1st XR5.0 Pilot Webinar – 8th December 2025

XR and AI-Enhanced Robotics Training

Human-Centric AI-Enabled Extended Reality Applications for the Industry 5.0 Era

Georgios Karantinakis, Harsh Manoj Shah, Robert Fejer, Andrii Horlov,

KUKA, HOLO, Siemens, IML, INNOV-ACTS

Funded by the European Union

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This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Agenda

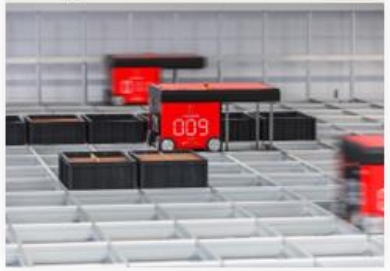
Introduction to the Webinar, Speaker: Elina Papadopoulou (Innov-Acts)
Troubleshooting and Training Use Cases Speaker: Georgios Karantinakis (KUKA)
Hololight Space enhanced for Robotics Training Speaker: Harsh Manoj Shah (HOLO)
KUKA-Bot with RAG Speakers: Robert Fejer (SIE)
Immersive Training Scenarios Speaker: Andrii Horlov (IML)
Live audience feedbackSpeaker Speaker: Elina Papadopoulou (Innov-Acts)
Open Discussion – Questions & Answers

Troubleshooting and training Use Cases

Pilot Overview

KUKA

Automation Powerhouse

Factory Automation			Logistics	Medical
Systems	**Robotics**	**Digital**	**Swisslog**	**SwisslogHealthcare**
KUKA	KUKA	VISUAL COMPONENTS · DEVICE INSIGHT · mosaixx	SWISSLOG	swisslog healthcare
Smart, safe & efficient production solutions	Hardware, Software & Service	Digital solutions for the entire production cycle	Data- & Robot-based logistics automation	Transport automation & pharmacy automatio
				

KUKA China

Globaler Business Service

Business Challenges

Cost

- Need to reduce downtime
- Pressure to cut costs and waste
- Market Competition

Innovation

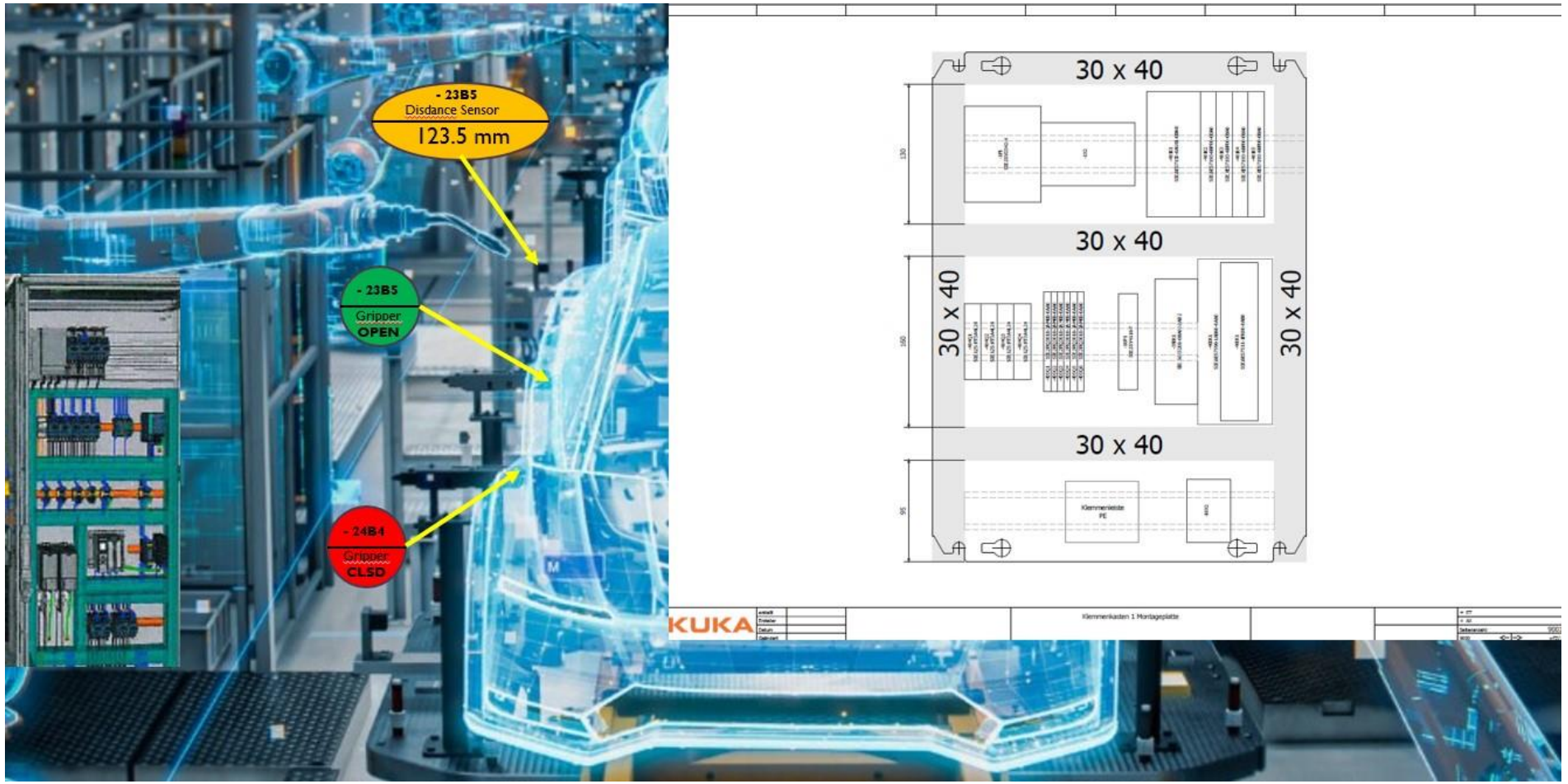
- Integrating advanced tech into existing systems
- Training - High complexity in assembly lines
- Market Competition

Labor

- Shortage of skilled workers
- human-centric operations
- Adapting to social changes in the labor market

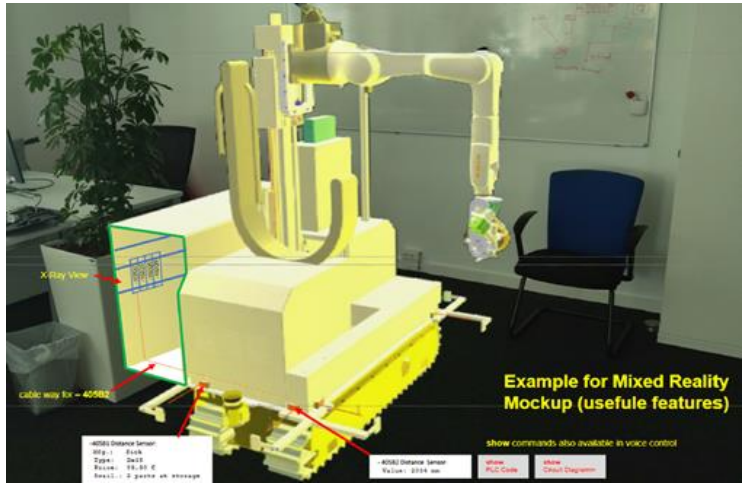
KUKAs XR 5.0 Vision

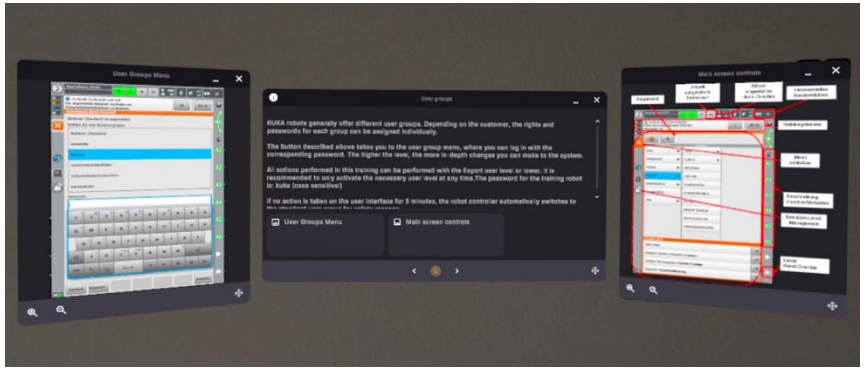
KUKAs XR 5.0 Vision



Use Case Overview

- UC 1.1 – Personalised XR in Assembly Line Production
  - AR Overlay – Retrieve and display Realtime Data
  - Remote Assistance – support Real-time Data sharing
  - Personalised Voice command XR Interaction





- UC 1.2 - Virtual Commissioning and Generative AI in Robotics
  - Digital Twin controlled by process signals via OPC UA
  - Visualisation of partly build machines
  - XR-Training – Step by Step instructions

Pilot Partners

Pilot Owner

KUKA

Pilot Technical Responsible

ATB Institut für angewandte Systemtechnik Bremen GmbH

Technical Partners

HOLOLIGHT

SIEMENS

IMMERSIVE LIVES

Scuola universitaria professionale della Svizzera italiana
SUPSI

UNPARALLEL

UNIVERSITY OF PIRAEUS RESEARCH CENTER

Hololight Space enhanced for Robotics Training

Hololight

- Deep-tech company building foundational technologies for XR for more than 10 years
- Develop XR software, XR streaming technology, and an XR ecosystem
- Hololight Space
  - Powerful XR software for design & engineering
  - Streamline engineering and product development processes

