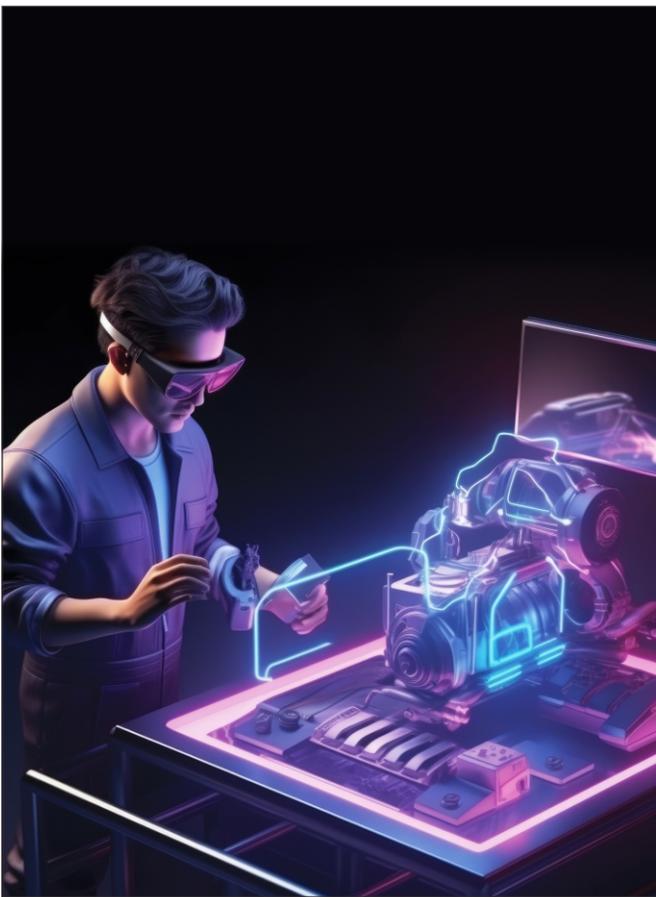


From Promise To Practice: AI As An Accelerant For New Product Development

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Problem of practice

Adoption of Artificial Intelligence (AI) for new product development is still in its nascent stage, but early adopters have already **experienced** substantial benefits.¹ A key finding from these early pilots is that AI has the potential to accelerate and de-risk the product development process. Consumer and B2B (business-to-business) products have begun to adopt AI in areas such as idea generation, concept testing, business case building and virtual prototyping. Such early adopters have seen substantial returns, including faster time to market, a better product-market fit and reduced development costs. Yet many businesses are hesitant to move beyond the pilot stage, as AI, to many, still seems complex, unsafe and inaccurate.

Recent **research** by Robert Cooper shows that the integration of AI can accelerate every stage of the development cycle, with the upside of increasing efficiency, creativity and market responsiveness.² Our essay explores how the reasons for business hesitation can be overcome and illustrates how product managers can accelerate the progress of new product ideas – from concept to launch

²The article 'The AI transformation of product innovation' by Robert G. Cooper, featured in Volume 119 of *Industrial Marketing Management* talks about how Artificial Intelligence (AI) not only finds many applications in new product development (NPD) but also offers substantial payoffs

New product stakes

The stakes in new product development are high, as are the costs of delay or failure. For instance, the failure rates of new consumer durable products are around 40%.³ The stakes are even higher in new industrial products such as turbines, medical devices, cars, tractors and chemical compounds. In this high-risk, high-reward activity, AI has been quietly transforming product innovation in manufacturing and engineering-driven industries: the number of firms reporting use of AI in the **new product development** (NPD) process has increased from 13% in 2023 to 24% in 2024.⁴

However, adoption across the board is still relatively low and often restricted to pilots. The primary concern is a lack of internal AI expertise and the unavailability of quality internal data to train reliable models. In legacy engineering or manufacturing firms, resistance to change also poses obstacles for adoption. Many firms

struggle to identify a clear business case or return on investment for AI pilots, leading to stalled projects. Keeping pace with AI advances often overwhelms firms, making technology choices difficult. It is here that research by Robert Cooper demonstrates how AI can be deployed to enhance the entire product development process chain.

