OCTOBER 15 2020

Process Simulation & Training Americas Advisory Board

AVEVA™ Unified Learning

Meet the team AVEVA Unified Learning Portfolio team

AVEVA Unified Learning Product Manager Lead	AVEVA Dynamic Simulation & Control Emulation Product Manager	Pipeline Training Simulation Product Manager	XR & Connected Worker Portfolio Director
Coral Siminovich	**Andrea Macri**	**Alexander Troxell**	**Peter Richmond**
			

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Agenda

1. AVEVA™ Unified Learning Overview
2. AVEVA™ Process Competency Training & AVEVA™ Learning Management

----Break----

3. AVEVA™ Operator Training Simulator
4. AVEVA™ Pipeline Training Simulator

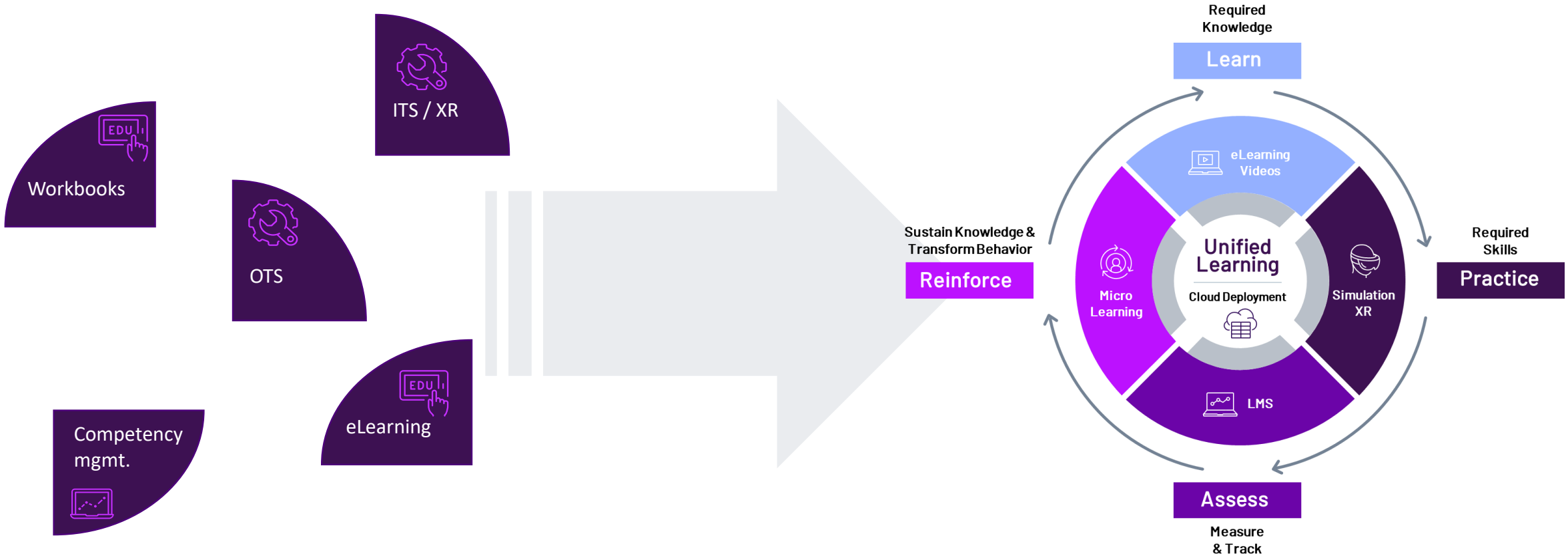
----Break----

4. AVEVA™ XR for Training
5. AI-Microlearning & Performance Support

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AVEVA Unified Learning

Going from a point solution to a unified approach

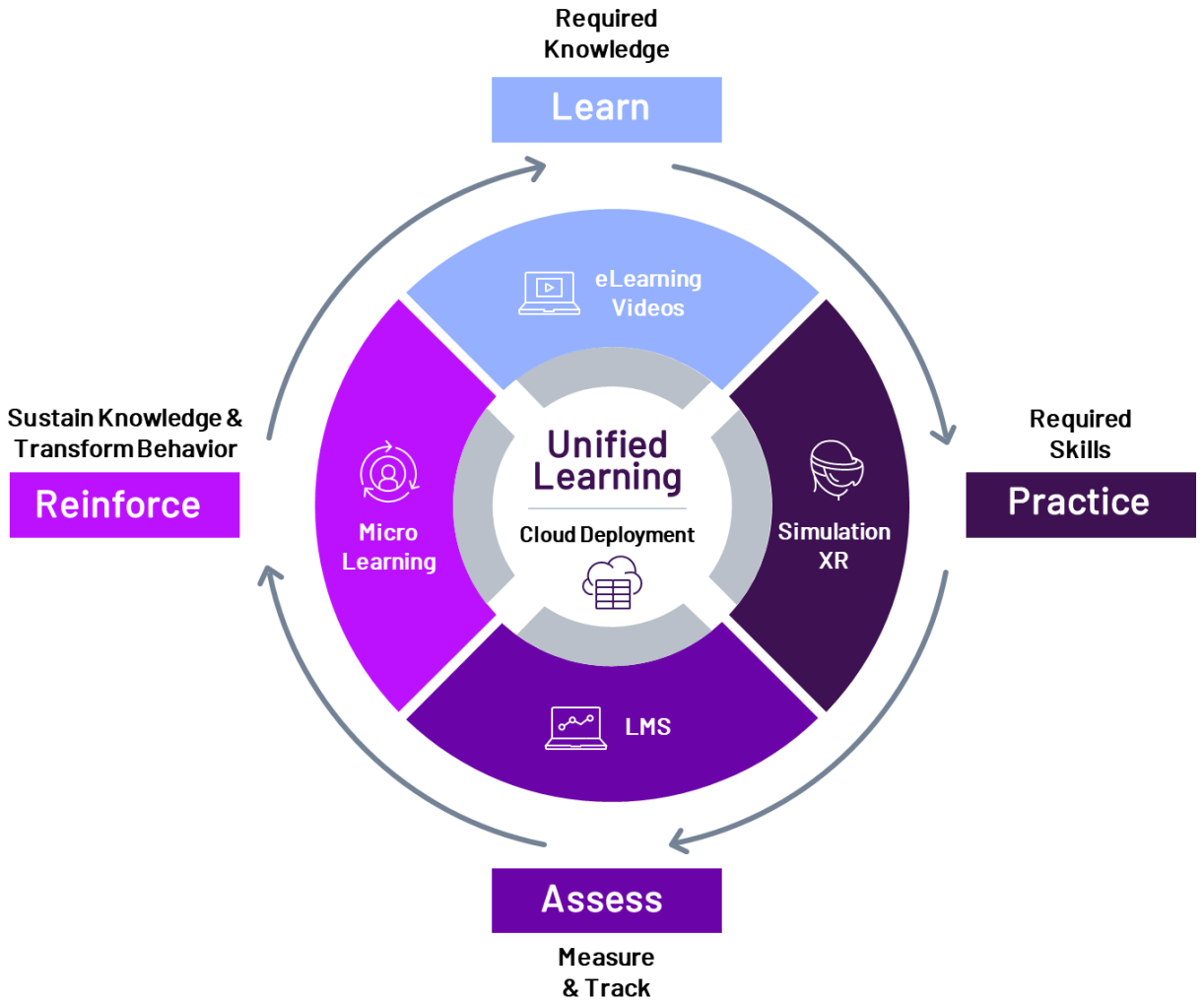


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AVEVA Unified Learning

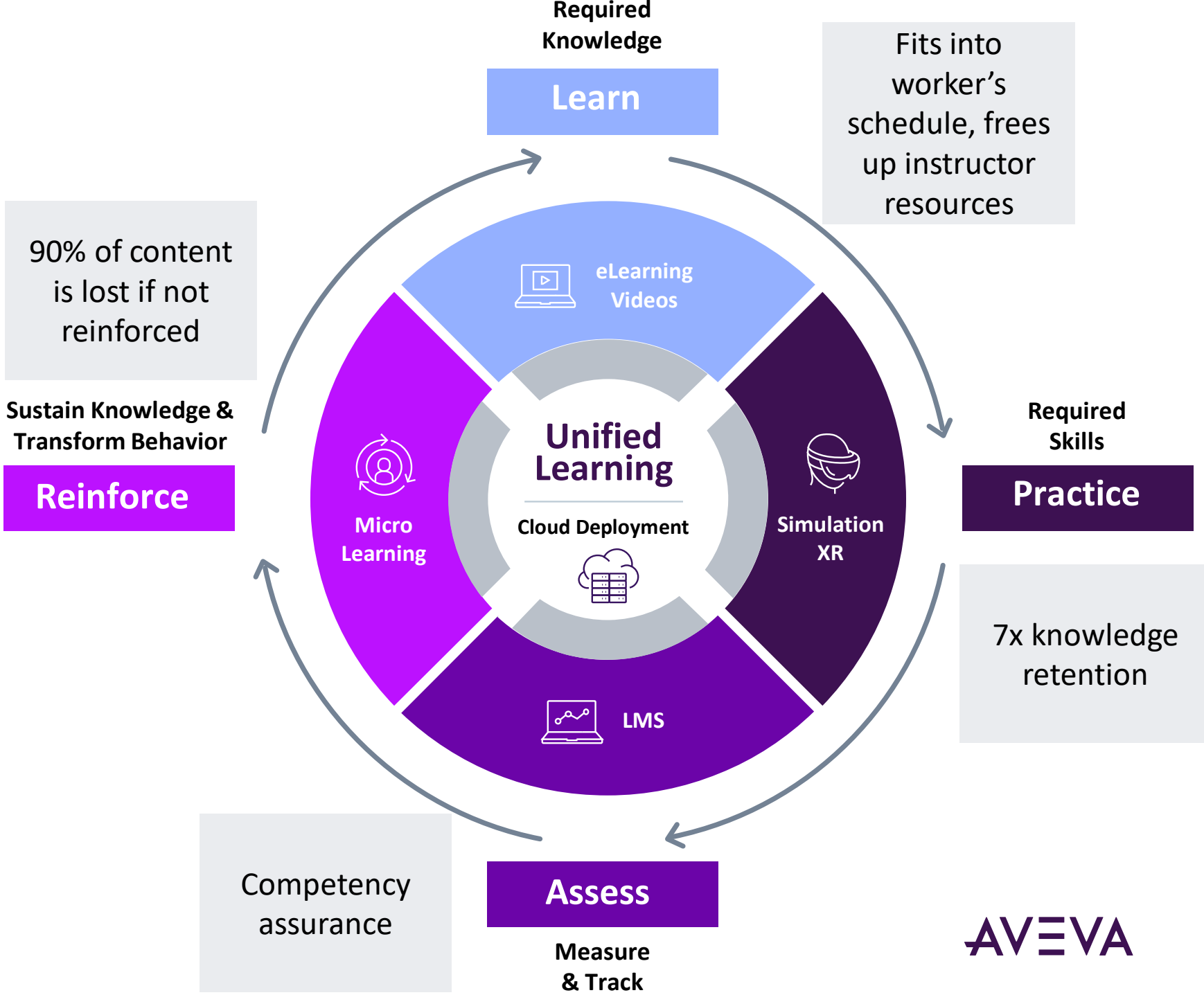
Integrated and scalable solution that combines eLearning, simulation, XR, LMS, AI, and microlearning as part of a framework that's designed to:

