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IMMERSI-VIEW

By team,

NYS

OUR AIM

- To build an **immersive AR/VR-based virtual data centre** platform that replicates real-world data centre infrastructure with **high fidelity.**
- To **integrate photorealistic 3D models** of data centre components such as servers, racks, routers, switches, power units, and cooling systems.
- To **implement natural XR interactions** using **hand tracking, physics-based simulation,** and AI-driven system responses for realistic equipment handling.
- To support **adaptive and intelligent learning** through real-time AI and computer vision for **context-aware guidance,** error detection, and tool recognition in data centre environments.

CORE OBJECTIVES

AI-DRIVEN EQUIPMENT IDENTIFICATION

Leverage YOLO to recognize equipment instantly for **guided interactions.**

ENABLE REALISTIC XR INTERACTIONS

Integrate hand tracking, soft-body physics, and AI-driven responses for natural interaction with virtual equipment.

DEVELOP VIRTUAL DATACENTRE SETUP

Construct a **realistic datacentre simulation** to teach industrial workflows and safety protocols

PROMOTE COST-EFFECTIVE LAB ACCESS

Minimize the need for expensive physical lab setups by offering a **scalable and reusable virtual alternative**.

Scene Integration → Unity HDRP/URP + Shader Graph

- Modeling → High-Poly Asset Creation
- Texturing → PBR Workflow
- Optimization → XR-Ready Assets
- Lighting & Rendering → Set up real-time lighting, baked lightmaps, and reflection probes to enhance realism while keeping performance optimized.
- Deployment Testing → Validate assets in XR environments (passthrough, PCVR) to ensure consistent visuals, frame rates, and interaction responsiveness.

3D Asset Creation → Blender, ZBrush, Substance Painter

- **Import Assets:** Bring optimized models into Unity (use FBX or GLB formats)
- **Lighting Setup:** Set up realistic GI, Light Probes, and Reflection Probes
- **Shader Creation:** Build custom surface shaders (e.g., Subsurface Scattering, Parallax Occlusion) using Shader Graph
- **Material Optimization:** Use GPU-friendly materials and texture atlasing to reduce draw calls and improve XR performance

Passthrough-Driven Contextual LLM Engine

- **Object-Aware Prompting:** YOLOv11n identifies machinery in the passthrough view and injects detected labels into the LLM context.
- **Automatic Context Resolution:** Ambiguous user queries (e.g., “How do I install this?”) are resolved by mapping references to the detected object and its manuals.
- **Metadata-Enriched Responses:** Live object metadata is overlaid in VR and provided to the LLM for accurate, context-specific guidance.

AR & XR Interaction → XR Toolkit + Meta XR SDK

- **XR Input:** Implement hand tracking, controller input with Unity XR Interaction Toolkit and Meta XR SDK, including gesture recognition and controller haptics.
- **Physics Interaction:** Add realistic soft-body physics (Obi Softbody Physics) for touchable feeling, with collision layers, force feedback, and deformation mapping.
- **IK Systems:** Integrate full-body inverse kinematics (FinalIK/Unity Animation Rigging) to map user hand and head movements onto avatars for natural motion.

HOW IT WORKS ???

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WHY US???

EXISTING SOLUTIONS

- **2D VIDEO TUTORIALS :**

  Offer only passive learning with no interactive or hands-on experience. Ex: Youtube

- **TRADITIONAL PHYSICAL LABS**

Require expensive equipment, maintenance, and limited access; high risk of damage or accidents Ex: Real Datacentre

- **BASIC VR DATACENTRE SIMULATORS :**

Provide static simulations with fixed interactions and no intelligent object detection or adaptive feedback.
Ex: Labster, iXR Labs

- **AR-BASED DEMONSTRATIONS**

Limited to overlaying visuals; lack realistic physics, industrial context, and automated evaluation.Ex:zSpace

OUR APPROACH

- **INTELLIGENT SUPPORT SYSTEM**

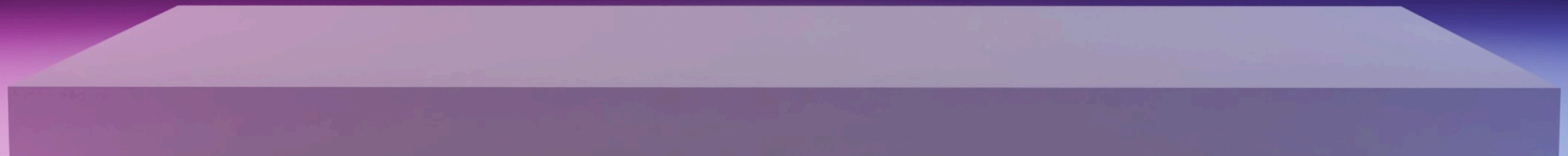
Real-time recognition of components for context-aware guidance and error detection.

