

Nvidia Omniverse: Convergence of AI & XR for a Digital Twin

6.2.2025

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Accenture in 'Numbers': an Ireland-registered global service provider of Strategy & Consulting, Technology and Operations. Leading capabilities in digital, cloud and security globally



733,000
People



200+
Cities



49
Countries

Accenture: Your Go-To Partner for Spatial Solutions

Accenture's XR practice was started in 2013.

Today, Accenture has **30+ XR studios** and **over 1,000 Metaverse practitioners** with a wide range of specialized skills making it easier to scale no matter where you are in the world.

Reusable IP & assets for industry specific solutions and to accelerate adoption and supported by **advanced analytics & behavioral insights practice**.

With **82 patents**, **30+ publications**, **35+ ecosystem partners**, and **10+ industry awards**, Accenture is at the forefront of the XR revolution.



91
of the Fortune Global 100 are Accenture clients



9,000
Clients across 120 countries



75%
of the Fortune Global 500 are Accenture clients



97
of our top 100 clients have been with us for at least 10 years

“An **evolution** of the internet that enables us enables us to move beyond ‘**browsing**’ to ‘**participating and/or inhabiting**’ in a **persistent shared** experience that spans the **spectrum** of our real world to a fully virtual world and in between.”

- Internet of place
 - Internet of ownership
-

The **convergence** and **proper use** of numerous capabilities will be required to create the Metaverse

Extended Reality



DLT & Tokenization



Digital Currency



Digital Twin



Digital Asset Markets



IoT & Edge



Artificial Intelligence



Digital Identity



Gaming / Graphics Engines

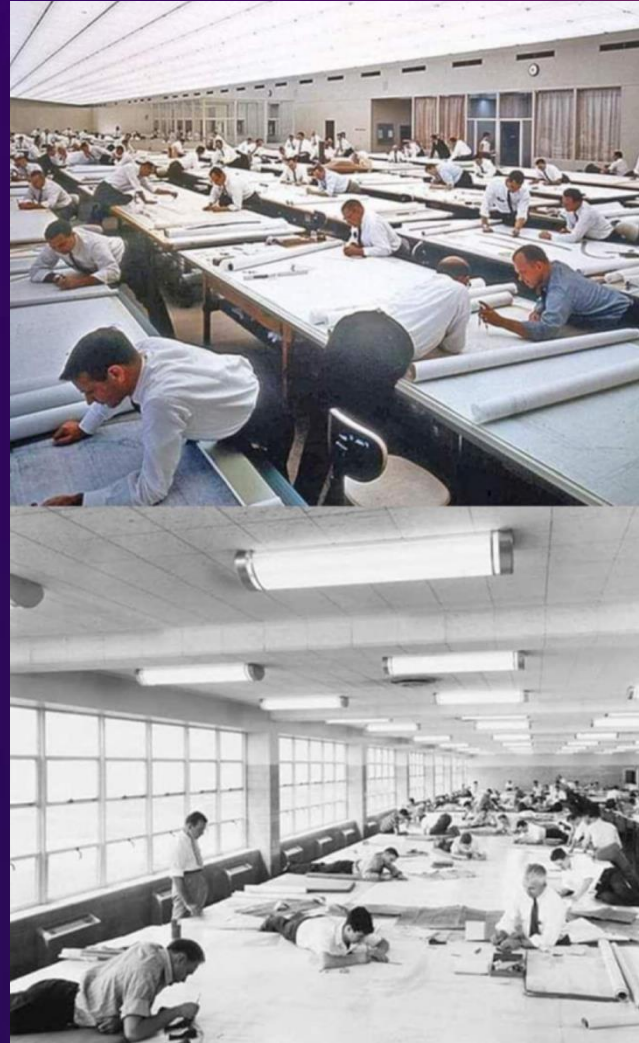


Building the next industrial revolution:

Before:

