



Research News

Engineering platform offers collaborative cloud options for sustainable manufacturing

Assists sectors such as chemicals, pharmaceuticals and other industries tied to bio-based economies



A new engineering platform offers collaborative cloud options for sustainable manufacturing.

[Credit and Larger Version \(/discoveries/disc_images.jsp?cntn_id=302321&org=NSF\)](#)

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An engineering innovator has developed a cloud-based platform aimed at mapping inter-industry dependence networks for materials and waste generation among manufacturers in sectors such as chemicals, pharmaceuticals and other industries tied to bio-based economies.

Shweta Singh of the [Purdue College of Engineering \(/cgi-bin/good-bye?https://www.purdue.edu/newsroom/releases/2021/Q1/engineering-platform-offers-collaborative-cloud-options-for-sustainable-manufacturing.html\)](#) led a team that developed a new method of automated creation of physical input-output tables to track flows in manufacturing networks. The work was funded by the [U.S. National Science Foundation <https://nsf.gov/awardsearch/showAward?AWD_ID=1805741&HistoricalAwards=false>](#).

The physical input-output tables provide a detailed mapping of inter-industrial dependence to meet a manufacturing target that can help determine economic and environmental outcomes for manufacturing pathways based on material requirements.

"Unlike current technologies that use tiered data flow systems or time series approximations to fill data bandgaps, our new platform allows for dynamic changes in manufacturing networks via models developed as computer codes or simulation systems to update network structures for industrial interactions," Singh said. "The goal of this technology is to assist manufacturers in tracking the materials flow and supply network demand to optimize the process and reduce overall waste, as well as assist in the decision-making process to pick the most sustainable and resilient technology in a supplier network."

Singh said the algorithms in this model help to map resource flows with enhanced accuracy and reliability, as data can be more easily reconciled based on models through this approach. She added that the platform offers a collaborative, cloud-based environment that may have applications in the pharmaceutical, food and chemical processing industries.

"American manufacturing is of immense importance to the nation, as is environmental sustainability," said Bruce Hamilton, a program director in NSF's Directorate for Engineering. "This platform helps to enable sustainable manufacturing."

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