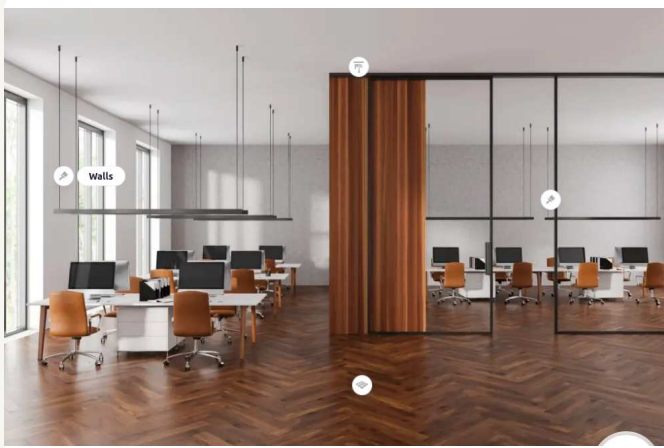


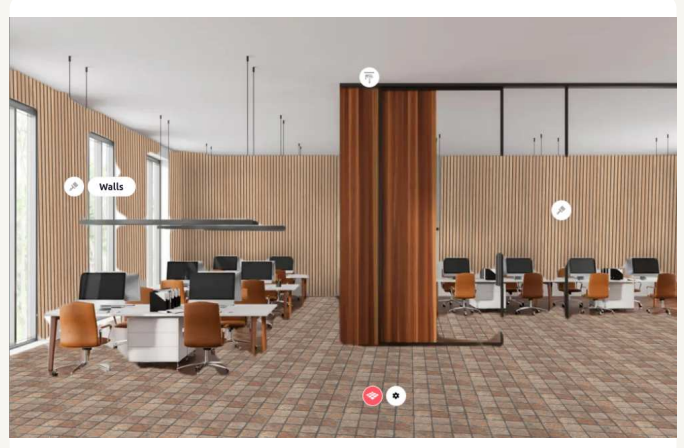
Material replacement in a real room

A Company offers an interior material visualiser. A user chooses wall and floor finishes and expects a credible preview of those exact materials in the original room.

PUBLIC DEMONSTRATION SCENE: BEFORE AND AFTER



Original public demonstration scene



Company visualiser result: wall and floor materials applied

THE TWO CATALOGUE PATTERNS SELECTED FOR THE DEMONSTRATION



Wall finish
Vertical timber-like slats



Floor finish
Square tile grid

THE EXPECTED RESULT

Correctly identify architectural surfaces; maintain room perspective, furniture, glazing, lighting and occlusions; apply the chosen material consistently across each surface without painting over objects or inventing new geometry.

What triggered the analysis? Even this public, curated demonstration result contains local visual inconsistencies. The next page shows the four original cropped areas. Their appearance is observed; the exact internal software causes remain hypotheses.

Four details worth investigating

The following four crops are enlarged parts of the Company visualiser output on the previous page. They show why the problem is more demanding than merely filling a labelled surface.



01 / DESKS AND CHAIRS

Tile boundaries around thin legs and wheels; examine object/floor separation.



02 / WINDOWS AND PANELS

Wall cladding meets glazing, frames and narrow surface transitions.



03 / FLOOR CONTINUITY

A conspicuous displaced tile edge or strip appears near the distant workstations.



04 / CENTRAL DIVIDER

A spurious geometric strip extends along the floor beside the central wooden divider.

WHAT THESE IMAGES PROVE — AND DO NOT PROVE

The visible output has local boundary and surface-consistency issues even on a public demonstration scene. The images alone do not identify whether segmentation, 3D geometry, occlusion handling or rendering caused each defect. That uncertainty defines the next experiments.

SOURCE Four untouched close-ups from the captured Company visualiser result, 11 Oct 2026.

Better picture, or better understanding?

Modern image editing can produce compelling room pictures, while geometric methods can give testable surface hypotheses. Neither alone solves the complete commercial problem.



Source room with divider and glazing



Our controlled experimental output

A PROMISING VISUAL RESULT IS NOT YET A PRODUCT

VISUAL QUALITY

A coherent-looking replacement

A generative route can yield a convincing appearance even when the scene has difficult boundaries.

