



# China Artificial Intelligence Industry Insights

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*You may use Alipay, Baidu, or TikTok. But did you know that Chinese AI and IT increasingly influence everyday life? The rapid growth of tech business in China has contributed to the development of a dynamic and competitive landscape. This article provides insights.*

**T**echnology in China is evolving in an incredible speed, both hardware and software. Chinese government's ambitious target is to establish global leadership in many technologies by

engines, or doing Internet shopping.

From the rise of e-commerce to the dominance of artificial intelligence (AI) applications, China has been a trendsetter. China is setting the course to become a world leader in AI. Policy makers in China have made IT and AI a strategic priority and are driving the Chinese tech industry to define global standards and norms. Progress can be observed in areas such as information technology,

2030.<sup>1</sup> To achieve this goal, China is actively investing in research and development, attracting top talent, and promoting collaboration between industry and academia on a significant scale.

## IT EVOLUTION IN CHINA

TikTok has opened the door to Chinese IT for most parts of the world. The originators are a major artificial intelligence tech conglomerate in China. Suddenly data privacy and cybersecurity risks related to everyday apps are discussed, that most people have not thought about when using for many years, using search

## FROM THE EDITOR

China is a key innovation hub in IT and software innovations. Topics such as artificial intelligence (AI), mobile applications, autonomous systems, and information technology show the fast-paced advances. Root causes are manifold, such as openness for innovation and technocracy. This article will explore the factors contributing to China's fast growth in software technology. As a case in point, we focus on generative AI and the various ecosystems and evolution paths in China. —Christof Ebert

cloud computing, 5G communication, and AI.

- › Information technology is driven by e-commerce and a billion local Internet users. Chinese citizens tend to have an open-minded attitude toward cutting-edge innovations. For example, the wide acceptance of e-commerce encouraged many years ago the development of live stream shopping, and face recognition payment. E-commerce platforms like Alibaba and JD.com have transformed retail, while mobile payment systems like Alipay and WeChat Pay have made digital transactions effortless.
- › Cloud computing is rapidly growing with players like Baidu Cloud, Alibaba Cloud, and Tencent Cloud investing heavily in infrastructure, AI, and big data capabilities. This shift to the cloud has enabled businesses to scale quickly, store data securely, and access resources on demand.
- › 5G technology is deployed across China at the fastest pace worldwide, providing 5G services to 750 million mobile users and thousands of companies across the country. The government has invested billions in building a world-class 5G network that is expected to drive innovation across multiple industries, including transportation, healthcare, stream shopping, and manufacturing.

- › AI has been a focal point for two decades. Heavy financial aid by the government drives AI research in universities and the big R&D efforts by corporations. The coordinated efforts target to establish China as a leader in this game-changing area.

China's entrepreneurial spirit and the presence of a vibrant startup ecosystem drive its technology dominance. Cities like Beijing, Shanghai, and Shenzhen have become innovation hubs, attracting talent, and fostering a culture of creativity and risk-taking. The rapid growth of tech startups in China has contributed to the development of a dynamic and competitive landscape, with companies like Alibaba, Tencent, and Huawei becoming global giants.

### AI TECHNOLOGIES AND INNOVATION IN CHINA

AI shows best what is behind the fast growth of China. Generative AI (GenAI) is impacting how we are producing software and how we are using knowledge.<sup>3</sup> It currently drives a lot of research and new companies worldwide. No wonder that the Chinese government has set an ambitious target of becoming the global leader in AI by 2030, and it is actively investing in research and development, attracting top talent, and promoting collaboration between industries and academia. In turn, over the past decade China has invested in AI technology advancements and new ecosystems to monetize AI. AI-related patent filings from China almost doubled the sum of U.S. patent filings in 2022.<sup>1</sup>

Companies like Baidu, AutoX, and Pony AI are developing autonomous driving technologies toward a more efficient and ecologic mobility. AI-generated content (AIGC) or GenAI is the trendiest field. AIGC is actively supported by prominent academic institutions like Tsinghua University and Fudan University, major technology companies like Baidu, Tencent, Alibaba, and ByteDance, and AIGC startups like Yi and Miaoya Camera.

The application-centric downstream startup opportunities are abundant, with the emergence of model-centric upstream startups. GenAI drives content generation in China across industries, such as IT documentation and specifications, multimedia, gaming, and marketing.

Figure 1 shows the segments and strategies of key players around the GenAI ecosystems.