Hololight Space

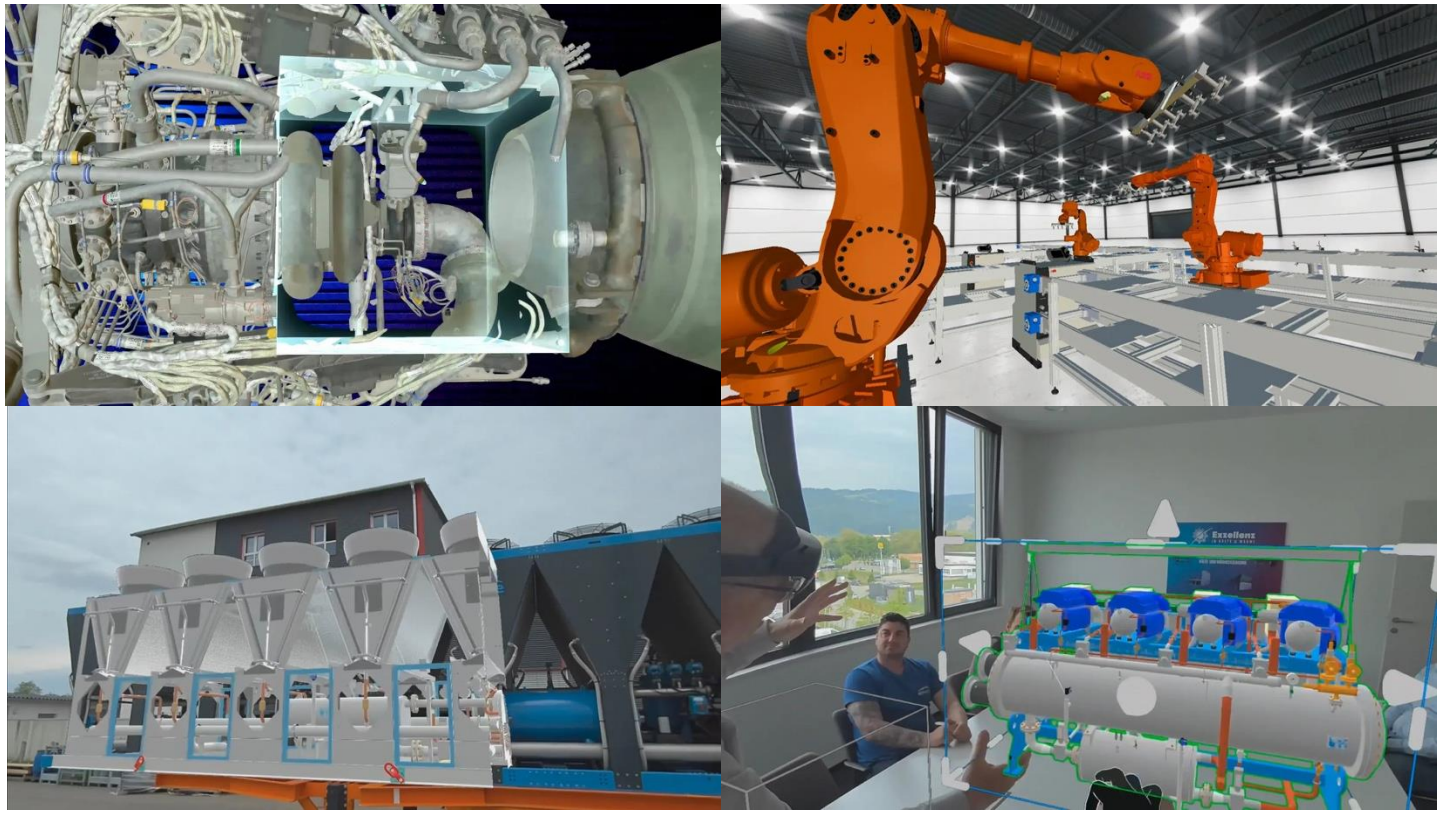
Features:

- Hololight Stream (XR streaming technology)
- Easy 3D CAD/BIM import without data preparation
- Interact with 3D content
- Manage file hierarchy via Space Manager
- Multi-user mode between AR and VR
- Object tracking, QR codes and 2-point alignment for overlays
- Device-agnostic

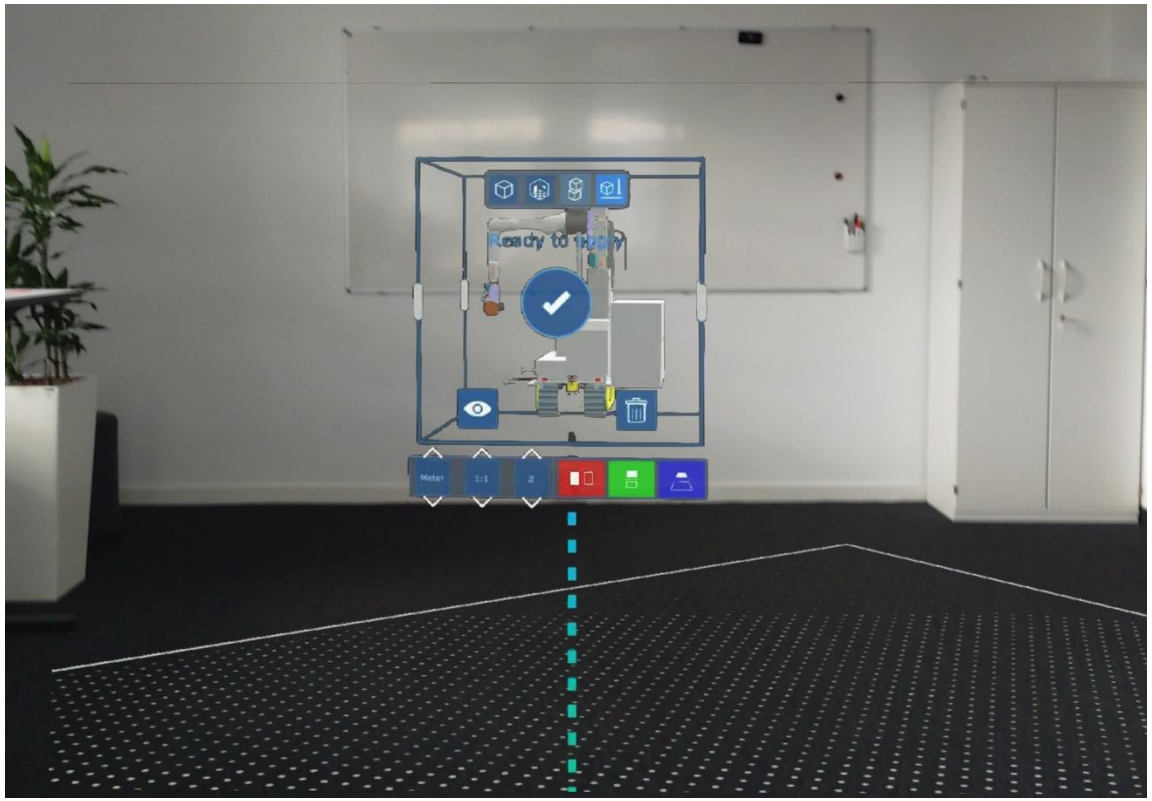
Hololight Space

Use cases:

- Design review
- Factory Planning
- Prototyping
- Risk Assessment
- Quality Assurance
- Plant Design
- Product Presentation