GEOMETRIC TRUTH

Explicit surfaces and camera

A projected 3D hypothesis can be measured and challenged independently of picture generation.

PRODUCT PRECISION

Exact SKU, pattern and scale

Customers need a specific catalogue material, not a merely similar synthetic texture.

RELIABILITY

Repeatability on difficult scenes

A real improvement must hold across rooms and retain the original furniture and illumination.

THE WORKING QUESTION

The research question was no longer “can we make a nicer picture?” It became “which observable checks explain, prevent or correct the failures?”

This was a comparison of technical directions, not a market-wide benchmark. It led to input-signal tests, independent geometry, and adversarial review.

SOURCE Research dialogue, 16–18 Sept; controlled materialisation and explicit 3D outputs.

Can more visible structure help?

The first controlled question concerned the input signal, not a replacement for the Company's pipeline.



Original public office scene



Image after VIC-TORI enhancement; same source scene

MEASURED CHANGES ON THREE ARCHIVED SCENES

SCENE 1

+20%

gradient magnitude gain

gradient map: 0.982 / strong edges:
98.4%

SCENE 2

+32%

gradient magnitude gain

gradient map: 0.982 / strong edges:
98.0%

SCENE 3

+25%

gradient magnitude gain

gradient map: 0.960 / strong edges:
98.5%

The gradient maps remained strongly correlated; most strong boundaries remained within approximately 1.5 pixels of their original positions. This suggested a useful stress test: apply the same downstream pipeline to original and enhanced inputs and compare segmentation, geometry and end-task quality.

EXPERIMENTAL LIMIT

Enhancing an image is not evidence that the final material-replacement task improves. The downstream A/B test remained to be done.

The first attempt exposed our own error

The important evidence was not a perfect image; it was discovering how an incorrect task description changed the result.



Original scene; a wooden interior divider sits in front of architectural surfaces



Experimental materialisation: plausible looking, but not a reliable semantic/3D reference

FAILURE MODE

“Central vertical surface” is not “architectural wall”

A loosely defined prompt caused an internal object/divider to be treated as a room surface. We did not patch this by explicitly pointing to the known mistake; we reformulated the semantic classes generically.

REVISED SEMANTIC CLASSES

1

Room envelope

Architectural walls, floor, ceiling

2

Room content

Furniture, glass partitions, curtains, interior objects

3

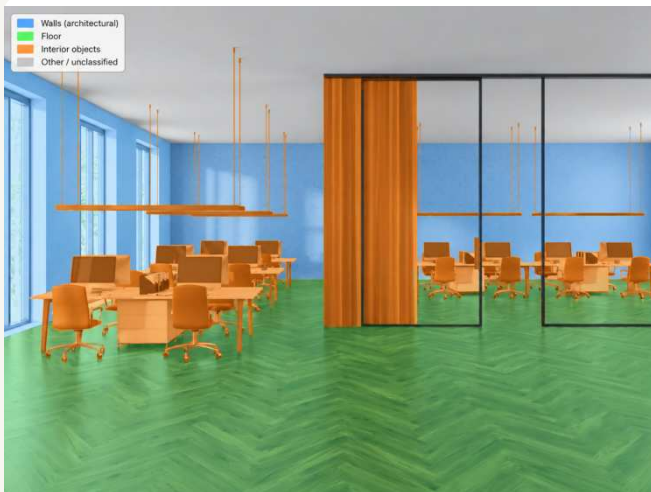
Preservation

Fixed camera, objects and source composition

This change was methodologically important: it separated “what constitutes the room” from “what is positioned inside the room”, without supplying the generator with a retrospective, location-specific answer.

Separate understanding from painting

We stopped asking one generative pass to infer structure, change materials and make an attractive picture simultaneously.



