

CASE STUDY · DATA SCIENCE & AI

THE SPACE REGISTER

What each metre of shelf earns, and which brand to let it to.

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AT A GLANCE

Store space is still let from a spreadsheet. It should be let on what it earns.

For a multi-brand beauty retailer, space is what it sells to brands. Headquarters merchandising tracks in a spreadsheet who holds which fixture, at what rent, until when. The file says neither how many shoppers stop at each shelf, nor what another brand would earn in its place.

10%

error on each bay's weekly sales, over 26 weeks the model never saw, against 21% for the spreadsheet's average.

+108 k€

of rent a month across 40 stores: busy vacant space let, and rents brought in line with traffic at renewal.

+7.7 k€

a month from two vacant bays on the Paris flagship's fragrance wall, given to Chanel, for €2,400 of refit.

WHAT THE SYSTEM DOES

- **It draws every store**: the floor plan, each fixture face-on, each one-metre bay with its brand, contract and rent.
- **It estimates shopper traffic** from sales: units sold divided by the category's conversion rate.
- **It forecasts what a brand would sell** on a bay where it has never been, and prices every reallocation.
- **It leaves the decision to the merchandiser**: an assistant proposes, the code reprices, a person decides.

WHY IT CAN BE TRUSTED

- **The model is measured** on 26 weeks it never saw, and its error is shown in the demo.
- **Its weights can be read**: Christmas, distance from the entrance, the endcap and the brand's strength, each on its own.
- **Gemini chooses, the code computes and checks**: no figure comes from a language model.
- **A brand never sees its competitors**: the retailer sees everything, and a test checks it on every release.

Floor plans follow Sephora's public layout rules. Contracts, rents, sales and traffic are synthetic, with hidden effects the model has to find on its own: the amounts show the method, a pilot on real data will give the real value.

The spreadsheet says who holds the shelf. Not what the shelf earns.



Fragrance wall in a Sephora store · illustration

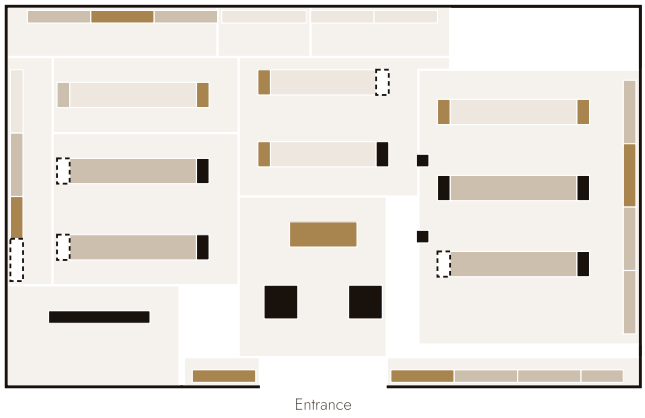
THE PARIS FLAGSHIP · 5 OCTOBER 2026

174 bays over 179 metres, 45 contracts, €60,900 of rent a month for €757,900 of sales. 10 bays are vacant, and three brand spaces come to an end within 90 days.

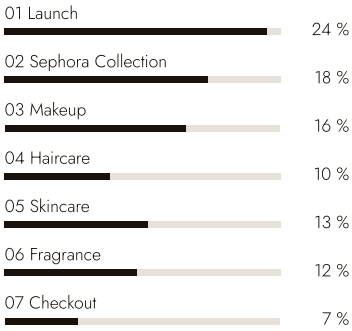
Traffic is invisible. The launch podiums facing the entrance get almost a quarter of all shopper stops: three times the store's average per metre. Skincare, in the middle, a quarter less than the average.

Rent does not follow traffic. Two vacant bays on the fragrance wall see more shoppers than the average. Across the network, 122 brand spaces pay less than two thirds of their store's median rent per 1,000 shoppers.

THE PARIS FLAGSHIP, EACH FIXTURE COLOURED BY ITS TRAFFIC INDEX



CUSTOMER JOURNEY · SHARE OF STOPS



Index 100: the store's average per metre. Traffic is estimated from sales: a product that sells a lot draws a lot of shoppers. A vacant bay takes the traffic of its neighbours within 3 m. The journey comes from the store's zone sensors.

Four steps, a rent with its figures.

