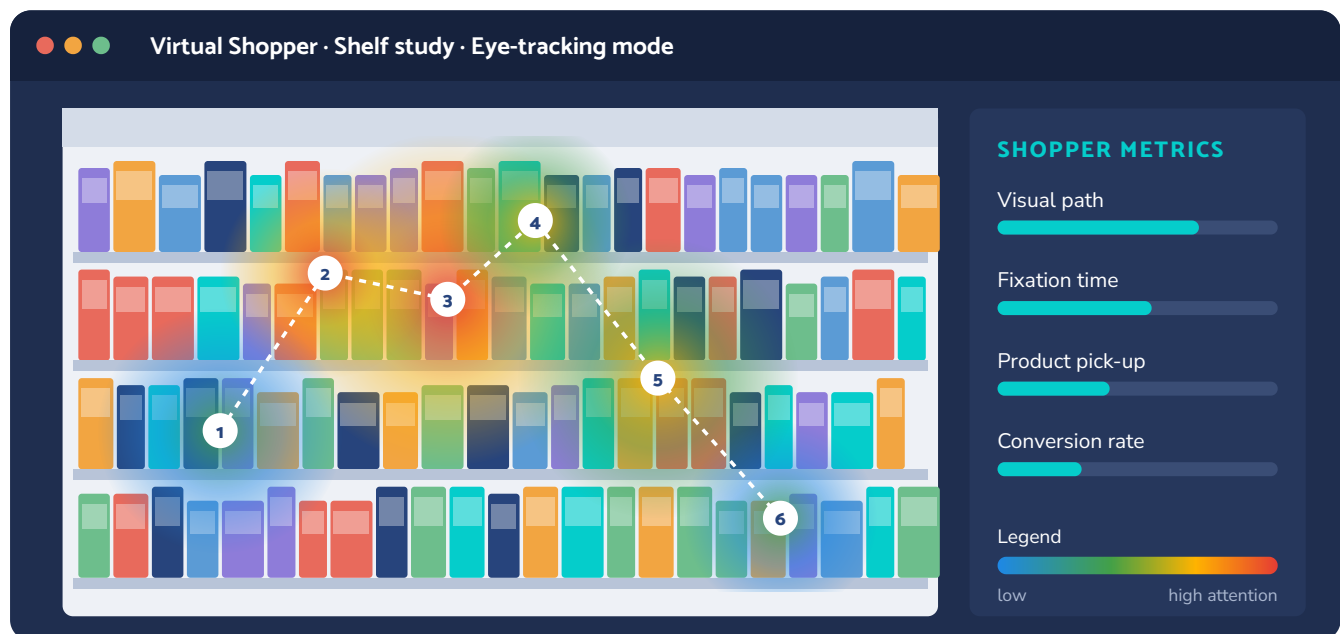
1/ Instant 3D modeling and virtual shopper studies

3D pack generation

Product modeling has long been a bottleneck: every SKU had to be rebuilt manually in 3D. AI now enables **instant conversion of a 2D photo into an interactive 3D model**, at zero cost. An entire category catalog can be digitized in record time — including packaging that does not yet physically exist.

3D Shopper Studies (Virtual Shopper)

Recreating **virtual supermarkets** makes it possible to analyze shopper behavior — visual paths, heatmaps, conversion rates — in partnership with market research firms (Kantar, Ipsos, BehavioRally). Several scenarios can be tested in parallel, on national or even international panels, with no physical setup.

