ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE DIGITAL ECONOMY

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Abstract. *The role of artificial intelligence (AI) tools and techniques in business and the global economy is a hot topic. This is not surprising given recent progress, breakthrough results, and demonstrations of AI, as well as the increasingly pervasive products and services already in wide use.*

Key words: *Artificial intelligence, economic modeling, economic simulation, MGI Tech Co., Ltd.*

ТЕХНОЛОГИИ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ЦИФРОВОЙ ЭКОНОМИКЕ

Аннотация. *Роль инструментов и методов искусственного интеллекта (ИИ) в бизнесе и мировой экономике является горячей темой. Это неудивительно, учитывая недавний прогресс, прорывные результаты и демонстрации ИИ, а также все более широкое распространение продуктов и услуг, которые уже широко используются.*

Ключевые слова: *искусственный интеллект, экономическое моделирование, экономическое моделирование, MGI Tech Co., Ltd.*

The role of artificial intelligence (AI) tools and techniques in business and the global economy is a hot topic. This is not surprising given recent progress, breakthrough results, and demonstrations of AI, as well as the increasingly pervasive products and services already in wide use. All of this has led to speculation that AI may usher in radical-arguably unprecedented-changes in the way people live and work, and even help to accelerate progress toward meeting the United Nations' Sustainable Development Goals (SDGs). Contributed by the McKinsey Global Institute (MGI)1, the economic and business research arm of McKinsey & Company, this paper offers a framework for thinking about how to model the economic impact of AI, putting this exercise in the context of the research on the dynamically changing world of work in the light of automation, the need for a skills revolution, and the increasing and potential use of AI by companies. This paper focuses largely on the results of new economic modeling and simulation of the impact of AI on the world economy. As such, it should help to broaden collective understanding of how AI may impact economic activity, and potentially touch off a competitive race with implications for firms, labor markets, and economies. Three key findings emerge:

AI has large potential to contribute to global economic activity. AI is not a single technology but a family of technologies. This paper focuses on five broad categories of AI technologies: computer vision, natural language, virtual assistants, robotic process automation, and advanced machine learning. Companies will likely use these tools to varying degrees. Some will take an opportunistic approach, testing only one technology and piloting it in a specific function. Others may be bolder, adopting all five and then absorbing them across their entire organization. For the sake of the modeling, the first approach is defined as adoption and the second as full absorption.4 Between these two poles will be many companies at different stages of adoption; the model captures partial impact, too. By 2030, the average simulation shows, 70

percent of companies may have adopted at least one type of AI technology, but less than half may have fully absorbed the five categories.

The economic impact may emerge gradually and be visible only over time. The impact of AI may not be linear, but may build up at an accelerating pace over time. AI's contribution to growth may be three or more times higher by 2030 than it is over the next five years. An S-curve pattern of AI adoption is likely—a slow start due to substantial costs and investment associated with learning and deploying these technologies, but then an acceleration driven by the cumulative effect of competition and an improvement in complementary capabilities. The fact that it takes time for productivity to unfold may be reminiscent of the Solow Paradox. Complementary management and process innovations will likely be necessary to take full advantage of AI innovations. It would be a misjudgment to interpret this "slow-burn" pattern of impact as proof that the effect of AI will be limited. The size of benefits for those who move into these technologies early will build up in later years at the expense of firms with limited or no adoption. • A key challenge is that adoption of AI could widen gaps between countries, companies, and workers. AI could deliver a boost to economic activity, but the distribution of benefits is likely to be uneven: - Countries. AI may widen gaps between countries, reinforcing the current digital divide. Countries may need different strategies and responses because AI adoption levels vary. AI leaders (mostly in developed countries) could increase their lead in AI adoption over developing countries. Leading countries could capture an additional 20 to 25 percent in net economic benefits compared with today, while developing countries may capture only about 5 to 15 percent. Many developed countries may have no choice but to push AI to capture higher productivity growth as their GDP growth momentum slows, in many cases partly reflecting the challenges related to aging populations. Moreover, wage rates in these economies are high, which means that there is more incentive than in low-wage, developing countries to substitute labor with machines. Developing countries tend to have other ways to improve their productivity, including catching up with best practices and restructuring their industries, and may therefore have less incentive to push for AI (which, in any case, may offer them a smaller economic benefit than advanced economies). However, this does not necessarily mean that developed economies are set to use AI better and developing economies are destined to lose the game. Depending on the choices that countries make to strengthen AI related foundation and enablers as well as capabilities to manage the transition countries can proactively change their paths. Some countries are already trying to shape bold paths for the future. For instance, China, as noted, has a national strategy in place to become a global leader in the AI supply chain, and is investing heavily.

Photo 1.1

What is Artificial Intelligence Used For?

1.   AI in marketing
2.   AI in Banking
3.   AI in Finance
4.   AI in Agriculture
5.   AI in HealthCare
6.   AI in Game
7.   AI in Space Exploration
8.   AI in Autonomous Vehicles
9.   AI in Chatbots
10.   AI in Artificial Creativity

Predicting the economic impact of AI or any disruptive technology is a highly speculative exercise. This is a world of near-continuous discontinuity. It has already been highlighted in many analyses that the scope and pace of automation deployment depend on several variables—some more predictable than others—including technical feasibility, the cost of developing and deploying technologies for specific uses in the workplace, labor-market dynamics including the quality and quantity of labor and associated wages, the benefits of automation beyond labor substitution, and regulatory and social acceptance. Similar factors are likely to determine the pace of AI adoption. In addition to these factors, competitors enabled by digital technologies can burst upon the scene, seemingly from nowhere, putting apparently well-protected and robust incumbent businesses under attack. Vast new markets can rise at a rapid pace. Consider, for instance, that only ten years ago, China accounted for 1 percent of global e-commerce transactions, but today, its share is over 40 percent. Technology has accelerated and intensified the natural forces of market competition, and developments are extremely hard to read. It is because of such considerations that this research has built scenarios and extends those through the use of simulations. Investment in AI beyond what is needed strictly for labor substitution can produce additional economic output by expanding firms' portfolios, increasing channels for

products and services, developing new business models, or some combination of the three. This research suggests that firms' motivation for adopting and absorbing AI relates as much to a desire to develop new products and services as to a bid to boost efficiency through automation. The survey, conducted by MGI in 2017, found that about one-third of companies were investing in AI to improve their sales of current offerings, to expand their offerings of products and services, or both—possibly at the expense of their rivals. To arrive at a sense of the magnitude of this effect, an extensive set of AI use cases was looked at in detail, and then the relative ratio between the efficiency gained from AI and the magnitude of impact from innovation and market extension was simulated.

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