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AI: The Intelligence Revolution

The coming AI revolution is going to be 100 times bigger than the industrial revolution – 10 times bigger and maybe 10 times faster, says Demis Hassabis, the CEO of DeepMind, the artificial intelligence arm of Google, and Noble Prize winner. We've received many questions from our clients about the impact of AI and how best to invest in it. Our first attempt at tackling this important topic follows.

The striking similarities between the Industrial Revolution and the AI Revolution provide useful insight into potential social changes and investment opportunities.

The industrial revolution caused the biggest change in society in a millennium, moving the world from an agrarian to an industrial mode of production. Similarly, we think AI will take us from an 'industrial' to an 'intelligence' society.

The steam engine, the primitive yet powerful mechanical heart of the Industrial Revolution, catalyzed transportation, manufacturing, and energy around the world in the first wave. Similarly, the large language model^[1] (LLM), the first cognitive engine of the AI Revolution, converts raw data into usable reasoning, creativity, and decision-making. This LLM engine, driven by transformers and powered by massive pretraining, has begun to reshape labor, productivity and communication on a global scale. Just as the steam engine was the catalyst for the start of the industrial revolution, the large language models (LLMs) are likely the catalyst for the first wave of the artificial intelligence revolution.

The Critical Feedback Loop

The steam engine created a feedback loop by enabling more efficient mining, which in turn provided the fuel and steel needed to power the engine itself. In AI, large language models (LLMs) drive advancements in the components that build them—such as semiconductor manufacturers—and also improve the LLMs themselves, creating a continuous cycle of innovation and enhancement.

Stages of Development

The technological changes in both the industrial and intelligence revolutions occur in predictable stages. In the first stage, technology provides new solutions for existing problems. For example, In the industrial revolution, the steam engine replaced the horse when power was needed. In the AI revolution, companies shifted to using chatbots for customer service jobs, and LLMs help generate reports and email.

In the second stage, companies develop whole new ways of using the technology. The steam engine allowed for new processes such as using coke to smelt ore, leading to the large-scale production of iron and later steel. This development provided for new construction materials and the rails for expanding railroads. With AI, research becomes more efficient, be it for drug discovery, for writers, academics, lawyers and others.

In the third stage, there is an explosion of uses which leads to specialization. For example, some LLMs will be used for robotics, others for writing code, summarizing company reports or psychological advice.

Subsequently, AI will be most successful in applications we cannot conceive of and result in technologies and science which don't currently exist.

Consequences

Both eras are marked by transformative technologies that fundamentally reshape economies, societies, and the nature of work. Just as the Industrial Revolution shifted labor from manual to machine-based, disrupting traditional roles and creating new industries, AI is automating cognitive and analytical tasks, changing how we work and generating new fields and professions.

Both revolutions sparked concerns about job displacement, raised questions about the value of uniquely human skills, and required adaptations in education and policy to manage widespread change. The Industrial Revolution led to the emergence of public education and labor protections. Similarly, integrating AI into corporate America will demand new approaches to workforce training and institutional innovation.

The challenges of AI—ensuring equitable access, managing displacement, and sharing the benefits—echo those faced in the industrial era. The pace of the AI revolution, propelled by digital connectivity, is much faster, however, and creates its own unique set of issues. Ensuring that the goals and motivations of AI are aligned with human goals and motivations is a major challenge. The need for human oversight remains.

Who are the major players in the Intelligence Revolution and what industries and companies do we see actively applying AI today?

Semiconductor companies are the brains, data centers the body, and energy producers provide the lifeblood that collectively enable the LLMs driving today's AI transformation.

- **Semiconductor companies** design and manufacture the high-performance chips—such as GPUs and specialized AI accelerators that provide the extraordinary computational power required to train and run LLMs.
- **Data centers**, equipped with thousands of these advanced chips, offer the physical and digital infrastructure to store data, facilitate communication, and deliver AI services at scale.
- **Energy producers** play an essential role by providing the vast amounts of electricity needed to fuel both the training and deployment of these computationally demanding models. These often-hidden drivers fuel the machinery behind the technological change.

Ultimately, the biggest beneficiaries tend to be the users of the technology who can leverage the tools to improve efficiency, reduce costs, make better decisions and create new capabilities in their fields. During the industrial revolution, key users such as railroads, pump manufacturers and loom makers applied new steam-powered technologies to transform transportation, water management and textile production. These companies' earnings, profitability and growth outpaced the steam engine manufacturers by miles.

LLMs like OpenAI, semiconductor companies such as Nvidia, and uranium companies like Cameco that power the data centers, may be the early beneficiaries of the AI revolution, but will they prevail? Xerox invented the personal computer, but Apple figured out why people needed to have one. Apple went on to become one of the most successful companies in the world, but Xerox treaded water for decades.

What industries and companies actively apply AI today?

One of the immediate impacts of AI is to lower the costs and complexity of running a business. Labor costs, usually one of the largest costs, can potentially be reduced. Tracking, monitoring, and predicting business activities will be significantly improved. AI speeds up recruitment, assesses candidates, predicts workforce needs, and personalizes employee development across several different businesses. Below, we discuss how AI is applied by industry and highlight companies currently taking advantage of its use.

- Retail and e-commerce: AI improves customer experience via personalized recommendations, optimizes inventory and pricing, and enables real-time personalized customer support, both online and in physical stores.
 - Examples: Amazon and Walmart
- Manufacturing: Users benefit from predictive maintenance, quality control, defect detection, supply chain optimization, dramatically shortened and improved design cycles and smart factory automation powered by AI.
 - Examples: Siemens, Tesla and Nike
- Transportation and logistics: AI supports autonomous vehicles, traffic management, route optimization, and supply chain efficiency.
 - Examples: UPS, DHL, Amazon and Walmart
- Energy and utilities: AI drives improvements in energy production forecasting, grid stability, reservoir management, and cost reduction.
 - Examples: Duke Energy and Exelon
- Legal services: Legal professionals benefit from AI-assisted research, contract analysis, and automating routine tasks.
 - Examples: Thompson, Reuters, and Westlaw
- Medical: AI promises to greatly reduce medical costs by optimizing disease and illness identification, treatment, and monitoring. Drug discovery and production costs will be reduced.
 - Examples: Intuitive surgical (DaVinci Robotics) and AstraZeneca
- Hospitality and tourism: AI enhances customer experiences, resource optimization, and operational efficiency in hospitality businesses.
 - Examples: Marriot International and Booking Holdings

Just as the industrial revolution created upheaval and changes in society, so will AI. In fact, the parallels between the industrial revolution and the AI revolution may have predictive value for investing today. The early winners may not be the ultimate beneficiaries in terms of creating economic value. Many of the companies that are the ultimate winners, may not even exist today.

If you'd like help thinking through portfolio adjustments or risk management strategies, we're here to help!

Need help sorting this all out? Make an appointment with us to help you through it.

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^[1] Large language models recognize, interpret and generate human language based on massive amounts of data. ChatGPT, Gemini, Anthropic (Claude) Perplexity and DeepSeek are all LLMs.

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