

Adoption of 'Industry 4.0' systems can lead to sustainability across organizations

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Adaptive "smart" technologies and integrated production systems driven by digital transformation are helping to accelerate more sustainable products and industries, Flinders University experts say.

Adoption of "Industry 4.0" systems are not only improving company and organizational capabilities, supply chains, data and other resource management but also elevating economic, social and environmental outcomes, they say in a new article in the *Journal of Manufacturing Technology Management*.

"These advances are leading to superior product innovation, process efficiencies and [quality control](#) as well as benefits for employee well-being, waste management and sustainability," says industrial engineer Dr. Temitayo Seyi Abiodun.

"Our study encourages organizations to lift performance through an Industry 4.0 framework to generate these smart capabilities," he says.

Flinders University Professor of Innovation Giselle Rampersad says the study of companies around the world highlighted the interesting finding that the use of new Industry 4.0 [digital technologies](#) to improve productivity, customer experience and safety can also lead to increased sustainability across organizations.

"Digital technologies lead to improved sustainability through smartness from optimization, production flexibility, information transparency, value chain integration and digitalized processes," says Professor Rampersad, who is based at the Tonsley Innovation District in Adelaide.

"The research is important in assisting organizations in showing how adoption of Industry 4.0 technologies can contribute to achieving their 'net zero' emissions targets and sustainability agenda.

"It is the evolution towards the so called Industry 5.0 where sustainability and human-centered design is key."

The Flinders researchers say the study is also in keeping with national

and global targets for green reindustrialization and more sustainable manufacturing.

Another co-author of the article, Associate Professor in Autonomous Systems Russell Brinkworth, says technology has played a major role in the evolution of manufacturing and [production processes](#)—from the industrial revolution of steam power (Industry 1) then electrical machines (Industry 2), through to computing and robotics (Industry 3) and Industry 4.0 (using system integration, cyber, customization and AI).

"Technology has always driven innovations in manufacturing," he says.

"The latest development and integration of adaptive systems has ushered in the new-era Industry 4.0 smart [production systems](#) driven by digital transformational technology, including [artificial intelligence](#) (AI), which are being used to accelerate more [sustainable products](#) and industries."

More information: Temitayo Seyi Abiodun et al, Driving smartness for organizational performance through Industry 4.0: a systems perspective, *Journal of Manufacturing Technology Management* (2023). [DOI: 10.1108/JMTM-09-2022-0335](https://doi.org/10.1108/JMTM-09-2022-0335)

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