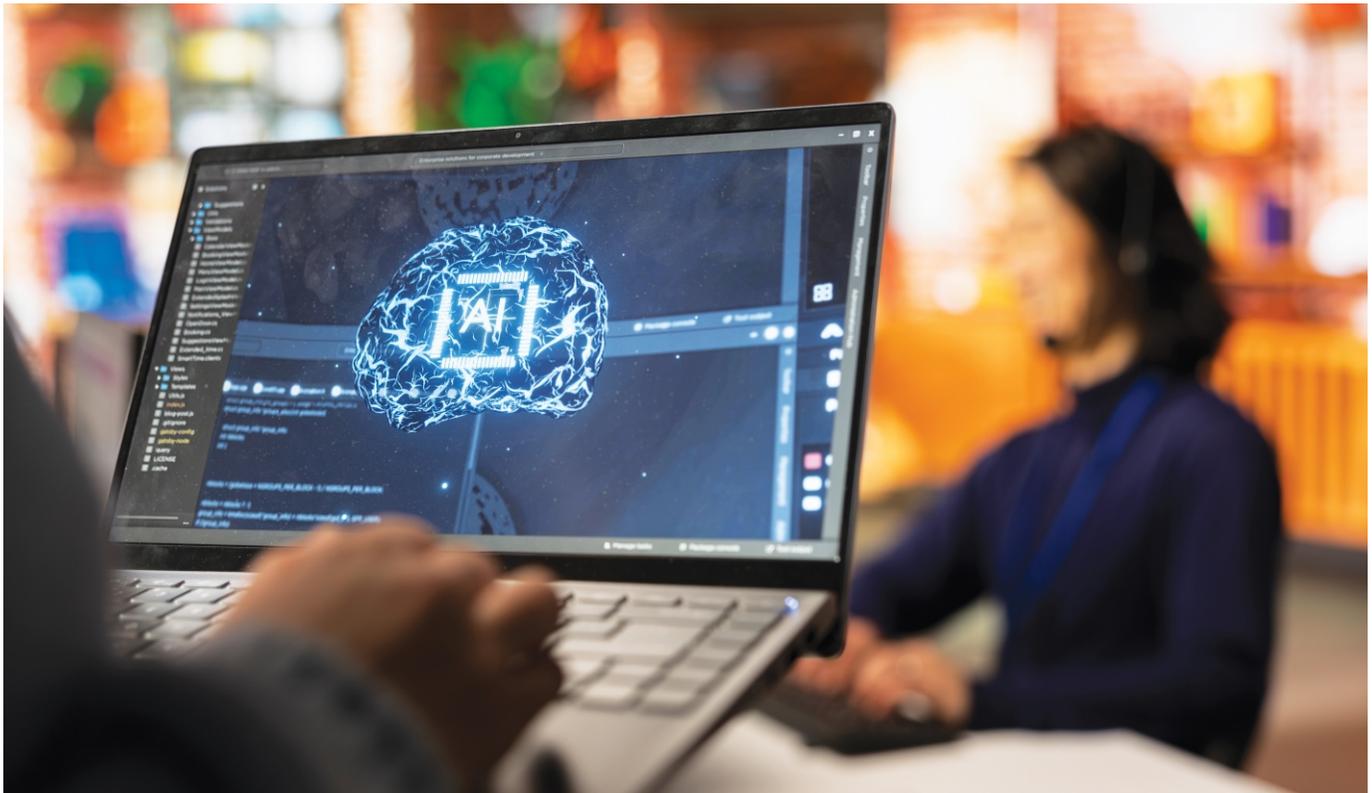
AI promise and impact

The process of developing new products can be broadly structured into four phases: ideation & concept generation, product design & prototyping, testing & refinement and product management. Across this chain, AI tools have been shown to **enhance** substantive elements such as generating digital prototypes, testing prototype iterations virtually and predicting product performance in the real world.⁵ See *Figure 1* for a mapping of AI tools and products to NPD elements and potential impact.

