

PROPVR SPATIAL OS

# Spatial Cave

*The Complete Immersive Room Solution for Real Estate, Smart Cities & Giga Projects*

Hardware + Software + Content + Integration — one partner, one solution. LED walls or projection, 180° to 360°, built on Spatial OS.

LED &amp; PROJECTION

180° - 360°

UNREAL ENGINE

ONE PARTNER

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**01** WHITEPAPER

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## 01 EXECUTIVE SUMMARY

# The complete immersive room — one partner, one solution

Real estate is entering an era of unprecedented project scale. Giga projects across Saudi Arabia, the UAE, and smart cities in India and the broader Middle East involve master-planned communities spanning thousands of hectares — impossible to convey through conventional presentation media. Consulting firms advising on these developments need immersive tools to present master plans, urban simulations, and project visions to governments, sovereign wealth funds, and institutional investors.

The LED-wall and projection market has matured rapidly. Dozens of vendors supply panels, projectors, and infrastructure. **But hardware alone does not create an immersive experience.** An LED wall without purpose-built software is just an expensive screen. Without interactive content, a control application, real-time data integration, and a storytelling framework, the room remains a passive viewing theater — the same problem it was meant to solve, only larger and more expensive.

Spatial Cave brings every layer together into a single product: display hardware (LED or projection), purpose-built control software, Unreal Engine 3D content, structured storytelling, real-time data integration, and ongoing content management — all delivered, integrated, and supported by one partner. Available in curved configurations (360°, 270°, 220°, 180°) and rectangular (4-wall cube, 3-wall, 2-wall), from 15ft × 15ft to 60ft × 60ft.

*“Hardware is a commodity. The experience is the product. Spatial Cave delivers the complete solution — display, software, content, and integration — so the room does not just display content, it tells a story.”*

THE SPATIAL CAVE THESIS

## 02 THE PROBLEM

# Hardware without a solution

Real estate developers, smart city authorities, giga project teams, and consulting firms invest heavily in immersive rooms. The typical path — LED hardware from one vendor, then software, content, and integration assembled from multiple others — creates a series of structural problems.

**LED VENDOR**
**The LED vendor gap**

LED suppliers (Absen, Leyard, Unilumin, ROE Visual, etc.) deliver screens, not solutions. Once the panels are mounted, the client has a blank wall and a question: what software runs on it, who creates the content, how does the audience interact, and how is it updated?

**NO DOMAIN**
**No real estate expertise**

Generic AV integrators and creative agencies do not understand the real estate sales process. They produce visually impressive content that lacks structure, data accuracy, and sales tools. Pricing goes stale; availability is not reflected; no CRM integration.

**MULTI-VENDOR**
**The multi-vendor problem**

Filling the gap requires a media-server company, a creative agency, a software developer, an AV integrator, and an IT team — each working in isolation with no shared accountability. A fragile, expensive patchwork that takes months to assemble.

**NO STORY**
**No structured storytelling**

Without a purpose-built presentation application, the experience depends on whoever is operating the media player. No branded intro, no consistent flow, no outro. The room that impresses a VIP on launch day deteriorates to a video-loop background within months.

**NO SOFTWARE**
**No interactive software**

LED vendors do not provide interactive software. The standard media-server setup plays pre-rendered video files in a loop. The presenter cannot navigate, switch sections, explore specific units, or respond to audience questions. The room behaves like a very large television.

**NO UPDATES**
**No content update pathway**

When project data changes — new pricing, updated availability, additional phases — there is no efficient pathway. The creative agency must be re-engaged, files re-produced, and the media server manually updated on-site. Most rooms run stale content.

