BCG

Weekly Brief

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Reshaping R&D for the AI Era

A CEO of a large industrial goods company recently shared that AI has compressed the time to design complex products by one-third—and expanded the number of possible product variants. He is not alone.

AI is fundamentally reshaping how companies invent, develop, and bring products to market. The question is not whether AI will transform innovation—but how quickly companies will see results hit the bottom line.

From Incremental Gains to AI-Powered Transformation

For decades, R&D challenges have been about optimizing speed, cost, and quality. By rewiring their operating model to harness AI, R&D organizations are evolving into a powerhouse of value creation, reducing time-to-market up to 20% and lowering costs by up to 20%.

Paired with smarter ways of working, AI can enable incremental innovation, augment the work of engineers with digital twins, and orchestrate open and distributed innovation. My colleagues explored these developments in R&D in their latest Executive Perspective on AI.

At BCG, we talk about using AI in three ways: deploying AI in everyday tasks, reshaping business functions end to end, and inventing new customer experiences, offerings, and business models. R&D is a function that is ripe for reshaping by AI.

Evidence already abounds. A global auto manufacturer is using AI-driven CAD to design lighter, stronger parts in a fraction of the time. In shipbuilding, AI is optimizing design and reducing engineering rework by up to 30%. In the pharmaceutical industry, the productivity of AI-based R&D could double that of classical approaches.

Reshaping R&D

Realizing AI's full potential requires more than just new tools—it demands a fundamental shift in how R&D operates. Success depends on five key factors:

- **Process Redesign.** Embedding AI throughout the R&D cycle rather than layering it onto legacy workflows and integrating ways of working that allow for rapid iteration and experimentation
- **AI Agents.** Leveraging generative and predictive AI to perform select tasks initially and eventually automate broader, more complex tasks and accelerate decision making
- **Data Infrastructure.** Ensuring seamless access to structured knowledge to power intelligent systems, allowing AI to identify patterns, optimize designs, and streamline collaboration across teams
- **IP-Centric Models.** Using that structured knowledge and proprietary data as a foundation for AI-driven innovation and training
- **Talent Development.** Upskilling engineers and scientists to work effectively with AI and creating a workforce that blends domain expertise and AI fluency

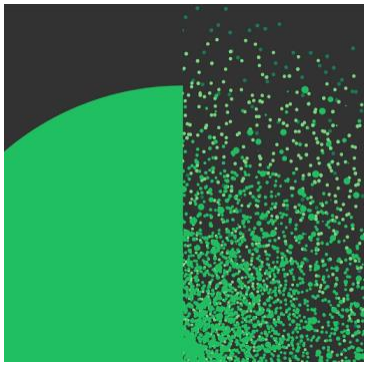
Beyond these technical and operational shifts, leadership alignment is critical. AI-driven R&D transformation requires executive sponsorship, clear governance, and cross-functional collaboration across R&D, IT, and business strategy teams.

Organizations that quickly establish AI strategies and operating models and experiment will define the next era of innovation.

Until next time,

Christoph Schweizer
Chief Executive Officer

Further Insights



AI-Powered R&D

AI can transform R&D and innovation, but it will require a new operating model.

SUPERCHARGE R&D WITH AI

Turning GenAI Magic into Business Impact

The technology is a marvel, but leaders are ready to see results. Here are three value plays organizations should make now.

MAXIMIZE AI'S POTENTIAL

Product Innovation and Engineering

BCG's product innovation consulting team helps companies engineer market-winning products and services, improve product excellence, and transform R&D.

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