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Physical AI: Powering Europe's Industrial Comeback

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For more than a century, Honeywell has helped to build the backbone of Europe's industrial economy. Our technologies are integrated into factories, aircraft systems and buildings - often out of sight, but essential for safe and efficient operation of modern infrastructure. This long-standing partnership contributes to Europe's own manufacturing strength: a global leadership position in advanced engineering and manufacturing, ranging from chemicals and energy to healthcare, automotive, and aviation.

The next decade will be shaped not only by what Europe builds, but by how effectively it operates what it has already built. Challenges like high energy costs, increasingly complex supply chains, aging labor force, and intensifying global competition for skills require investment to extract greater value from existing assets - running them smarter, safer and more efficiently. This is where physical AI comes into view.

More than a chat bot: how AI powers industry, efficiency and skills

Generative AI has captured headlines and public imagination, but the real industrial transformation lies elsewhere: in embedding intelligence and real-time data processing directly into machines, production lines and buildings. In automotive plants, physical AI can optimise complex workflows; in commercial buildings, it can continuously improve energy performance. By combining live operational data with decades of industrial expertise, it delivers measurable gains in energy efficiency, reliability and safety.

The development of physical AI aligns closely with European values, particularly when it comes to data integrity and responsible deployment. Unlike probabilistic consumer chatbots, which rely on broad, generic datasets, deterministic physical AI is trained on proprietary operational data. While a chatbot may sometimes give us a bad restaurant recommendation or suggest an edit to some text that we disagree with, a misinterpreted signal at a chemical plant could result in millions of dollars lost - or even more serious consequences. In this context, the expectations of precision, accountability and human oversight embedded in the EU's AI regulatory framework are not optional - they are essential.

At the same time, physical AI offers a pragmatic response to Europe's shortage of highly skilled labor. The issue is not only that fewer workers are entering capital intensive industries, but that those already in the

workforce must continuously adapt to more complex, digitally enabled systems. AI-assisted tools can help bridge this gap. An AI-assisted maintenance platform, for example, can guide a newly hired technician through intricate repairs via a handheld interface, adjusting instructions in real time and reinforcing best practice as the task progresses using the data from years of previous service records. In doing so, physical AI helps transfer expertise, preserve institutional knowledge and accelerate learning on the job.

Unlocking AI's potential – and doing so safely – means playing by new rules

AI is the latest chapter in an automation process that has been driving civilisation since its dawn. And just as the Luddites wrongly feared that automation in textiles will sideline workers, we risk misunderstanding the role of AI in the evolution of industrial autonomy. Physical AI depends on human judgment. Intelligent systems can analyse, monitor and recommend, but it is the worker's expertise and contextual understanding that completes the loop. By moving people out of high-risk environments and replacing physically demanding tasks with oversight, diagnostics and quality control roles, physical AI can make industrial work safer, more skilled and more sustainable.

Europe's digital rulebook is world leading in making digital services and products safer; however, these frameworks have largely been designed with software based applications and virtual interfaces in mind. As AI increasingly moves into safety critical, cyber physical systems embedded in industrial environments, policymakers face the challenge that the regulatory framework for automation and physical AI differs materially, with distinct implications for data security and risk mitigation.

Addressing this gap will require regulatory approaches that reflect the specific risk profiles and validation needs of physical AI systems, alongside clearer pathways for demonstrating safety and compliance. Greater alignment of safety and conformity standards across key markets, including Europe and the United States, would further reduce fragmentation and support trusted deployment at scale - particularly in globally integrated sectors.

Taking Europe's industrial heritage into the future

Europe's continued industrial leadership will depend on its ability to modernise existing systems in pursuit of greater efficiency, better performance and higher quality. Supporting the deployment of physical AI in full alignment with European values will be essential for transforming Europe's engineering heritage into a competitive industry for the future.

This transformation can be accelerated by targeted public-private investment, including test environments for largescale industrial use cases - such as energy systems and smart infrastructure - as well as incentives that help companies upgrade established assets with advanced AI-enabled control, sensing and automation capabilities.

About the author



Benjamin Linke is President of Industrial Automation Europe at Honeywell, where he leads strategy, growth, and deployment of advanced automation solutions across the industrial verticals. He previously spent over two decades at Baker Hughes & GE, holding senior international business leadership roles across energy & industrial sectors. Linke is recognised for driving customer-focused innovation, operational excellence, and sustainable transformation. His work centers on expanding digital industrial capabilities & strengthening Honeywell's position in Europe's evolving automation & energy landscape. He brings global experience & cross-functional leadership expertise.

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