

Matrix Loading Operator

An AI-operated world editor for AR and VR — ask for something, create it in your world, interact with it, and return later.

WORKING QUEST 3 PROTOTYPE

CU BOULDER • MIXED REALITY PROJECT 1

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The Problem with Spatial Creation

The workflow breaks immersion

Creating a spatial experience today means leaving the headset — hunting for assets, modeling objects in desktop tools, then re-entering the scene to check the result.

Catalogs have hard limits

The original Matrix concept relied on a large prebuilt library. But what happens when the object you need simply doesn't exist in any catalog?

- ❏ Matrix answers this with creation on demand — inside the headset, while you stand in the world.



The Working Prototype

Voice or Text Request

Describe a change from inside the headset. An AI Agent receives the request and the current scene context.

AI Operates the Tools

The Agent selects and runs a creation tool — procedural generator or Blender — and returns editable 3D content to the world.

Interact and Save

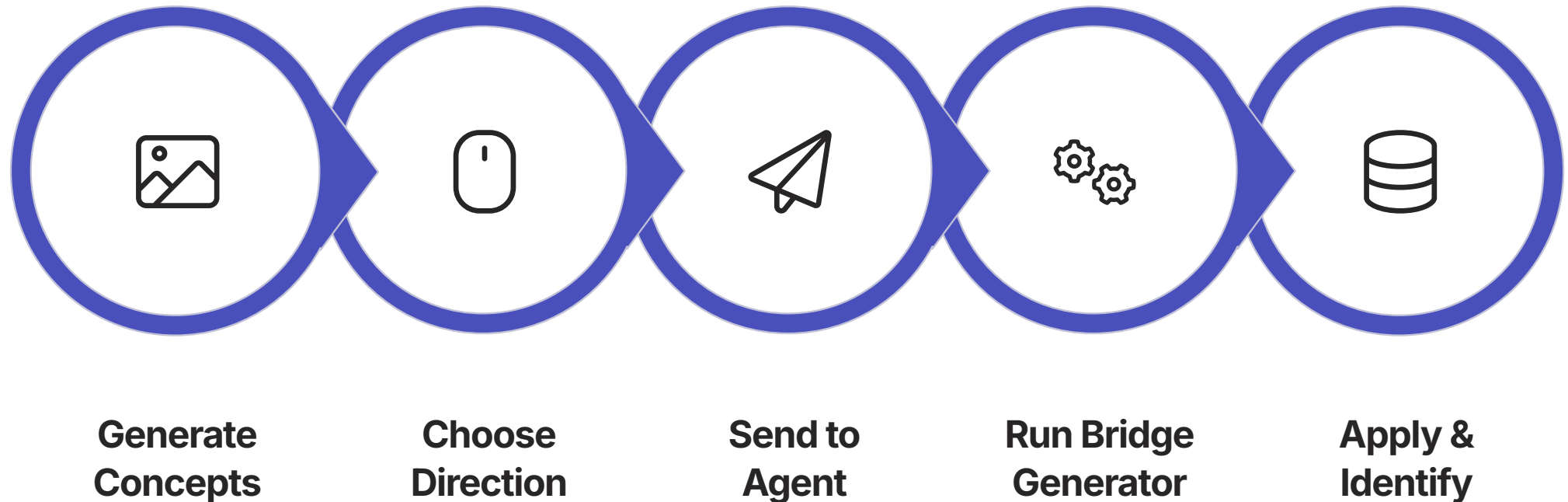
Grab and move objects, place content relative to measured room surfaces in AR, then save the world and reopen it later.

Quest Browser runs the spatial experience. A connected PC runs the Operator and AI tools.

One Request Becomes World Content

DOCUMENTED V1.0 VALIDATION

"Create a small moonlit stone footbridge with blue lanterns."



The selected concept image guides the visual direction. A procedural creation tool builds the actual 3D geometry. Blender is a second configured creation path.

How the Pieces Connect

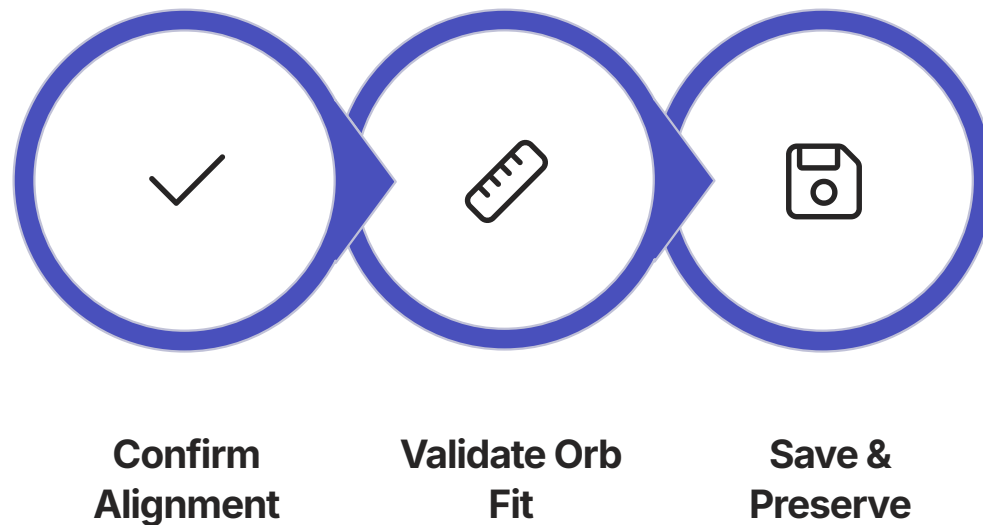


Key design points

- The AI **operates tools** — it does not hallucinate geometry directly
- Three.js renders every scene in the Quest Browser
- A receipt confirms the edit; a fresh scene read verifies it
- The concept image guides the build — it is not the 3D mesh
- Registered assets can be reused without re-creation