Frozen semantic map: room-envelope and interior-object classes



Controlled surface-stage visualisation



Combined controlled materialisation; a qualitative demonstration, not a production output

WHAT CHANGED

A staged workflow

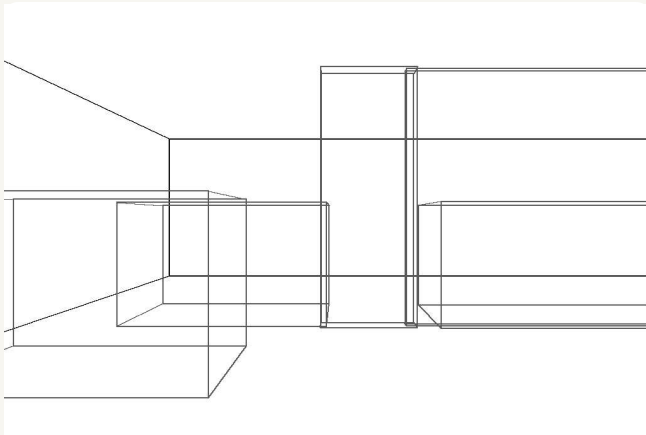
1. Identify semantic categories.
2. Freeze the map.
3. Change walls and floor by separate operations.
4. Compare against the original scene and preserve fixed objects.

CRITICAL DISTINCTION

A persuasive generated picture can still be built on false geometry, changed furniture or an incorrect product pattern.

Rejecting plausible but invented 3D

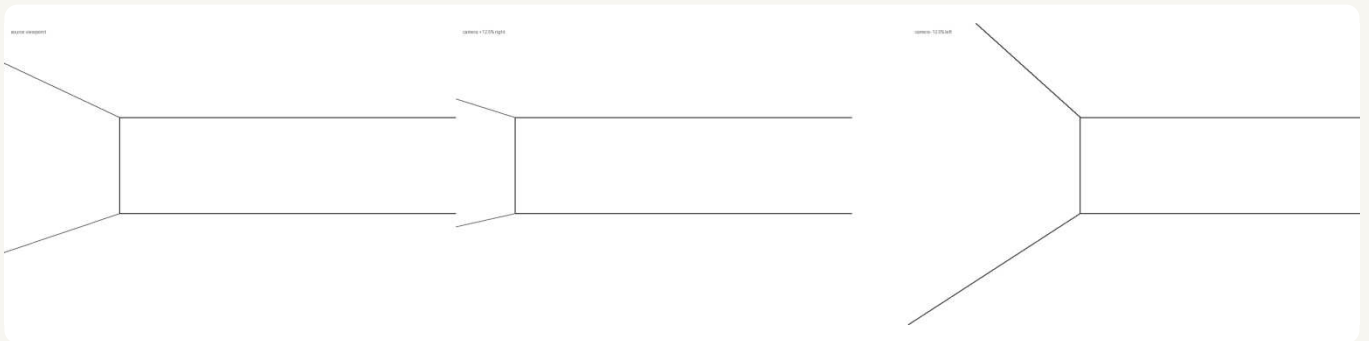
A second disagreement changed the experiment: instead of synthesising another view, build an explicit model and project it mathematically.



Explicit coarse room-shell wireframe; relative, not metric geometry



Projection of the explicit room model into the original camera



Three projections from one geometric model; generated without image synthesis

RULE INTRODUCED

OPEN / UNKNOWN is an allowed answer

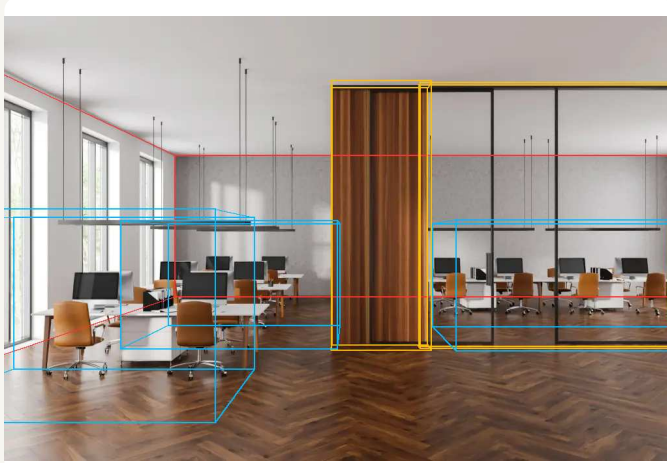
An invisible corner or unobserved wall junction must not be closed merely to produce a complete rectangular room. A one-view interpretation can remain ambiguous even when its 2D projection looks plausible.

The resulting artefacts included the camera/plane model in JSON, a coarse room-shell representation and reprojected images. What we verified was geometrical consistency of our explicit hypothesis under projection, not centimetre-accurate reconstruction of the real room.

