
BUSINESS

OUR VISION

To provide world-leading AI platforms and solutions that catalyze progression of society and growth of enterprises.

OUR MISSION

To empower AI transformation and advance AI for all businesses.

OVERVIEW OF OUR BUSINESS

Who We Are

We are a leader in enterprise AI. We offer platform-centric AI solutions that can be rapidly deployed by enterprises on a large scale to uncover hidden patterns in data and comprehensively enhance their decision-making capabilities.

We were the largest player by revenue in the platform-centric decision-making AI market, a sub-segment of the AI market, in China in 2022, according to the CIC Report. We have been leading in the research of advanced AI technologies and the utilization of these technologies in commercial solutions. For example, according to CIC, our proprietary AutoML algorithm is a cutting-edge AutoML algorithm in the world. For details, see “Our Technology – AutoML.” With our AutoML algorithms, we broke the world records of two Open Graph Benchmark (“OGB”) tasks in terms of the accuracy and effectiveness of the algorithm in April 2021. OGB is a globally recognized collection of benchmark datasets for machine learning on graphs that AI companies and research institutions utilize to test and evaluate performance of AI models. Participants include world-famous innovative enterprises and research institutes, such as Facebook, Alibaba, Stanford University and Cornell University. Our AutoML algorithm also ranks top 1% in Kaggle Structured Data and Image Classification Competition 2019.

We emphasize value creation. Our solutions have covered a myriad of industries including, but not limited to, finance, retail, manufacturing, energy and power, telecommunications, transportation, technology, education, media and healthcare. For example, our AI solutions have successfully helped banks enhance anti-fraud accuracy rate, retailers forecast sales volume and formulate precision marketing strategies, manufacturers optimize quality control, and energy companies detect and prevent equipment anomalies and failures. In 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, we had 47, 75, 104, 49 and 62 lighthouse users, respectively. In 2020, 2021 and 2022, the net dollar expansion rates of our lighthouse users were 167%, 140% and 126%, respectively. A net dollar expansion rate above 100% reflects that we have generated increased revenue from the relevant lighthouse users.

During the Track Record Period, we have experienced tremendous growth. Our revenue grew by 114.2% from RMB942.2 million in 2020 to RMB2,018.4 million in 2021, and by 52.7% to RMB3,082.6 million in 2022. Our revenue grew by 33.6% from RMB482.3 million for the three months ended March 31, 2022 to RMB644.4 million for the three months ended March 31, 2023.

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Our Market Opportunities

We see massive market opportunities in enterprise AI application. As a result of the advancements in AI-related academic research, surge in computing power and accumulation of data, AI plays a pivotal role in enterprise decision-making. According to CIC, the total spending on AI by enterprises in China increased from RMB59.3 billion in 2018 to RMB225.5 billion in 2022, representing a CAGR of 39.7%, and is expected to reach RMB691.0 billion in 2027 at a CAGR of 25.1%.

We believe, however, that large-scale AI transformation faces the following key challenges:

- (i) *Shortage of experts.* Experienced AI experts, especially in advanced technologies, are scarce in the market, and hence enterprises face significant difficulty and uncertainty in in-house development of AI capabilities that are tailored to various scenarios in their business operations.
- (ii) *High total cost of ownership.* According to CIC, it is estimated that companies need to spend an average of RMB500 million to develop enterprise AI applications in-house, which, coupled with costs of ongoing maintenance, procurement of hardware and engagement of AI experts, results in high total cost of ownership.
- (iii) *Long deployment time.* In the course of developing AI applications in-house or purchasing point solutions, companies likely need to adopt a “trial and error” approach in order to find the optimal portfolio of AI applications that suit their business needs. According to CIC, it is estimated to take three years on average for enterprises to establish large-scale AI infrastructure and capabilities internally with their current AI team setup.
- (iv) *Data and software incompatibility.* With point solutions designed to only address a limited number of scenario-specific problems, enterprises typically need to purchase multiple point solutions from different vendors for large-scale deployment. These solutions are often not compatible to each other and may require continuous refinement by AI engineers. Organizations’ increased awareness of data security and data privacy protection adds to the complexity of deploying different point solutions and integrating multiple data sources.

