IP BRIEFS®

WIPO's *World Intellectual Property Report 2026: Technology on the Move* explains why invention alone is not enough—and why the real battleground is how fast technology and know-how spread. Drawing on 250 years of adoption history and decades of patent-citation evidence, the report shows that diffusion is accelerating dramatically but remains uneven across countries and sectors. This post highlights the report's key findings and what they mean for innovation policy, competitiveness, and development.

From Telegraphs to Generative AI: What WIPO's 2026 Report Reveals About the New Speed of Technology Diffusion

The telegraph debuted in the 1840s—and then took decades to become truly global. By contrast, ChatGPT reached users in virtually every country within days of its release. That contrast is more than a fun statistic. It captures a shift that is reshaping innovation, competition, and development: the world is not only shrinking; it is accelerating.

That acceleration is the central theme of the World Intellectual Property Organization's *World Intellectual Property Report 2026: Technology on the Move*. WIPO's argument is deceptively simple: invention is only the start. New technologies create broad economic and social value only when they spread—when firms and households can adopt them, adapt them, and use them at scale. This is "technology diffusion," and it is neither automatic nor evenly distributed.

What makes the report worth reading is that it moves beyond anecdotes. It draws on evidence spanning 250 years of technological history and multiple decades of global patent and citation data to answer three practical questions: Are new technologies really diffusing faster? Is the knowledge behind innovation traveling more internationally? And what does all this mean for policy and business strategy?

Diffusion is speeding up—dramatically

WIPO's first headline finding is that global adoption lags have collapsed over time. The report uses "adoption lags"—the number of years between a technology's first invention anywhere and its first recorded adoption in a given country—to show a clear long-run pattern: newer technologies reach more places faster than earlier ones.

In the 19th century, foundational technologies like the telegraph and the automobile took around four decades to spread widely across countries. By the late 20th century, mobile phones and the internet diffused in a fraction of that time. In the extreme case of generative AI, diffusion is measured, not in years or decades, but in days—because GenAI services ride on a ready-made global infrastructure: the internet.

This is not merely a story about convenience. Shorter adoption lags change who benefits first, who captures market share, and how quickly economies can translate frontier inventions into productivity gains.

But diffusion isn't just "arrival"—it's intensity of use

Technology arriving in a country is not the same thing as becoming economically transformative there. WIPO's second main initiative is to distinguish between when a technology is adopted and how extensively it is utilised once introduced.

Historically, the report finds that while technologies eventually arrived in developing economies, the "use intensity gap" between advanced economies and others often widened across the 19th and much of the 20th century. Put simply, although diffusion took place, it was not uniform; disparities in the extent of technology usage contributed to lasting differences in income and productivity.

The encouraging twist is that this pattern is changing for some modern technologies. For recent digital technologies, especially 3G and 4G—the intensity gap shows signs of narrowing. The implication is not that development becomes automatic, but that the newest wave of general-purpose digital tools may offer more plausible "catch-up" pathways than earlier infrastructure-heavy technologies did.

Not every technology spreads like software

One of the report's most useful cautions is that the "GenAI speed story" is not a universal template. Some technologies remain slow to scale because their diffusion depends on expensive physical infrastructure, complex supply chains, regulatory approvals, and local adaptation.

WIPO highlights several examples:

- Electric vehicles, despite being comparatively new, can face longer adoption lags because they depend on charging networks and grid capacity—investments that take time and coordination.
- Genetically modified crops require extensive local adaptation and formal regulatory approval. The report notes that bringing a new GM trait from discovery through development and authorization can take, on average, about 16.5 years.
- Clean energy technologies often take decades to move from prototype to meaningful market share. Even solar PV—now a global success story—historically, required a long runway before it became "material" in the energy system.

The message is clear: diffusion speed depends on technology characteristics—especially modularity, capital intensity, infrastructure requirements, and regulatory burden. Policy and strategy need to be tailored accordingly.

Knowledge is traveling faster across borders—but leadership remains concentrated

A major contribution of the report is its distinction between diffusion of technologies (use) and diffusion of technological knowledge (know-how). To map knowledge flows, WIPO uses several tools, notably patent-to-patent citations, patent citations to scientific articles, and measures of the international "reuse" of breakthrough inventions.

The pattern is striking. Over the past five decades, international knowledge diffusion has accelerated markedly. The time to first cite an international patent has reduced by about half. More importantly, the gap between domestic and international knowledge-flow has nearly disappeared—suggesting geography is no longer a meaningful barrier to the speed at which codified technological knowledge travels.

Yet speed is only one dimension. The report also finds persistent concentration on who creates and who absorbs global knowledge. The United States, Western Europe and Japan remain dominant as both sources and destinations of technological knowledge flows, with China emerging as a major and increasingly open participant—especially in science-based "deep tech" sourcing.