Figure 1: New product development process & AI impact

	Ideation	Design & prototyping	Testing & refinement	Product management
NPD process description	<ul style="list-style-type: none"> Generates novel ideas for new products 	<ul style="list-style-type: none"> Design product concepts, attributes, use cases 	<ul style="list-style-type: none"> Conduct field trials, identify risks and refine product concept 	<ul style="list-style-type: none"> Optimise future investment, resource allocation and new product iterations
AI-augmented process	<ul style="list-style-type: none"> Surfaces user needs, mines technical data, detects patterns for new product concepts 	<ul style="list-style-type: none"> Creates virtual models & prototypes for rapid and iterative product design 	<ul style="list-style-type: none"> Efficient design of field experiments & user feedback analysis 	<ul style="list-style-type: none"> Analyses sales and supply chain data to generate recommendations for product life cycles
Samples of AI tools	<ul style="list-style-type: none"> ChatGPT, Claude, Gemini, Google TrendsAPI 	<ul style="list-style-type: none"> Midjourney, DALL-E, GitHub, Copilot 	<ul style="list-style-type: none"> Hotjar AI insights, DeepCode, SonarQube 	<ul style="list-style-type: none"> Monday.comAI, Asana intelligence, Microsoft Project AI
Efficiency gains by using AI	<ul style="list-style-type: none"> R&D cost reduction ~25% Formulation process reduction~50% 	<ul style="list-style-type: none"> Rework avoidance ~30% Time to design acceleration~30-40% Time to market reduction~10-60% 	<ul style="list-style-type: none"> Physical test cost reduction ~50% Lead time reduction ~80% 	<ul style="list-style-type: none"> Engineering resources saved ~45% Employee efficiency ~35%

Sources: Created by authors, including inputs from *the BCG report*⁶



To illustrate a business-to-business use case, consider the example of US-based multinational company General Electric. Researchers there are utilizing AI and

AI in NPD yields various benefits, in fields such as design thinking, effectiveness of open innovation, generating product concepts and ideas, digital prototyping, accelerating development and testing and facilitating better go/no-go decision-making

machine learning to enhance the design of gas turbine aerodynamic components, aiming for a 30-50% reduction in design cycle times, from one year to a few months.⁷ Global automaker General Motors is leveraging [automotive design](#) powered by AI and cloud computing to design lighter, more efficient, and customizable cars.⁸

The use of AI is not limited to mechanical design; pharmaceutical companies are now utilizing AI to address long-standing challenges, such as high failure rates, lengthy development timelines and resource inefficiency. Firms like Pfizer, Sanofi, Novartis, GSK to name a few, have partnered up with firms like IBM, Microsoft and NVIDIA to [transform](#) the landscape of drug discovery, clinical trials and manufacturing.⁹

Fast-moving consumer goods companies like Dabur and Marico, based in India, are adopting AI across various stages of new product development. Marico has developed a skin analyzer tool that leverages AI and machine learning to [assess facial skin conditions](#) and recommend personalized routines, supporting more targeted product offerings.¹⁰ Ashish Pandey, Global Chief Information Officer at Dabur, talks about how the company is [leveraging](#) AI-powered insights to develop personalised product recommendations and enhance customer engagement across digital channels.¹¹

At the aforementioned companies, AI is rapidly reshaping NPD, not just by automating tasks, but also by amplifying human insight, speeding up processes and enhancing decision-making. We highlight some of the more specific impact points of AI:

Market-focused ideation: Understanding the competitive situation, customer needs and market nature are essential inputs for product innovation and AI is revolutionizing this early phase of generating ideas and testing concepts. With the right prompts, in a few seconds, a generative AI tool can list clever ideas after analysing millions of data points. Natural Language Processing and machine learning can scan unstructured text like reviews, user forums and complaints to identify market gaps and customer pain points that humans might miss.

For example, in a B2B case involving medical devices, AI distilled thousands of online patient conversations into 120 concrete customer needs, helping the firms prioritize high-impact features. This kind of insight, at scale, makes AI a powerful tool for discovering unmet needs and guiding concepts. Nestlé also leveraged AI to scan the Internet and mine technical data, enabling the discovery of new insights and increasing the pace of innovation by 60%.¹²

Building the voice of the customer into product design is also critical and, here too, AI can add value by analysing extensive data and generating insights that can enrich product design decisions. Generative AI can also create realistic 3D renderings of concepts. With the right 'what if' prompts, different product concepts can be compared. This can be used to design digital prototypes for user concept validation after initial concept and idea testing at the firm level.¹³

Smarter decisions: The go-to development decision is among the most crucial resource commitment decisions in the NPD process. However, an estimated 70% of projects that managers approve for development never become commercial successes. A good go/no-go decision depends on the precision of the business case, and AI, with its potential to scan multiple data sources and gather and analyze data, becomes a great help in building the business case.