- › Traditional content tool companies, primarily concentrating on tool development, capitalize on their widespread customer network and established proficiency in product innovation and development. However, their weakness lies in the lack of AI capabilities and understanding. In anticipation of shifting dynamics, these entities are positioning themselves to concentrate on technological advancements to maintain their competitive edge.
- › Specialized content tool companies, such as Meitu and Tezan, showcase expertise in specific fields, excelling in the seamless integration of new technology into their existing product lines. This adept integration not only accelerates the enhancement of user experiences but also underscores their competitiveness in the evolving market.
- › User-generated content platforms strategically integrate GenAI tools to pave the way for novel business opportunities and

reinforces user base. Xiaohongshu's (equivalent to Instagram) introduction of the AI drawing tool "TriK" is a noteworthy instance of this strategic approach. Additionally, Kuaishou, equivalent to TikTok, explores AI music creation and digital human generation, and Weibo, equivalent to Twitter/X, introduces a GenAI creative assistant, further exemplifying the implementation of this strategy.

- › Technology-focused corporations and Internet giants direct their efforts toward core big model development with an emphasis on showcasing model capabilities. They are trying to accumulate users for a data flywheel and secure a prominent product ecosystem position.

The early stages of open sourcing large language models (LLMs) in China were primarily driven by academic institutions and organizations, such as Tsinghua University's ChatGLM-6B and Fudan University's MOSS. Leading cloud service providers, including

Baidu with its ERNIE-Bot and Alibaba with the Qwen, joined this movement, contributing significantly to the development of China's GenAI open source community. They prioritize the

development of large-scale model-based services through the adoption of Model as a Service. In this model, cloud computing serves as the foundation, delivering services based on large models for diverse purposes such as data processing, feature engineering, model training, tuning, and inference deployment.

For instance, Baidu's commercial ERNIE-Bot, known as Qianfan Large Model, stands out as a comprehensive platform tailored for enterprise developers. Offering a one-stop solution for large model development and service operations, it encompasses a full development environment with AI tools

and third-party open-source models. It provides a general-purpose large model to efficiently manage data, model adaptations and fine tuning, and deploy inference services.

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**CHINA TECHNOLOGY EVOLUTION**

China's rapid technological strides is reshaping the global landscape. Major drivers for such fast and sustainable growth are as follows:

- › *Government strategy:* The Chinese government has made IT growth a major strategic target and articulates a clear, ambitious mission on IT and especially artificial intelligence. Chinese leaders have understood early that AI is revolutionizing virtually all

Product DNA	<b>Traditional Companies</b> WPS, OEMs Across Industries	<ul style="list-style-type: none"> <li>• Deep product understanding to enhances the overall ecosystem.</li> <li>• AI complements traditional products.</li> <li>• Market potential in consolidating first-come industry monopolies.</li> </ul>
Service DNA	<b>Verticals</b> Meitu   Tezan	<ul style="list-style-type: none"> <li>• Established in vertical scenarios.</li> <li>• Early accumulation of industry clients and know-how, coupled with AIGC technology.</li> <li>• Enhance product capabilities, further solidifying competitive advantages.</li> <li>• Biggest profitability potential.</li> </ul>
	<b>UGC Platforms</b> Xiaohongshu   Douyin   Kuaishou	
AI DNA	<b>AIGC Startups</b> Miaoya   Tiamat	<ul style="list-style-type: none"> <li>• Present focus on generic content creation tools.</li> <li>• Manufacturers with self-developed models face substantial upfront technical investment.</li> <li>• Necessity to build core competitiveness from the ground up.</li> </ul>
	<b>AI Companies</b> SenseTime   iFLY TEK	
	<b>Internet Giants</b> Baidu   Alibaba   Tencent	<ul style="list-style-type: none"> <li>• Strong AI foundation, in-house development of large models.</li> <li>• AI tools prioritize general applications, exerting significant market influence.</li> <li>• Short-term profitability not prioritized; emphasis on showcasing model capabilities.</li> <li>• Accumulating users for a data flywheel and securing a prominent product ecosystem position.</li> </ul>
	<b>Universities</b> Tsinghua University   Fudan University	

**FIGURE 1.** China AI market and ecosystems.

aspects of people's lives. China's fast growing technology impact is rooted in a strong belief in technocracy fueled by a long-term government strategy with agile execution, substantial investment in R&D, and a sometimes-enforced usage of new products.

- › *Learning and innovation:* With the openness of consumers in Asia for innovative technology, software technology is rapidly growing. Chinese industry's fervent investment enthusiasm is attracting a significant number of entrepreneurs to join. From numerous startups to major cloud service providers, the

has imposed restrictions on the export of some innovative AI technology with the aim of safeguarding national economic security.