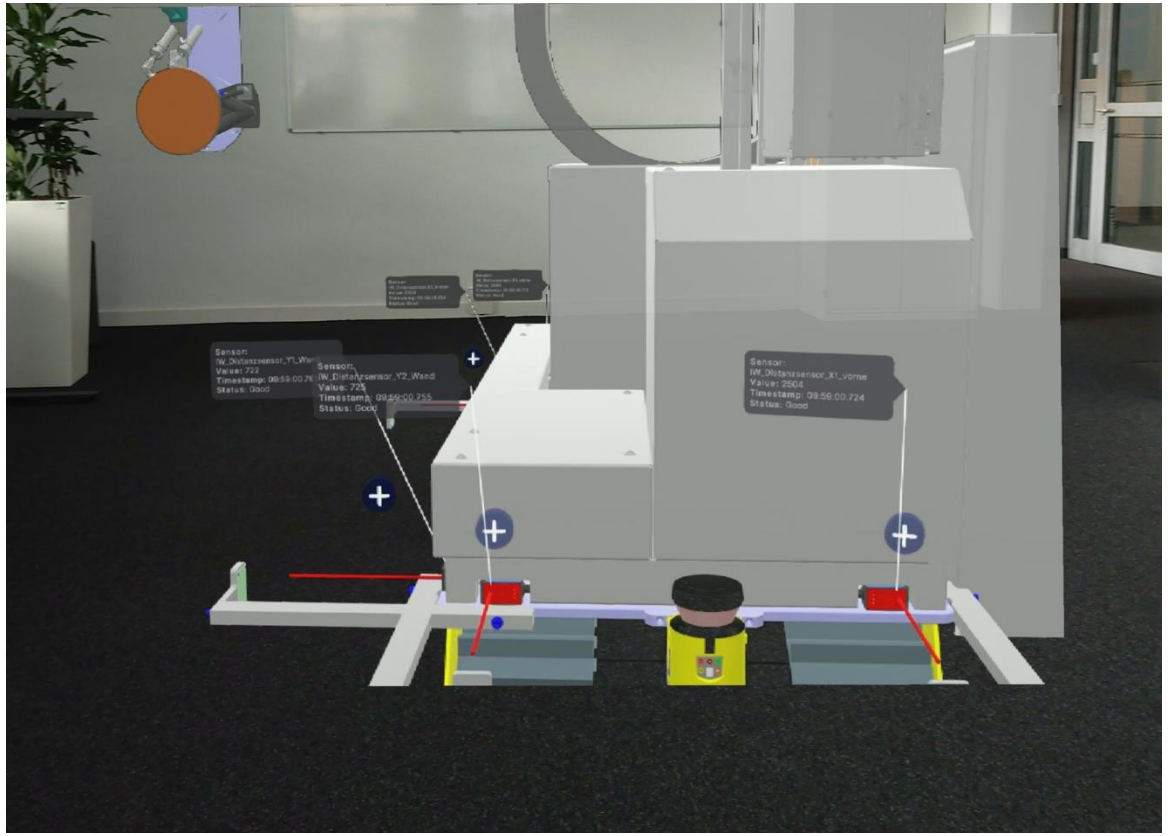
Hololight Space in XR5.0



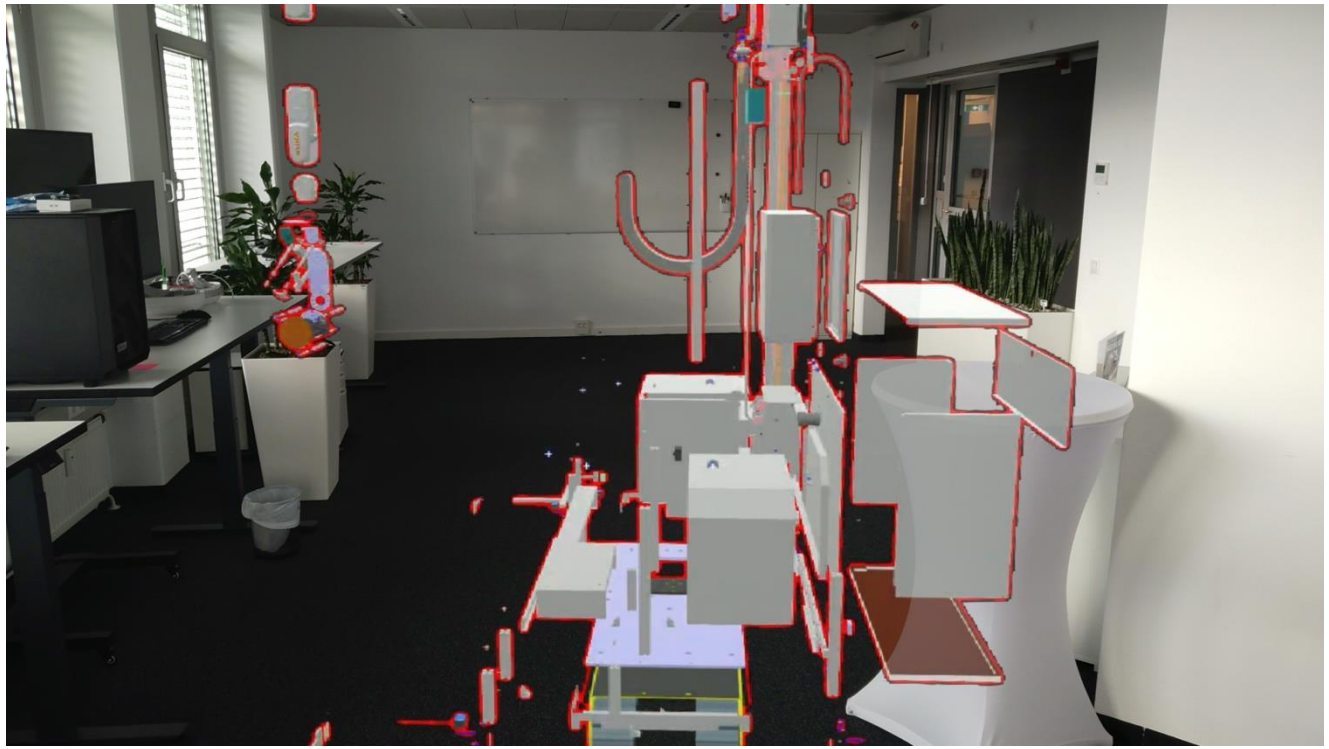
3D Model Import

3D Robot Crawler Visualisation

Hololight Space in XR5.0



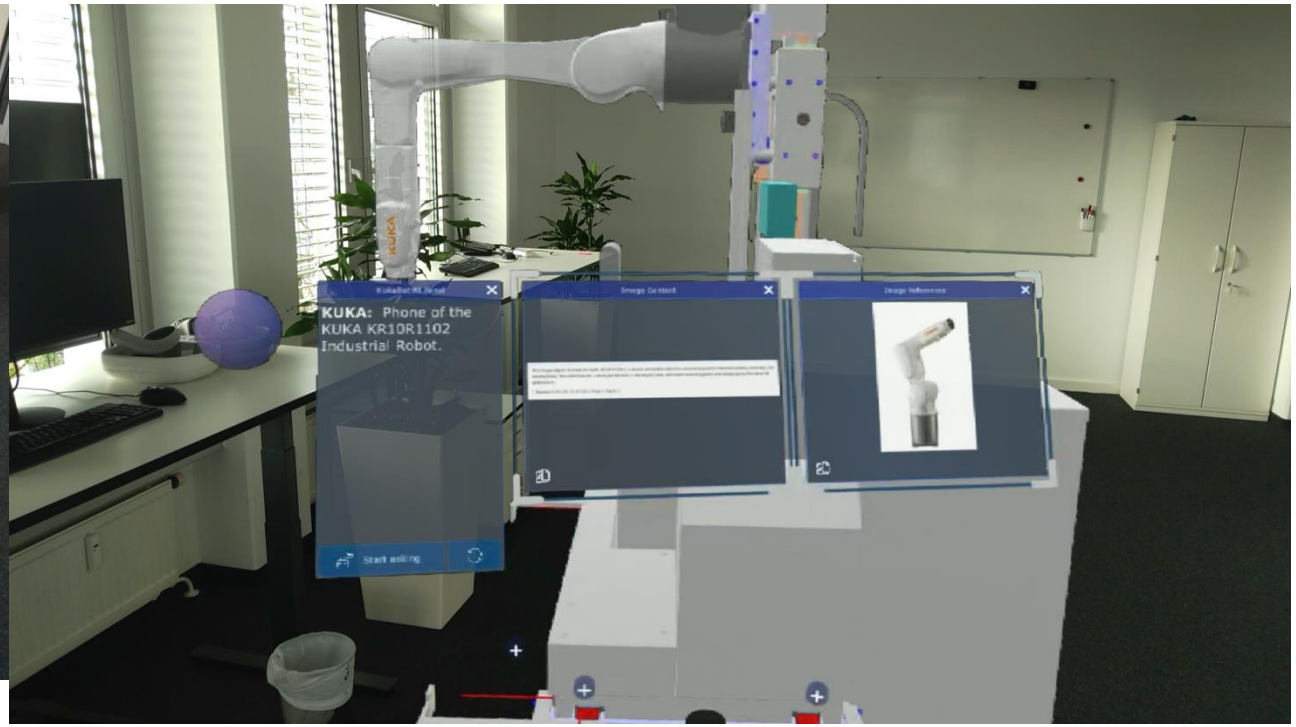
Robot Digital Twin – Sensor Data from OPC UA server