## THE RESULT

Developers invest heavily in LED hardware but end up with an expensive, passive display room that plays looping videos, cannot be updated easily, has no interactive capabilities, and delivers an experience no more engaging than a flat screen – just bigger. **The hardware investment is wasted without the software, content, and integration layers that make it a solution.**

## WHAT DEVELOPERS ACTUALLY NEED

LAYER	LED VENDOR APPROACH	PROPVR SPATIAL CAVE
Display hardware	LED panels supplied and installed	LED or projection – specified, supplied, integrated
Media playback	Third-party media server (video loop)	Proprietary rendering pipeline (Unreal + WebLite)
Interactive software	Not provided	Spatial Cave Web App – tablet-controlled
Real-time 3D content	Not provided	Unreal Engine walkthroughs & flythroughs
Storytelling framework	Not provided	Intro / Presentation / Outro structure
Data integration	Not provided	Real-time CMS sync
Content updates	Re-engage creative agency	Remote CMS – instant
Analytics	Not provided	Session tracking, dwell time, lead scoring
Single point of contact	No – multiple vendors	Yes – one partner, one contract

## 03 THE SOLUTION

# A complete immersive room product

Spatial Cave is not an LED wall. It is not a projection system. It is not a media player. It is a complete, integrated immersive room product that includes every layer required to deliver an interactive, branded, data-connected experience – from the display surface to the cloud.



FINISHED CAVE – IMMERSIVE NIGHT CITYSCAPE



LIVE PRESENTATION – MASTERPLAN ACROSS MULTIPLE WALLS

## WHAT PROPVR DELIVERS THAT LED VENDORS CANNOT

### HARDWARE

#### Display, specified & supplied

LED or projection systems selected on room size, ambient light, budget, and visual requirements. Managed end-to-end – the client never engages a separate LED vendor.

### CONTENT

#### Unreal Engine 3D

Photoreal environments calibrated for the room's specific configuration and resolution. Real-time walkthroughs, masterplan flythroughs, dynamic lighting, physically accurate materials.

### SOFTWARE

#### Spatial Cave Web App

Tablet-controlled presentation system with structured Intro / Presentation / Outro flow, interactive exploration, and multi-project switching.

### DATA

#### Spatial OS pipeline

Pricing, availability, floor plans, and project content sync from the developer's CMS in real time. Changes reflect in the room automatically – no agency re-engagement.

## ONE PARTNER, ONE CONTRACT, ONE SUPPORT LINE

PROPVR provides full solution support – software updates, content refreshes, hardware maintenance, remote monitoring, priority support. No fragmented chain of vendors pointing fingers at each other.

## 04 ARCHITECTURE

# The five layers of Spatial Cave

Five layers integrated into a single product, all engineered to work together.

### 01 LAYER 1 Display hardware

LED panels or projection systems specified, supplied, installed, and calibrated by PROPVR – selected on room size, configuration, ambient light, and budget. One partner manages the entire hardware layer.

### 02 LAYER 2 Interactive software

The Spatial Cave Web App gives the sales agent or presenter full control from a tablet. Structured storytelling (Intro / Presentation / Outro) ensures consistent, branded delivery. Interactive exploration enables real-time navigation of interiors, amenities, exteriors, and districts.

### 03 LAYER 3 Immersive content

Photoreal environments in Unreal Engine, calibrated for the room's specific configuration and resolution. Real-time 3D walkthroughs, masterplan flythroughs, dynamic lighting, physically accurate materials. PROPVR WebLite provides 360° browser-based experiences for rapid deployment.

### 04 LAYER 4 Data integration

Spatial Cave connects to the Spatial OS data pipeline. Pricing, availability, floor plans, and content sync in real time from the developer's CMS. Status changes reflect in the immersive room automatically.

