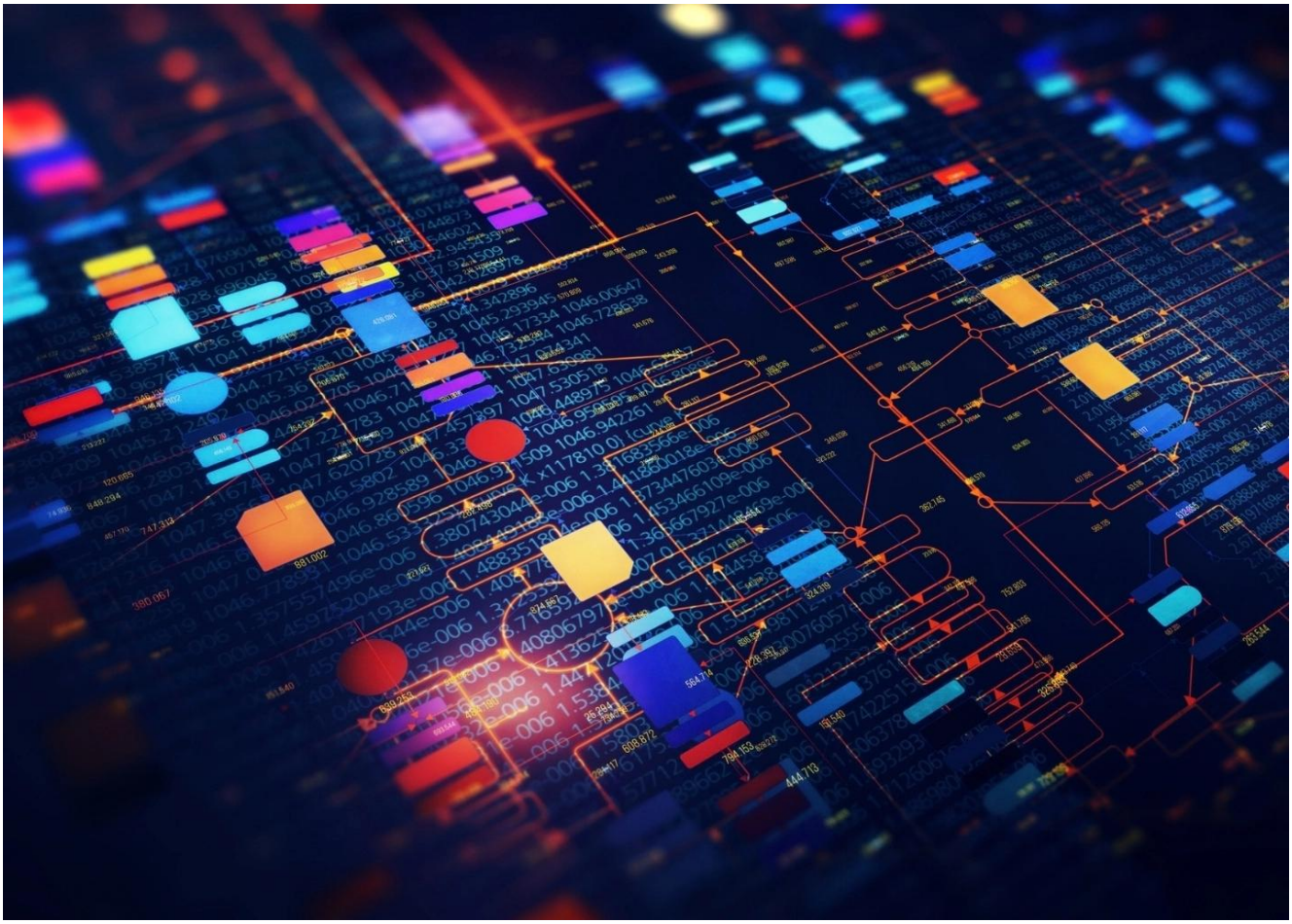
As machines learn, AI erodes the human monopoly on tacit knowledge

Innovation-driven companies must ensure humans and machines share what they know.