The application of AI can help build robust business cases and 'go-to-development' decisions, as it uses predictive modelling, scenario analysis and pattern recognition to assess market size, revenue potential and risk more objectively. AI can finetune forecasts by scanning competitors' pricing, product launches and customer sentiment. Companies can also use generative AI tools to draft the initial business cases, simulate potential outcomes and suggest actionable steps.

Companies can use such analysis to remove firm-level biases, add speed and reduce uncertainty, just like Hindustan Unilever. The company uses an AI Hub to capture and assess consumer signals, enabling faster idea generation and validation.¹⁴ At their Dapada factory, AI and machine learning solutions have reduced product development lead times by 50% and significantly lowered manufacturing costs and quality defects.

Faster design, development and testing: Being the first-mover in the market, by capitalizing on the 'window of opportunity', can result in higher sales and profits. The third significant contribution of AI is in the design, development and testing phase. AI simulation tools and digital twins (sophisticated digital models that accurately replicate physical products and can be used

during field trials and actual product usage, facilitating the collection, analysis and utilisation of data for product optimization) enable engineers to test product configurations. GE's digital twins of its GE90 engines on Boeing 777 aircraft monitor engine degradation, while Siemens employs ATOM, a digital twin for its gas turbines and compressors.^{15,16} AI can enhance how we collect and analyse user feedback. Natural Language Processing can help detect issues and refine designs more efficiently. AI can thus reduce development time, improve product fit and accelerate time to market.

Implementation pitfalls

To truly harness the power of AI for innovation and ideation, organisations must adopt a strategic, integrated approach that permeates every layer of their operations. Many firms struggle to identify a clear

AI's use in new product development

- Market-focused ideation
 - Smarter decisions with AI-backed business cases
 - Faster product design, development and testing
-



business case or return on investment for AI pilots, leading to stalled projects. A related challenge is the rapid advancements in AI tools, which make technology choices difficult.

To overcome these challenges, a commitment from top management is imperative, as it creates an organisation-wide focus on human-AI collaboration, cross-functional deployment and deep integration. To move beyond isolated pilots, top management must define a clear AI vision and make it the organisation's strategic intent. A starting point is for **leaders** to believe in the potential of AI and develop a mindset that entails a

The use of AI is not restricted to mechanical design; pharmaceutical companies are now using AI to overcome long-standing challenges like high failure rates, long development timelines and resource inefficiency

willingness to experiment, accept failure and lead cultural transformation.¹⁷ Executives need to become **AI evangelists** who foster a culture of experimentation, as without visible top-level sponsorship, AI initiatives risk stalling in 'pilot purgatory'.¹⁸

A big barrier to AI adoption is the lack of internal expertise, which can be overcome by **investing** in

reskilling technical and product staff.¹⁹ The goal is to have an NPD organisation that is ready to experiment, question legacy processes, show agility and be open to adopting a changed way of working, along with access to external AI experts.

Another stumbling block for AI adoption, in general, is the evolving regulatory landscape. Companies must prioritize adherence to data protection laws, sector-specific AI principles, and product safety requirements. Ironically, **companies** can utilize AI to augment their compliance functions, helping them keep pace with the rapidly evolving legal jurisdictions and frameworks.²⁰

Unlock value of AI

Deliberate action is required at the firm level to fully embed AI in the NPD. Firms should start small, select one high-impact NPD area, such as concept testing or digital prototyping, and run a focused AI experiment. But to stop there can risk losing out to bolder rivals. Hence, companies should also invest in capability building in cross-functional teams, AI training and partnerships with external experts. Top management should establish a clear vision for implementing AI. This should be supported with measurable goals and KPIs. The firm's initiative needs to be driven by top management by creating an environment that fosters collaboration, fearless experimentation and quick learning. Firms can unlock the value of AI and stay ahead in the innovation race with the commitment and dedication of leadership.

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