### 05 LAYER 5 Ongoing support

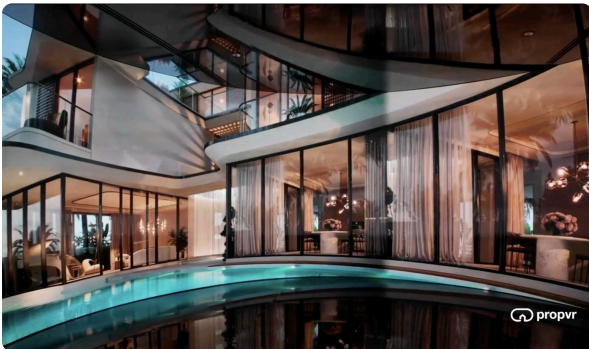
PROPVR provides full solution support: software updates, content refreshes, hardware maintenance, remote monitoring, and priority support. One contract, one partner, one support line.

## 05 CONFIGURATIONS

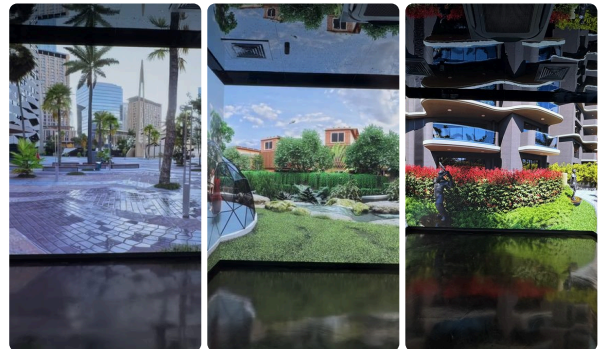
# Curved or rectangular — any space, any budget

Available in curved configurations that wrap the audience’s peripheral vision, and rectangular configurations for standard rooms. Every installation is custom-sized.

CONFIGURATION	COVERAGE	BEST FOR	TYPICAL SIZE
360° Curved	Full surround	Giga project showcases, flagship centres	20ft – 60ft diameter
270° Curved	Three-quarter wrap	Premium sales galleries, consulting suites	20ft – 50ft
220° Curved	Wide panoramic	Large galleries, smart city halls	18ft – 45ft
180° Curved	Half-room wrap	Retrofit spaces, budget-conscious	15ft – 40ft
4-Wall Cube	All four walls	Dedicated immersive rooms	15ft – 30ft / side
3-Wall Room	Three walls covered	Most common gallery retrofit	15ft – 30ft / side
2-Wall Room	Two adjacent walls	Boardrooms, compact installs	15ft – 25ft / side

**CURVED**

**Curved configurations**

Seamless wrap eliminates corners and creates a continuous panoramic environment — particularly powerful for large-scale masterplans and aerial flythroughs.

**CUBE / RECTANGULAR**

**Cube & rectangular configurations**

Flat surfaces on standard room walls — simpler to construct, well-suited to existing gallery spaces and boardrooms. The 4-wall Cube delivers maximum immersion in a rectangular footprint.

06 DISPLAY

# LED walls or projection — selected to the room

PROPVR specifies, supplies, and integrates the display hardware as part of the Spatial Cave solution. Selected based on room size, ambient light, budget, and visual requirements — clients never engage a separate LED vendor.

**LED WALLS**

### Direct-view LED panels

**Advantages:** superior brightness and contrast, visible even in partially lit rooms. Seamless panel-to-panel joins. Pixel pitch from P1.5 to P3.9 based on viewing distance. **Best for:** premium installations, flagship centres, giga project showcases, ambient-lit spaces.

**PROJECTION**

### Multi-projector arrays

**Advantages:** lower cost per square foot for very large rooms. Naturally suited to curved surfaces without complex panel fabrication. **Consideration:** requires controlled ambient light for optimal quality. **Best for:** large curved rooms, budget-conscious deployments, controlled-light spaces.