- ✓**Build competence**
- ✓**Improve worker performance**
- ✓**Drive behavior change**



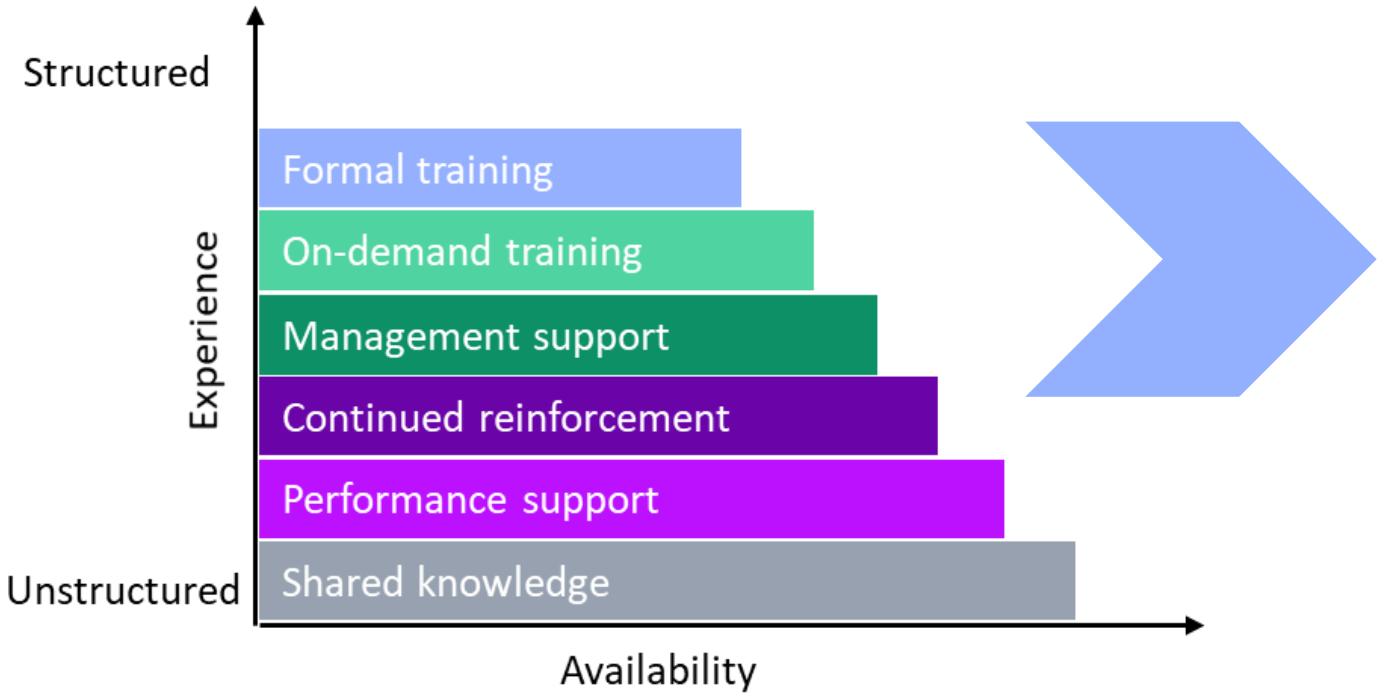
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Performance-driven competency framework for plant lifecycle



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Learning strategy for all stages of learning



- Learner centric
- Results driven
- Measurable
- Supported by Management
- Agile

Novice

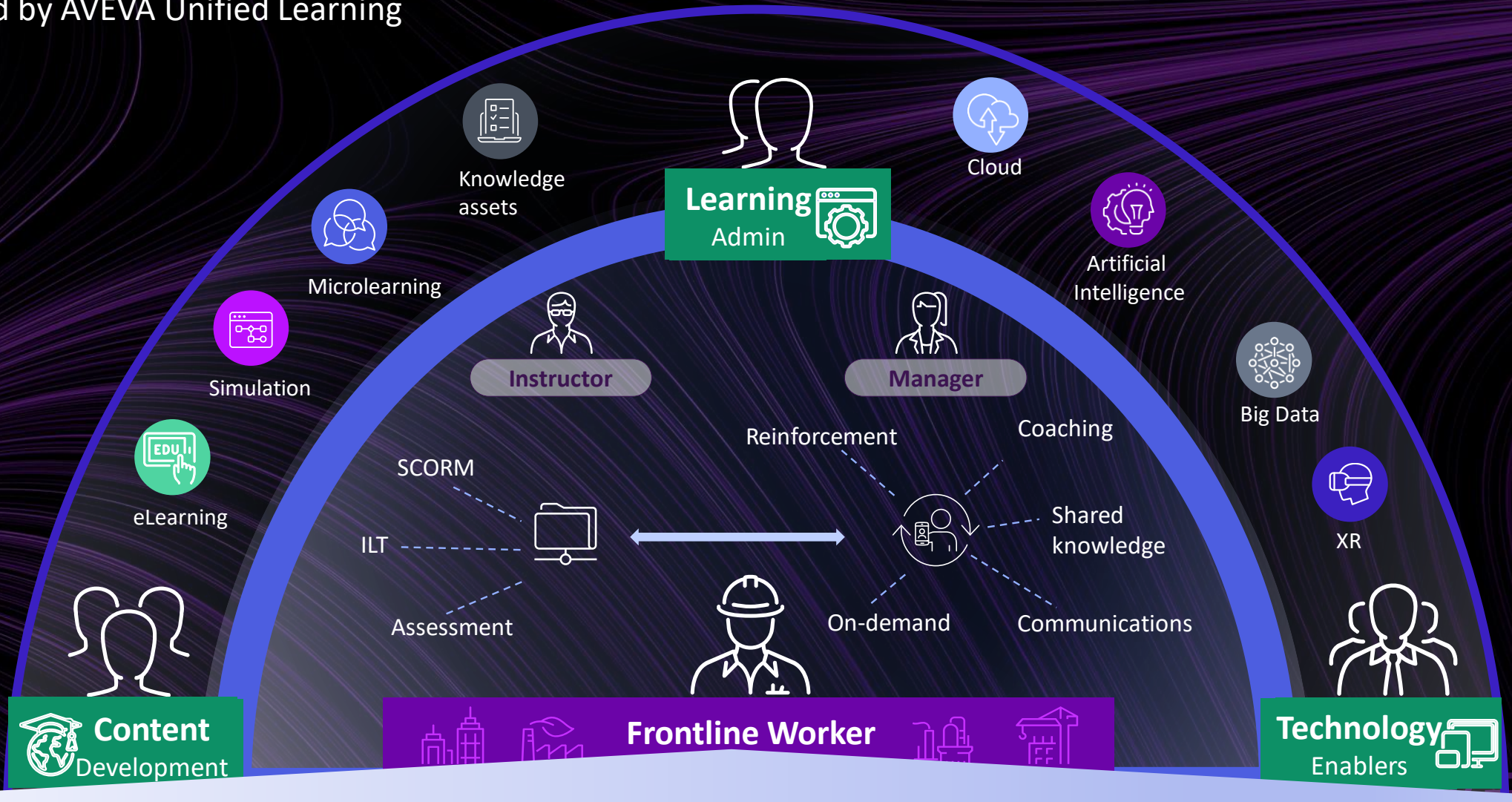
Skilled

Expert

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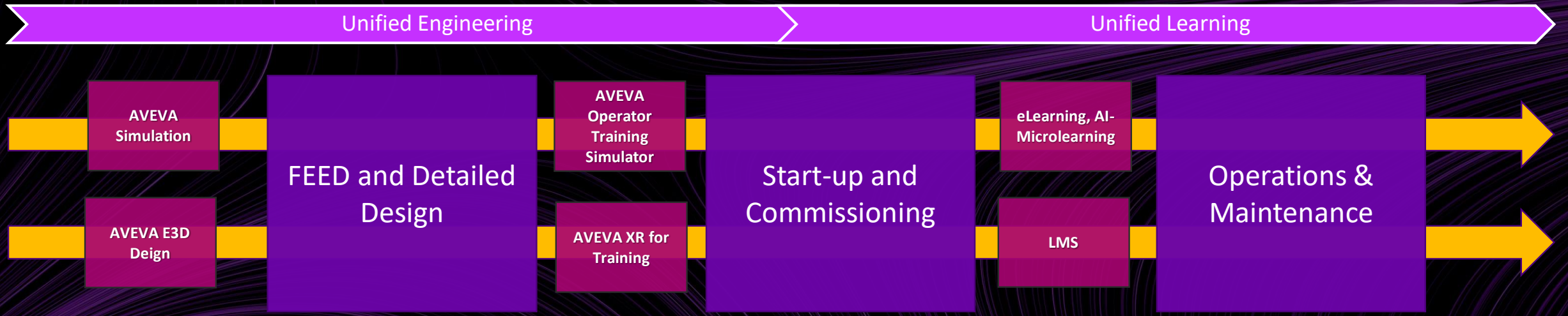
Performance-driven learning ecosystem for Industry's connected worker

Powered by AVEVA Unified Learning



RESULTS-DRIVEN LEARNING STRATEGY & COMPETENCY FRAMEWORK

From Simulation & Design to Experiential Learning



Extending the value of the digital twin across the plant lifecycle to unlock unparalleled value

- Gain valuable process insights
- Identify and eliminate design mistakes
- Analyze operability of highly integrated plants

- De-risk capital projects
- Shorten commissioning and startup time to nameplate capacity
- Make sure that people and systems are ready day one

- Build competence
- Improve worker performance
- Drive behavior change

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What’s coming

Today

- Cloud native learning management platform integrated with eLearning, Standard OTS and XR for Training
- Enhancements for OTS to Improve ease of use and maintainability
- New VR learning delivery applications for industrial personnel centred around safety and behavioural training items
- AI-enabled Microlearning Solution for Industry 4.0 customers

Tomorrow

- Ready-made experiential courses for industrial processes
- Enhancements for OTS to improve UI\UX of training tools
- XR for Training templates and libraries
- Expanded cloud-based capabilities

Future

- Library of generic industrial experiential courses
- Enhancements for OTS to Improve software ease of use, engineering efficiency and training capabilities
- Fully integrated on-demand learning solution

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AVEVA

Question

What is your preferred deployment method?

1. AVEVA Cloud
2. Private Cloud
3. On-premise/Local installations

Please answer using the chat

Question

How are simulation-based training programs implemented?