SOURCE Frozen 2D→3D note, 18 Sept; room_coarse.json, projection.png and mathematical-view figures.

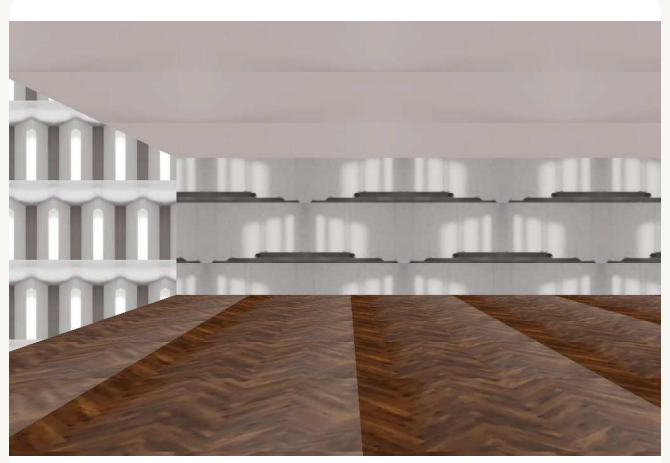
A deliberate stop, not a failed deliverable

Adding simplified furniture solids came too early: some apparent “objects” are actually exceptions to the wall or floor plane.



Early internal-box hypothesis: retained for provenance, not adopted as the next step

REVISED ORDER OF WORK



Pattern-filled coarse shell: an exploratory geometric/material check

01

Frozen semantics

Architectural walls, floor, interior objects and other

02

Independent coarse geometry

Planes, camera and visible room envelope

03

Surface exceptions

Openings, recesses, protrusions, local plane deviations

04

Reprojection + disagreement

Compare the predicted class map with frozen segmentation

05

Only then: remaining objects

Explain unexplained image structures and render

No completed residual-based reconciliation or full Inspector was claimed at this point. The experiment was frozen so the next study would begin where evidence was genuinely missing.

SOURCE 18 Sept frozen note; room_stage2_internal_boxes_projection.png; room_shell_filled_realpatterns.png.

Make the hypothesis vulnerable

A designated opponent role was used to challenge the logic. This was an adversarial review within the inquiry, not external certification.

CHALLENGE 01

COMMON FAILURE

Independent-looking semantic and geometric branches can share assumptions and fail together.

CHALLENGE 02

2D IS NOT 3D

Accurate reprojection into a single view does not prove the world geometry is correct.

CHALLENGE 03

BAD PRIOR

A crude room shell can overwrite a valid segmentation boundary.

CHALLENGE 04

UNRESOLVED CONFLICT

If the branches disagree, we still need a disciplined way to decide or preserve uncertainty.

CHALLENGE 05

PRODUCT CONSTRAINT

A compelling generated room is not enough if SKU, pattern scale or repeatability are wrong.

CHALLENGE 06

UNKNOWN BASELINE

The Company's internal pipeline might be stronger than our isolated tests suggest.

AFTER THE OPPONENT

A hypothesis that only explains the images it was developed on is not yet a validated engineering solution.

The result of the critique was not a longer feature list. It was a stricter experimental design: independent branches, clearly defined surface exceptions, explicit uncertainty, frozen baselines and blind comparison against real failure cases.

How the work changed direction

These were not simultaneous modules in a pre-written project plan. Each technical decision followed a specific failed assumption or limitation observed during the inquiry.

A. INPUT IMAGE

Visibility improved

Observation: The enhancer strengthened local gradients while preserving the source structure.

Next action: Instead of claiming a prettier output, define an original/enhanced-input stability test for segmentation and geometry. Not completed against the private pipeline.

B. SEMANTIC ERROR

A divider became a wall

Observation: The initial instruction described a central vertical surface rather than an architectural class.

Next action: Replace the shortcut with generic semantic classes; keep the results fixed for further geometric tests.

C. SYNTHETIC VIEW

Plausible is not a measurement

Observation: A generated second viewpoint can look realistic while changing scene geometry.

Next action: Build explicit planes and camera; mathematically reproject the same model without a generative renderer.