For developing economies, this creates a paradox: knowledge can travel quickly, but the ability to identify, absorb and build on that knowledge—what economists call "absorptive capacity"—remains highly uneven.

Deep tech takes time: science-to-technology diffusion has a longer clock

In "deep tech" fields—such as biotechnology, AI, quantum computing, and advanced materials—the report highlights a slower pipeline from scientific discovery to patented invention. On average, scientific articles take around 10 years to receive a first patent citation, far longer than patent-to-patent knowledge diffusion.

This matters for anyone designing innovation policy or investing in frontier R&D. It means deep tech diffusion is not only about access to information; it requires institutions that can translate science into applications: research funding, skilled talent, labs and testing capacity, and pathways for commercialization.

Innovation leaders stay ahead by reusing breakthroughs faster

One of the report's more provocative findings is that leading innovation ecosystems do not merely invent more—they also adopt and reuse foreign breakthroughs faster and more intensively.

Using a method that tracks "breakthrough inventions" as novel combinations of existing technological components, WIPO shows that innovation leaders excel at rapidly identifying and building upon breakthroughs that originate elsewhere. The report illustrates this asymmetry with corridor comparisons showing that the United States, for example, can be significantly faster at reusing certain foreign-origin breakthroughs than the origin country itself.

This helps explain why leadership persists even as knowledge diffusion speeds up globally: advantage comes not only from generating new knowledge but from quickly integrating external knowledge into new products, processes, and patents.

Three case studies: agriculture, clean tech and digital

To keep the analysis grounded, WIPO evaluates its diffusion framework in three sectors, each with different diffusion mechanics.

Agriculture: GM crops and precision agriculture technologies

The report emphasizes that agricultural technologies are context specific. GM crops often require local R&D to adapt traits to local varieties and conditions, then must pass regulatory approval. Precision agriculture technologies (PATs) are modular—farmers adopting components rather than full systems—but adoption is constrained by high fixed costs, skills needs, interoperability concerns, and connectivity. Farm size matters throughout: large farms spread fixed costs more easily and tend to adopt faster; smallholders face higher per-unit costs and information gaps.

Clean technologies: solar PV, EVs, hydrogen

Solar PV shows how modular design, scale manufacturing, and policy support can push technologies down steep cost curves. EVs highlight the centrality of complementary infrastructure (charging) and durable demand-side policy signals. Hydrogen illustrates the hardest diffusion problem: system coordination. Scaling requires aligned investments across production, transport infrastructure, standards, and credible demand from industrial off-takers.

Digital technologies: connectivity as a gatekeeper

Digital diffusion can be extraordinarily fast once the enabling layers exist—submarine cables, broadband networks, and robust last-mile access. But the report stresses persistent divides in infrastructure vulnerability, affordability, skills, and uneven access to advanced network generations. It also explains the role of standards and standard essential patents (SEPs), typically licensed on FRAND terms, in enabling interoperability—while noting that complex licensing processes can burden smaller firms and developing economies.

The report's practical framework: four drivers of diffusion

WIPO distills its findings into four determinants that can guide policymakers and business leaders:

1. Technology characteristics matter: modularity, complexity, cost, and infrastructure dependence determines diffusion speed.
2. Information flows matter: digital platforms and tools accelerate access to knowledge, lowering learning costs.
3. Absorptive capacity matters: skills, institutions and innovation capabilities shape whether users can adopt and adapt new technologies.
4. Public policy and institutions matter: infrastructure, standards, regulation,

finance, and IP frameworks can accelerate diffusion—or slow it.

The takeaway: diffusion is the real battleground

The report's bottom line is optimistic but disciplined. Technology is spreading faster than ever, and in some domains the usage gap is narrowing. But none of this happens "by default." Faster knowledge flows do not automatically translate into inclusive economic gains.

For governments, the message is that innovation policy cannot stop at R&D incentives or patent filings. It must also build the conditions that make adoption feasible: infrastructure, predictable regulation, workforce skills, and institutions that turn foreign and domestic knowledge into local productive capacity.

For businesses, the report underscores a strategic reality: competitive advantage increasingly comes from diffusion capability—how quickly a firm can adopt, integrate, and scale technologies, including those developed elsewhere.

The future will not belong only to the best inventors; it will belong to the fastest adopters—and to the ecosystems that make that adoption possible.

MM Kleyn, Editor

Source

World Intellectual Property Organization (WIPO) (2026). World Intellectual Property Report 2026: Technology on the Move*. Geneva: WIPO. DOI: 10.34667/tind.59025.*