1. At the site level
2. At the corporate level
3. Hybrid

Please answer using the chat

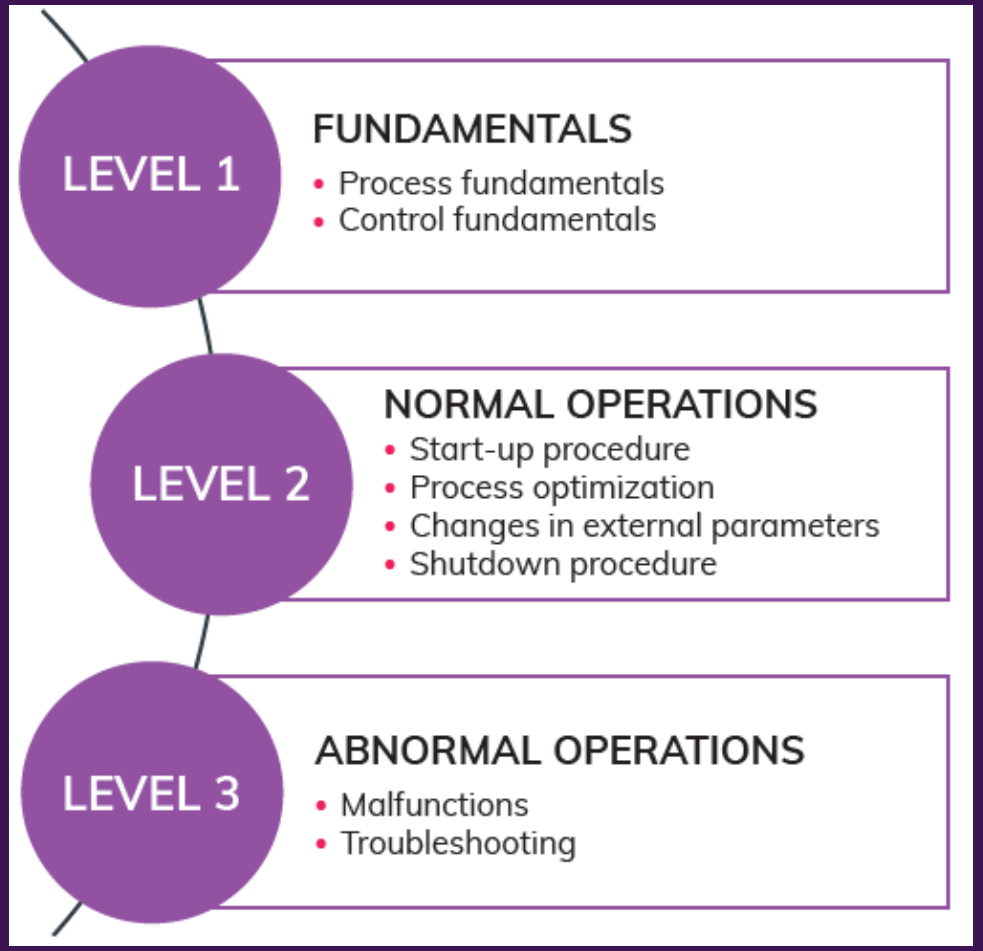
Q&A - Discussions

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AVEVA Process Competency Training
AVEVA Learning Management

Ready-made simulation-based courses for industrial processes

- Cloud-based
- On-demand
- Self-paced
- Course components:
    1. Theoretical part (done through an eLearning or video-based module);
    2. Practice exercise (done on the simulator);
    3. Assessments (built-in and tracked in LMS).



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AVEVA Cloud Training Center

coral.siminovich@aveva.com
You are logged in as carol.he@aveva.com

Dashboard | New Releases | All Courses | Help | My courses

Dashboard › My courses › More...

Learning plans

My plans

SimLMS Demo Learning Plan

Recently accessed courses



TRAINING-DEMO
Distillation Process Competency ...



TRAINING-DEMO
Generic Combined Cycle - Scenario 1



TRAINING-DEMO
Generic CDU/VDU - Scenario 1

Starred courses



Distillation Process Competency Training

Course overview

In progress | Course name | Summary



QA

Course topics

Process units	CDU/VDU	DCU	NH3	Combined cycle
Basic Modules	Furnace	Distillation	Fired heater	Centrifugal pump
	Compressor	Valves	Heat exchanger	Basic Process Science

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AVEVA

AVEVA and OEG have partnered to bring library of rich, video-based learning content for industrial personnel training as part of AVEVA Unified Learning

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AVEVA

ALL

Learning Asset Type

Filter

Search

Notifications

Coral Siminovich

- Favorites
- Playlists
- Syllabus
- Micro Courses
- Assessment
- Assignment
- Support

Abnormal Mechanical Conditions



Air Cooled Heat Exchangers



Anacortes Treater Explosion



API Pump Types



API Seal Plan 02



API Seal Plan 11



API Seal Plan 13



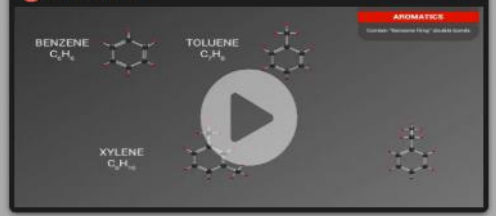
API Seal Plans



Applications



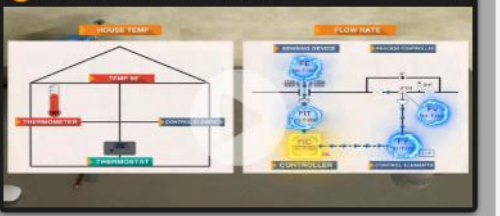
Aromatics



Auto-Ignition



Automated Control Systems



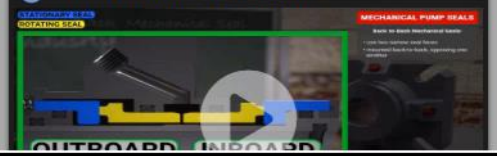
Automated Valve Control



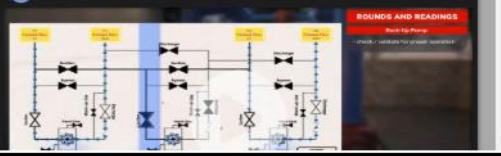
Axial Forces



Back-to-Back Mechanical Seals



Back-up (Spare) Pump



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Question

Which units/processes are a priority?

1. FCC
2. LNG
3. Other
4. None

Please answer using the chat

Question

What type of learning content and format is most useful?

1. eLearning/Videos
2. Classroom
3. Both
4. None

Please answer using the chat

Question

Which LMS is preferred?

1. AVEVA Learning Management
2. Existing LMS
3. No LMS

Please answer using the chat

Q&A - Discussions

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AVEVA Operator Training Simulator

For process and pipeline

AVEVA XR for Training

Definition of XR

XR

Extended Reality

AR

Augmented Reality



Augmenting the real world view captured via a device camera with 2D/3D digital information

AR often thought of as applied to Smart Phone/Tablets

MR

Mixed Reality



A form of augmented reality that blends the holographic images more seamlessly with the real world using spatial recognition

MR often thought of as applied to Wearables

VR

Virtual Reality



A 3D real-time synthetic world, typically interactive, that totally encloses the user using a head mounted display (HMD) or Cave automatic virtual environment (CAVE)

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A **new lens** for AVEVA Industrial Software



AR
Augmented Reality



MR
Mixed Reality



VR
Virtual Reality

XR
Extended Reality



Connect

Visualise

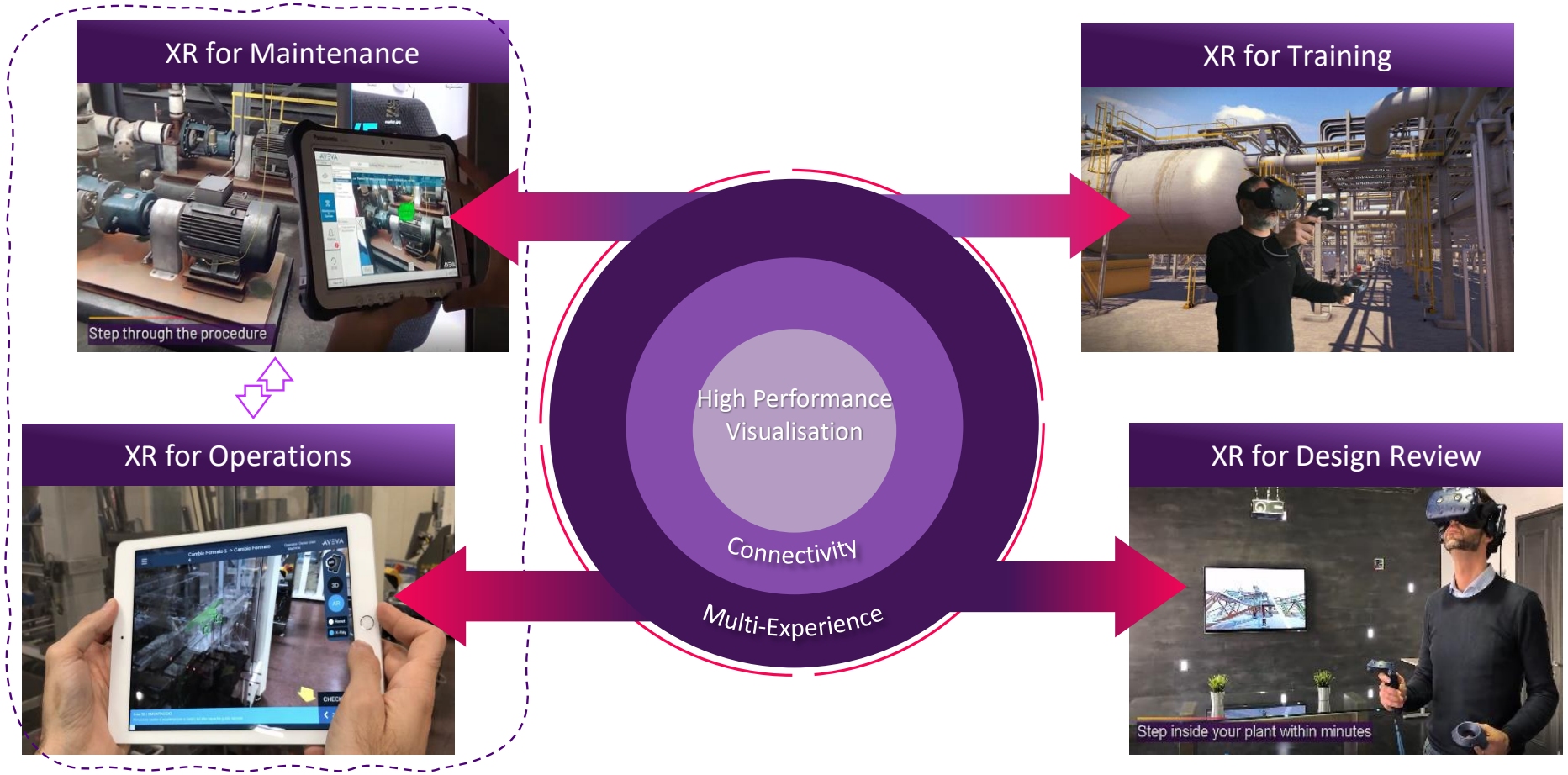
Interact

Collaborate

A **paradigm shift** for
access and **interaction** with the **living digital twin**