D. PREMATURE BOXES

The model explained too much

Observation: Some shapes treated as free-standing objects might be openings or deviations of base planes.

Next action: Freeze the object-box branch; add surface exceptions before object reconstruction and residual checks.

E. CRITICAL OPPOSITION

Independent-looking evidence can agree wrongly

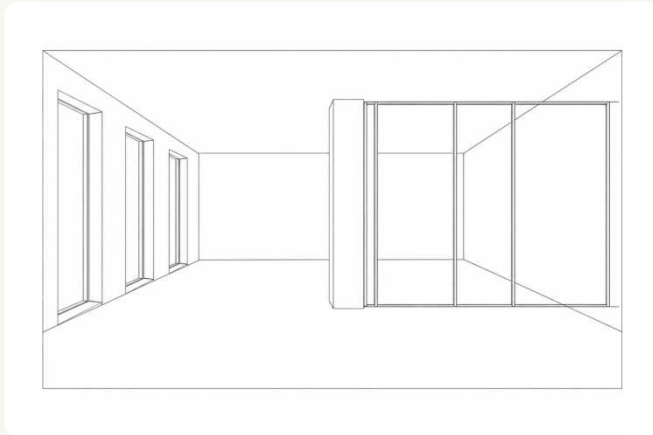
Observation: Segmentation and geometry may share hidden assumptions; single-view reprojection is underconstrained.

Next action: Preserve OPEN/UNKNOWN, retain independent branches, design disagreement maps and a blinded case test.

SOURCE 16–18 Sept dialogue and frozen-methodology note; experimental steps vs proposed follow-ups separated.

Reusing our own earlier work

The inquiry also exposed useful connections to older VIC·TORI algorithms - without pretending they already solved the Company's task.



Perspective/geometric reasoning example from the research materials



Model reprojection used to test an explicit camera/surface hypothesis

AXES / PERSPECTIVE

Vanishing structure, camera orientation

Potentially independent geometry evidence; adaptation was still an R&D task.

LINES / GRADIENTS

Local boundaries and patterns

Useful measurements, but an image gradient is not automatically a semantic boundary.

UNIVERSAL ENHANCER

Input visibility without model training

A controlled test signal; downstream quality still must be measured.

EXPERIMENTAL DIALOGUE

Generate, question, revise, test

Not a fixed workflow: the sequence changed as hypotheses failed.

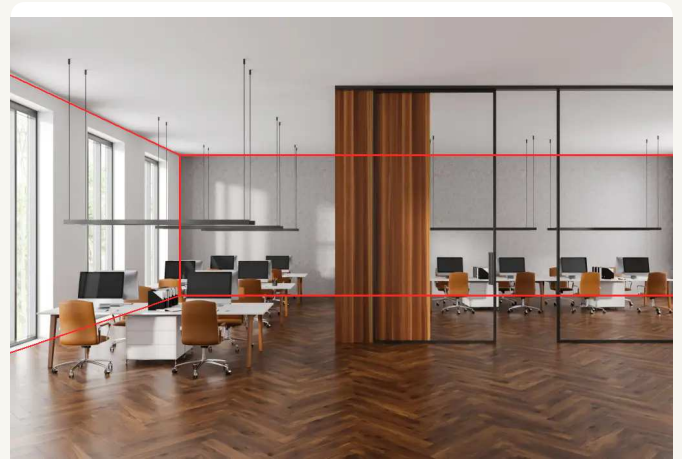
Recurring method: do not equate model confidence, visual plausibility and measured reality. Translate hypotheses into observables; preserve the branches separately until they can challenge each other.

An independent surface Inspector

The first bounded route was not “replace the AI”, but measure where the current result disagrees with evidence in the source image.



Frozen segmentation as input to a diagnostic surface check



A separate geometric interpretation for cross-checking boundaries

PROPOSED PROCESS

1

Observe

Image + output mask + product material

2

Inspect

Gradients, colour, line continuity, shadows, texture

3

Decide

Keep, shift, remove or mark uncertain

4

Measure

Compare corrected cases and unchanged controls

STATUS

Concrete R&D design, not completed integration

To validate the Inspector, the Company would need to supply real failures, existing outputs and an agreed evaluation protocol; no internal model weights would be required for the first test.