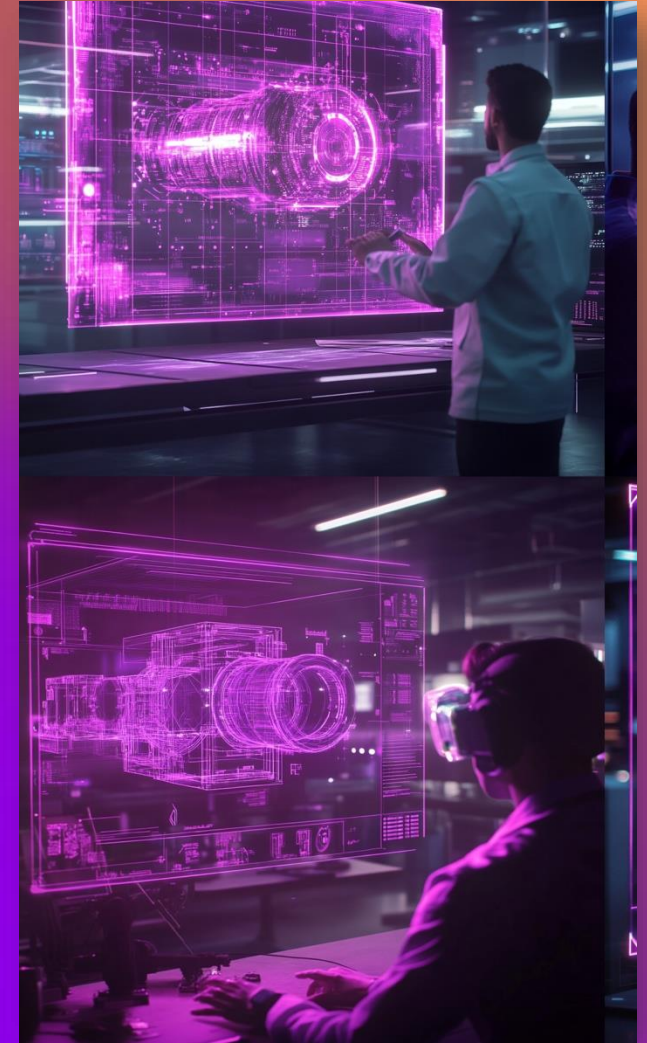
Days even before AutoCAD and computers. Plans drawn by hand, millimeter precision, multiple versions and fixing errors on paper with erasers.

One would be surprised how siloed and slow processes are still today.



After:

How might we ensure one source of truth, greater accessibility for all stakeholders for future plans? Visualize the end product in the most accurate manner. Redefine what design works processes and collaboration feel like. And avoid costly fixes in the future?





NVIDIA Omniverse is a platform of APIs, SDKs, and services that enable developers to easily integrate OpenUSD (Universal Scene Description) and RTX rendering technologies.

The Era of AI-Enabled Digital Twins Has Arrived:

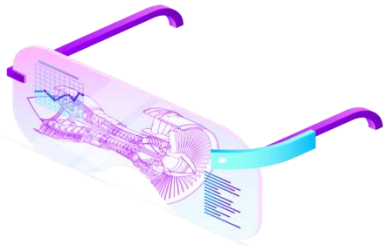
The world's enterprises are racing to digitalize and become software-defined. With NVIDIA Omniverse™, NVIDIA AI, and OpenUSD, developers are building a **new era of digital twins to design, simulate, operate, and optimize their products and production facilities**. Once born, these digital twins become the testing grounds for physical AI to power autonomous systems.

*“Beyond media and entertainment, USD will give 3D artists, designers, developers and others **the ability to work collaboratively across diverse workflows and applications as they build virtual worlds.**”*

— Rev Lebedian, Vice President of Omniverse and Simulation Technology, NVIDIA

Create, simulate and collaborate in large-scale 3D worlds!

Fundamental Capabilities of Nvidia Omniverse



Photorealistic, XR Rendering

NVIDIA's RTX GPU technology delivers real-time ray tracing, AI-accelerated denoising, and physically accurate lighting simulations for photorealistic rendering of complex scenes and animations in real-time.



Collaboration & Content-Sourcing

Users can collaborate in real-time by sharing and editing assets, scenes, and simulations, and see changes made by other collaborators whether they are in the same location or distributed globally.