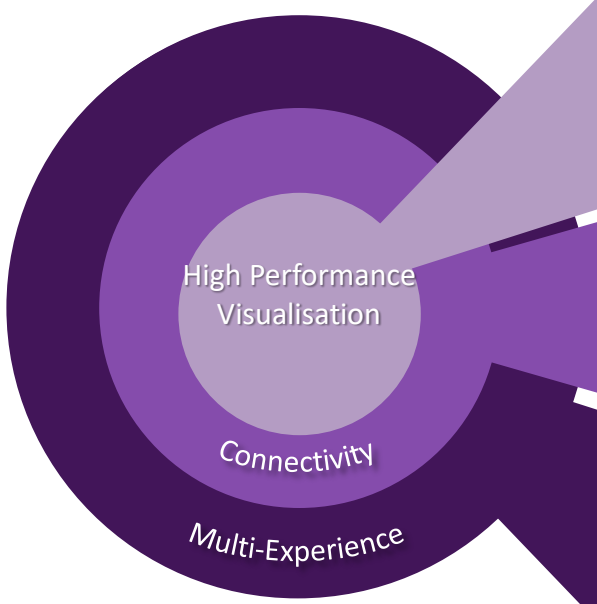
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AVEVA XR value available today



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Key technology features to drive XR Applications



High Performance 3D real-time rendering

- **The capability to render photo realistic graphics at** very high frame rates **(~90Hz for VR)**
- **The capability to render** very large 3D scenes **(entire plant/asset)**





Connectivity

- **The capability to connect any information from either the Asset or Operations Lifecyle to the visual context**
- **Bi-directional connection and management of information**

AVEVA Unified Learning

AVEVA Asset Information

AVEVA Unified Operations

Multi-Experience

- **The ability to deploy the same application on ANY hardware device (Desktop, Mobile, Wearable), locally and from the CLOUD**
- **AR and MR features enabled through XR software and hardware devices**

Desktop & Multi-touch



Virtual Reality



Mobile & Wearable



AVEVA™

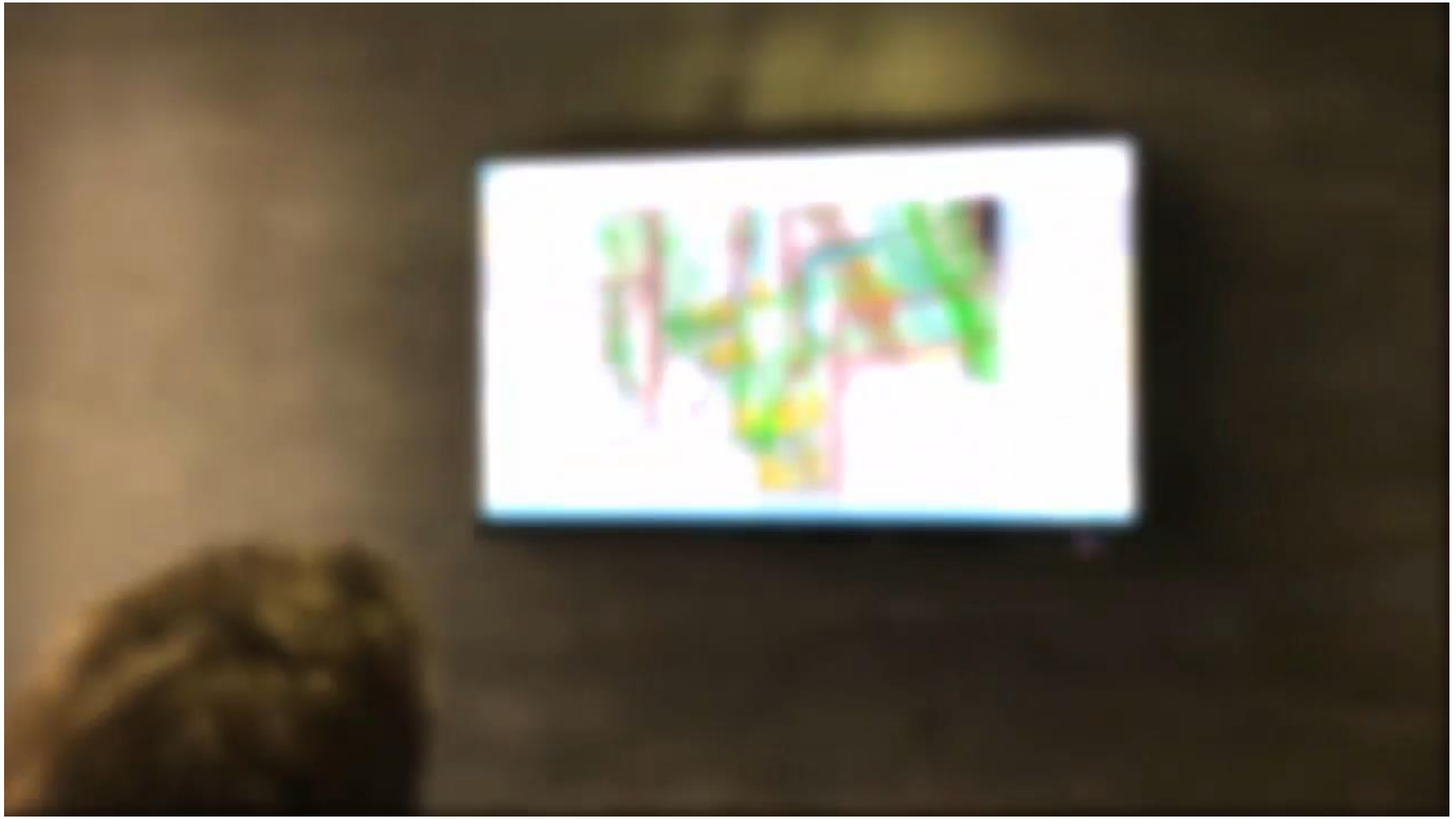
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Video Examples of XR applications

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XR for 3D Design Review



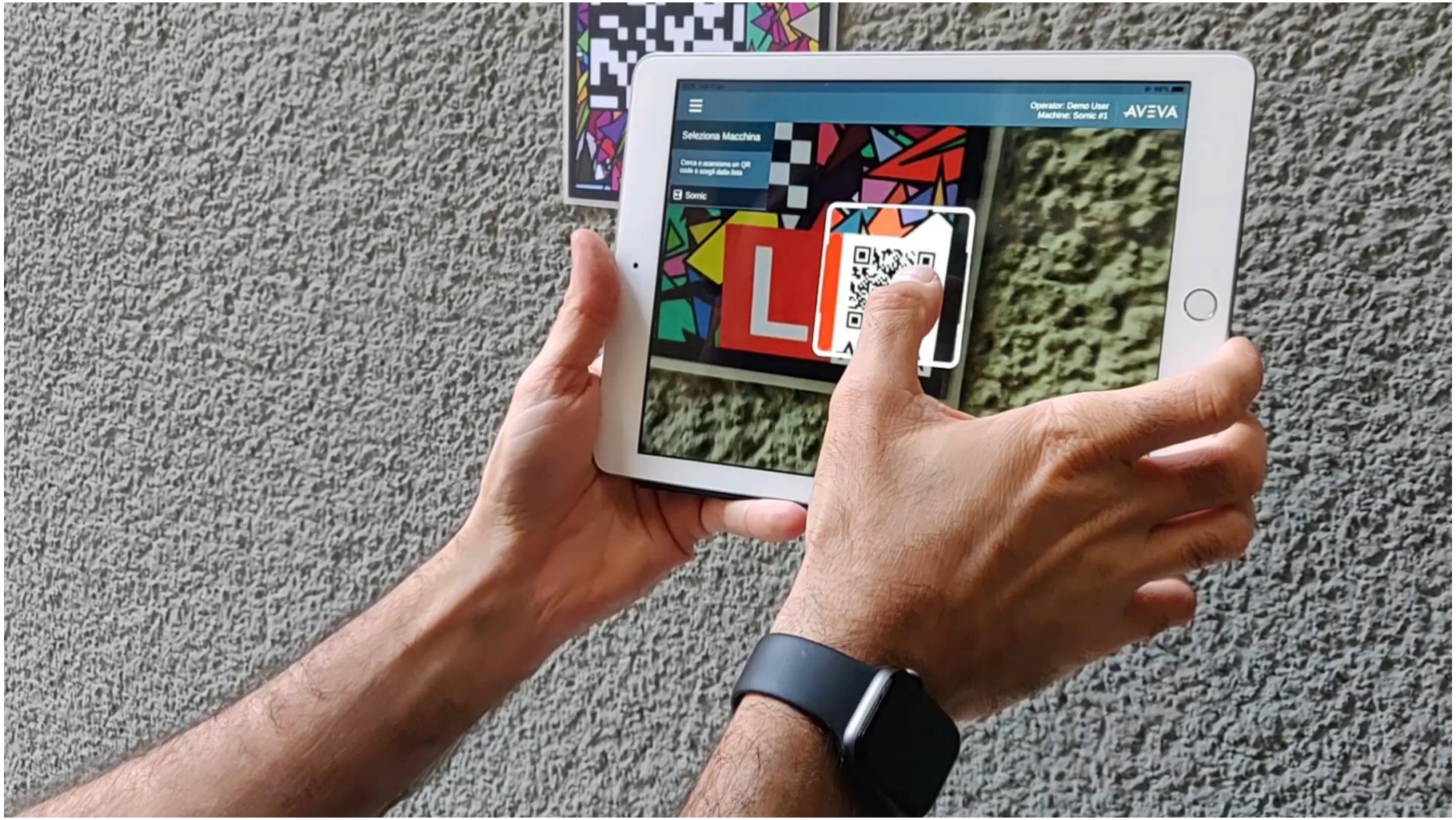


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XR for Operations and Maintenance





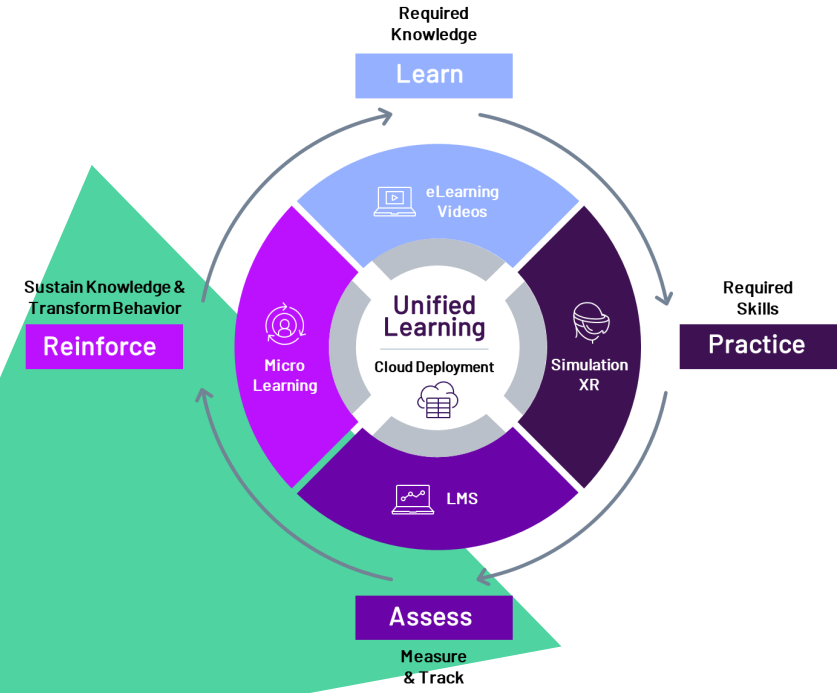


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XR for Training Use Cases

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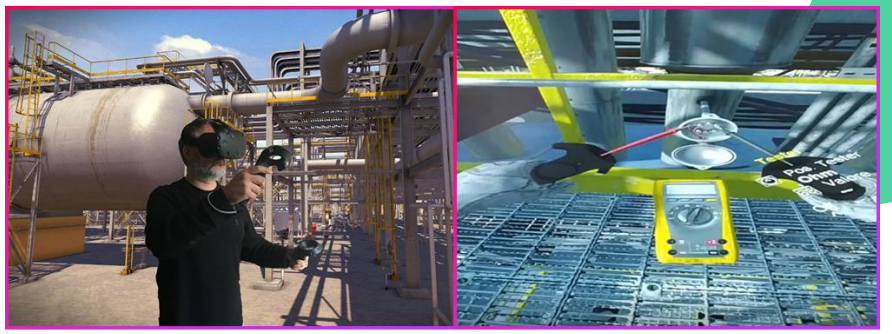
OTS and ITS fits seamlessly inside a bigger picture