Platform centric solutions are more effective than point solutions in addressing the challenges above. Platform-centric solution is a new category under AI solution that provides building blocks, i.e., operating and development systems, runtime environment and visualization services, to build AI applications which can be tested and utilized for various use cases. Unlike point solutions that are required for scenario-specific use cases, platform-centric decision-making AI solutions provide end users with an AI development platform in addition to AI applications and underlying computing infrastructure. Such an AI development platform provides end users with uniform development standards, high compatibility as well as flexible

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expansion of applications per actual demands. With the plug-and-play feature and infrastructure for further developing and operating use-case-specific solutions, decision-making AI platforms allow for much greater flexibility, scalability, compatibility and easier management. According to CIC, the market of platform-centric decision-making AI market is expected to reach RMB74.9 billion in 2027, representing a CAGR of 42.3% from RMB12.8 billion in 2022. As a platform-centric AI solution provider, we believe we are able to capture the massive market opportunities in enterprise AI application.

Our Core Technologies and Solutions

Our platform-centric AI solutions seek to overcome challenges faced by in-house development of AI capabilities and point solutions that are designed for scenario-specific use cases, and allow enterprises to benefit from the advancement of AI technologies to the largest extent possible.

- (i) *Ease of use.* The low- and/or no-code feature of our platform and the intuitive interface of our operating system allow users with limited knowledge or experience in AI to develop, deploy and operate customized AI applications on a firm-wide basis.
- (ii) *High return on investments.* Our platform-centric AI solutions can be applied for a wide range of industries and use cases at scale. With real-time operational intelligence guiding better business decision-making, our solutions also allow users to realize meaningful economic benefits from additional revenue opportunities and improved operational efficiency.
- (iii) *Rapid time to deploy.* Due to the plug-and-play and low- and/or no-code nature of our solutions, large-scale deployment can happen in potentially just a number of days and need not to involve employees or experts with significant experience in AI.
- (iv) *Full compatibility.* Our platform-centric solutions enable data integration from different systems and sources. We focus on providing platforms and development tools for users to fully harness the value of their data, without engaging in collecting of our users’ data.

Our Core AI Technologies

We have been leading in the research of advanced AI technologies and the utilization of these technologies in commercial solutions. Core technologies underlying our AI solutions include:

- *AutoML.* Our AutoML technology automates the process of machine learning and enables algorithms to automatically discover new patterns, hence minimizing the involvement of AI engineers responsible for building, adjusting, maintaining and refining the AI models.

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- *Transfer Learning.* Our transfer learning technology expands application of AI to industries in which data is sensitive or scarce and resolves privacy issues surrounding application of AI in fields involving sensitive data subjects. It equips our algorithms with the ability to “transfer” analysis conducted and patterns discovered in one industry or scenario to another with similarity, hence being able to provide AI solutions even where data is not readily available or accessible.
- *Environment Learning.* Our environment learning technology reduces the cost of model training and ensures safety by training models in a simulated environment. As compared to traditional simulation technologies, our environment learning technology is able to build a high-precision simulated environment without complete domain knowledge, enabling the application of intelligent decision-making technologies in more use cases.
- *AutoRL.* Our AutoRL technology automates the process of reinforcement learning, which refers to the training of machine learning models to make a sequence of decisions in a dynamic, uncertain, potentially complex environment. Our AutoRL technology provides an end-to-end and automatic suite of tools for reinforcement learning. Users are able to develop reinforcement learning algorithms without extensive prerequisite background or knowledge.

Our End-to-End Enterprise AI Solutions

Leveraging our core technologies, we have developed end-to-end enterprise AI solutions that cater for enterprises’ needs across application, platform and infrastructure levels.

Sage Platform is the backbone of our solutions. It allows enterprises to easily build their customized AI systems that automate the process of machine learning, application, decision-making and evaluation driven by our AutoML algorithms, featuring quick, simple build-up, low- and/or no-code environment, and implementation without significant involvement of AI experts.

- Sage AIOS is an AI operating system featuring user-friendly interface, standardized data processing, automated resource management and allocation and fully compatible middleware that are comparable to personal computer operating systems. Major components of Sage AIOS include data kernel and runtime kernel. Data kernel is a platform for AI data. By defining the standards and formats of data that are ready for AI applications, data kernel enables users to comprehensively enhance its data quality and modeling efficiency. Runtime kernel is a centralized management kernel for multi-layer computation, memory and communication. Runtime kernel is capable of automatically scheduling and managing heterogeneous resources without affecting user experience, thereby enhancing computation resource utilization rates, and optimize the efficiency of developing AI models and applications.