AR Placement Uses the Real Room

SEPARATE TABLETOP ORB VALIDATION



How placement works

Room measurements supply the placement geometry. Camera sharing is optional qualitative context — it does not provide calibrated depth or metric pose.

What was validated

- Edge point correctly rejected
- Clear point accepted and spawned
- Object moved, saved, reloaded, preserved
- AR re-entry requires renewed alignment

❏ The bridge and Orb tests ran in separate saved worlds.

Watch the Prototype

See the request, the resulting object, interaction, and the relationship between virtual content and the physical room.

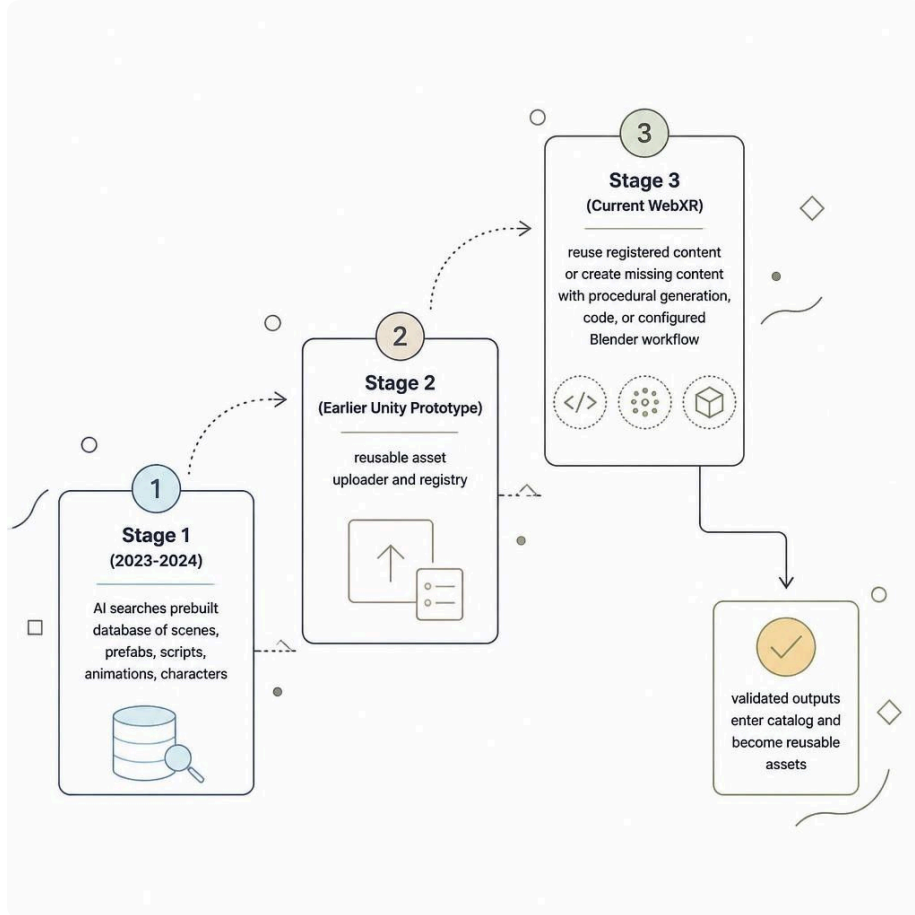
 [Watch Recorded Demo](#)

Recorded prototype footage. The documented v1.0 validation also covers concept selection and save/reopen. Not every validation step appears in this video.



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The Catalog Became Writable



The key shift

When a needed object doesn't exist in the catalog, the system creates it. Validated outputs can then **enter the catalog** and become reusable prefabs.

Today's created object can become tomorrow's registered asset.

What the Current Build Demonstrates

FROZEN V1.0 RELEASE • COMMIT A7664AE

✓ Demonstrated Capabilities

- Concept-guided creation of editable world content
- Controller grabbing and object movement
- Measured AR spawn and repositioning
- Saving and reopening worlds with state preserved

Evidence

- Quest 3 wearer validation sessions
- 893 service tests • 703 web tests • 11 release-builder tests
- Source: revised Project 1 report

⚠ Current Practical Limits

- Asset creation can take time
- Tools require a connected PC and configuration
- AR re-entry requires renewed alignment
- Digital city and civilization are future work



FUTURE VISION

A Persistent Digital Boulder

A living digital counterpart to Boulder — populated by AI citizens with memories, goals, relationships, and institutions. People enter in VR or view selected layers over physical places through spatial glasses.

Loading Operator Role

The creator and admin interface for building and governing this persistent world.

Wearable Context

Future integration could connect a user's relevant real-world state to a digital counterpart — with permission.

Concept illustration • future vision — not an existing product capability or city-scale relocalization feature.

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