- **COST-EFFECTIVE & SCALABLE**

Unlimited virtual deployment without physical lab setup or maintenance costs.

- **REALISTIC INTERACTION & IMMERSION**

The platform provides physics-based VR interactions that closely simulate real-world equipment handling. Trainees experience realistic weight, placement, and component behavior, which most existing simulators do not support.



REVENUE NUMBERS

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1 MARKET SIZE

In 2025, the AR labs market in India was valued at $23 million. expected to grow to $457 million by 2033, growing at CAGR 35%

2 CUSTOMER LIFE TIME VALUE(FOR 1 YEAR)

SOURCE	COST(Rs)
Annual Subscription	6,00,000
Headset Rental	75,000
Certification	10,000
TOTAL	6,85,000

3 CAC

	MONTHLY EXPENSE
EMPLOYEE	5,00,000
HOSTING AND LICENSING	3,00,000
TOTAL	(8,00,000*12)/6000=1600

Assuming in the first year we target **30 Institutions**

Gross revenue	**6,85,000x30 = 2,05,50,00,000**
Net revenue	**1,68,51,000**
Mandatory expenses	**96,00,00,000**
HEADESETS	**75,00,000**
Total	**1,71,00,000**

NET PROFIT(%)= -1.5%

Note: Assuming Every Institution will need 5 Headsets,
=30x5x50000=75,00,000

BREAKEVEN ANALYSIS

In the second year we add another **30 Institutions**

Gross revenue	**6,85,000x60 = 4,11,00,00,000**
Net revenue	**3,37,02,000**
Mandatory expenses	**1,08,00,000**
HEADESETS	**75,00,000**
Total	**1,08,00,000+75,00,000=1,83, 00,000**

NET PROFIT(%)=44%

SCENE INTEGRATION → UNITY HDRP/URP + SHADER GRAPH

PHASE 1-2

3D ASSET CREATION → BLENDER, ZBRUSH, SUBSTANCE PAINTER

PHASE 2-3

PASSTHROUGH-DRIVEN CONTEXTUAL LLM ENGINE

PHASE 3

AR & XR INTERACTION → XR TOOLKIT + META XR SDK

DEVELOPMENT CYCLE

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OUTCOMES

1. Enhanced Learning through Immersive XR

ImmersiView delivers realistic, hands-on industrial training using Unity-based VR simulations, enabling users to assemble, maintain, and troubleshoot equipment virtually. Immersive interaction improves skill retention and effectively bridges the gap between theoretical knowledge and practical application.

2. Cost-Effective and Safe Training Infrastructure

By replacing physical machinery with high-fidelity virtual environments, the platform achieves a 60–80% reduction in equipment and maintenance costs. VR-based training ensures zero risk of accidents or equipment damage and eliminates the need for dedicated physical lab spaces.

3. Scalable and Accessible Deployment

The system supports unlimited simultaneous users through standalone and PCVR modes. With 24/7 on-demand access, ImmersiView can be easily deployed across multiple institutions, ensuring consistent training experiences without scheduling or capacity constraints.

4. AI-Driven Intelligence and Context Awareness

Integration of a FastAPI-based LLM backend with RAG enables real-time, context-aware guidance for maintenance and troubleshooting. Combined with YOLO-based object detection, the system provides intelligent feedback, error detection, and personalized adaptive learning paths.

5. Performance Analytics and Automated Assessment

ImmersiView enables detailed tracking of user interactions, task completion times, and error patterns. These analytics provide data-driven insights for educators and support automated performance-based certification, ensuring objective and measurable skill evaluation.

6. Improved Workforce Readiness and Employability

Exposure to realistic industrial workflows and AI-assisted training prepares learners to be industry-ready. Graduates trained on ImmersiView require reduced employer onboarding time, leading to enhanced employability and stronger career prospects.