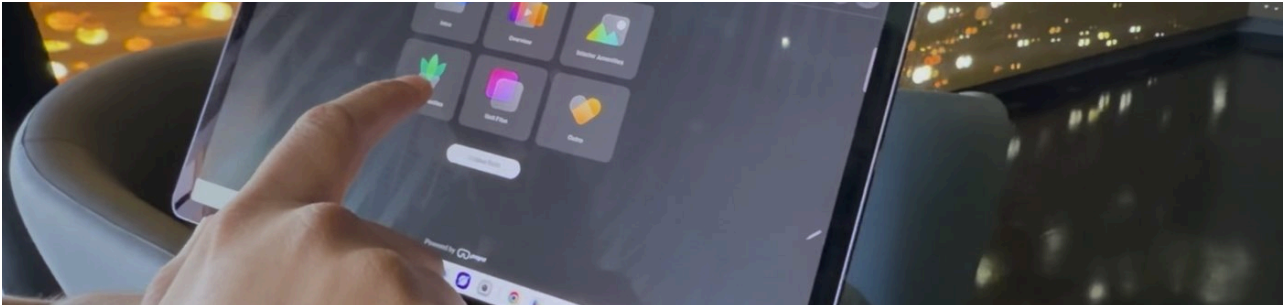
FACTOR	LED WALLS	PROJECTION SYSTEMS
Brightness	High (ambient light)	Moderate (controlled light)
Seamlessness	Panel joins (minimal)	Edge-blended (seamless)
Curved surfaces	Custom panel fabrication	Naturally suited
Cost	Higher per sq ft	Lower per sq ft
Maintenance	Minimal	Lamp / laser cycles

*“Whether LED or projection, PROPVR delivers the display as part of the complete solution.”*

## 07 SOFTWARE

# The Spatial Cave web application

The software layer is what transforms an LED room from a passive display into an interactive experience. Purpose-built for real estate, running on a tablet or touchscreen connected to the room’s content server.



TABLET CONTROL – THE PRESENTER DRIVES THE ROOM WITH ONE HAND

## STRUCTURED STORYTELLING FLOW

### ACT 1

#### Intro

A branded opening – developer logo, project identity, atmospheric visuals, and a cinematic opening that wraps around the room. The moment of impact as the room comes alive.

### ACT 2

#### Full presentation

Masterplan, location advantages, architectural vision, lifestyle imagery, amenities, infrastructure, district breakdowns, unit walkthroughs. Every section designed for the immersive format.

### ACT 3

#### Outro

A branded closing sequence reinforcing the developer’s identity, displaying contact information, and transitioning the room to standby.

## INTERACTIVE EXPLORATION MODE

### INTERIORS

#### Select interiors

Launch 3D walkthroughs of any unit type at room scale.

### AMENITIES

#### Browse amenities

Pools, gyms, parks, clubhouses, and public spaces as panoramic environments.

### EXTERIORS

#### Explore exteriors

View the project from any angle – aerial, street-level, waterfront – wrapped across the room.

### COMPARE

#### Compare floor plans

Display floor plans alongside immersive views for direct comparison.

### DISTRICTS

#### District navigation

Move between residential, commercial, cultural, retail, and infrastructure zones.

### TIME

#### Day / night toggle

Switch between morning, sunset, and night views – same space, different qualities.

**Multi-project support:** a single installation hosts presentations for multiple projects. The presenter selects the project from the app, and the room’s content, branding, and storytelling flow switch instantly.

## 08 | USE CASES

# Where Spatial Cave earns its keep



## SALES GALLERY

### Real estate sales galleries

Replaces the traditional AV room with a fully immersive, interactive environment. Agents deliver structured presentations, switching between overview, interior walkthroughs, amenity showcases, and floor-plan comparisons. The immersive format creates the emotional connection that drives purchasing decisions.

## CONSULTING

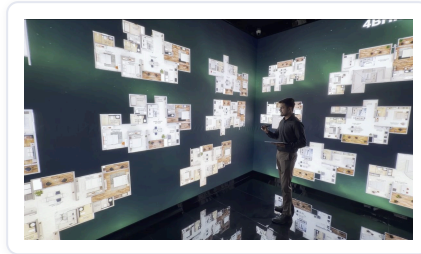
### Consulting client suites

McKinsey, BCG, Bain, PwC, Deloitte, KPMG, and urban-planning specialists transform PowerPoint-in-a-conference-room delivery into immersive presentations where the audience stands inside the proposed development – elevating delivery and strengthening the case for investment.