Explosion View

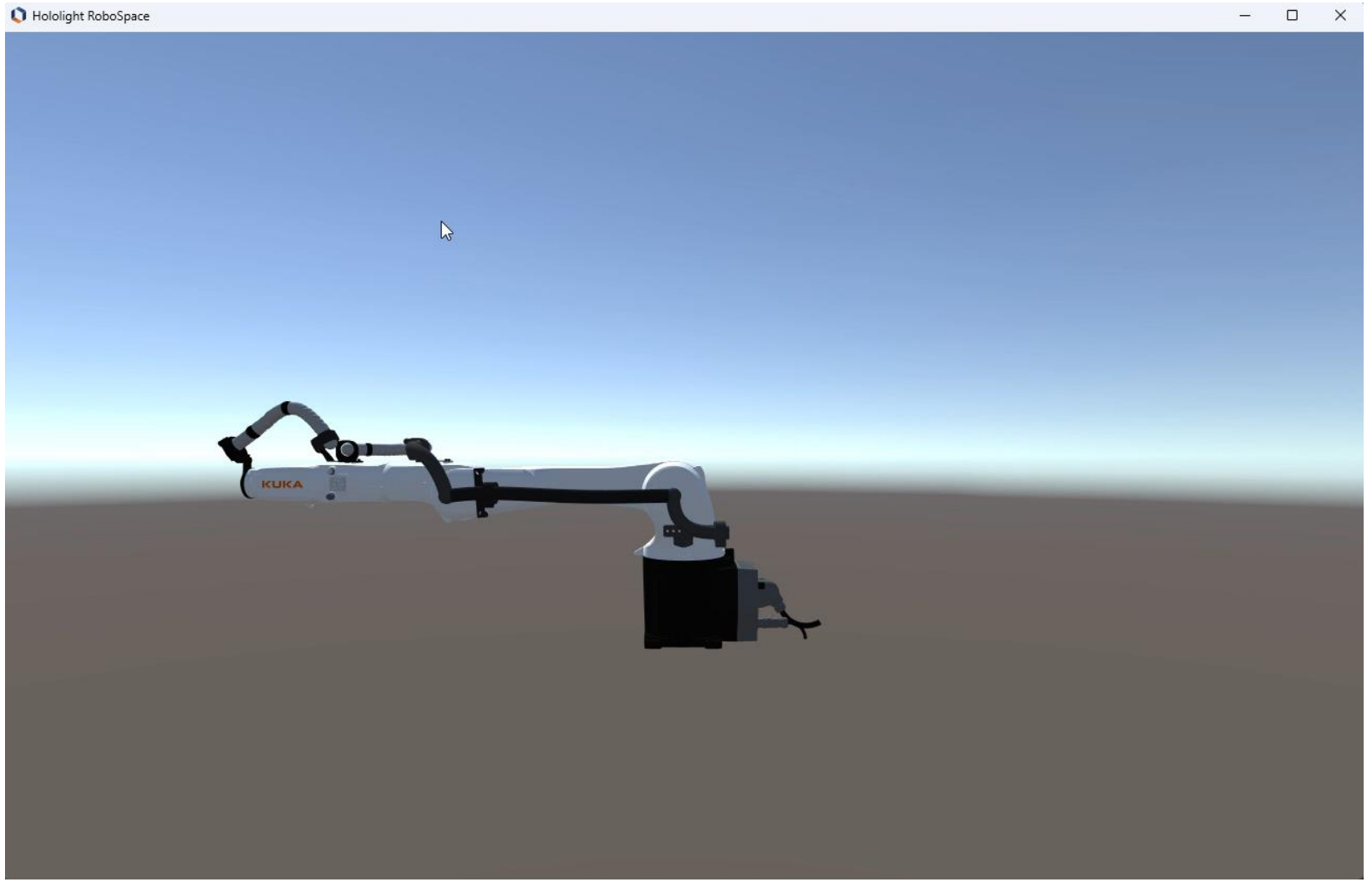
Hololight Space in XR5.0

XR Training Programs



KUKABot Integration

Hololight Space in XR5.0



Interactive Robot Simulation

Hololight Space

- What's Next
  - Native App Assistant
  - Safety Zone Checker
  - Voice-driven User Interfaces
  - Robot Simulation Remote Control (Kinematic Data)
  - Integration with cloud-streaming XR5.0 Training Platform

- Benefits
  - No model simplification
  - High-performance on lightweight devices via Hololight Stream
  - High-fidelity 3D visualisation and interaction
  - Improved spatial understanding
  - Secure and scalable by design
  - Cross-team collaboration
  - Support real-world engineering use cases

KUKA-Bot with RAG

Introduction

Current Reality:

- Lots of technical manuals, all formatted using different styles
- Engineers spend hours searching for answers
- Information buried in PDFs, images, tables, lists
- Some topics may span across lost of pages

KUKA-Bot Solution:

- Two step service application for Processing Documents and RAG Assistant
- Knowledge base for Hundreds of technical manuals
- Add, Update or Remove any Documents part of the Knowledge base
- Ask questions in plain language
- Get on-point answers with sources
- Multimedia responses via Voice, Text and Imagery

What is RAG?

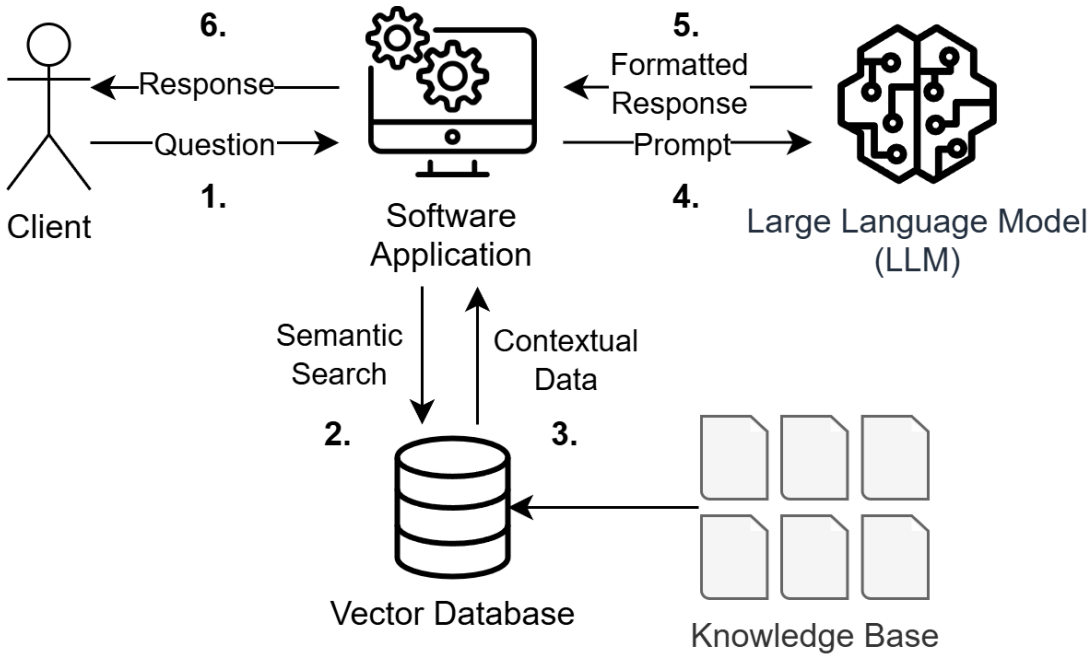
Traditional LLM Problems:

- Outdated pre-trained knowledge
- Hallucinates facts
- Generic answers

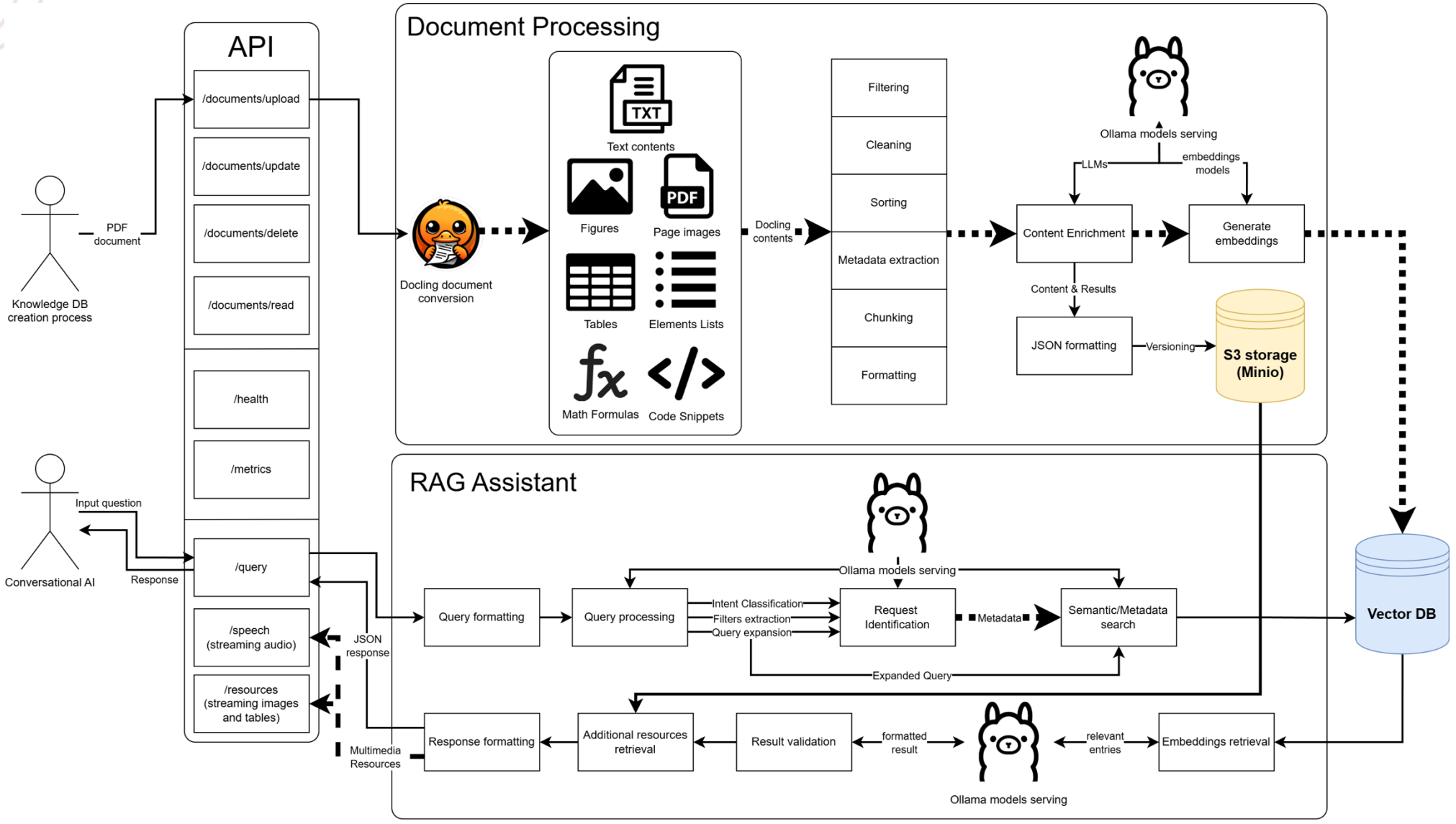
RAG Empowered LLM Solution:

- Retrieves relevant document sections
- Controls AI context and knowledge base
- Generate grounded, accurate answers

Empowering LLMs with Retrieval-Augmented Generation (RAG)