An alternative controlled generative route

A second path was preserved as a technical alternative to local correction, not declared the winner.



Experimental before/after material visualisation on the same office-scene family

1

Exact material

Did the output apply the selected catalogue SKU, not a similar-looking invention?

2

Scene invariance

Were camera, architecture, furniture and major boundaries preserved?

3

Pattern geometry

Did texture scale and orientation respect the actual surface?

4

Repeatability

Could the result survive repeated requests and diverse interiors?

5

Economics

Would latency and compute cost work at product scale?

The internal controlled images proved that this path deserved testing. They did not establish an automatic, deterministic or commercially safe replacement for the existing Visualizer.

SOURCE Proposal of two alternative R&D routes; experimental materialisation archive; 18 Sept client-study note.

From exploratory notes to a bounded pilot

The local alternatives were translated into a proposal that could be accepted, rejected or measured - unlike a vague promise to “improve AI”.

WORKING PILOT

10 working days

20-50 difficult scenes; original input, the selected material, and the current visualiser result when available. Compare local correction with a controlled generative route.

REFINED OFFER / 29 SEP

4-week focused R&D

One agreed failure class; Week 1 baseline, Week 2 alternatives, Week 3 implementation, Week 4 frozen blind validation and technical handover.

PROPOSED COMMERCIAL AND EVALUATION TERMS

€6,000 base + €2,000 success = €8,000 maximum

Initial target for discussion: at least 70% of blind failures in the selected class corrected, with no material damage to valid controls. Exact criteria still required agreement.

OUTCOME / LIMITS

The document was an offer for a possible next R&D stage, not evidence that the stage took place. We had no client failure set, no frozen joint acceptance criteria and no validated measured success rate. The Company was informed of our observations and proposals, including direct founder contact; that contact did not retrospectively turn the independent inquiry into commissioned work.

PILOT DESIGN PRINCIPLE

A useful R&D proposal must be able to fail quickly and informatively - not merely describe an impressive possible architecture.

SOURCE 29 Sept Focused R&D Stage Proposal; proposed short external pilot. No evidence of contracted execution.

Why not ask for the missing view?

A geometric limitation became the seed of the third direction: intelligence actively acquires the information needed to do the job.



Original single-camera input: some surfaces are not observable with confidence

ACTIVE CAPTURE

User: "Change the floor; keep the room."

System: "I cannot determine the left corner reliably. Please move a little to the right and show it."

WHY THIS MATTERS

1

Old assumption

A person must guess which photographs the algorithm needs.

2

New assumption

The system measures uncertainty and requests exactly the missing observation.

3

Generalised consequence

The same control logic can guide masks, geometry, materials, catalogue choice and recovery.

NEW PRODUCT-LEVEL PRINCIPLE

The user should not learn the product's internal functions; the product should understand the user's intended result.

Active Capture was a conceptual extension of the geometric tests, not a deployed capture system. Its significance was the change in who organises the next step.

SOURCE 3D scene concept note; concept dialogue; Contact proposal.

A better engine or a different product?

The inquiry broadened from material replacement to a strategic question: who should orchestrate all the capabilities of the product?

FUNCTION-LED PRODUCT

USER



Menus / controls / workflows



Segmentation · geometry · material mapping · rendering

INTENT-LED PRODUCT

USER ↔ CONTACT

intent + context + history + uncertainty



Orchestrated tools + task-specific interface

The existing segmentation, geometry, rendering and catalogue capabilities were not obsolete. The proposal was to make them resources available to an intelligent participant that guides the user towards a result.

COMPETITIVE ANALYSIS — HYPOTHESIS

The interface itself can become the vulnerable advantage

A future rival might deliver a better perceived user journey using less mature individual engines but a stronger intent/context/uncertainty loop. We compared paradigms and discussed examples such as Dex; this was not a measured competitor benchmark or a forecast of a certain market outcome.

CONCEPT THESIS

Do not make the user navigate the entire set of functions. Generate the next interaction from the current goal and state.

SOURCE Concept dialogue new/0.odt and Contact proposal versions 1–3. Competitive claim explicitly hypothetical.

From requesting one camera view to a new interface

The strategic proposal was not introduced as a replacement for the engineering investigation. It emerged by generalising a specific response to geometric uncertainty.