Real-World Simulation

Built-in support for physics-based simulations, vehicle dynamics, fluid and particle effects and real-time environment rendering can power complex simulations in virtual environments.



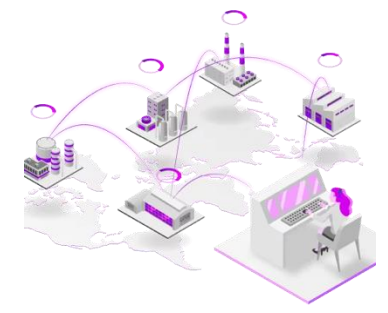
Built-in GenAI & ML Frameworks

Generative AI, computer vision, natural language processing, semantic segmentation and synthetic data generation use-cases can all be developed using native AI & ML components.



Extensible Development

A range of custom extensions and services can be developed using the Kit and Connect SDKs to add new features, improve existing workflows, or create entirely new applications.



3rd Party Connect Ecosystem

Allows users to connect and integrate with a wide range of data pipelines, 3rd party digital content creation tools and applications. This enables live import and export of data, enabling a flexible and customizable workflow.

Integrating industrial simulator into Omniverse



Accenture NVIDIA Business Group

New Accenture NVIDIA Business Group launched with 30,000 professionals receiving training globally to help clients reinvent processes and scale enterprise AI adoption

Newsroom

OCTOBER 2, 2024

Accenture and NVIDIA Lead Enterprises into Era of AI

- New Accenture NVIDIA Business Group launched with 30,000 professionals receiving training globally to help clients reinvent processes and scale enterprise AI adoption with AI agents
- Accenture AI Refinery platform helping companies jump-start their custom agentic AI journeys using the full NVIDIA AI stack
- Network of Accenture AI Refinery Engineering Hubs serving 57,000 Accenture AI practitioners to open in Europe, Asia and North America, supporting large-scale operations, agentic architecture and foundation model development with NVIDIA AI
- Deployment of autonomous agents built in AI Refinery achieves early outcomes in Accenture's marketing function



In this video

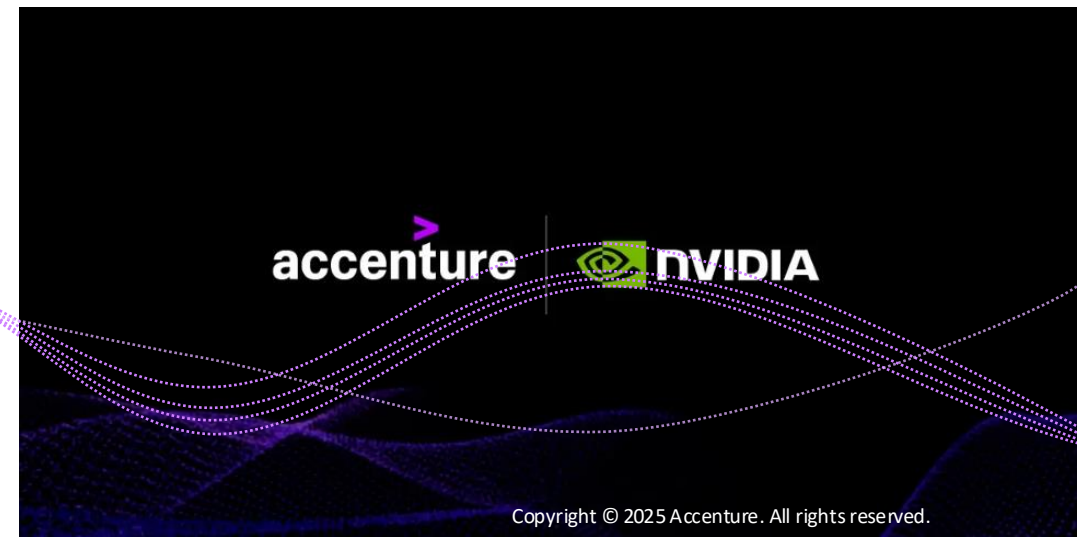
CSA-AFF +3.50 (+0.93%)