## GOVERNMENT

### Government & regulatory presentations

Smart city authorities and giga project developers present to government bodies for approvals, zoning decisions, and public consultations. Spatial Cave communicates the project's impact on the surrounding environment and community far more effectively than 2D drawings on a projector screen.



## SMART CITIES

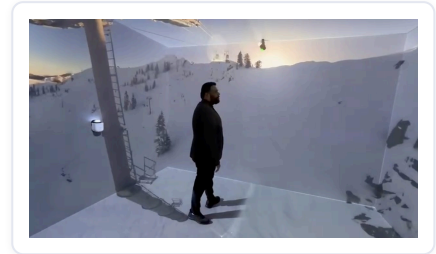
### Smart city showcases

NEOM, The Line, Dholera, DIFC 2.0 – masterplans with multiple districts, infrastructure layers, and decades of phased delivery. Spatial Cave immerses government stakeholders, investors, and the public inside the city vision – flying the masterplan, descending into districts, walking public spaces.

## HQ

### Developer headquarters & boardrooms

A 2-wall or 3-wall Cave in headquarters serves both client-facing presentations at immersive scale and internal design review meetings where teams evaluate projects within spatial context.



## GIGA PROJECTS

### Giga project presentation centres

The Red Sea, Amaala, Qiddiya, Diriyah Gate, Jeddah Tower – presentation environments matching the ambition of the project. A 360° or 270° Spatial Cave becomes the centrepiece of the experience centre, showcasing scale no flat screen can communicate.

## EVENTS

### Exhibitions & activations

Portable or semi-permanent installs at Cityscape, IPS, CREDAI Natcon, FII, or branded launch events – a show-stopping anchor attraction that draws foot traffic and generates leads.

## 09 WHY PROPVR

# The holistic solution advantage

The immersive room market is full of LED vendors and AV integrators who can supply hardware. PROPVR's differentiation is that Spatial Cave is not a hardware product – it is a complete solution delivered by a single partner with deep real estate domain expertise.

## SINGLE PARTNER

### One company, end to end

One contract for hardware specification and supply, software development, content creation, data integration, installation, calibration, and ongoing support. No gaps between vendors, no finger-pointing, no coordination overhead.

## DOMAIN

### Real estate expertise

PROPVR builds products exclusively for real estate. The app is designed around the sales process: unit selection, floor plans, payment plans, availability, CRM integration, lead capture. Generic AV integrators cannot replicate this functionality.

## INTEGRATION

### Software + hardware integrated

Engineered to work together. Content calibrated for the specific room geometry, resolution, and display technology. The control app communicates directly with the rendering pipeline. No middleware, no compatibility layer, no integration risk.

## ECOSYSTEM

### Spatial OS ecosystem

Spatial Cave is one of nine Spatial OS products. Content created for Cave is automatically available across Touch, Holo, Agent, Tour, and every other Spatial product. No LED vendor offers this ecosystem advantage.

## UPDATES

### Content update pathway

Updates flow through the Spatial OS CMS – no agency re-engagement, no file re-rendering, no on-site media server update. The client's team updates pricing or availability; the room reflects the change within minutes.

## PROOF

### Proven track record

Deployed immersive room solutions across India, the UAE, and Saudi Arabia for leading real estate developers. PROPVR understands the physical, logistical, and operational requirements of installing in sales galleries, experience centres, and exhibition venues.

## 10 FEATURES

# Features & capabilities

### RENDERING

#### Real-time 3D (Unreal)

Photoreal environments rendered across multiple surfaces. Multi-surface synchronization. Dynamic lighting from morning to night. Marble, glass, water, vegetation, steel, concrete at physically accurate appearance.