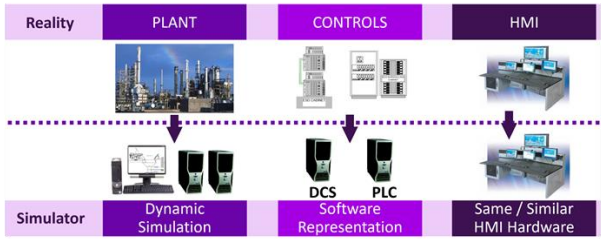


Operator Training Simulator (OTS)



Immersive Training System (ITS)





Standalone or Connected



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XR for Training Types

Team Training



Panel and Field working together

Product, Machine, Equipment Training





Process and SOP Procedural Training

Electrical and Mechanical Training





Behavioral, Hazzard Recognition, and Safety Awareness

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AVEVA

XR for Training Electrical and Mechanical teams

Digitize best practice, transfer knowledge, reduce downtime, improve safety



Example of electrical and mechanical technician training



Trainee View



Instructor View
(videos are not synchronized)

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Safety and Behavioural Training is a new application of XR for Training

Cloud-based VR learning for all industrial personnel on AVEVA Unified Learning

- ✓ Situational awareness
- ✓ Managing abnormal situations
- ✓ Safe work planning and execution
- ✓ Proactive monitoring
- ✓ Managing instruments and alarms
- ✓ PPE
- ✓ Safety intervention and improvement

Goes beyond understanding and practicing the operating procedures:

- Ensures workers understand expectations and what to do when faced with particular challenges that may involve colleagues or even supervisors
- Assesses how people behave when faced with unexpected situations in the plant

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AVEVA

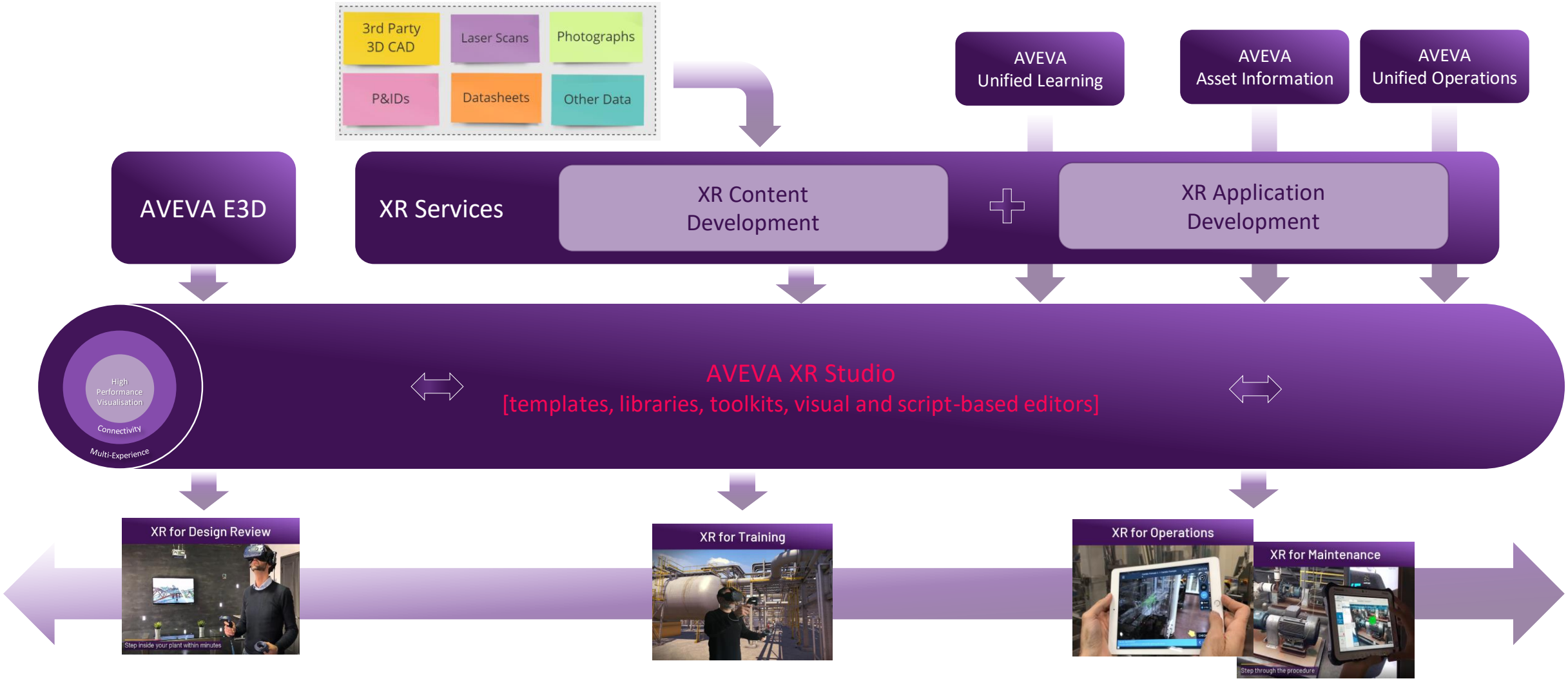


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How is an XR application created?

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Extending the value of the living digital twin



Workflow for XR Application Types



Prepare E3D Model → Import to XR Studio → Add XR Features [Optional] → Publish XR Runtime



Create Application Design → Prepare 3D Data → Create XR Content In DCC tool* (3D graphics/CGI) → Import to XR Studio → Add XR Features → Publish XR Runtime



Create Application Design → Prepare 3D Data → Create XR Content In DCC tool* (3D graphics/CGI) → Import to XR Studio → Add XR Features → Publish XR Runtime

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* DCC = Digital Content Creation tools such as Blender, 3D StudioMax and Maya

AVEVA™

XR Content Creation – Define the visual quality

Scalable Visual Quality: defined by the XR application type and customer requirements and budget

Level 0: CAD-Like



- Geometries taken directly from the 3D model
- Some enhancements via automated shaders and real-time lighting
- Background context added (Land/Sky/Sea)

Level 1: Realistic



- Some object optimization and grouping for application building
- Bulk texturing with generic textures and materials
- Occasional photo-real objects added

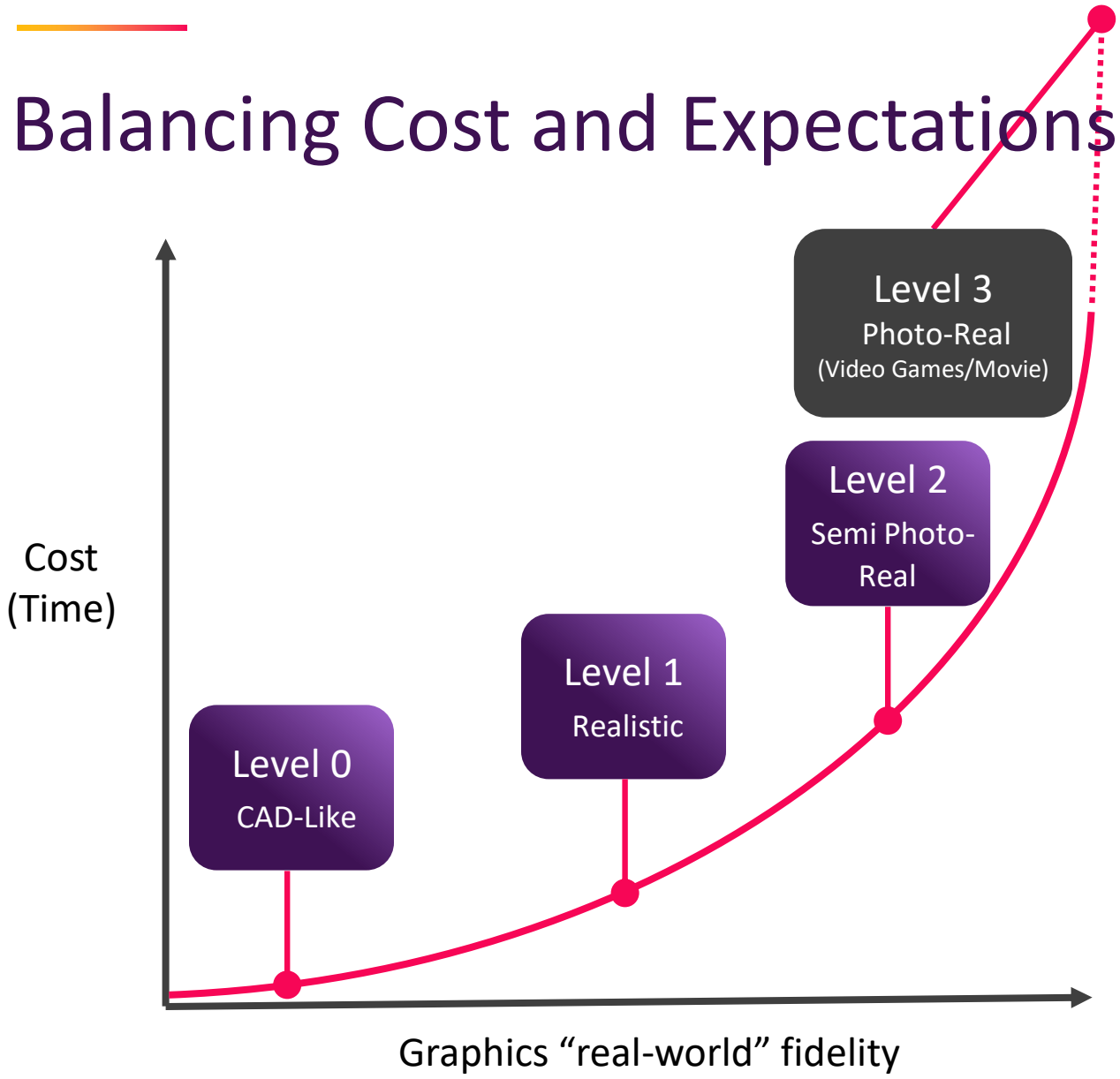
Level 2: Semi Photo-Real



- Highly optimized object structure for High Quality & High Performance
- Key elements created with photo-real appearance from photographs
- Accurate texturing with realistic shaders and materials wherever possible

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Balancing Cost and Expectations



Percentage of photo-real objects

Level 2 → Level 3

~20-30% ~80-100%



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How do you create XR Content?