COMPARATIVE ANALYSIS

Training Method	Interaction Level	Learning Efficiency	Error Reduction	Cost Efficiency	Scalability	What ImmersiView Does Better
2D Video Tutorials (Hoang et al., Liu et al.)	Very Low (Passive)	1× (Baseline)	Negligible	High	Very High	Adds hands-on VR interaction, real-time feedback, and task-based learning instead of passive viewing
Traditional Physical Labs (Terkaj et al., Gavish et al.)	High	1.2×	20–30%	Very Low	Very Low	Eliminates safety risks, equipment damage, and capacity limits while preserving procedural realism
Basic VR Simulators (Gavish et al., Zafeiropoulos et al.)	Medium	1.4×	35–45%	Medium	Medium	Introduces AI-driven guidance, physics-based interaction, and dynamic error detection

COMPARATIVE ANALYSIS

Training Method	Interaction Level	Learning Efficiency	Error Reduction	Cost Efficiency	Scalability	What ImmersiView Does Better
AR-Based Demonstrations (Strnad et al., Medium et al.)	Medium	1.3×	25–30%	Medium	Medium	Goes beyond visual overlays by enabling full VR manipulation, realistic physics, and performance assessment
VR + Guided Interaction (Laine et al., Ipiales et al.)	High	1.6×	50–60%	Medium	High	Adds adaptive intelligence (LLM + RAG), context awareness, and personalized learning paths
Proposed System (ImmersiView)	Very High (Immersive + AI)	2.0×–2.3×	65–80%	Very High	Very High	Combines physics-based VR, YOLO-based object detection, LLM-assisted troubleshooting, and automated analytics

UNIQUE SELLING POINT

- Real-lab realism using true 360° spatial capture of data centre environments, not simulated or stitched scenes.
- Natural interaction with data centre equipment through hand tracking and advanced physics-based (soft-body) interactions.
- On-device AI intelligence using Unity Sentis to enable adaptive system behavior and real-time, low-latency responses.
- Zero physical infrastructure requirement, enabling plug-and-play immersive training from anywhere.

TARGET AUDIENCE

- Industrial Training Institutes (ITIs) and Vocational Colleges
- Corporate Workforce Training and Upskilling Organizations
- Universities and Engineering Colleges
- Government Skill Development and Workforce Development Programs
- EdTech and XR-Based Learning Platforms
- Industrial Equipment and Data Centre Infrastructure Manufacturers

CUSTOMER ACQUISITION

- **Targeted Institutional Partnerships:** Partner with ITIs, engineering colleges, and data centre training institutes to pilot virtual data centre labs with demo programs and early-adopter pricing.
- **Enterprise & Corporate Training Outreach:** Collaborate with data centre operators, cloud service providers, and system integrators to offer VR-based workforce upskilling and certification training.
- **Campus & Faculty Champion Programs :** Engage faculty members and student champions to run workshops, demo sessions, and collect feedback for continuous platform improvement.
- **Industry Conferences & Skill Development Events :** Showcase live demos at data centre, cloud, IT infrastructure, and XR/AR conferences to connect with institutional buyers and government skill bodies.

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FUTURE SCOPE

Multi-User Collaborative Training

ImmersiView can be extended to support multi-user VR sessions, enabling collaborative industrial training where instructors and trainees interact in the same virtual environment. This will facilitate guided demonstrations, peer learning, and real-time supervision.

Digital Twin Integration

Future versions can incorporate digital twins of real industrial equipment, enabling synchronization between virtual models and live machine data. This would allow predictive maintenance training and real-time simulation based on actual operational parameters.

Advanced AI Tutoring and Personalization

Enhancing the LLM backend with user profiling and adaptive learning models can enable personalized training paths, difficulty adjustment, and intelligent skill recommendations based on learner performance and behavior.

On-Device AI and Edge Inference

Deploying lightweight AI models directly on XR devices using Unity Sentis and ONNX can reduce latency and improve offline functionality for object detection and basic guidance in bandwidth-constrained environments.

Integration with LMS and Certification Systems

Future integration with Learning Management Systems (LMS) and industry certification platforms will allow automated reporting, standardized assessments, and credential issuance, improving adoption in academic and corporate environments.

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THANK YOU!