01	DRAW	Each store is described fixture by fixture: walls, double-sided gondolas, endcaps, podiums, checkout, each cut into bays of about a metre. A planogram export can also be read from an image by Gemini, then checked by hand. 95% OF FIXTURES PLACED RIGHT, 2 TO 5 CM OFF, ON 9 PLANS
02	COUNT	A bay's units sold, divided by its category's conversion rate, 8% in fragrance, 16% in makeup, give its shopper stops a week. Each spot gets a rent per 1,000 shoppers, compared with the rest of the store. A SUGGESTED RENT FOR EVERY FREE BAY
03	FORECAST	A regression in BigQuery ML, trained on two years of sales, splits what the spot is worth from what the brand is worth, with the retail calendar and launches. 10% ERROR, AGAINST 21% FOR THE SPREADSHEET'S AVERAGE
04	SIMULATE	Give bays to a brand, to a new brand, or leave them vacant: rent, sales, margin, refit and payback. A Gemini assistant proposes a plan, which the code checks and reprices before showing it. A BRAND UNDER CONTRACT IS MOVED, NEVER EVICTED



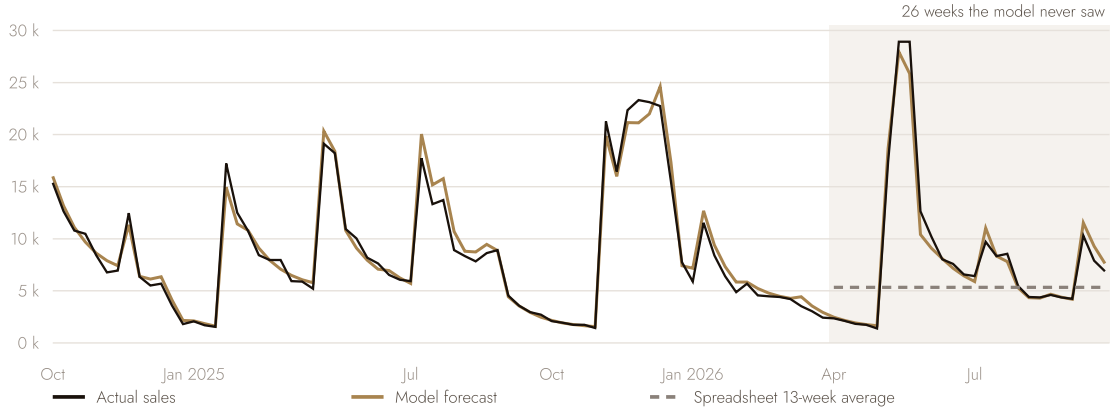
Skincare gondola in a Sephora store, one bay per brand · illustration

FORECASTING

What a brand would sell on a bay where it has never been.

That is the question behind every reallocation of space. The spreadsheet answers with the bay's average over the last 13 weeks, which still carries the previous brand. Since each department was re-laid out once, the model sees the same brand in two places, and tells the value of the spot from the strength of the brand.

A LAUNCH PODIUM OF THE FLAGSHIP, WEEKLY SALES OVER TWO YEARS



HELD-OUT WEEKS	MODEL	13-WEEK AVERAGE	SAME WEEK LAST YEAR
All, 150,756 bay-weeks	10%	21%	25%
Retail events: Mother's Day, sales, August	10%	28%	27%
Bays that changed brand	10%	39%	42%
Launch podiums	12%	49%	60%

Absolute error over actual sales, per bay and week. Trained on 78 weeks, measured on the next 26, April to September 2026. The error is this low partly because the synthetic data follows the model's form; on real sales it will be larger, and the protocol stays the same.

CHRISTMAS

Fragrance sells 2.75 times more in the peak week, against 2.85 hidden in the data.

THE ENTRANCE

A bay at the entrance sells 1.83 times a bay at the back, against 1.79 hidden.

THE ENDCAP

2.5 times a wall bay, as in the data: the model's weights can be checked.

What to act on in the flagship, largest amount first.

OLAPLEX
Contract ended 34 days ago, not renewed — €2,640

FRAGRANCE WALL
2 vacant bays, traffic index 132 — €1,190

MAKEUP
2 vacant bays, traffic index 113 — €1,120

GUERLAIN
Contract ends in 84 days — €470

JO MALONE LONDON
Contract ended 33 days ago — €370

Monthly amount at stake: the current rent of a contract to renew, the suggested rent of a vacant space given its traffic.

FRAGRANCE WALL · 2 VACANT BAYS	FORECAST SALES	MANUAL ESTIMATE	GAIN / MONTH	PAYBACK
Chanel	€17,051	€11,069	+€7,670	0.3 months
Dior	€15,265	€11,522	+€6,991	0.3 months
Yves Saint Laurent Beauté	€13,567	€9,107	+€6,346	0.4 months
Armani Beauty	€11,324	€7,847	+€5,493	0.4 months

Monthly sales the model forecasts on these two bays, against the manual estimate: the brand's sales per metre across the network. Gain = suggested rent of €1,190 + the retailer's 38% margin on sales. Refit: €1,200 per bay.

THE SAME CALCULATION ACROSS 40 STORES

+60 k€
of rent a month: 102 busy vacant bays, let within the year at their suggested rent.

+48 k€
a month by closing, at renewal, half the gap of the 122 rents too low for their traffic.