NVDA +5.11 (+4.31%)

CLOSING BELL: OVERTIME

SHARE f X in

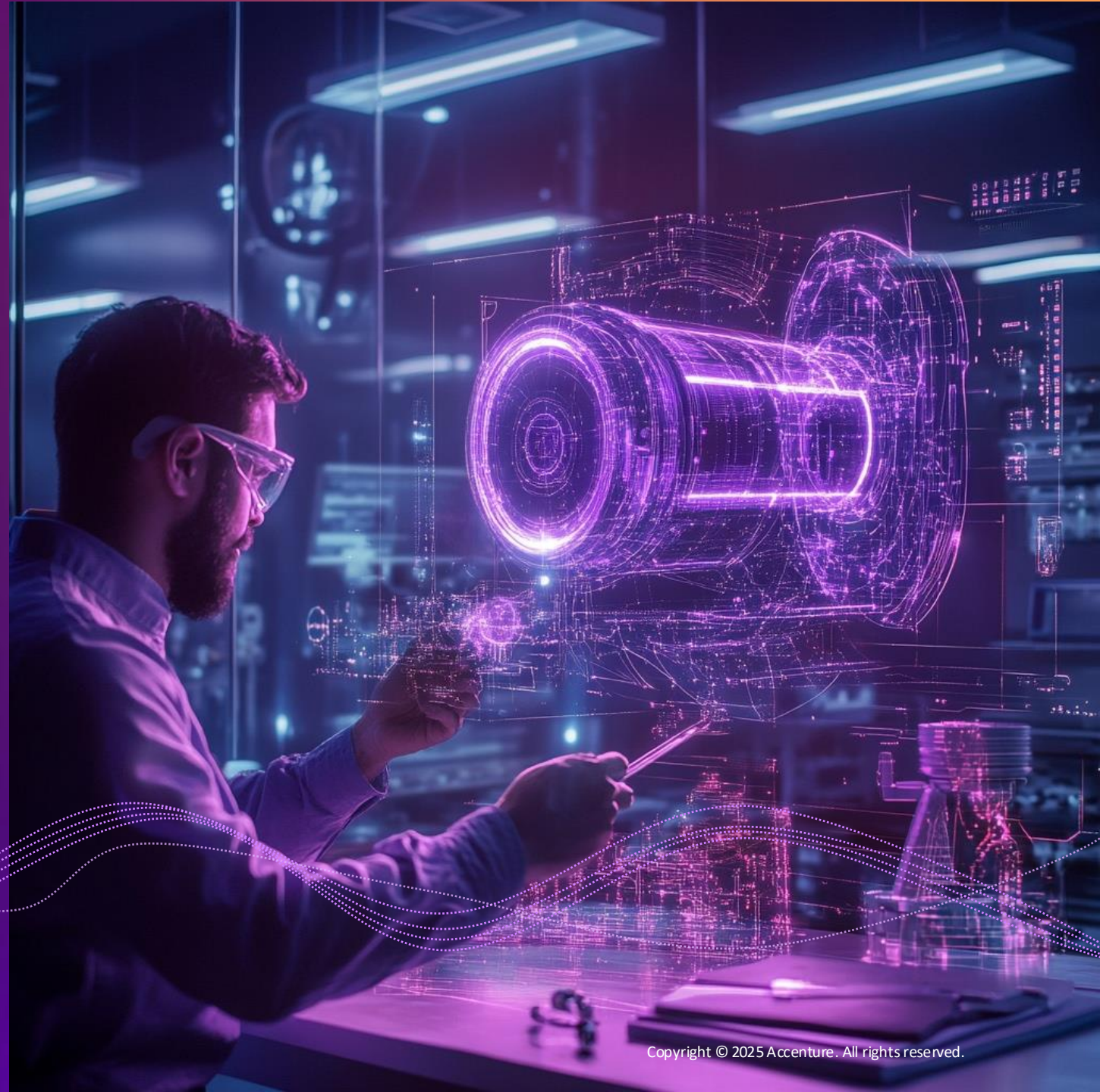
Nvidia CEO Jensen Huang: We're looking at the beginning of the next wave of AI



Neuron

A transformative initiative, harnessing the power of Nvidia Omniverse and Nvidia AI to digitize end-to-end operations.