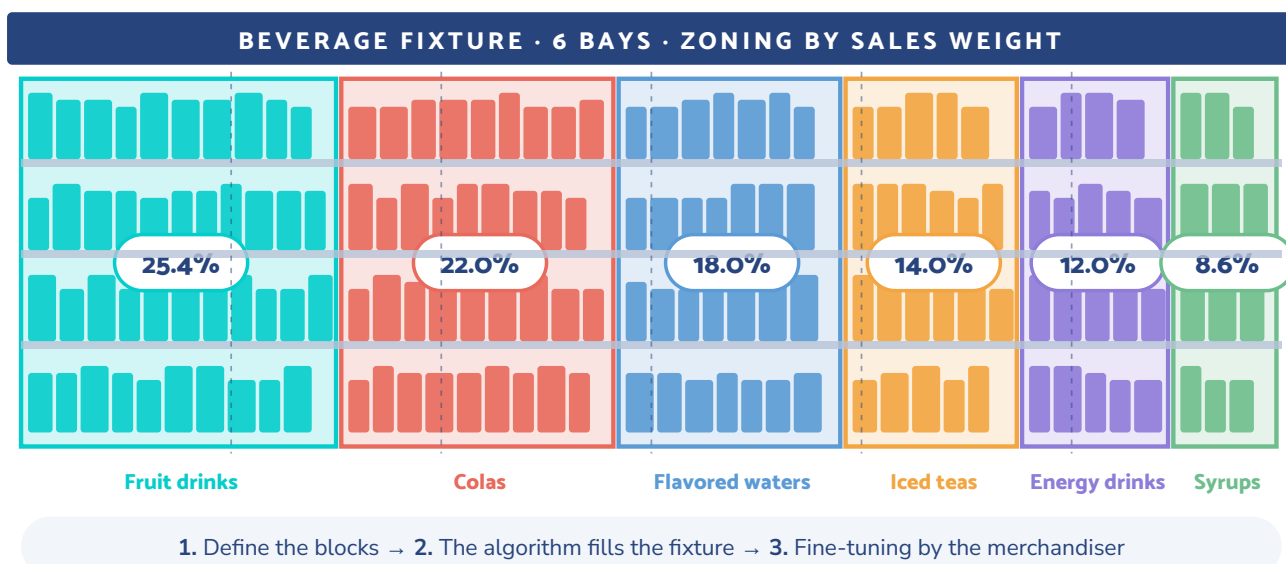


Virtual Shopper application: heatmap of a panelist's gaze and sequence of fixations on the shelf.

2/ Automated creation: from zoning to natural-language prompts

Smart business zoning

Rather than placing products one by one, the merchandiser **defines category blocks according to their sales weight** (for example: 25.4% fruit drinks). The algorithm then automatically fills the fixture while respecting business rules — minimum facings, safety stock, adjacencies, shelf heights. The result: **50% time savings** compared with traditional drag-and-drop.



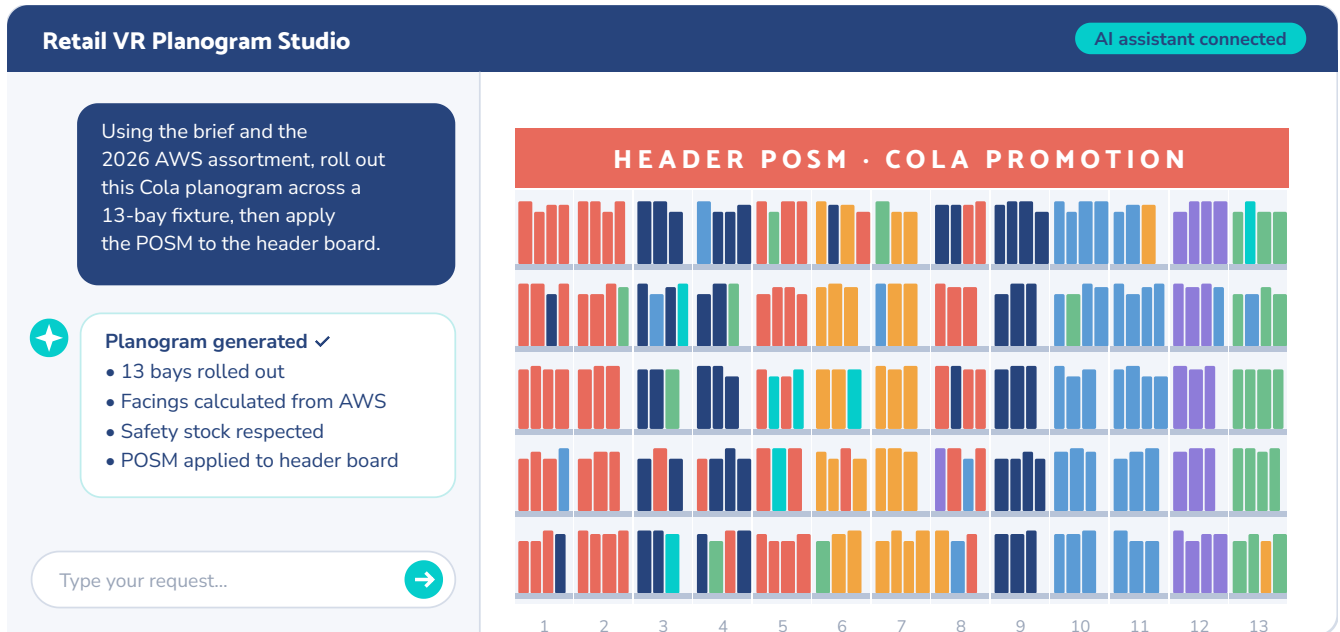
Retail VR zoning: a fixture divided into color-coded category blocks, showing each block's share of shelf.