The incumbent perception that China just copies western intellectual property is not an excuse anymore. Take 5G, where both authors have been working and hands-on faced the differences. While western telecom original equipment manufacturers and service providers were deploying 3G and 4G, China started to prepare for 5G. As early as 2000, China had a lead in the necessary patents which today gives them a competitive advantage. Strategic thinking and execution matters.

contracts, while big IT players such as ByteDance are recently slashing jobs. Alibaba lost almost 80% of its value since its all-time high in 2020. Hong Kong is steadily losing its democracy bonus with growing mainland influence. Hong Kong's leading index today is worth less than it was at the turn of the millennium. Stock market legend Warren Buffett was bullish on China and invested heavily. Yet he changed his mind and for instance recently cut his BYD stake by almost two thirds.

Regulations on local AI companies are increasing recently.<sup>5</sup> GenAI tools have created worries in the Chinese government that AI-generated content could undermine the so-far controlled Internet. On 13 July 2023, the Cyberspace Administration of China (CAC, the national Internet regulator and censor of China) issued the "Interim Measures for the Management of Generative Artificial Intelligence Services." Marking China's first dedicated regulatory document for the GenAI sector, this regulatory framework underscores China's approach of encouraging development while emphasizing risk prevention in GenAI technology. In consequence, LLMs and GenAI technology must be approved by the government before its deployment. Reasons for such heavy regulation are obviously different from similar more ethics-related AI controls in western countries.

Despite its rapid advancements, China faces challenges such as intellectual property concerns and content regulation, while other markets such as the United States and Korea are catching up. The "Regulations on the Management of Algorithmic Recommendations for Internet Information Services," effective since 1 March 2022, and the "Regulations on the Deep Synthesis Management of Internet Information Services," effective since 10 January 2023, collectively constitute the fundamental regulatory framework for algorithmic artificial intelligence in China. Together, they outline a comprehensive approach to managing

### Cities like Beijing, Shanghai, and Shenzhen have become innovation hubs, attracting talent, and fostering a culture of creativity and risk-taking.

nation is pioneering many new technologies with a fast idea to impact cycle.

- › *Huge domestic market:* A thriving entrepreneurial ecosystem is supported by a massive domestic market, unified by a rather coherent culture, which simplifies the development and scaling of products across over a billion potential users. This thriving is supported by Internet giants, startups, substantial investments, and governmental regulation.
- › *Market protection:* Traditionally, China is eager to attract foreign investors that bring technology innovation to the country. In parallel, the Chinese markets have been protected by regulations such as business ownership and disclosure of intellectual property. This eliminates external competition. Advancing fast with IT, China recently

China puts a lot of emphasis on learning, starting in school age.<sup>2</sup> Where there are demands, China is bolstering its research with knowledge gained overseas. Global learning and work plays a pivotal role for innovation.<sup>4</sup> One-fifth of the top Chinese researchers are trained in a western country.<sup>1</sup> Also, Chinese tech companies have actively engaged in global collaboration and partnerships. By global collaboration, Chinese firms have gained access to diverse expertise and resources.

Deliberately, we will not dive into politics, yet see that the Chinese economy is at a turning point. The high growth rates of the past are gone. Democratic countries like India, though slower, show a steadier growth. Chinese markets have been trending sideways for some time. Investors fear legal uncertainty as companies must subordinate themselves to the state. Work conditions are challenging, often enforcing employees in non-compete

and fostering the GenAI landscape, reflecting the government's commitment to balancing innovation and risk control.

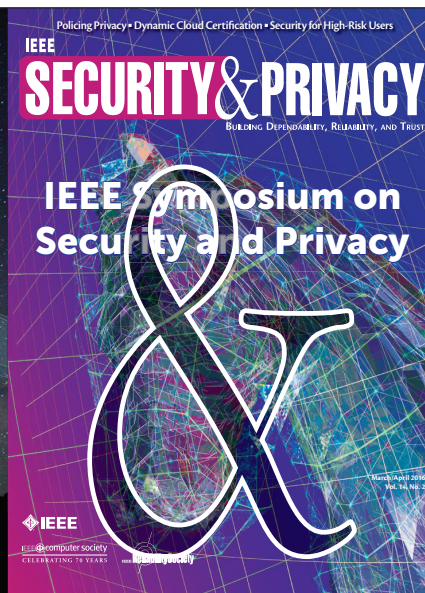
**W**here do we go from here and what can we learn? Most relevant, to be aware of the global technology race. The call of the day is to stay competitive. One of the authors has been working for decades in various industries around the world. In China, he observed already at the turn of the century that omnipresent industry motto "sharpen the sword." We know this slogan as "sharpen your axe" which means to continuously learn and grow. More than ever, we recommend learning and growing your own market value. Do this extra step toward staying competitive. 

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