Providing stakeholders with actionable insights through real-time digital twins, elevating decision-making and execution capabilities across projects.



Challenges of Traditional Processes

- Traditional planning phase for a new manufacturing line relies on static **2D blueprints, 3D CAD designs and physical assessments**.
- This traditional approach is **time-consuming and expensive** as it is difficult to achieve a **cohesive understanding** of the final physical layout using 2D blueprints alone.
- Sometimes, resorting to methods like **chalking lines or building cardboard mock-ups** is necessary to grasp size, scale, and ergonomics.
- Relying on 2D plans often leads to **costly retrofits and engineering modifications** during the installation phase.
- These **retrofits and modifications prolong** the overall project timeline, particularly at critical installation phases.



Client Example

Accenture's Digital Twin Connector asset

- **Break the silos:** Integrate various tools and teams across multiple locations to work in one centralized digital solution
- **Decouple the workflows:** Enable clients, vendors and any 3rd party to collaborate within the same centralized solution to enhance efficiency and reduce time-to-market
- **Virtual Prototyping:** Plan simulation-based improvements during the build phase. Ensure the cutting-edge production with continuous improvements during the operation

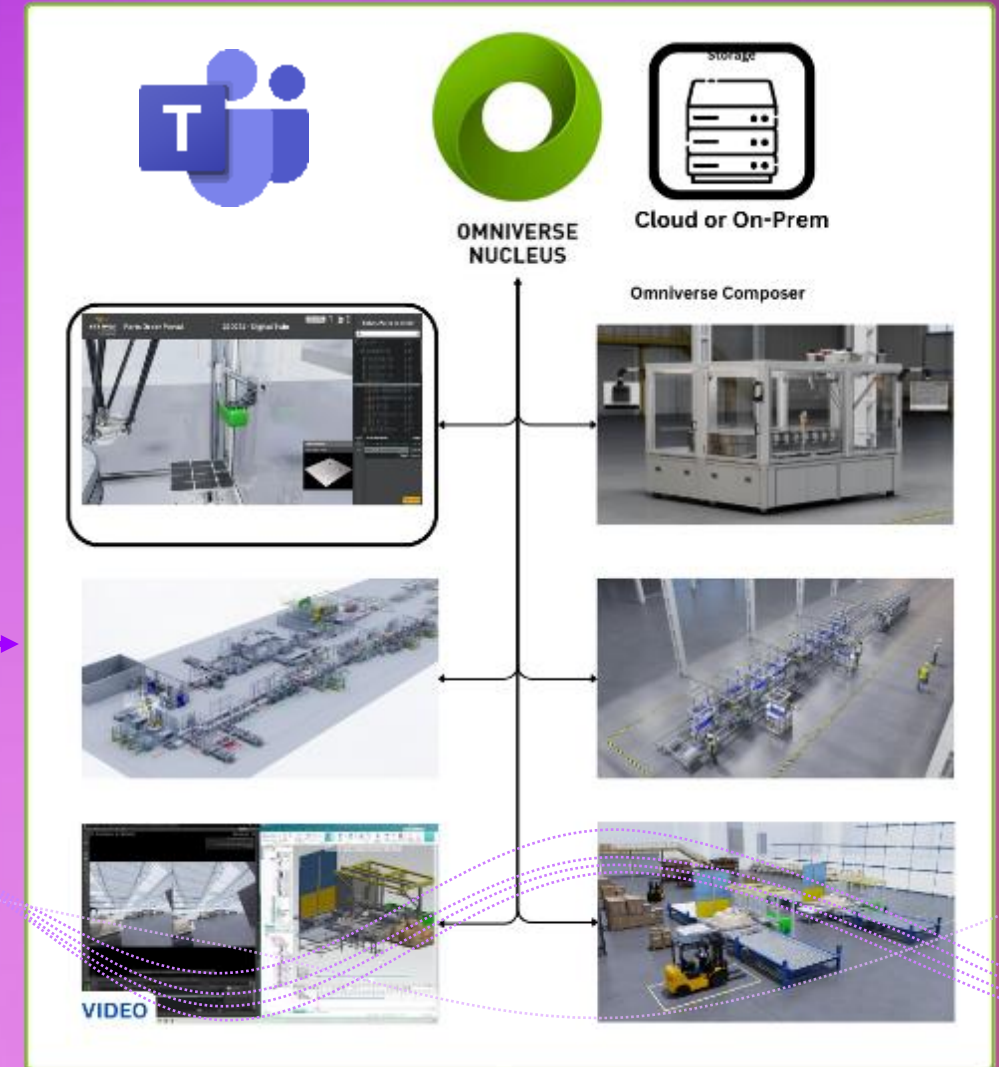


Design

Simulation



NVIDIA
OMNIVERSE™
ENTERPRISE



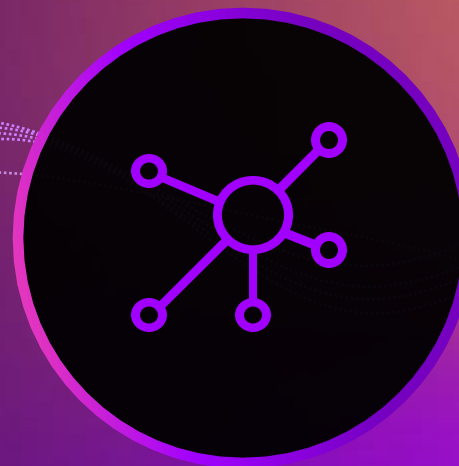
NEURON CONSISTS OF MULTIPLE EXTENSIONS & KIT APPLICATIONS



1. XR EXTENSION



2. AI EXTENSION



3. PDM EXTENSION



4. MATERIALS
EXTENSION

+ other extensions and kit applications in development

Accelerators into Play



Capabilities of Omniverse AR Solution



Visualize your production environment in physical reality as if it were there



Utilize Generative AI to intuitively control the scene around you with voice and hand gestures



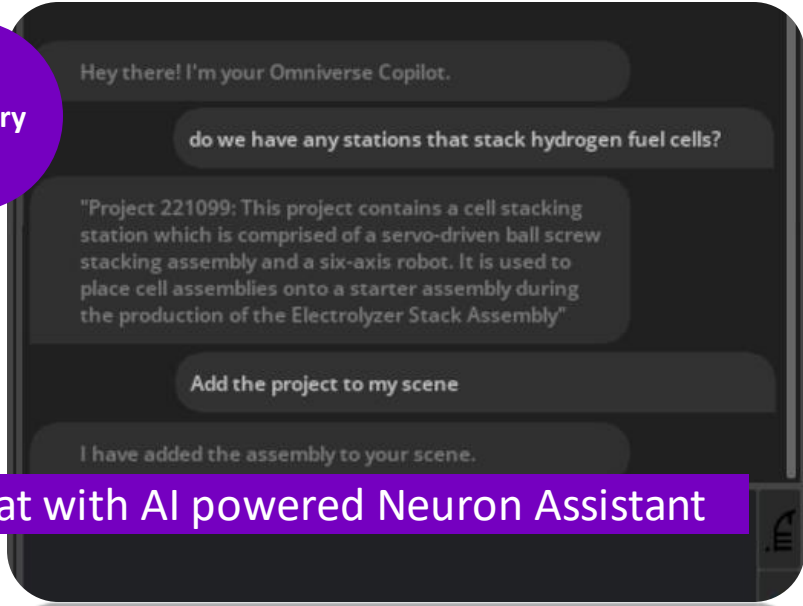
Annotate and comment in AR for all stakeholders to see as if you were leaving a “sticky note” on the machine



Concept and visualize potential changes or additions in real-time at the intended location