### NAVIGATION

#### Masterplan navigation

Fly over masterplans, descend into districts, navigate infrastructure corridors in real time. Day/night toggle across the entire room. Materials at physically accurate appearance.

### SALES TOOLS

#### Sales & marketing tools

Floor-plan viewer at room scale alongside immersive views. Configurable payment plans. QR codes for visitors to save content. Side-by-side unit comparison. Location and infrastructure maps. Lead capture into CRM.

### CMS

#### Remote content management

Update content remotely without site visits. Multi-project support — switch between projects on the same installation. Standby mode loops ambient content. Instant updates propagate across all Spatial OS products simultaneously.

### ANALYTICS

#### Visitor analytics

Every presentation generates structured data: sections viewed, dwell time, interiors explored, amenities selected, districts navigated, session duration — feeding the Spatial OS analytics dashboard.

### AUDIO

#### Spatial audio

Integrated surround sound calibrated to room dimensions. Room-specific ambient sound, interaction sounds, environmental effects across the immersive space.

## 11 ARCHITECTURE

# Technical architecture

## SOFTWARE STACK

COMPONENT	DETAILS
Rendering engine	Unreal Engine (latest stable)
Platform	PROPVR Spatial OS – shared data pipeline across all Spatial products
Control application	Spatial Cave Web App – tablet/touchscreen presenter control
Multi-surface sync	Proprietary synchronization layer for multi-projector/LED alignment
Edge blending	Software-based edge blending and geometric correction
Data layer	Real-time CMS sync for pricing, availability, content
Analytics	Session tracking, section popularity, dwell time, lead scoring

## HARDWARE SPECIFICATIONS

SPECIFICATION	DETAILS
Display (LED)	Direct-view LED panels, P0.9 to P1.5, high brightness
Display (projection)	Multi-projector array with edge blending, 4K+ per projector
Room configurations	Curved (360°/270°/220°/180°) and rectangular (4/3/2-wall)
Room size range	15ft × 15ft (cube) to 60ft × 60ft (curved)
Compute	High-performance media server(s), dedicated GPU (NVIDIA RTX class)
Control device	Tablet, touchscreen, or any browser-equipped device
Audio	Integrated surround sound calibrated to room dimensions
Connectivity	Wi-Fi, Ethernet, HDMI/SDI distribution

## 12 ROI

# The cost of the multi-vendor approach

Developers who purchase LED hardware from one vendor and source software, content, and integration separately typically face **30–50% higher total cost of ownership** over three years versus the Spatial Cave integrated solution. Hidden costs: creative agency re-engagement, AV integrator callouts, software compatibility issues, multi-vendor coordination overhead.

FACTOR	LED VENDOR + THIRD PARTIES	PROPVR SPATIAL CAVE
Hardware	Supplied	Supplied and integrated
Interactive software	Sourced separately (if at all)	Included – Spatial Cave Web App
Real-time 3D content	Sourced separately	Included – Unreal Engine
Storytelling framework	Not available	Included – Intro / Presentation / Outro
Data integration	Custom development	Included – Spatial OS CMS
Content updates	Re-engage agency + on-site visit	Remote CMS – instant
Analytics	Not available	Included – Spatial OS dashboard
Ecosystem	Standalone room	9 products, shared content
Vendors to manage	3–5 separate companies	1 partner
Time to go-live	4–6 months	6–10 weeks
Total cost of ownership	Higher (hidden integration)	Lower (integrated)

**Experience impact:** immersive rooms create 3–5× the emotional impact of traditional AV rooms, measured by dwell time and post-visit recall. The structured storytelling flow ensures consistent delivery regardless of who is presenting.

## 13 ECOSYSTEM & IMPLEMENTATION

# Ecosystem & implementation

## PART OF THE SPATIAL OS ECOSYSTEM

One of nine products. All share the same Unreal Engine core, project data pipeline, and CMS – content created once is deployed everywhere.