KUKA-Bot High Level Architecture



Proprietary Solution Benefits Assessment

Advantages

- On-Premise Deployment - Data sovereignty, compliance, network isolation
- Data Sensitivity & Privacy - Zero third-party exposure, audit trails
- XR Integration - Voice interface, spatial context, real-time performance
- Local Storage - S3-compatible, high throughput, cost efficiency
- LLM Resource Enrichment - Image descriptions, table interpretation, 85-95% retrieval accuracy
- Intent Detection - Contextual awareness, query expansion, disambiguation
- On-the-Fly Indexing - Real-time updates with no downtime

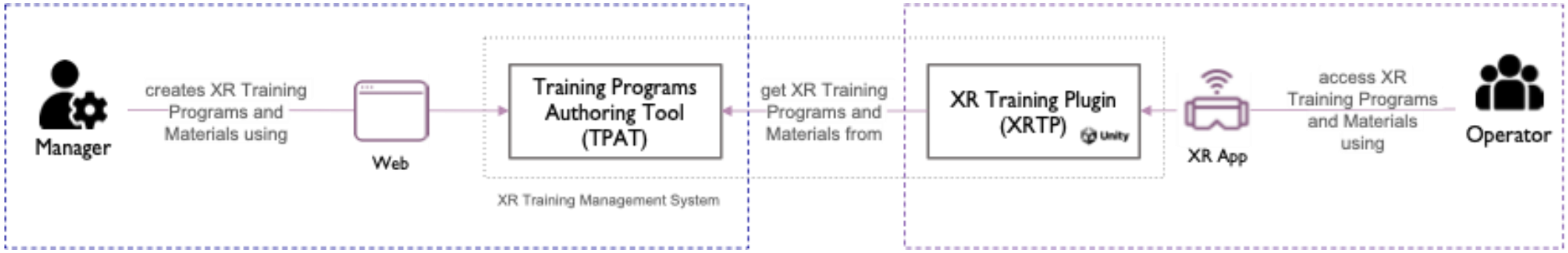
Disadvantages

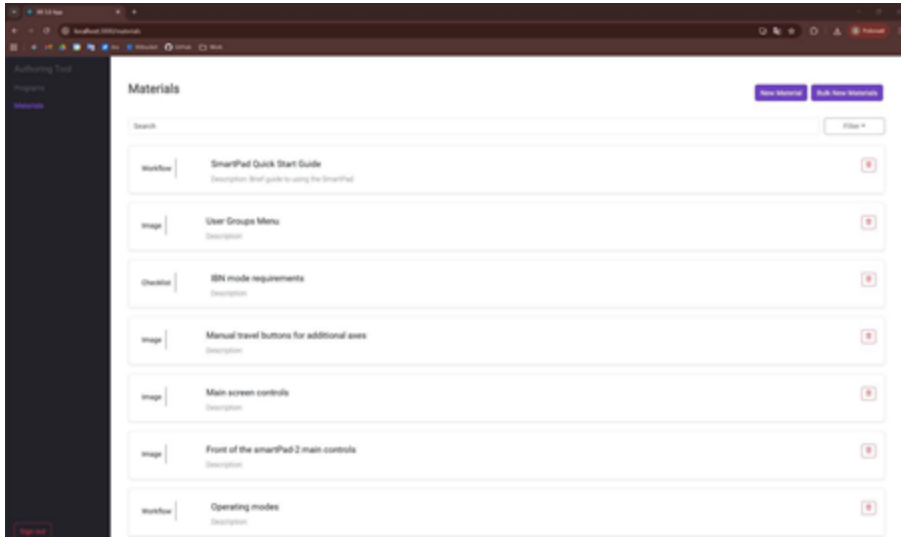
- Infrastructure Requirements – hardware, maintenance overhead
- Limited Model Capabilities – Smaller LLM models, reduced context window
- Resource Intensity - GPU dependency, concurrent user limits
- Maintenance Burden - Manual updates, monitoring setup
- XR Integration Complexity - Latency challenges, custom development
- Accuracy Concerns - Hallucination risk, inconsistent responses
- Single Point of Failure - No built-in redundancy

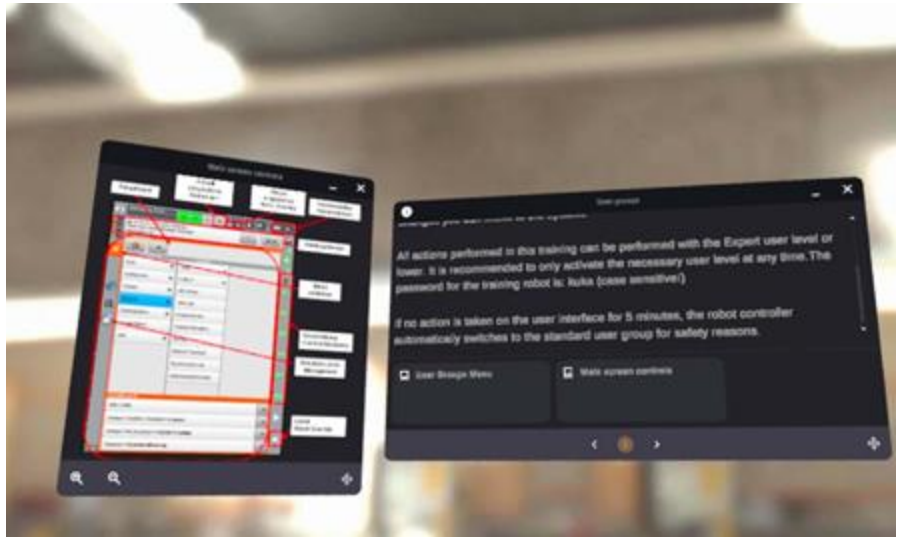
Immersive Training Scenarios

Training Platform

XR Training







Supported Training Content

Procedural Content

- Step-by-step workflows
- Smart checklists
- Guided procedures

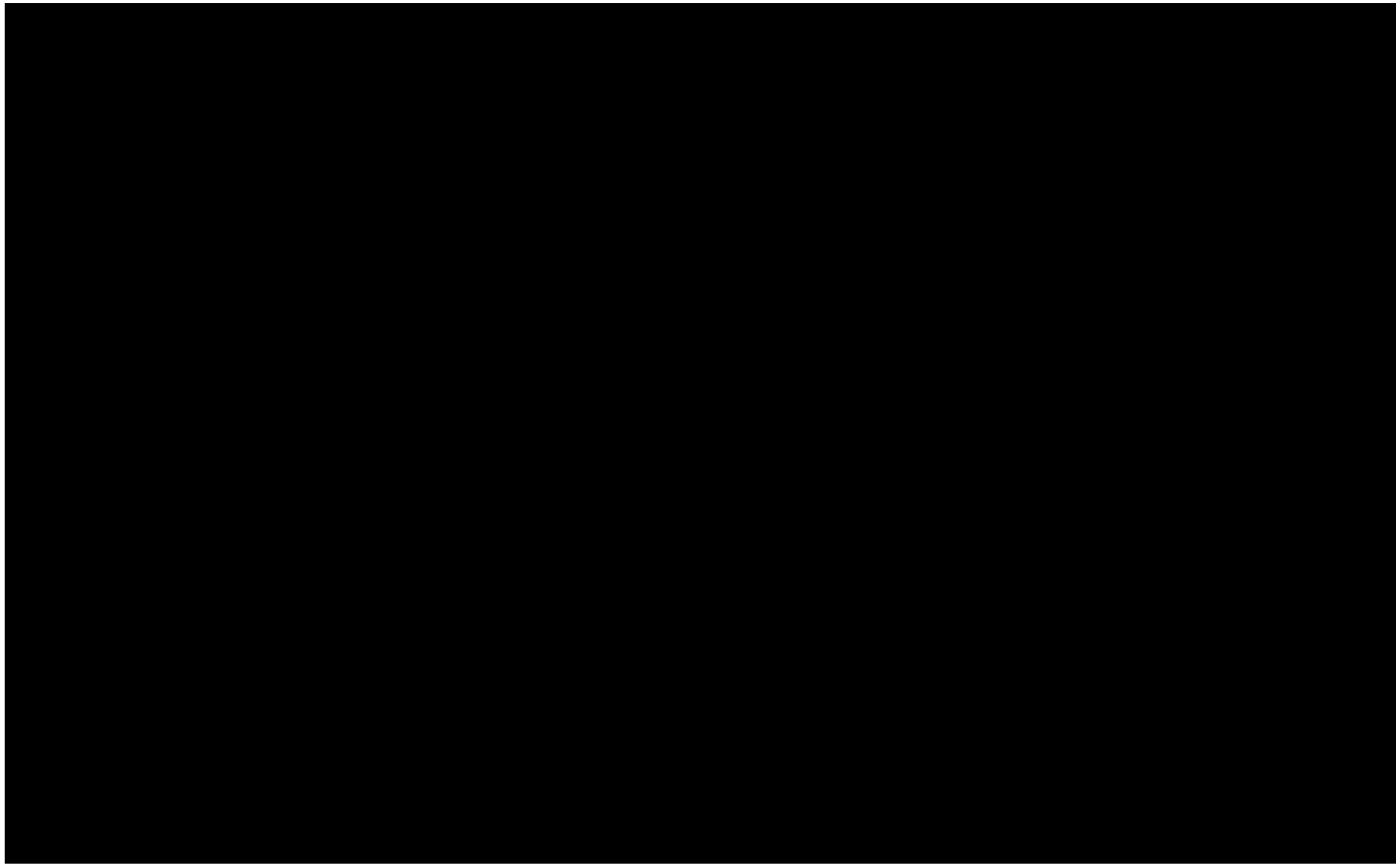
Platform Compatibility

- OpenXR devices
- Quest / Magic Leap / HoloLens
- Cloud streaming
- Cloud repository