October 15, 2026

A key challenge for knowledge-based companies is how to ensure that employees share with others the expertise and experience they've acquired, converting individual tacit knowledge

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into organizational intelligence. AI introduces a new source of knowledge into the mix, requiring companies to also ensure that machines and employees share what they know with each other.

For Ikujiro Nonaka, the influential management scholar who died in 2025, innovation in knowledge-based companies hinges precisely on their ability to provide a fertile environment in which organizational knowledge can grow. This growth, according to Nonaka, occurs through the continuous interaction between tacit knowledge (acquired through experience and practice) and explicit knowledge (laid down in manuals, analyzed and taught).

In an article for a special issue of *Organization Science* on Nonaka's legacy, IESE's Eduard Talamas, Duke University's Aaron Chatterji and the University of Pennsylvania's Daniel Rock explore how AI enters the knowledge-creation process.

Nonaka's insights are more relevant than ever, the authors find. But if Nonaka envisioned an innovation cycle that begins with experienced employees sharing what they know, artificial intelligence introduces a new element: tacit machine knowledge, or what AI learns over time, which does not follow explicit rules and which can be difficult to articulate or explain.

How individual tacit knowledge becomes shared organizational knowledge

In his seminal book, *The Knowledge-Creating Company*, Nonaka posits that organizations develop knowledge through a four-stage process.

1. Externalization
Tacit knowledge possessed by individual employees is articulated and transformed into explicit knowledge.

2. Socialization
That knowledge is shared with other people across the organization.

3. Combination
The knowledge is enriched by different individual viewpoints to become new knowledge.

4. Internalization
The new knowledge is internalized once again by a larger number of individuals as new, richer, subjective knowledge, which then becomes the basis for starting another cycle of knowledge creation.

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This dynamic interplay between tacit and explicit knowledge then starts all over again, but at a higher level. Innovation emerges as the knowledge spirals upward.

5 ways humans and machines share knowledge

Enter artificial intelligence. Unlike earlier technologies, AI learns from data and does not follow explicitly specified rules, developing a type of knowledge that is also tricky to articulate or explain — tacit machine knowledge. In the age of AI, making human and machine knowledge available to one another is a crucial challenge for companies.

For Chatterji, Rock and Talamas, there are five movements in the process of knowledge exchange and conversion, the last of which connects machine to machine.

Encoding

From explicit knowledge to tacit machine knowledge

Companies can feed documents, formulas, scientific relationships, technical specifications and other records into a learning system. Machines then use this material to form internal relationships that shape what they recognize and propose.

Embedding

From tacit human knowledge to tacit machine knowledge

Human tacit knowledge can be partially transferred to machines through choices, demonstrations, corrections, ratings and modifications. This process is analogous to Nonaka’s socialization, but involves machines.

Extraction

From tacit machine knowledge to explicit human knowledge

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Machines express what they have learned in the form of predictions, designs, hypotheses or recipes. This process mirrors Nonaka's externalization from human tacit knowledge to human explicit knowledge.

Assimilation

From tacit machine knowledge to tacit human knowledge

People can also learn from machines through observation, experimentation and practice. Assimilation is the reverse of embedding: Just as tacit human knowledge shapes machine knowledge, tacit machine knowledge reshapes human knowledge.

Machine Transfer

From tacit machine knowledge to tacit machine knowledge

Machine tacit knowledge is expensive to create, but the marginal cost of transferring it to other machines is relatively low. Once knowledge is embodied in model weights, architectures, embeddings, memories or other machine-readable representations, it can be copied, distilled, fine-tuned, deployed through an API or incorporated into another system.

This differs substantially from tacit human knowledge, which travels slowly through interpersonal interactions. Tacit machine knowledge, in contrast, can move at scale at the speed of software, even if it is never fully articulated. A model trained in one organization can serve as the starting point for another model, product, workflow or organization.

For the authors, AI reinforces Nonaka's insight that companies that want to innovate and thrive must create an environment in which knowledge can be transferred and built upon. But in the age of AI, this space must now be shared between humans and machines.

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