PRODUCT	DESCRIPTION
Spatial Cave	Complete immersive room solution for cinematic walkthroughs and branded environments
Spatial Holo	Interactive 3D holographic model viewer (Cube & Vista holobox)
Spatial Agent	AI-powered avatar assistant inside the holobox for conversational Q&A
Spatial Touch	Touchscreen kiosk, table, and wall display for masterplan exploration
Spatial Tour	VR headset station for first-person interior walkthroughs
Spatial Lens	AR on-site visualization via phone or tablet
Spatial Table	Interactive tangible tabletop for collaborative sales presentations
Spatial Drive	Immersive buggy ride simulation through the community
Spatial Map	Projection mapping system for physical scale models

## IMPLEMENTATION PHASES – 6–10 WEEKS

PHASE	DURATION	KEY OUTPUT
Discovery & site survey	Weeks 1–2	Scope, configuration, 3D visualisation
Room & display install	Weeks 2–6	Room build, display installation, calibration
Content creation	Weeks 3–6	Immersive Unreal / WebLite content
App configuration	Weeks 5–7	Branded app, storytelling flow, CMS integration
Calibration & go-live	Weeks 7–8	Calibrated system, live with on-site support

## 14 INSTALLATION

# From empty room to immersive Cave

A real PROPVR build – wall structure, panel fabrication, frame installation, server room, calibration, content testing, and live delivery to the client.



01 · WALL PLY INSTALL



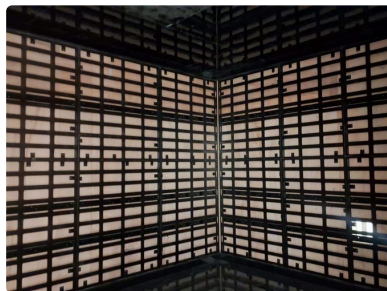
02 · PANEL FABRICATION



03 · FRAME STRUCTURE



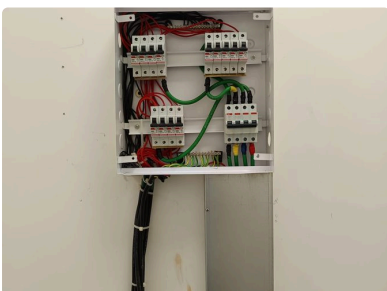
04 · FRAME MOUNTING



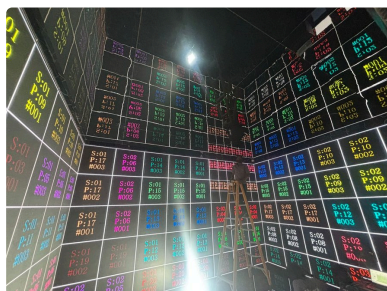
05 · FRAME INTERIOR



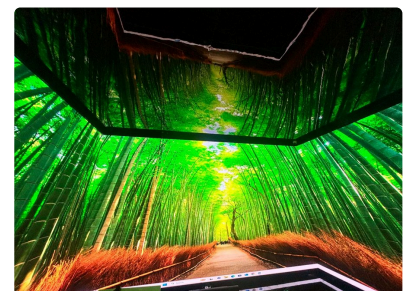
06 · FRAME COMPLETE



07 · SERVER ROOM &amp; ELECTRICAL



08 · LED TEST PATTERN



09 · CONTENT TEST – BAMBOO FOREST

**End-to-end by one partner:** from the empty room and ply structure to LED fabrication, frame mounting, server-room electrical, colour calibration, and live content – every phase delivered, installed, and supported by PROPVR.



CONTACT US

# Step inside the project.

Whether you are replacing an existing AV room, building a giga project experience centre, equipping a smart city presentation hall, or creating an immersive consulting presentation suite – PROPVR delivers the complete solution from one partner. Reach out for a demo.

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PRESENCE

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