

Metaverse: Could creating a virtual world build a more sustainable one? (PART 3)



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This is a critical moment in the environmental and social sustainability of the metaverse. Business leaders can't be spectators.

(CONTINUED FROM PREVIOUS EDITION)

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David Markowitz

Co-author of “Virtual reality and the psychology of climate change”

Meeting in the metaverse: a new way to travel

Recreational and business travel, both air and ground based, could also be displaced by metaverse experiences to a significant degree. Air travel accounted for 2.5% of global emissions prior to the onset of the pandemic, after which the sector's emissions were cut in half. The business world and consumers learned that videoconferencing, while not great, was good enough for many purposes, from team meetings to virtual happy hours.

Imagine then a convening in the metaverse, whether for work or play, with real personal presence and the ability collaborate, share and recreate in ways which wouldn't be possible in a “live” gathering – without the time, expense and complexity of conventional travel.

This is already happening with metaverse-based concerts which would have sparked travel by thousands of people if held in the physical world. While in-person interactions will always be important, metaverse travel could displace many discretionary trips.

Digital twins: optimizing physical with virtual

The convergence of AI, AR/VR, and IoT and satellite-generated data in the metaverse promises to elevate digital twins. Virtual representations of real-world entities and processes, digital twins could help propel sustainability at the planetary level, from supply chains and manufacturing assets, to individuals:

- ▶ The European Space Agency is working toward a digital twin of the earth which will help visualize and forecast the impacts of human activity on the planet, simulating

different scenarios to inform policy decision-makers. The project will start with key planetary subsystems, such as antarctica, oceans, forests and climate.

- ▶ Manufacturing and supply chain digital twins can drive optimization of material inputs, processes, energy, traceability and logistics. Combining digital twins with agile manufacturing applications, such as generative design and additive manufacturing, is already happening in many industries and can yield significant reductions in scrap and energy use.
- ▶ Digital patient twin technology integrates a wide range of data sources beyond the traditional medical record – from wearable sensors, to air pollution levels – to forecast the future health of individuals and enable better care and outcomes.

But perhaps the biggest sustainability opportunity – and imperative – for digital twins is in cities, where 70% of global carbon emissions occur. Building operations – heating, cooling, lighting, and the like – alone contribute 28% of global emissions. Global building floor area is expected to double by 2060, the equivalent of adding an entire New York City to world's building stock every month, for 40 years.

A whitepaper by EY teams (pdf) shows that digital twins can:

- ▶ Reduce a building's carbon emissions by 50%
- ▶ Improve operational and maintenance efficiency by 35%
- ▶ Increase human productivity by 20%
- ▶ Improve space utilization by 15%

“As the nexus of IoT, 3-D visualization, open data, and mobile data, urban digital twins are the only real-world metaverse here today,” argues Michael Jansen, CEO of Cityzenith, which offers an urban digital twin platform. “Eliminating emissions in the built environment requires the integration of different types of tools to simulate if-then scenarios. Because urban digital twins are good at dealing with data variety, visualization at scale and multisystem simulation, they're perfect for this kind of challenge,” he adds.

In the future, Jansen says we're likely to see urban systems of building digital twins connected to area or city-wide twins, giving city managers deep insights into the metabolism of the city and new opportunities for broad sustainability gains.

CHAPTER 3

Catalyzing climate action with immersive experiences

The biggest barrier to addressing climate change is not technological – it's behavioral. Evolution has conditioned us for success in the “now” through hyperbolic discounting, valuing small rewards and costs in the present substantially more than larger ones in the future. For long-term, seemingly gradual problems like climate change, human behavior is a recipe for disaster.

Tackling the psychological barrier to climate change

Our short-term bias is so ingrained we have a hard time perceiving climate change even when it is happening quickly. A study of two billion social media posts found we quickly normalize climate conditions which would be considered historically extreme. People base their idea of normal weather on what has occurred in only the past two to eight years, the study showed.

Fortunately, the immersive experiences which will form a central element of the metaverse have the ability to tap into

other parts of our psyche to create new climate consciousness that could spur action. The VR environment provides users with three key dimensions of experience:

- ▶ **Presence:** users forget they are in a synthetic, mediated experience.
- ▶ **Immersion:** the technological quality of the medium enables presence.
- ▶ **Embodiment:** one can believably change perspective or character in the environment.

“As with any form of immersive technology, the metaverse is likely to offer a range of promises the physical world can't,” says David Markowitz, Assistant Professor in the School of Journalism and Communication at the University of Oregon, and co-author of “Virtual reality and the psychology of climate change” with Jeremy Bailenson, founding director of Stanford University's Virtual Human Interaction Lab. ■

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