AI prompt-based generation (LLM)

The next step: **driving creation in natural language**. Through an assistant connected to the platform (Retail VR Planogram Studio), the category manager expresses their intent just as they would to a colleague. The LLM interprets the brief, queries assortment and sales data, then generates the layout.

USER PROMPT

"Using the brief and the 2026 AWS assortment, roll out this Cola planogram across a 13-bay fixture, then apply the POS materials to the header board."



Conversation with the AI assistant (left) and the complete planogram generated automatically (right).

3/ Augmented field sell-in (In-Store Activation)

Equipped with a smartphone or tablet, sales reps **project 3D fixtures, display boxes and POS materials at actual size (1:1 scale)** in the store aisle, using augmented reality or a simple QR code. The department manager immediately sees the promotion exactly where it will be set up.

The result: real-time response to the department manager's requirements, a photo of the approved project, and an **average of 5 hours of admin work saved per week** for each sales rep.



In-Store Activation: a refrigerated cabinet and a POS display column projected in augmented reality, at 1:1 scale, in the store aisle.

4/ Continuous shelf monitoring (Computer Vision & IoT)

Designing a perfect planogram is not enough: it must also be **correctly executed and maintained** over time. Computer vision and connected devices make it possible to move from one-off audits to continuous monitoring.

Image recognition audits

Automatic analysis of shelf photos to calculate the **Compliance Rate** against the theoretical planogram: missing products, misplaced items, facings not respected.

IoT & the connected store

On-shelf cameras and electronic shelf labels (for example **VusionGroup / Captana**) to **detect stockouts in real time** and trigger replenishment.

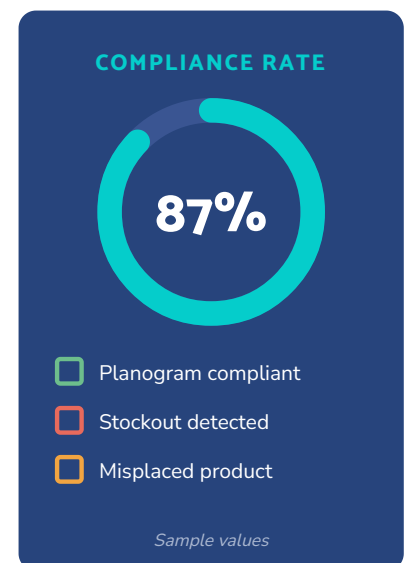
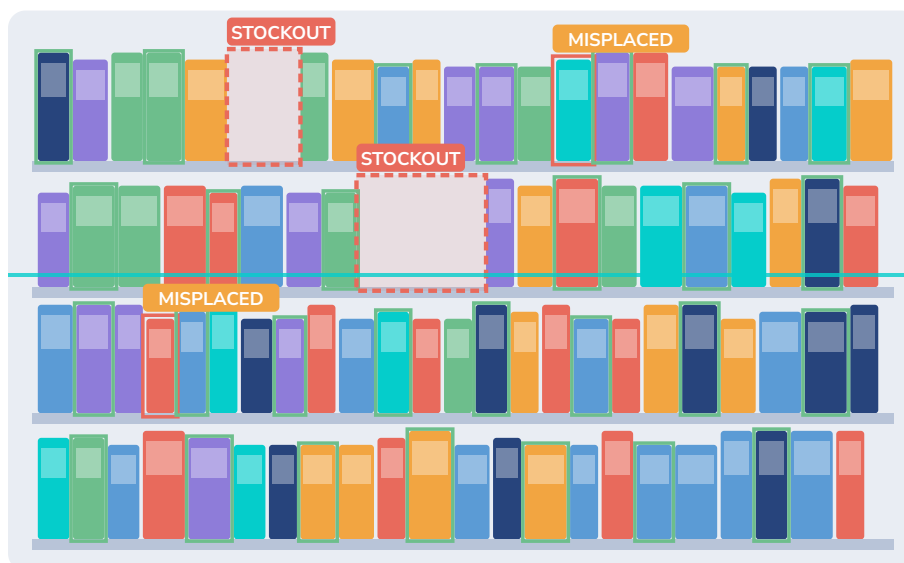


Image recognition: detection of stockouts and planogram deviations, and calculation of the compliance rate.

D/ THE BENEFITS OF AI AND A STRATEGIC MATRIX

Throughout this white paper, we have seen that 3D technologies, generative AI and computer vision are not isolated building blocks: each, at its own stage, addresses very real challenges for brands and retailers alike. The following matrix sets them side by side.