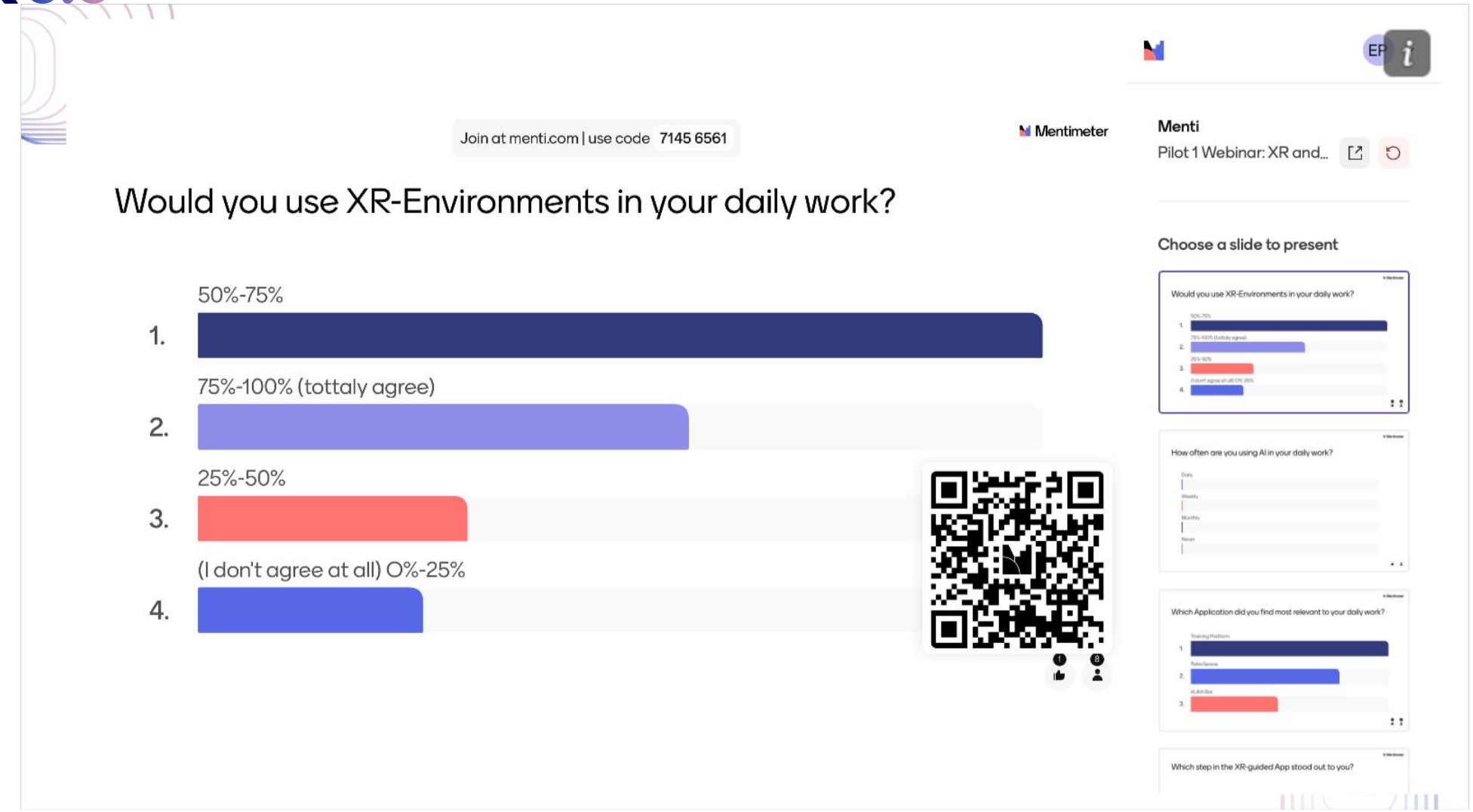
Interactive & Visual Content

- Annotated images
- Videos
- 3D Models
- Multi-view dashboards
- AI voice assistant