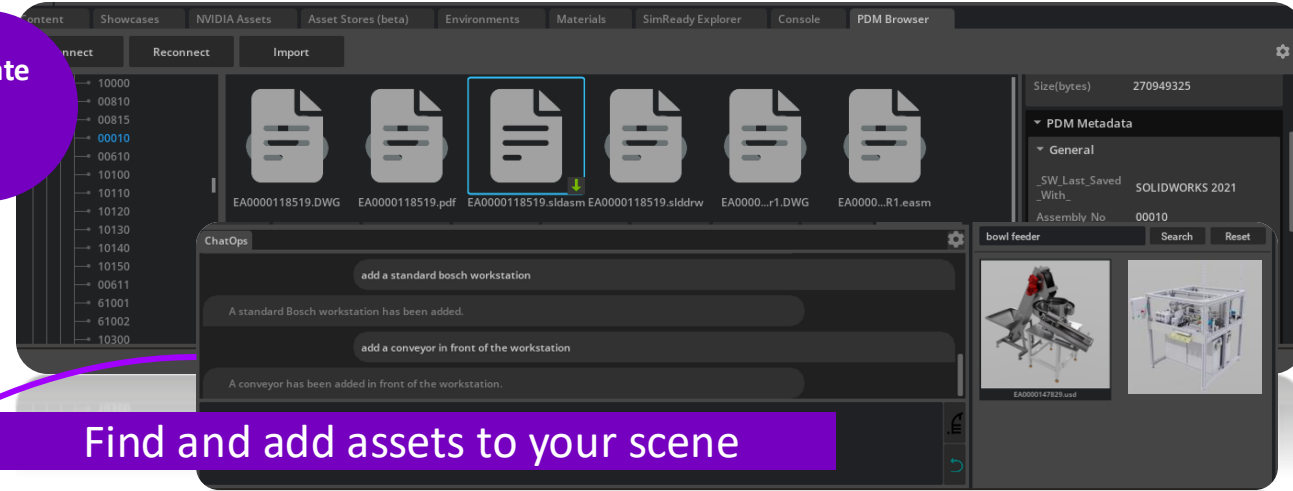
System Configurator Flow

1. Query



Chat with AI powered Neuron Assistant

2. Locate & Add



Find and add assets to your scene

3. Visualize



4. Contextualize



Iterate and preview in XR



Internal Web App

The screenshot displays a 3D simulation of a factory floor with various machinery and conveyor belts. Below the simulation are two tables: 'Costing' and 'Mech Parts'.

#	Station/Description	QTY	Cost	Total
1	OP10 - Robot Cell	1	\$182,856.00	\$233,752.00
1.1	Perimeter Guarding	2	\$42,000.00	\$42,000.00
1.2	Fanuc Robot	2	\$140,856.00	\$281,712.00
1.2.1	EOAT	1		
2	OP20 - Material Transport	1	\$276,890.25	\$276,890.25
2.1	Infeed Conveyor	1		
2.2	Duffel Conveyor	1		
2.2.1	Powered Roller conveyor	1		
2.2.2	AGV Pick-up Station	1		

#	Part Description	QTY	Cost	Total
1.1.1	Ferrous Door Lock	2	\$850.00	\$1,900.00
1.1.2	50 Ft Cable	1	\$150.00	\$150.00
1.1.3		1		

Buttons at the bottom include 'Launch Live Session', 'View in XR', '3D Library', and 'Locate'.

Use-case: Scene creation and integration to costing data base

Client Facing Omniverse Cloud Web App

The screenshot shows a 3D model of a yellow robotic arm in a factory setting. To the right is a 'Chat with Proposal' section with a detailed process flow for 'OP 40 - Cleaning Station & Laser Marking Station Process Flow'.

