Insights from IBM Think Circles

Revolutionizing visualization

Modernizing supply chains with digital twin visualization

The Industrial Revolution fundamentally changed the way people work with machines and with each other. And now, because of its speed, scope, and global reach, the Digital and AI Revolution may have an even more profound effect on individuals, organizations, and the future of work.

"AI may not take your job, but somebody else using AI most certainly will."

In what ways can AI technology revolutionize the operation of digital twins and modernize how modern supply chains are visualized? How is AI going to change work methods? What business impacts might be realized? And how fast will this happen?

Visualizing the city of the future

→ NEOM

Click to visit the NEOM website and vision

To glimpse the future of digital twins, our Thinker Alessio Garofalo, CIO and CTO of Oxagon NEOM's Industrial City, shared his insights and approach.

NEOM is Saudi Arabia's most ambitious Giga-Project, strategically situated at the northern tip of the Red Sea, near the Gulf of Aqaba. Spanning a vast 26,500 km², NEOM encompasses several regions, including The Line, Oxagon, Trojena, Sindalah, and Magna. These regions will be powered by renewable energy and designed as cutting-edge cognitive cities, setting a new standard for future living.

The Oxagon Digital Twin aims to "digitize the city even before construction, oversee progress during the build, and monitor and manage operations once completed. It serves as a command and control tool to enhance efficiency, organization, and the overall experience for businesses and residents."

Here's how it works:

- The comprehensive platform comprises a Geographic Information System (GIS) with a geospatial layer, an information layer, and an orchestration layer.
- Data from assets such as drones, robots, humanoids, and quadrupeds, including camera images and AI algorithmic learning, are all connected to the data layer.
- Time-lapsed visualizations show evolutions through chosen time frames for evaluation, monitoring, and actualization.
- Dynamic 3D models leverage AI to provide enhanced Building Information Modeling (BIM) visibility.
- Algorithms understand the business analytics and rules and are programmed to act on them.

"You can see the digital and physical world in a practical way."

"This type of AI-enabled visualization translates and transforms the supply chain landscape. It brings many systems—edge computing, IoT, building management, enterprise asset management, facility management, and transportation optimization—into a visualization platform."

Syncing with reality

In the context of building digital twin visualization models, orchestration refers to the process of integrating, coordinating, and managing multiple data sources, systems, and tools to create unified, real-time, and interactive visualization feedback loops. Alessio and other Thinkers collaborated on the practicalities and potential use cases of interactive, visualized orchestration including people, planet, process, and provisioning.

"A platform where you can have multiple order entries, multiple devices, and one control point. The cameras and data from each vehicle are like a feedback loop as it's being deployed. This orchestration layer has widespread application."

"A digital twin is extremely relevant. AI can manage the simulations and information needs. The visualization provides last-mile delivery stations with the data from the live operation. This has application from the operator on the floor with SKU dimensions, to locations through digitalized representation."

"I think immediately of traffic movement control through simulations."

"The application is rules-based to product movement and predictive and proactive maintenance. Let the data and the visualization tell us the most optimal path."

Balancing the IT/OT relationship

There is a long-anticipated vision in some industries where near real-time data flows seamlessly between IT and operational technology (OT) systems: a vision of a more agile approach that reacts to constant change. The maturation of AI capabilities has made IT and OT interchange a reality—not only to visualize the physical and the digital, but to also advance real-time decision activation based on that data.

"AI works well in the dark—a dark world of mathematical models and digesting data—tons of it! The value of visualization is to enhance the people view, their understanding and ability to respond. Use cases for high-fidelity visualizations should be prioritized for those that require intricate correlations."

"We will find simple ways to automate low-risk, low-value activities. But the vast majority of where we're looking at AI augmented activities will clearly extend from OT devices to our processes and IT control points."

The pot of gold at the end of the rainbow

While the promise of AI and visualization is impressive, the Thinkers remain focused on value creation and optimizing performance—all while applying forward-thinking visionary approaches.

"If you want to create value, you have to see the pot of gold at the end of the rainbow."

"I'm thinking about the value of what we see proactively, through scenarios, that lead to optimization. It opens another layer of cross functional understanding about how to unlock savings or value potential that is otherwise hidden."

For more insight:

The Think Circle Compendium

From smart to genius: Navigating supply chains in the age of gen AI.

https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/think-circle-compendium

5 Trends for 2024

Our look at the trends shaping the world today—and the bets that can help propel business forward.

https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/business-trends-2024

The CEO's Guide to Generative AI

Includes 12 individual reports highlighting what executives need to know and do as they embrace generative AI, with a deep dive on generative AI in supply chain.

https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/ceo-generative-ai-book

Seizing the AI and automation opportunity: The moment is now

A comprehensive investigation into the potential use cases and impact of AI and automation, exploring intelligent workflows, productivity, agility, and proactive IT automation.

https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/ai-and-automation

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