Demo



Live audience feedback and live survey in an online event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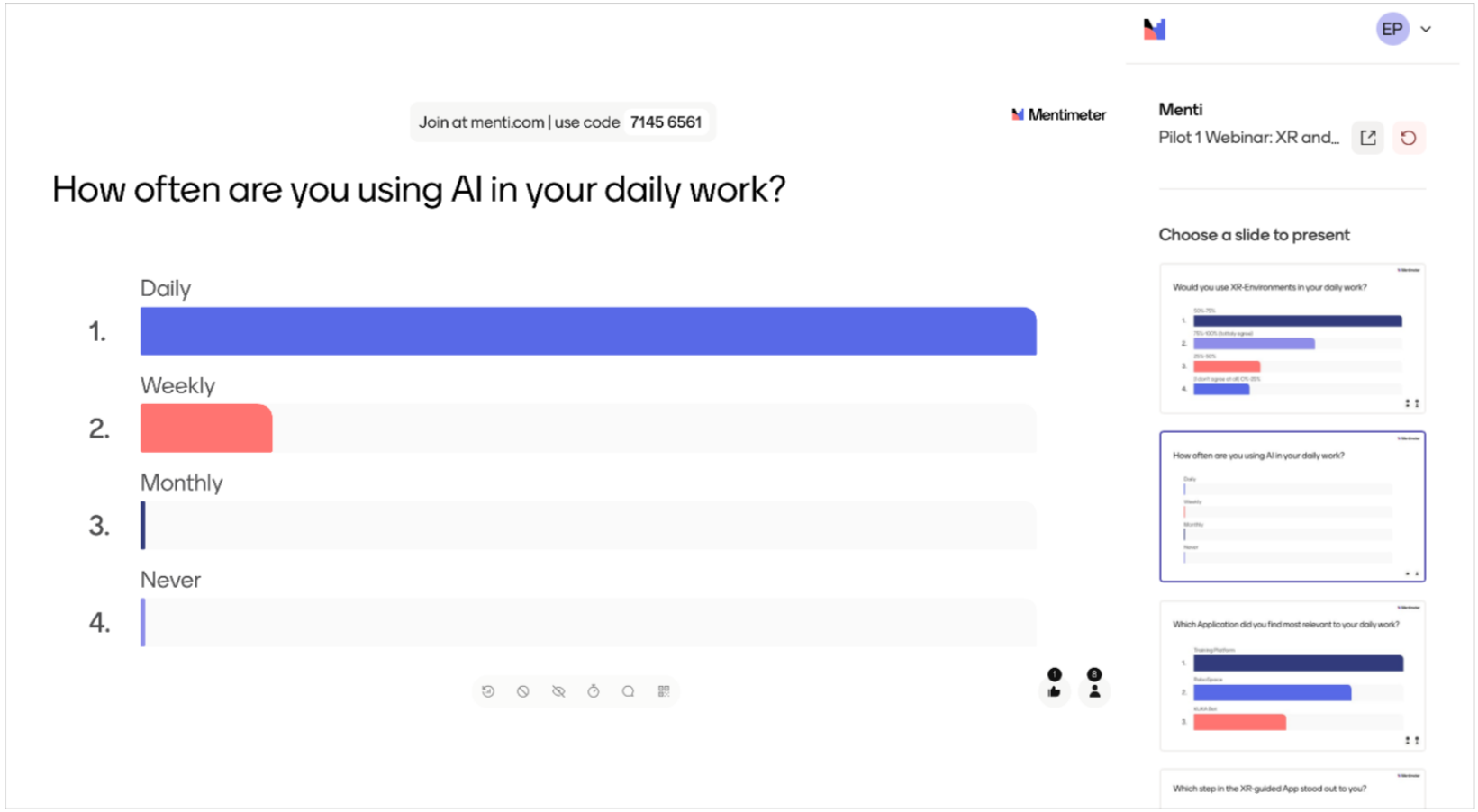
Mentimeter
Would you use XR-Environments in your daily work?
1. 50%-75%
2. 75%-100% (tottaly agree)
3. 25%-50%
4. (I don't agree at all) O%-25%
Menti
Pilot 1 Webinar: XR and...
Choose a slide to present
Would you use XR-Environments in your daily work?
How often are you using AI in your daily work?
Which Application did you find most relevant to your daily work?
Which step in the XR-guided App stood out to you?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How often are you using AI in your daily work?
1. Daily
2. Weekly
3. Monthly
4. Never
EP
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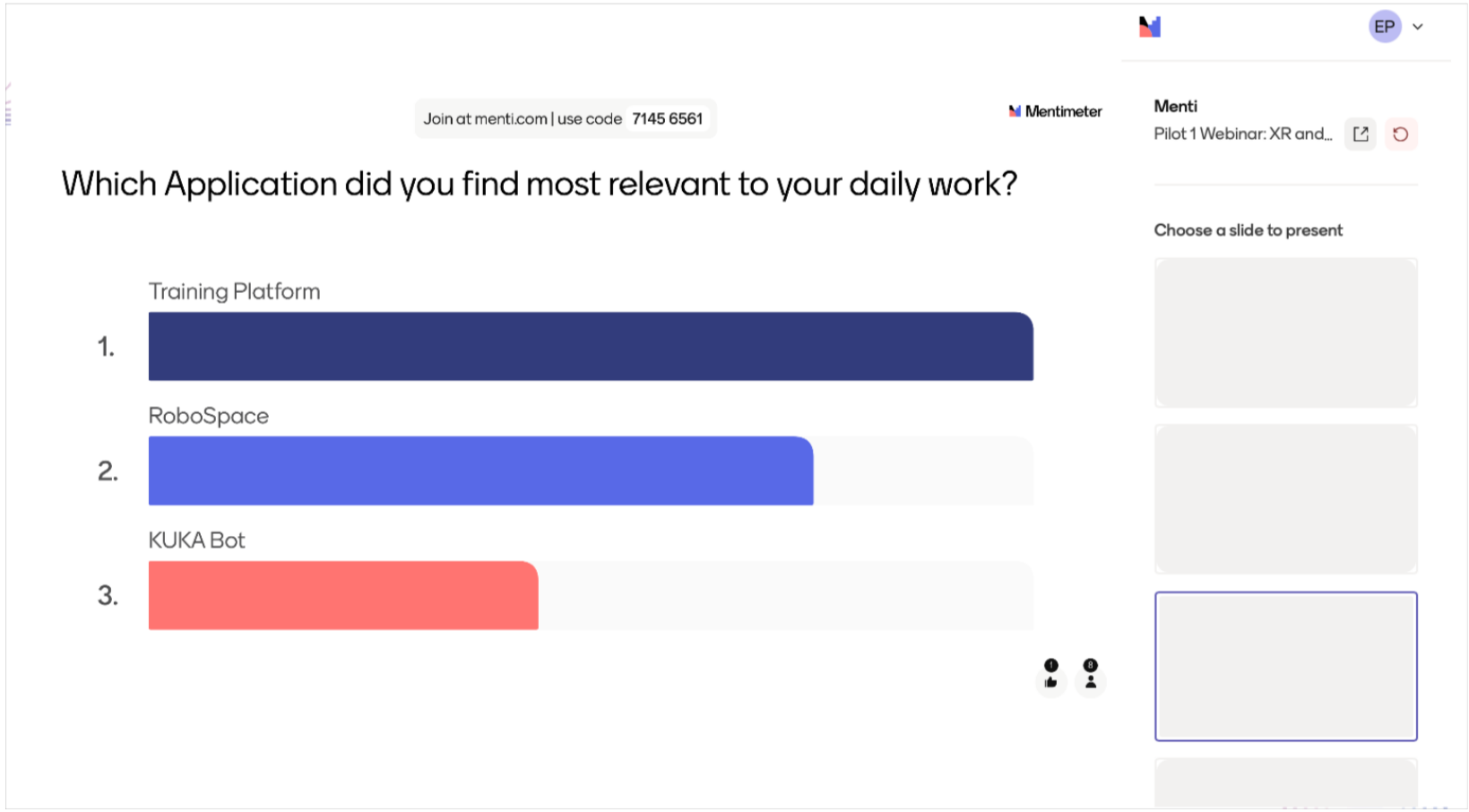
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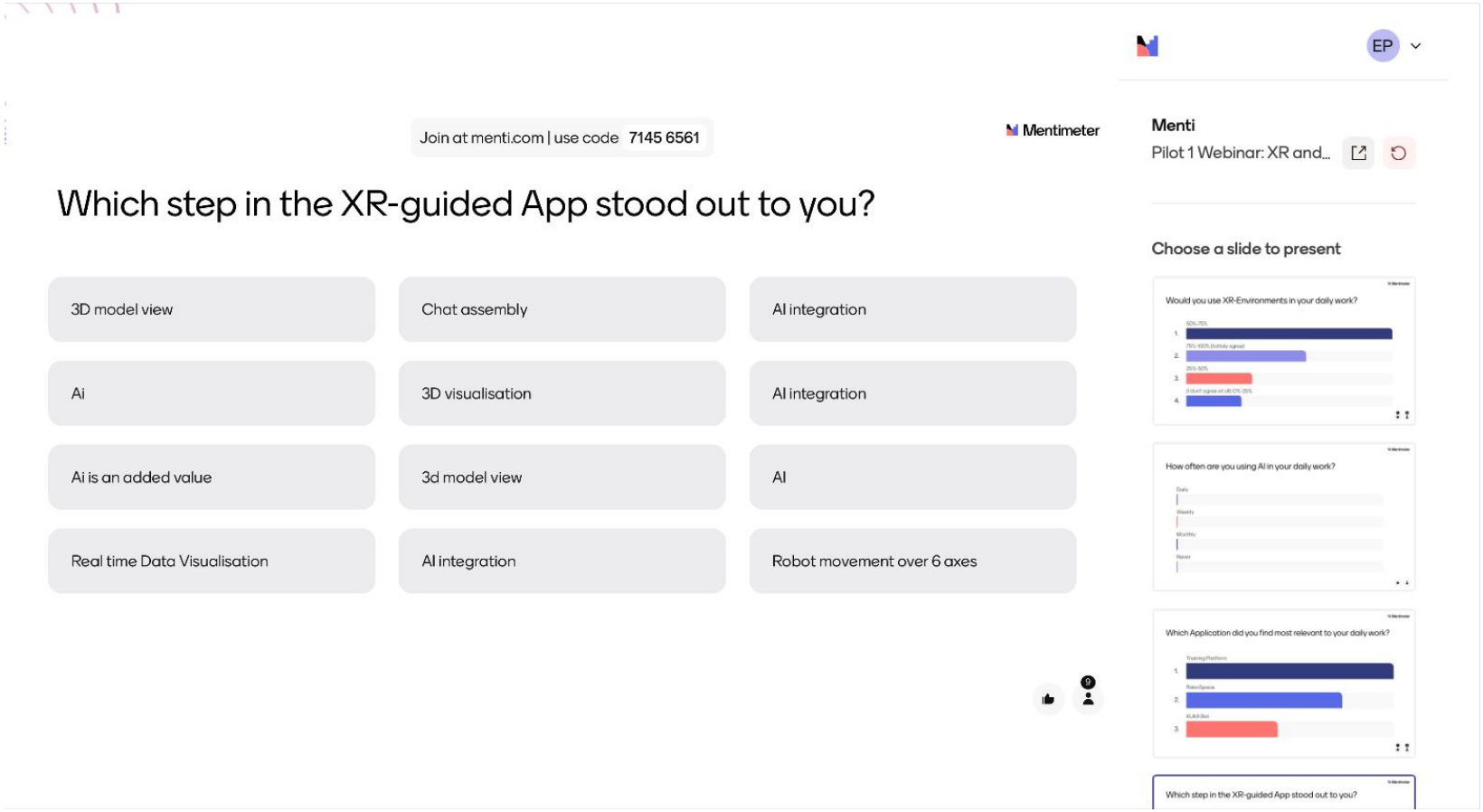
Which Application did you find most relevant to your daily work?
Choose a slide to present
Training Platform
1.
RoboSpace
2.
KUKA Bot
3.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Mentimeter
Which step in the XR-guided App stood out to you?
3D model view
Chat assembly
AI integration
Ai
3D visualisation
AI integration
Ai is an added value
3d model view
AI
Real time Data Visualisation
AI integration
Robot movement over 6 axes
EP