01 / TECHNICAL LIMITATION

Question: One photograph can leave wall junctions hidden or geometrically ambiguous.

Resulting idea: Do not invent what cannot be observed. Request another view only if it changes the answer.

02 / ACTIVE ACQUISITION

Question: The best next operation may involve the user rather than another model pass.

Resulting idea: The system detects uncertainty, asks the person to show a specific corner and resumes its computation.

03 / GENERALISATION

Question: Other stages also require contextual decisions: segmentation, catalogue selection, rendering and recovery.

Resulting idea: Why make the user navigate modules? Let an intelligent layer orchestrate them in response to intent.

04 / NEW PRODUCT THESIS

Question: The current engines are capabilities; the interface decides who coordinates their use.

Resulting idea: Introduce Contact: intent + context + history + uncertainty → next tool and next meaningful interaction.

Evidence status: Active Capture and Contact were product-level designs illustrated in the concept proposal. No deployed application, market-wide competitive benchmark, or customer preference test was established by this independent study.

SOURCE 3D scene concept and later concept dialogue; Contact Concept Proposal, v2 and v3.

Contact: intent first, interface on demand

This was the third final proposal: not an interface polish, but a different allocation of control between user and system.

STAGE I

Active Capture + Geometry

Request an additional view only when scene geometry is insufficient.

STAGE II

Uncertainty-driven workflow

Ask targeted questions or perform targeted checks where current processing becomes ambiguous.

STAGE III

Intent-driven product

Turn the customer goal into a sequence of segmentation, geometry, rendering, catalogue and verification actions.

WHAT THE USER EXPERIENCES

“I want a warmer floor. Keep the walls and furniture.”

The intelligent layer maintains the intention, requests missing information, chooses relevant catalogue options and reveals only the next meaningful decision.

Status: defined and illustrated product concept, with a proposed staged validation path. No claim of a deployed Company Contact system.

SOURCE Contact Concept Proposal, Contact v2 and v3; no real deployment reported.

What the independent inquiry produced

Three proposals at different scales; each has a different evidentiary status.

LOCAL / A

Independent Inspector

Check surface masks, boundaries, geometry and uncertainty against observable image evidence.

Evidence status: R&D method proposed; requires real cases and validation.

LOCAL / B

Controlled generation

Test whether staged, constraint-aware generative editing improves visual and SKU-level outcomes.

Evidence status: Promising qualitative images; production constraints untested.

STRATEGIC / C

Intent-driven Contact

Redesign the user-product relationship through intent, context, uncertainty and active interaction.

Evidence status: Concept documented; staged pilot suggested, not implemented.

HOW VIC-TORI WORKS

The most important result is the ability to change the original question while preserving a traceable line of evidence.

SOURCE All three outcomes follow from the archived sequence; none presented as accepted client deliverables.

Illustrations, limits and source trail

The research record is organised for review. Readers can distinguish image evidence, design decisions and strategic extrapolation.

PRIMARY MATERIALS IN THE RESEARCH ARCHIVE

01	16 September	16 September resource inventory; 3D scene concept; public image set
02	16-18 September	research dialogue A / research dialogue B; prompt experiments, gradient metrics and iterative discussion
03	18 September	Frozen scene-understanding note (18 September)
04	18 September	Pre-project image / scene analysis report (18 September)
05	Pilot proposals	Inspector pilot design; proposed local R&D pilot (RU)
06	29 September	Focused four-week R&D stage proposal (29 September)
07	Later concept	new/0.odt and Contact_Concept_Proposal / Contact_v2 / Contact_v3 PDFs

PUBLICATION RULES

- The company is anonymised as “the Company”. Supporting documents are identified by descriptive titles rather than by internal filenames.
- Public before/after screenshots and selected patterns were captured from the Company visualiser; other figures are VIC-TORI experimental outputs or labelled concept diagrams.
- “Observed”, “tested”, “proposed” and “hypothesised” are deliberately distinguished.
- The opponent was an adversarial review role, not an independent external laboratory.
- This PDF is a replaceable research example for the HOW WE WORK area; it does not require changes to the website code.

VIC-TORI • Independent applied R&D • Research record compiled 11 October 2026

SOURCE Compiled from the user-provided research archive; original results and their limits preserved.