#1 - Geometry

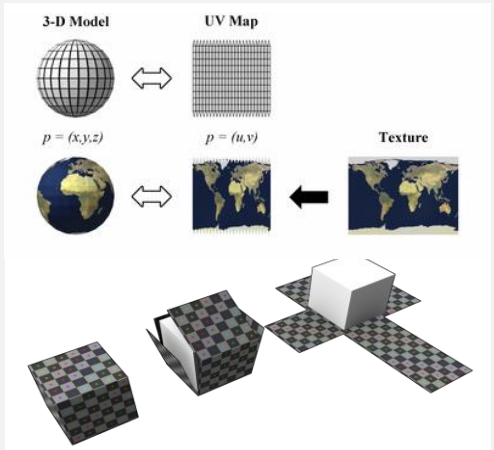
- Manage file import
- Optimize model structure and collate to logical groups
- Build missing geometry
- Reduce/Optimize unnecessary geometries





#2 – UV maps

- UV mapping is the process of projecting a 2D image on to a 3D geometry
- UV map allows a texture file to be assigned to the geometry



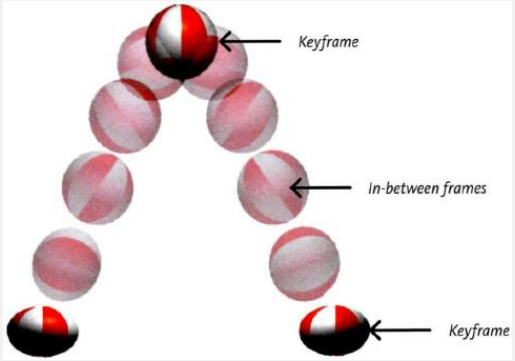
#3 - Materials

- Assign textures to the UV maps
- Assign Materials/Shaders to objects to simulate different types of real-life materials
- Increase the realism of the model



#4 - Animations

- Prepare the objects for any animations needed by the application
- Prepare the key frame characteristics and information ready for animation in XR Studio



#5 – Export XR Assets [FBX/MWX]

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How do you create XR Applications?

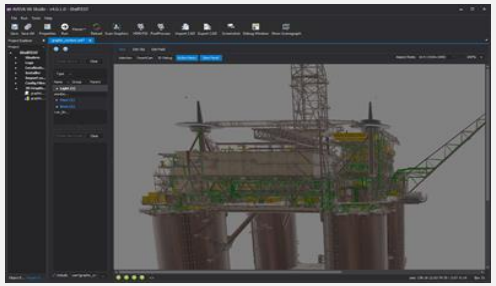
#1 – Select Template

- Decide application type and create a project with desired template:
  - Design Review
  - Training
  - Operations/Maintenance



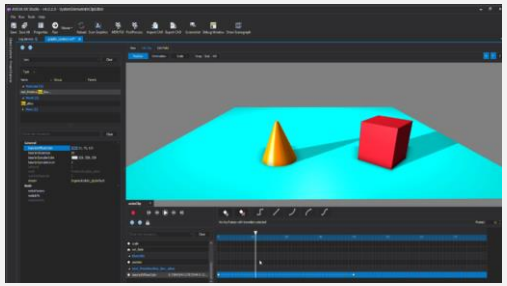
#2 – Import Assets

- Import XR Assets
  - Direct from E3D
  - Via a 3d Modeler tool
  - From XR libraries



#3 – Build Features

- Build the desired application functionality
- Develop via visual editing tools
- Develop using XML scripting tools



#4 – Publish Runtime

- Test the application
- Publish the XR Runtime in the form required for the Target Hardware



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What are we developing?

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Main themes for medium term XR development

XR Rendering & Engine

- Continue the work already underway to combine the best high-performance rendering technologies from AVEVA into a common componentized architecture to enable it to add value across the product portfolio.
- XR Renderer v.1 will combine ARF and NEKO with the first beneficiaries being XR Studio followed by Engage and 3DVS.
- Longer term adding LFM technologies and looking at multiple operating systems

XR Streaming and Deployment

- Develop how we Stream 3D real-time content both as whole applications and into windows within other applications.
- Review how we maximize 3rd party streaming services alongside WebRTC native investigations to achieve our business requirements.
- Review how we add audio/video streaming capabilities, and management of I/O.

XR File Format

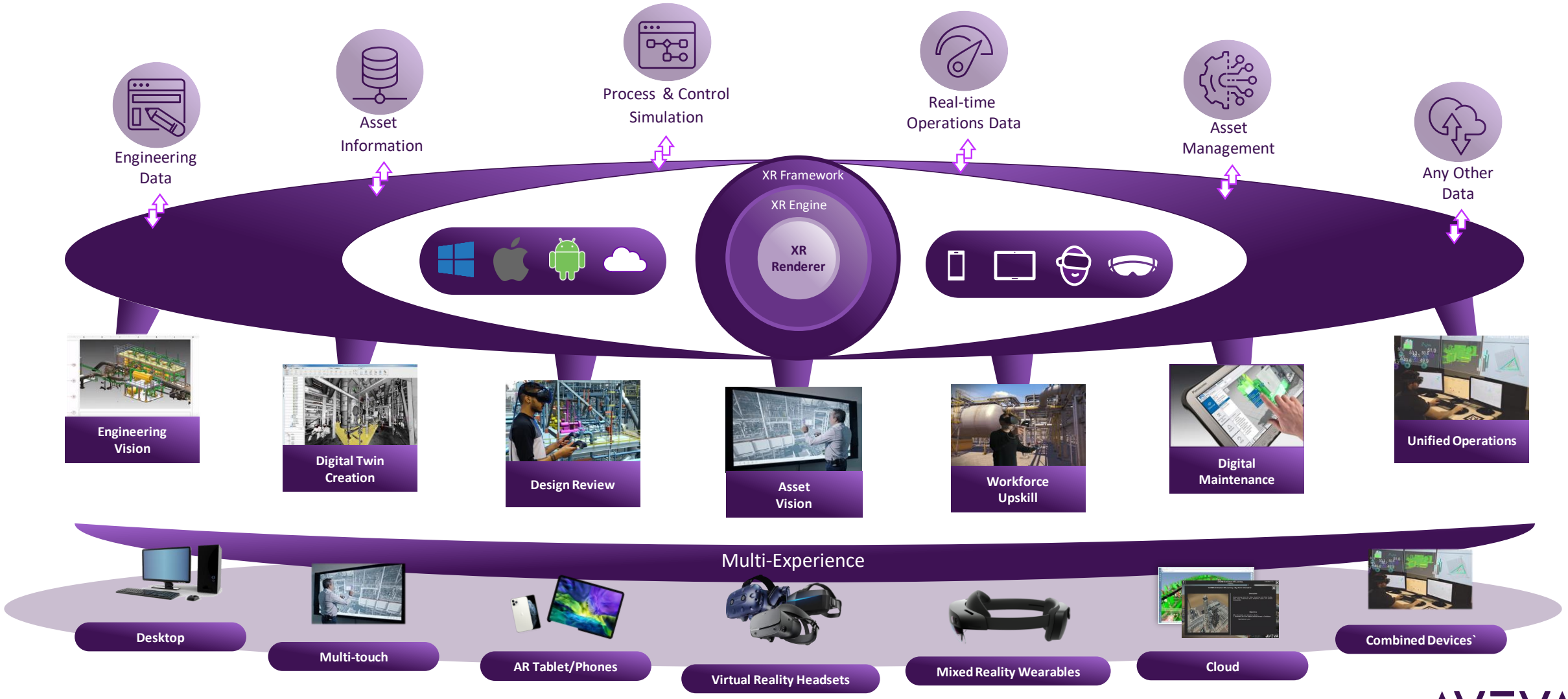
- Development around the AVEVA file format for high performance visualisation requirements to enable the different use case scenarios in a smarter way.
- Architect ready to consider different application needs for the streaming technologies of the future

XR Template Development

- The templates deliver the end customer solution and value from XR applications created in XR Studio.
- Significant development effort will be focused around the use case requirements for Design Review, Training, and Operational and Maintenance support applications.

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Unified Extended Reality and Visualisation



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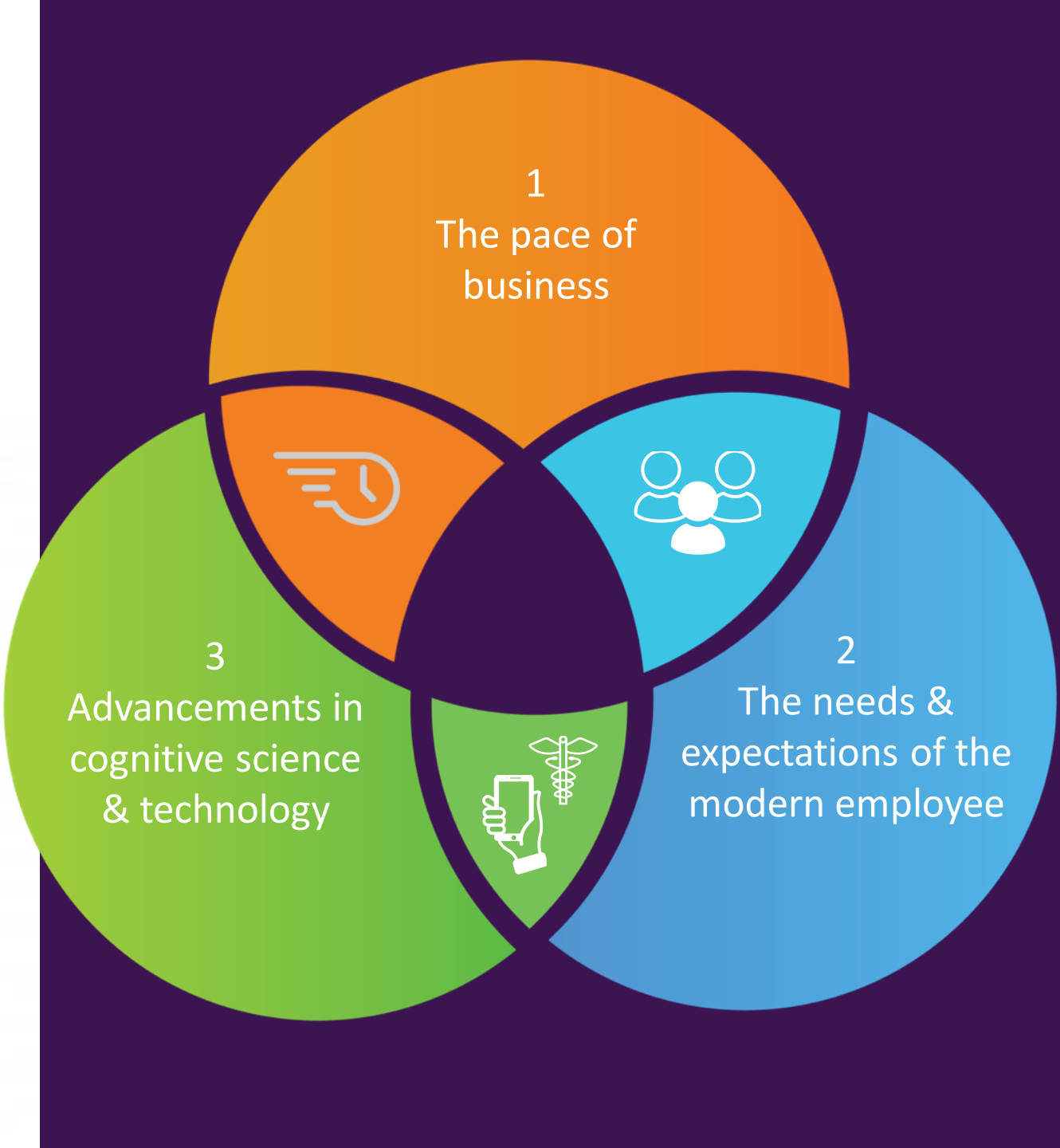
Q&A - Discussions