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Choose a slide to present
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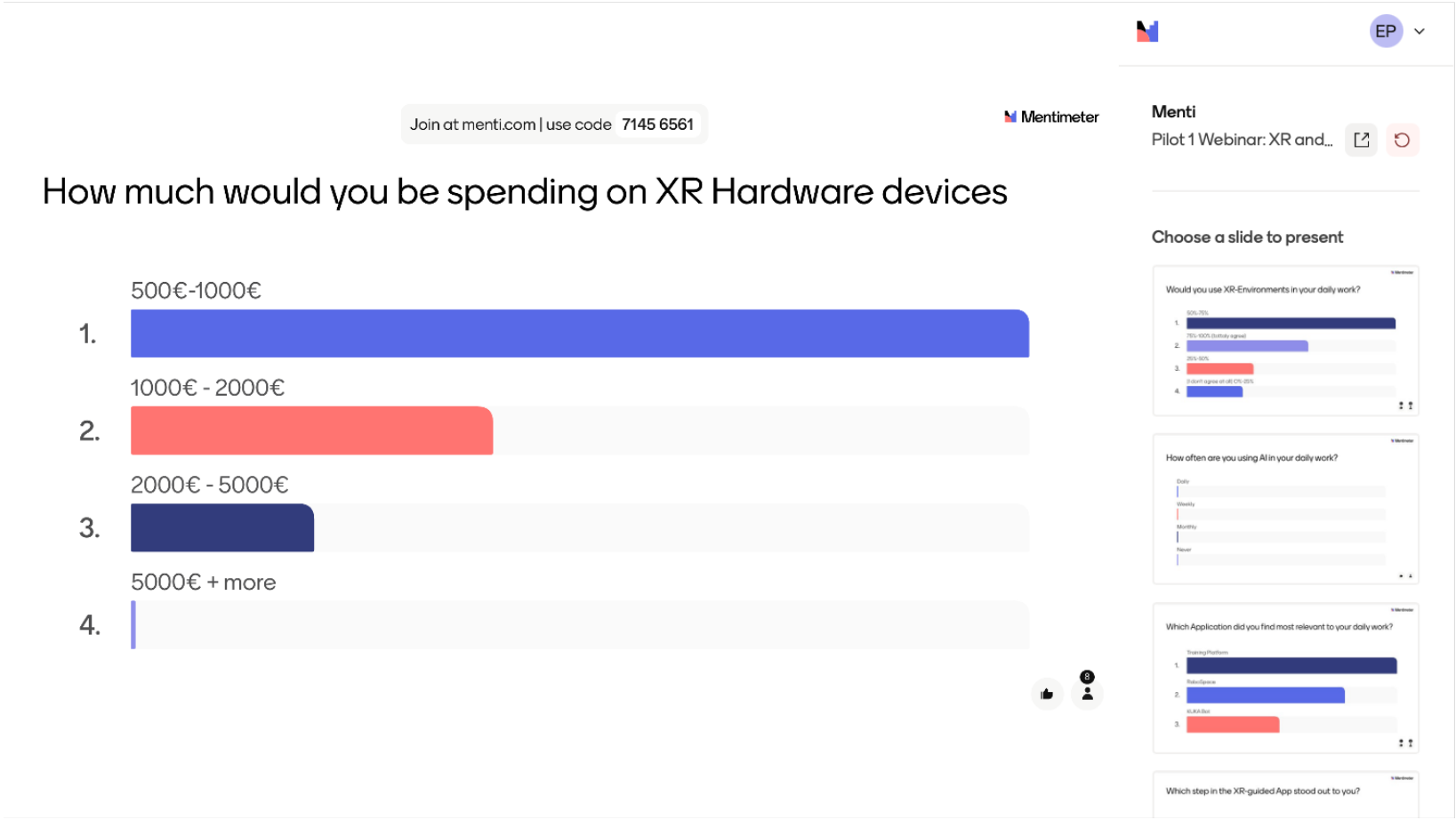
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How much would you be spending on XR Hardware devices
500€-1000€
1.
1000€ - 2000€
2.
2000€ - 5000€
3.
5000€ + more
4.
EP
Menti
Pilot 1 Webinar: XR and...
Choose a slide to present
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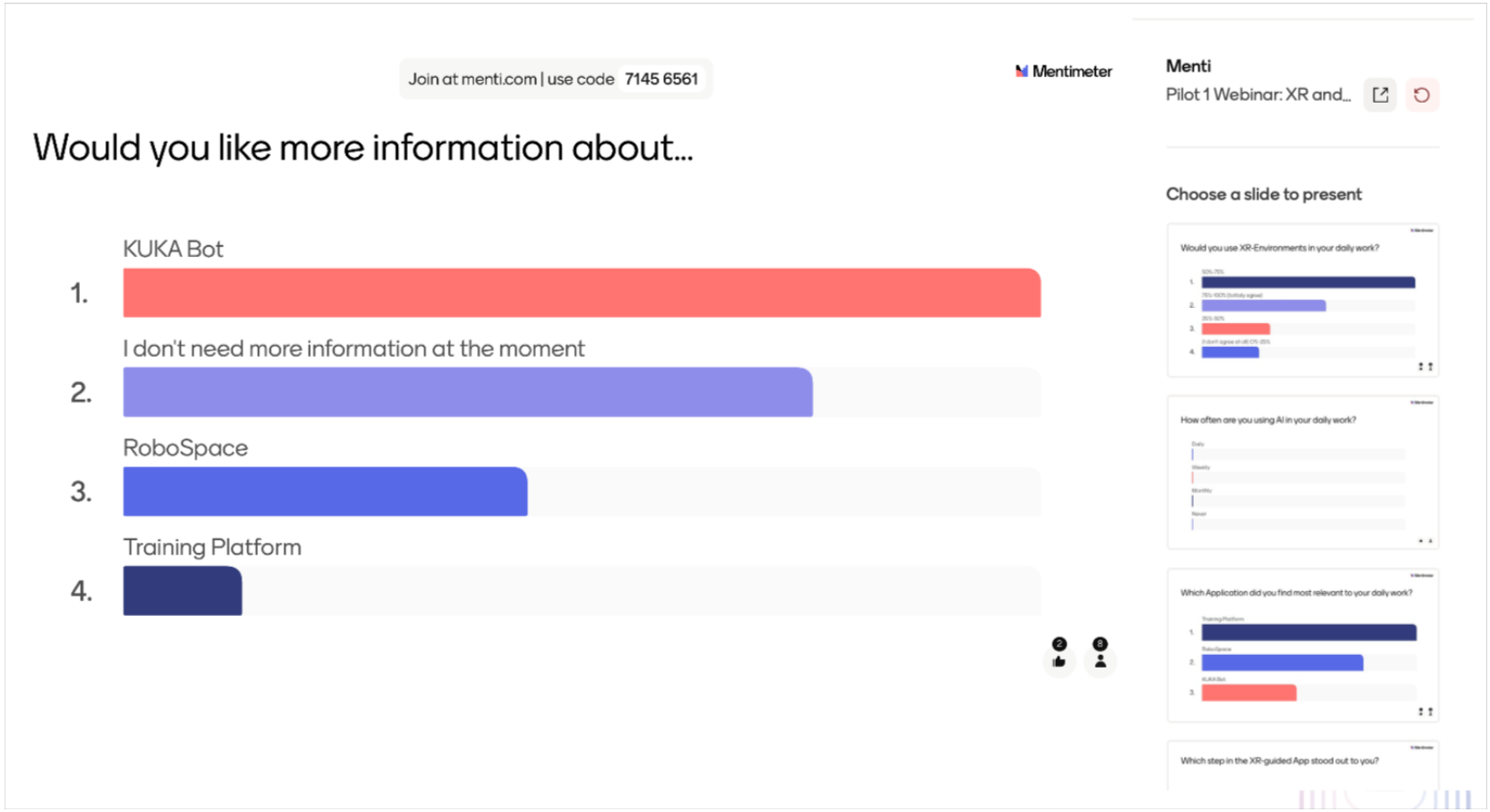
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Would you like more information about...
1. KUKA Bot
2. I don't need more information at the moment
3. RoboSpace
4. Training Platform
Menti
Pilot 1 Webinar: XR and...
Choose a slide to present
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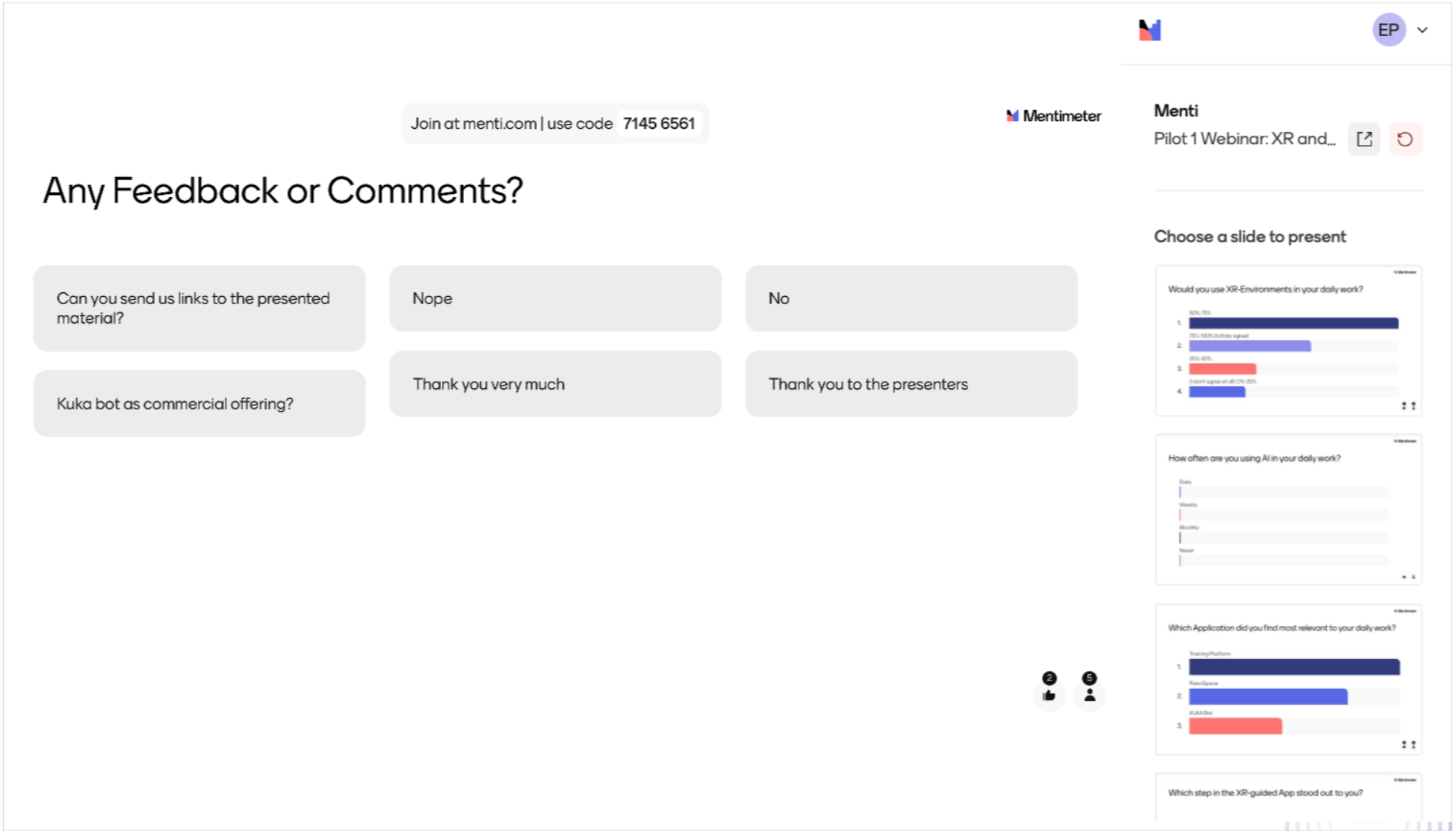
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Any Feedback or Comments?
Choose a slide to present
Can you send us links to the presented material?
Nope
No
Kuka bot as commercial offering?
Thank you very much
Thank you to the presenters
Would you use XR-Environments in your daily work?
How often are you using AI in your daily work?
Which Application did you find most relevant to your daily work?
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Open Discussion – Questions & Answers

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