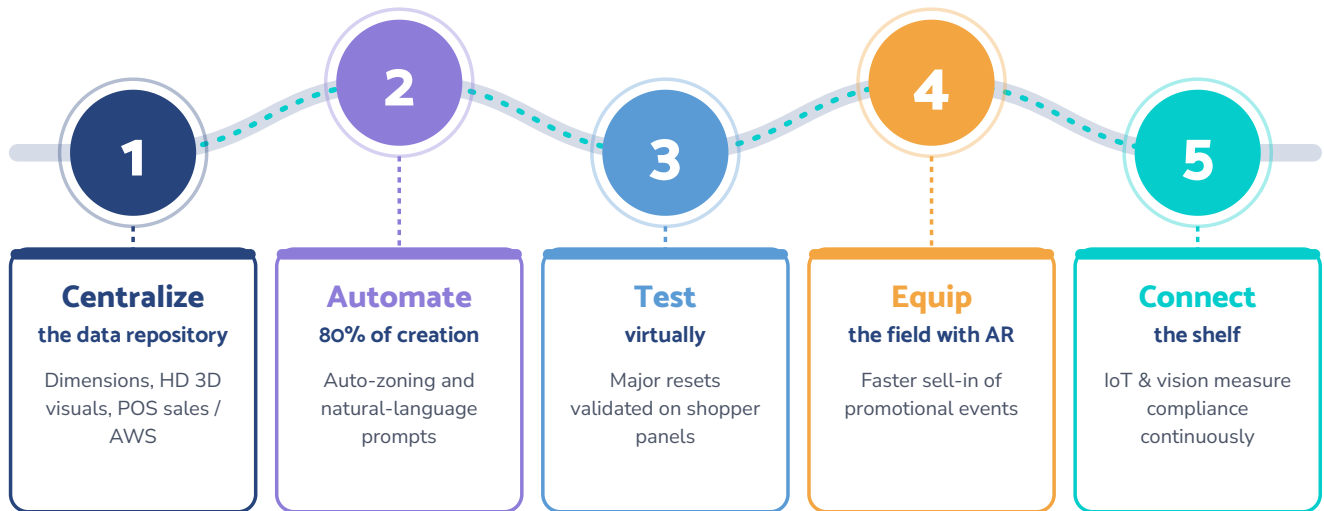
1/ Impact matrix: Brand vs Retailer

Merchandising axis	Brand challenges (CPG / FMCG)	Retailer challenges	Key solution & technology
O1 Understand & Test	Validate pack appeal and Share of Shelf.	Maximize overall profitability per m ² .	Virtual Shopper / InContext (immersive 3D)
O2 Design & Roll Out	Quickly generate multi-retailer merchandising guidelines (IWD).	Adapt planograms to the size of each store (Store-Specific).	Retail VR / NIQ Spaceman (zoning & AI prompts)
O3 Convince & Activate	Negotiate locations and space for promotional events.	Ensure technical feasibility on the shelf and smooth setup.	In-Store Activation (augmented reality / QR code)
O4 Measure & Optimize	Ensure negotiated commercial agreements are respected.	Eliminate visible stockouts (Out-of-Stock).	Computer Vision / VusionGroup (IoT)

Brands and retailers now share the same visual and data reference: the planogram becomes a shared object of collaboration rather than a blind negotiation.

2/ A 5-step deployment framework

Adopting AI in merchandising does not happen by decree: it is built step by step, first securing the data foundations before extending use cases to the field. Here is the framework we recommend.



1

Centralize the data repository

Product dimensions, HD visuals and 3D models, POS sales and AWS data: a single, reliable repository is the prerequisite for any automation.

2

Automate 80% of creation

Automatic zoning and natural-language prompts take over production; teams focus on high-value decisions.

3

Test virtually

Major resets are validated with shopper panels in a virtual store before any physical rollout.

4

Equip the field with augmented reality

The sales force speeds up the sell-in of promotional events and eliminates administrative re-entry.

5

Connect the shelf

IoT and computer vision measure compliance continuously and feed results back into the data repository.

CONCLUSION

Merchandising is entering the **Store-Specific** era. What was once an operational impossibility — a planogram tailored to every store in a network of several hundred points of sale — is now within reach thanks to the combination of 3D, generative AI and computer vision.

For Category Management and Merchandising teams, the goal is not to replace business expertise but to **free it up**: fewer spreadsheets and less data entry, more analysis, testing and collaboration with partners. For brands and retailers alike, it means better-informed, faster decisions that are actually executed on the shelf.

ABOUT RETAIL VR

Founded in 2018, Retail VR develops **AI-powered 3D, virtual reality and augmented reality solutions** for the retail industry. Through its platform, Retail VR supports brands, retailers and e-merchants across shopper research, planogram design and rollout, field activation and in-store execution monitoring.

Learn more: www.retail-vr.com

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