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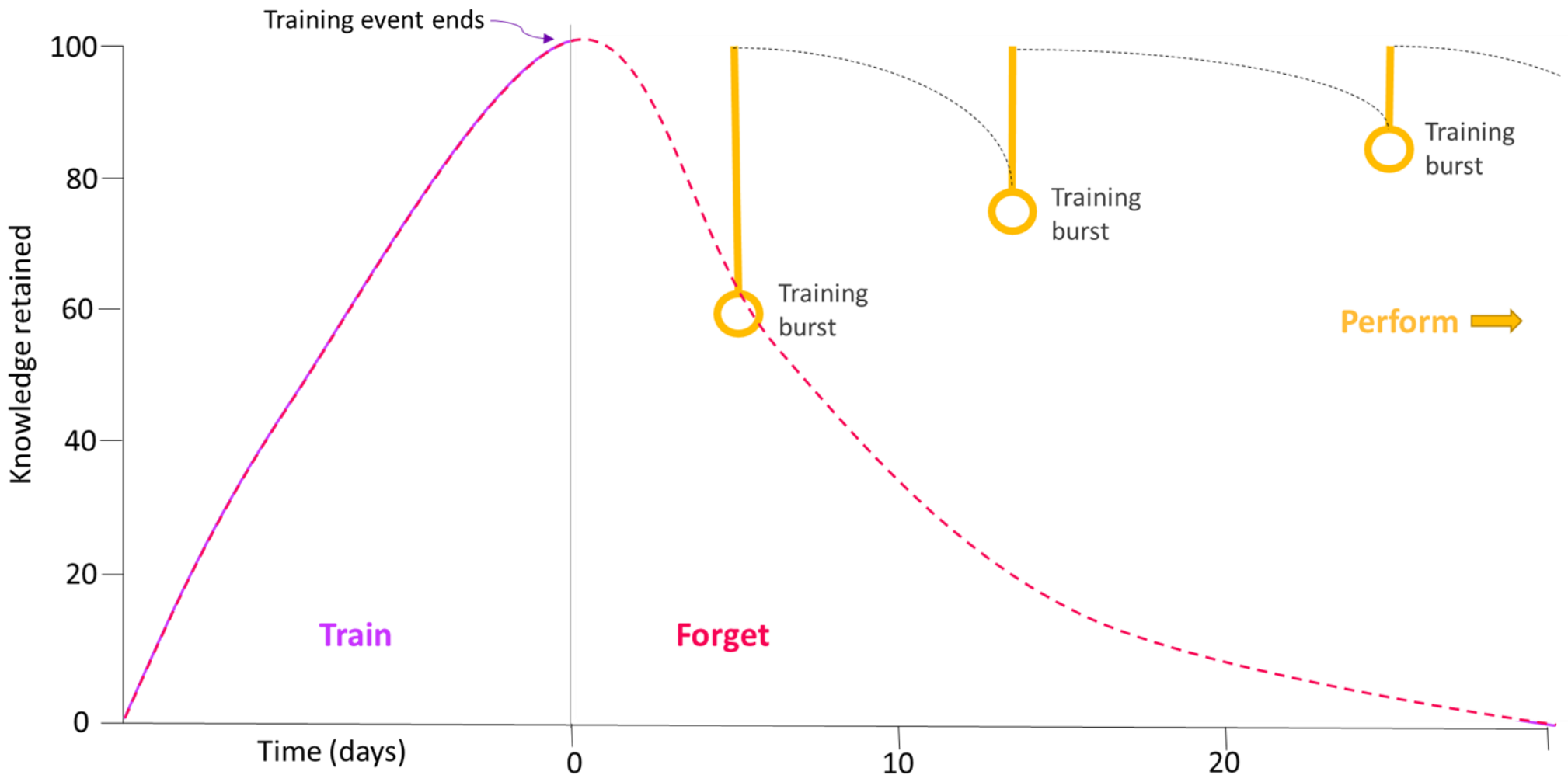
Microlearning & Performance Support

Why is microlearning gaining such momentum?





The forgetting curve



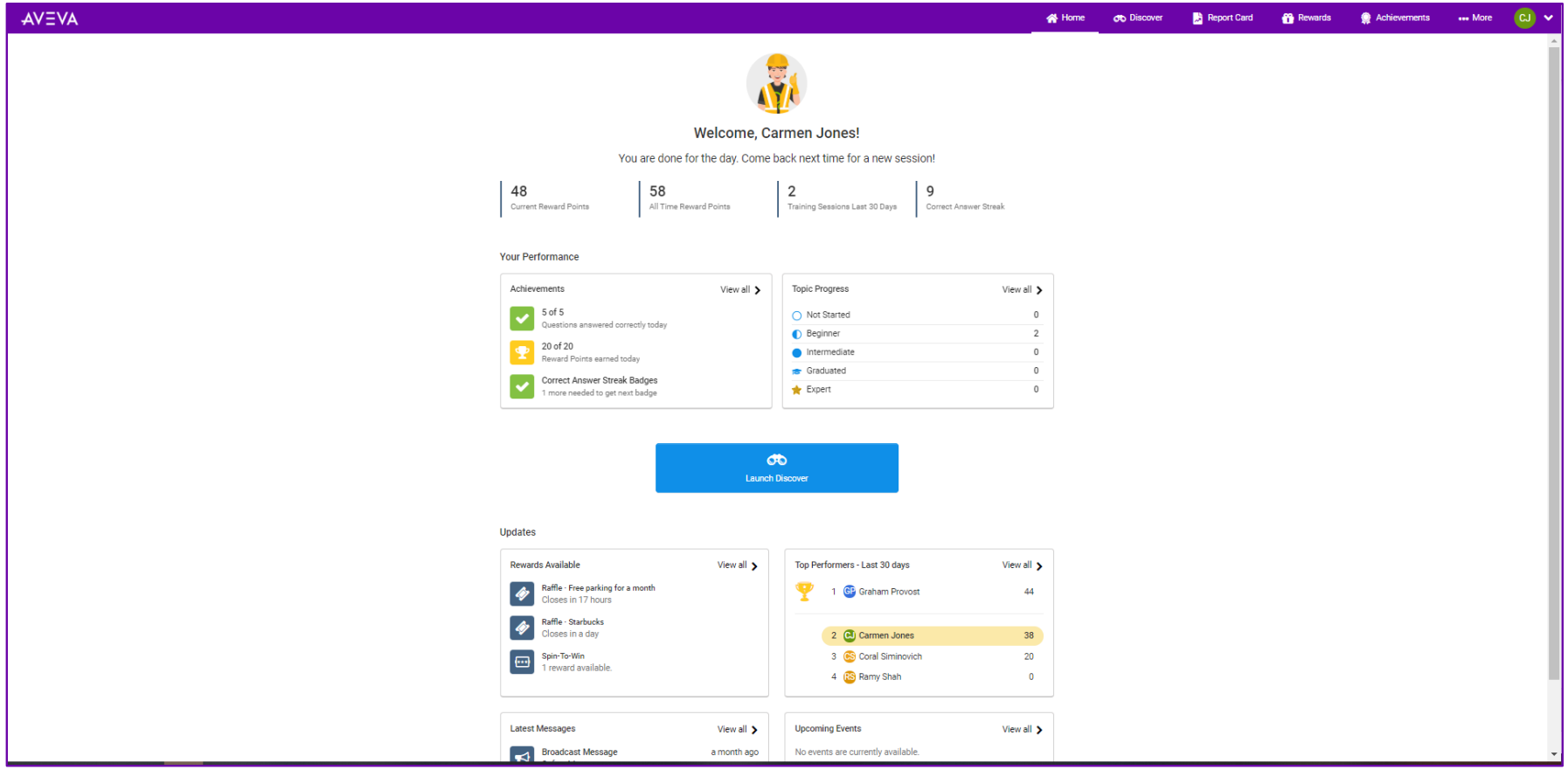
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AVEVA and Axonify have partnered to bring modern frontline learning to Industry 4.0

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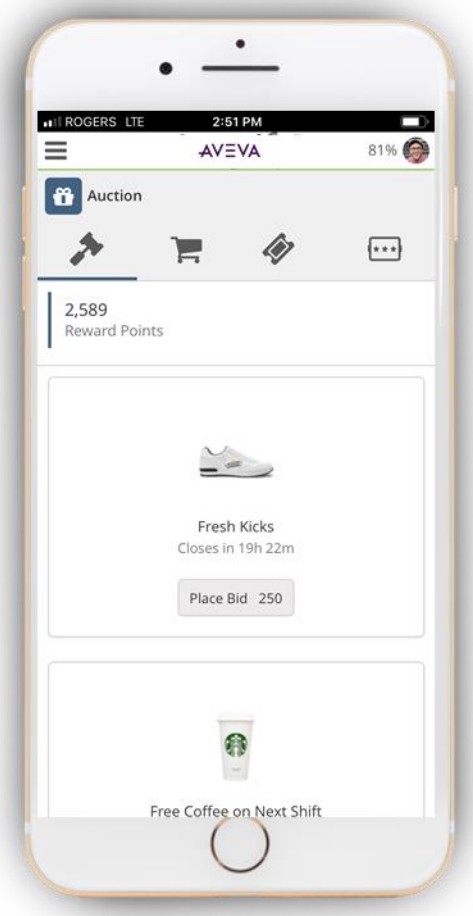
Adaptive learning for a tailored experience