Chat with Proposal

User: Summarize the process flow for this station

Proposal Neuron:

OP 40 - Cleaning Station & Laser Marking Station Process Flow

- Billet Arrival**
 - The copper billet arrives at the station post-forging, guided by the recipe.
- Transportation to Cleaning Station**
 - The billet is transported to the Dry Ice cleaning station for Graffiti removal.
- Cleaning Cycle Execution**
 - First Side Cleaning**
 - The billet undergoes a Dry Ice blasting process on its first side.
 - Second Side Cleaning**
 - The billet is flipped, rotated, or handled accordingly to clean the second side using the same Dry Ice blasting process.
- Transition to Laser Marking Station**
 - After cleaning, the billet is moved to the laser marking station.
- Laser Marking Process**
 - The billet is placed inside a laser-safe enclosure.
 - The Keyence MD-X2500A Laser marking system generates a QR code and human-readable text on the billet.
- Finished Billet Handling**
 - The cleaned and marked billet is then prepared for the next stage in the production process or final inspection (if required).

Buttons at the top include 'Play Simulation', 'View in XR', and 'Launch Live Session'.

Use-case: Client portal to preview the digital twin and talk to proposal

Control Tower - Visualizing Health

The screenshot shows a dashboard titled 'Adoption & Usage' with an 'Executive Dashboard: SPI' section. It features a table of project level status with columns for Project Name, Allowed Budget, Remaining Commitments, Forecast, Forecast Variance, Actual, and CR. A status indicator shows 'SPI' with a green dot and a value of 1.50.

Project Name	Allowed Budget (USD)	Remaining Commitments (USD)	Forecast (USD)	Forecast Variance (USD)	Actual (USD)	CR	Adjusted CR
22089 Oracle Energy - Robot Control Sys	-15871	112,888.88	2,084,033.77	1,947,144.89	3.15	0.19	1.50
248789 Alliance - Manual Forking Cell	24,744.75	9,366.76	112,171.79	179,817.02	175,703.04	2.57	0.11
248787 Alliance - Hinged Turret	371.23	2,017,242.44	1,023.84	493,366.75	443,037.04	1.15	1.05
242184 Horizon - Manual Line	4,000.00	1,000.00	1,000.00	1,760,451.00	1,811,046.40	1.12	1.28
221785 Horizon - Alliance	2,495.54	0.00	191,262.12	3,576,167.08	3,442,275.10	0.96	0.98
242450 Horizon - Proof of Process	0.00	0.00	288,302.20	284,182.11	0.00	0.00	0.00
22121-07 Horizon - Halyard Scope	48,124.46	0.00	48,124.75	0.00	48,888,032.02	0.00	0.00

Use-case: Frictionless access to real-time data and analytics with 3D data for better decision-making. Enhanced visibility of project health and earned value across all stages of a project.

Neuron Roles and Personas

Who is using Neuron Kit app, why and how?

1. Sales



"I want to sell a large factory assembly, i.e. custom automated manufacturing solution"

I am overseeing the client relationship and sales process. I talk to the client, collect requirements and share proposal.

2. Apps Engineer



"I design the factory and 3D concept."

I am creating the 3D concept for the client. My work output is 3D digital twin (USD) and it will be included in the proposal.

3. Supervisor (Leadership stakeholders)



"I help to approve the opportunity and check the proposal"

I am responsible to check and review the progress and proposal.

4. External client: Buyer & Decision maker



"Can you show me what the factory that I am buying looks like? I want to see the Digital Twin"

I want to understand the proposal, and concept - what I am buying and how it will look in the future

5. Operations (Internal Client)



"I will build the factory based on the concept in the proposal"

I will get the concept from the Apps Engineers and actually build the physical factory/assembly line.

Key Takeaways: Convergence of AI & XR for a Digital Twin

AI is Reshaping our relationship with knowledge

- Gen AI providing answers in conversational manner with context
- The way we interact with information systems is evolving. Amplify customer service, reimagine search or share knowledge.
- Online search experience will **move from retrieving data to advising and providing answers with data**

Unsilos the Technologies

- Combinational power of numerous technologies such as XR, Gen AI, Robotics and so on will bring about greater value in new applications and experiences
- Gen AI can boost Spatial Computing f.eg. through rapid 3D asset creation, real time visualization etc.

Amplify & Redefine

- Gen AI will amplify the experiences and skills
- We are on the verge of re-assessing and re-design processes because GEN AI gives us super powers and capabilities we did not have before

Thank you

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