180
brand spaces ending within 90 days, each with its candidate brands.

COST IN PRODUCTION

With no server left running, the register only costs its calls.

The demo runs on GCP, in the free tier: Cloud Run, Firestore, BigQuery. At a retailer, it plugs into the existing data warehouse. Simulations are computed in memory, with no paid call; what the project adds comes down to the assistant's Gemini calls and one retraining of the model a month.

≈ 8 € / month

under €100 a year for headquarters, however many simulations are run.

WHAT THE PROJECT ADDS	ASSUMPTION	€ / MONTH
Reorganisation assistant	500 plans a month, €0.006 each	3.00
Questions in plain words	1,000 questions a month, €0.003 each	3.00
Reading imported plans	50 plans a month, €0.008 each	0.40
Retraining the model	once a month, BigQuery ML	< 1.00
Simulations and indicators	computed in memory	0

Unit costs measured on the live version, except the question in plain words, estimated. Cost follows the use of the assistant, not the number of stores or brands.

CAP

A daily cap on Gemini spend in the code, which cuts off at once, then a budget with alerts.

TRACEABILITY

A label per project and a log per call: model, tokens, cost. The cost of each plan can be read in BigQuery.

RESTRAINT

Flash-Lite for the assistant: 1 to 2 seconds a call, instead of 30 to 60 with a larger model.

NEXT STEPS

A twelve-week pilot, then what comes next.

W1–3	**FRAME**	Choose ten stores and their floor plans with headquarters merchandising. Gather the space contracts file, weekly sales per bay and door counts. DELIVERABLE · THE REGISTER OF THE TEN STORES, SIGNED OFF
W4–7	**REPLAY**	Replay the model on re-layouts already made: what it forecast against what sold, compared with the spreadsheet's average. DELIVERABLE · THE ERROR MEASURED ON REAL SALES
W8–12	**PILOT**	Renewals and reallocations of space in test stores, against control stores that keep today's method. The gap is read every week. DELIVERABLE · THE DECISION TO SCALE

WHAT IT TAKES AT SEPHORA

DATA

Floor plans, space contracts, weekly sales per bay or per product, door counts.

TEAM

A lead merchandiser to sign off the plans, an AI engineer to connect the data, run and monitor the model.

PLATFORM

The data warehouse in place. To add: user identity for brand partitioning, model monitoring and cost tracking.

The same register, from the contract to the negotiation.

Once the pilot is measured, the same foundation answers other decisions in merchandising, trade marketing and brand relations: each one compared with today's method, in euros.

CONTRACTS & BRANDS

NEGOTIATION BRIEF

Traffic, rent per 1,000 shoppers, suggested rent, in a retailer and a brand version.

READING CONTRACTS

Dates, rent and penalty from a PDF, unusual clauses flagged, checked before they enter the register.

SELLING SPACE

A free bay, a target brand, the pitch with its figures.

WEEKLY BRIEFING

Contracts ending, spots falling behind, per profile.

MERCHANDISING

SPACE ELASTICITY

Does one more metre earn as much as the last? By brand and by category.

ADJACENCIES

A brand's effect on its neighbours, and adjacencies drawn from tickets.

THE WHOLE NETWORK

Re-laying out hundreds of stores under constraints: exclusivities, fragrance rules, running contracts.

TWIN STORES

What a similar store gained with the same reorganisation.

OMNICHANNEL

IN STORE, ONLINE

1,000 shoppers at the shelf against 1,000 impressions on the website.

RETAIL CALENDAR

Launches and Christmas, with clashes on an endcap.

STOCK-OUTS AND SPACE

The sales a bay loses when out of stock, flagged before the gap grows.

TEST AND LEARN

Each reorganisation compared afterwards with control stores.



THE AUTHOR

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Senior Data Scientist. Six years in supply chain, operations and omnichannel, at Bouygues Telecom, Crédit Agricole and Ardian. Dataiku certified, on GCP and BigQuery.

I designed and built this project end to end: the business question, the forecasting model, the assistant, and the architecture that runs them on GCP, from the store plan to the API, with its cost and partitioning safeguards.

It is how I work: start from a business decision, put a figure on it against today's method, build what makes it run, and make it readable to the people who take it.

FRAME

A precise business decision, a costed case that technical and business teams discuss together, and whatever does not hold, dropped.

DELIVER

Models compared with today's method, in euros, and the architecture that puts them in production on GCP, ready to hand over to data engineers.

BRING THE BUSINESS ALONG

A model only counts if it is used: train the merchandisers, explain each figure, leave them the decision and improve the tool with their feedback.

LIVE DEMO

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Independent project, not affiliated with Sephora or LVMH. Contracts, rents, sales and traffic are synthetic; floor plans are inspired by Sephora's public layout rules. Photos of Sephora stores for illustration only.