AI and big data continuously identify and fill individual knowledge gaps

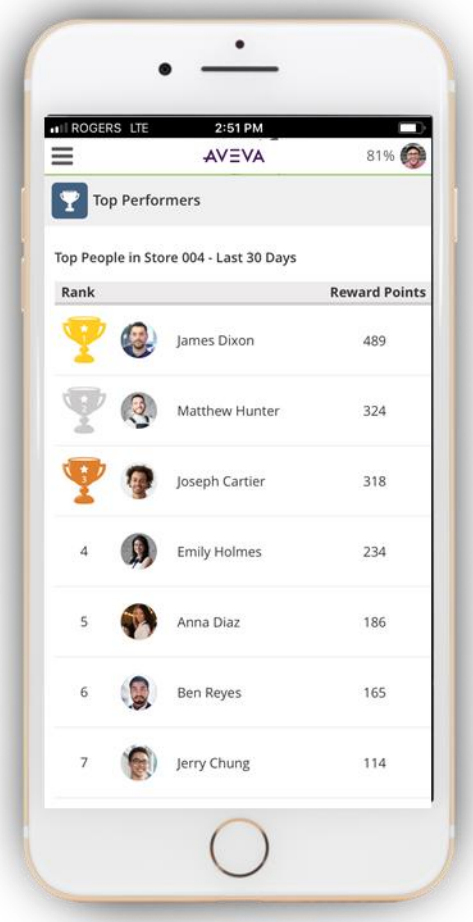


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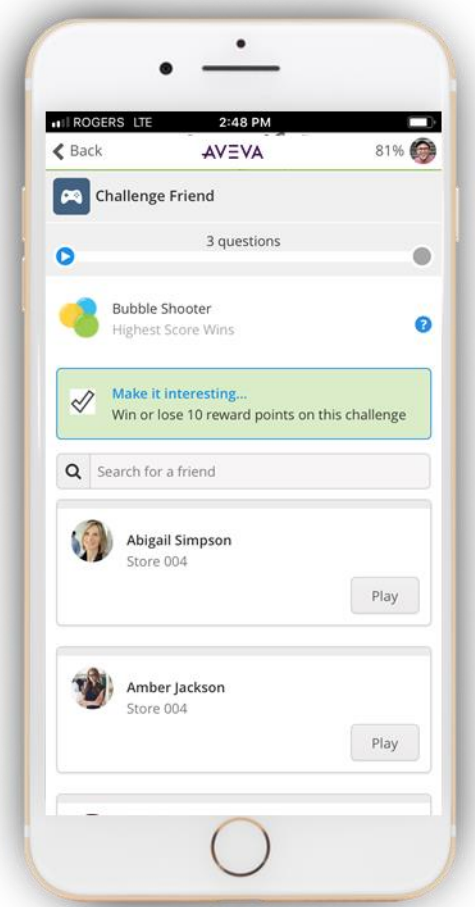
Built-in game mechanics to drive engagement



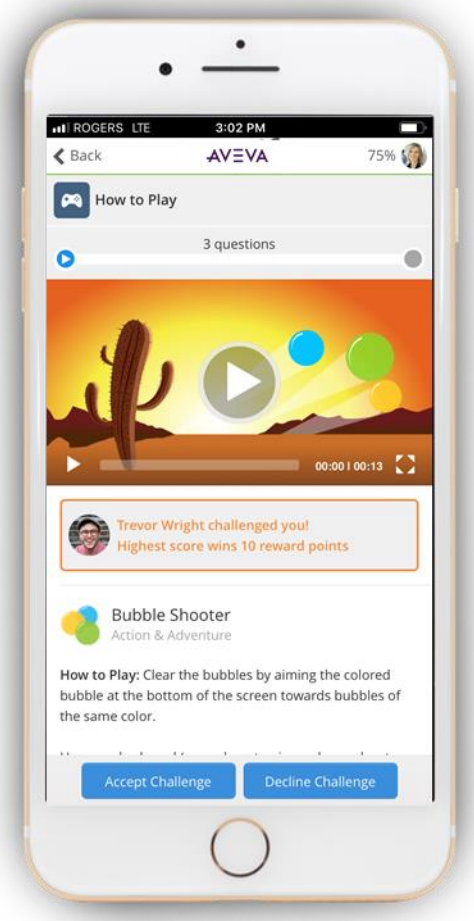
REWARDS



INCENTIVES



MOTIVATION



GAME PLAY

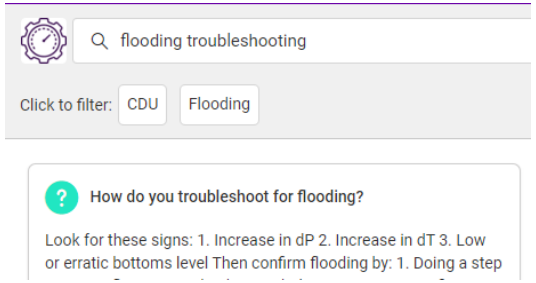
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Performance support

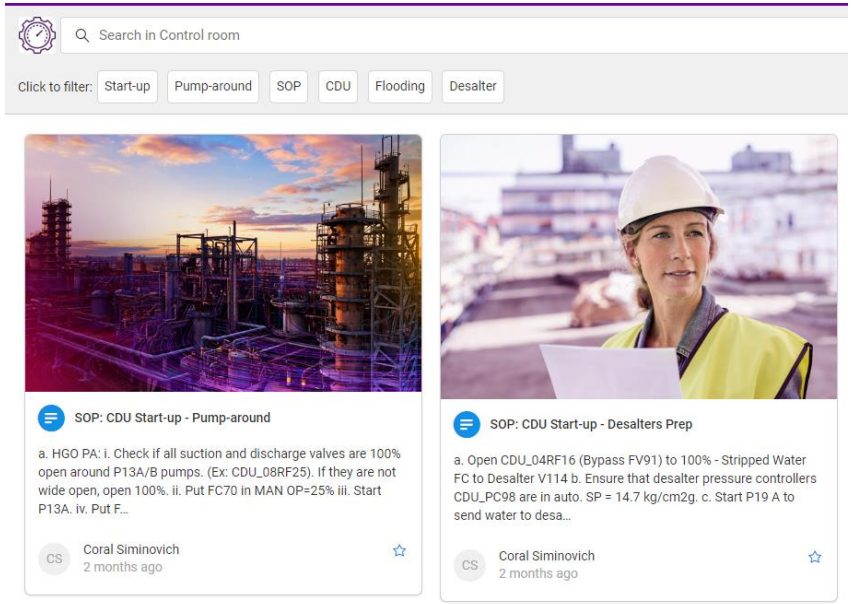
Social learning experience that connects workforce to the help they need, when they need it

1. Search or ask questions

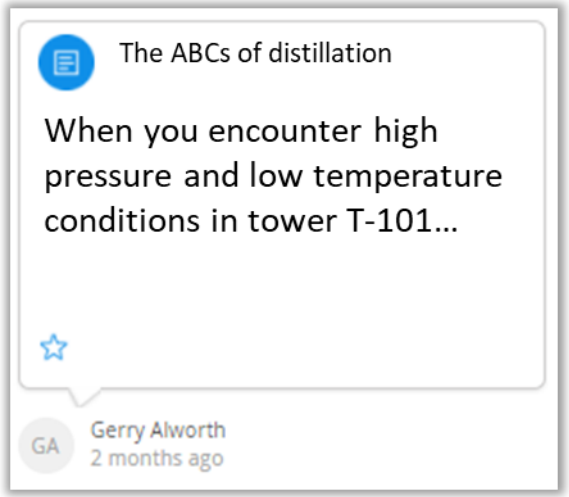


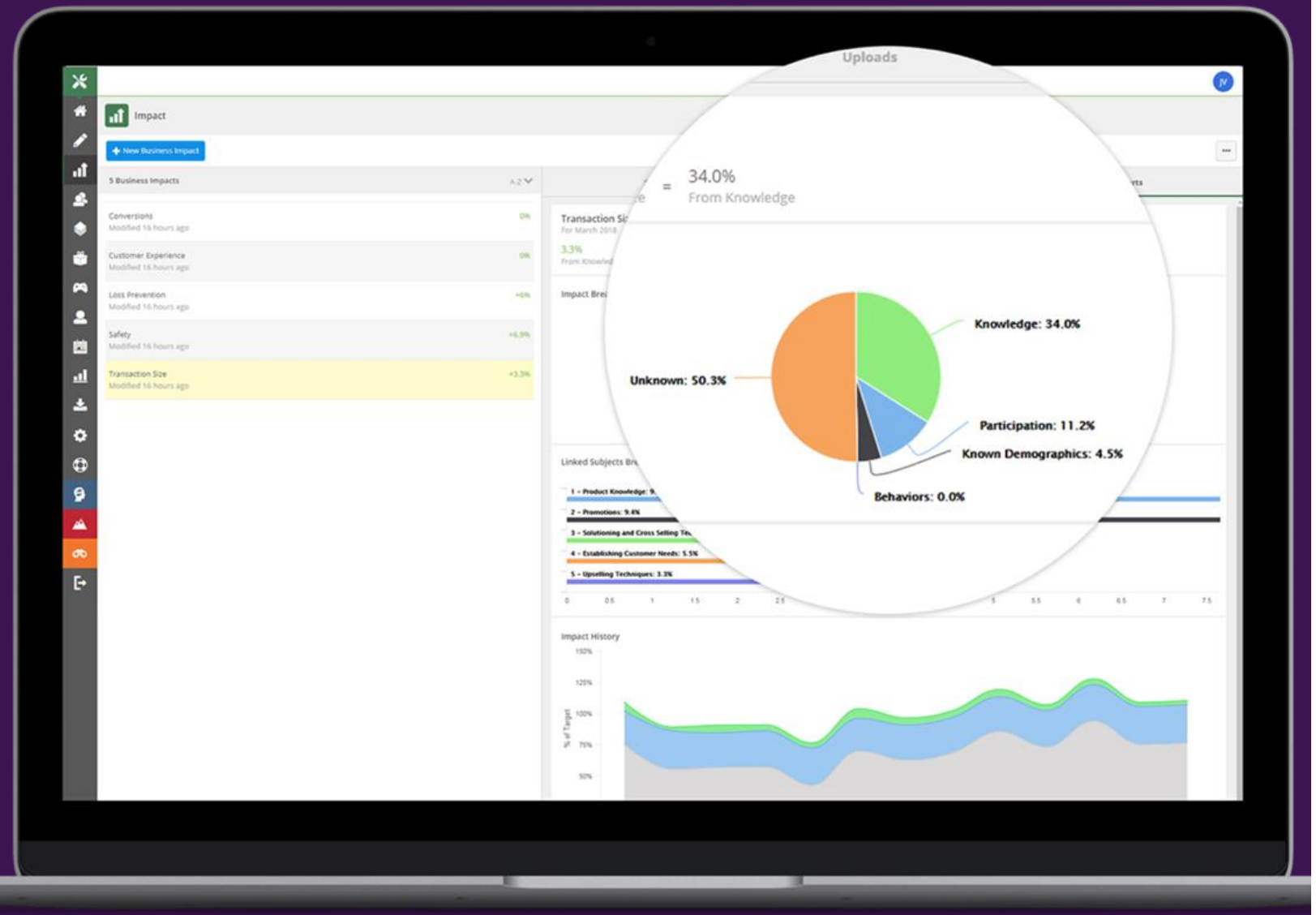


2. Discover answers



3. Share your knowledge





Smart enough to prove ROI

- Identify behavioral gaps
- See the impact of training on the organization
- Improve the effectiveness of programs
- Optimize results

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Management support

From the C-suite to the front-line

- Provides managers with intelligence and influence with easy to use dashboards and actionable insights on learning progress and content

- Managers can provide coaching to front-line employees based on supporting data regarding employees' knowledge levels and behaviors



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Question

How soon will your organization consider implementing microlearning?

1. Already using
2. Within 1 year or less
3. Within 1 – 3 years
4. Not sure

Please answer using the chat

Q&A - Discussions

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ABOUT AVEVA

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The company's engineering, planning and operations, asset performance, and monitoring and control solutions deliver proven results to over 16,000 customers across the globe. Its customers are supported by the largest industrial software ecosystem, including 4,200 partners and 5,700 certified developers. AVEVA is headquartered in Cambridge, UK, with over 4,400 employees at 80 locations in over 40 countries.

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