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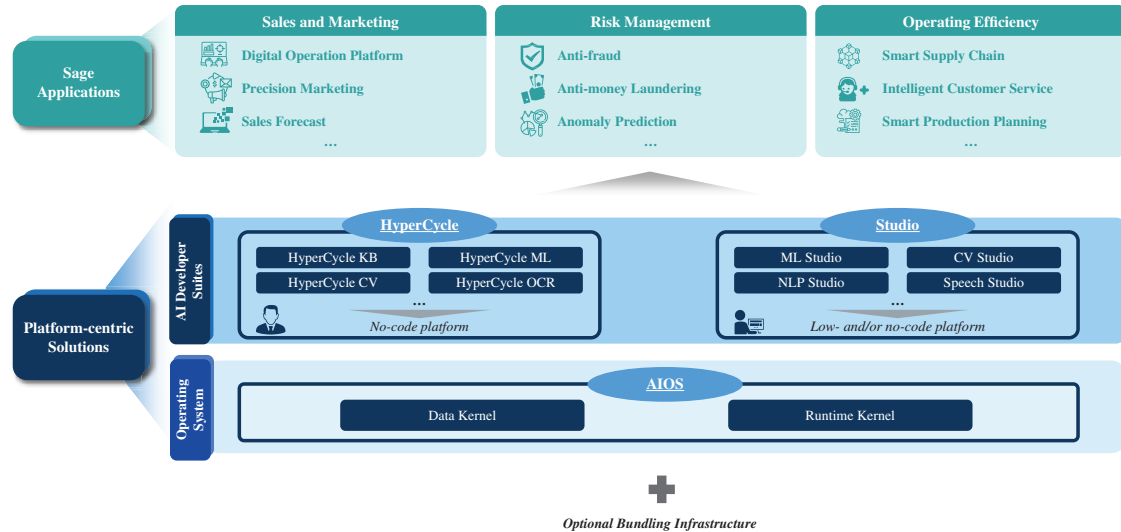
- Built on Sage AIOS, there are two AI developer suites, for which users can choose depending on their coding capabilities, one being the HyperCycle series with no-code development tool and the other one being the Sage Studio series with low-code and no-code development tools. AI applications in different use cases require different types of algorithms. Accordingly, at the users’ choice based on the types of AI applications they want to develop, we offer HyperCycle ML, HyperCycle CV, HyperCycle OCR, HyperCycle KB, ML Studio, CV Studio, NLP Studio and Speech Studio, among others.

In addition, we offer ready-to-use AI software applications that users could directly deploy to improve their business operations, primarily in the fields of sales and marketing, risk management and operating efficiency in general. Moreover, we launched our enterprise-level AI application store in June 2021, which is a marketplace for AI applications at the choice of our users. It integrates a cluster of both ready-to-use AI applications developed by us and AI applications developed by our partners in the ecosystem on Sage AIOS using our algorithms and standards, thereby addressing users’ needs for intelligent operations in different use cases. For applications developed by ecosystem partners, we also work with them to optimize the applications and to ensure compatibility with Sage Platform. As a result, relevant legal titles and intellectual property rights of such applications are jointly owned by our ecosystem partners and us. Fees charged for such applications are shared by our ecosystem partners and us at a ratio agreed by both parties. We also provide application development services and help users develop customized AI applications on Sage Platform to address their specific business needs.

Based on the needs of users, we also offer optional bundled infrastructure, which primarily represent SageOne, our software-defined “All-in-One” solutions. SageOne provides bundled “hardware + software” server infrastructure with pre-built Sage Platform and our ready-to-use AI applications, including applications developed by us and our ecosystem partners. SageOne maximizes the synergistic effect between software and hardware. Leveraging software-defined optimization of computing, network and storage resources, SageOne improves the output and performance of our AI solutions as compared to running on conventional and generalized architecture servers, thereby empowering organizations to rapidly enhance intelligence in their operations.

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The following diagram illustrates our solution offerings:



Our Value-oriented Strategy and Success in Commercialization

We believe that the benefits of our solutions speak for themselves. Creating value for users is a key driver of our success in commercialization.

Our go-to-market strategy starts with market leaders in each industry we target to enter who are also early adopters of AI. We demonstrate the value of our solutions through one or a few entry projects. Because of the platform-centric nature of our solutions, once our value has been proven, we are then able to expand our services quickly to address other business needs of our users. The number of our lighthouse users has increased from 47 in 2020 to 75 in 2021, and further to 104 in 2022. The number of our lighthouse users has increased from 49 in the three months ended March 31, 2022 to 62 in the three months ended March 31, 2023. Our average revenue per lighthouse user has increased from RMB12.3 million in 2020 to RMB13.7 million in 2021, and further to RMB17.9 million in 2022. For the three months ended March 31, 2022 and 2023, our average revenue per lighthouse user stayed the same as RMB5.4 million.

After we succeed with the lighthouse users, we leverage our understanding of the industries, our reputation established through collaborating with industry leaders, and our AI ecosystem to further enhance our influence in such industries, enabling us to further penetrate and provide solutions to other players, without incurring significant sales and marketing efforts. Our total number of users has increased from 156 in 2020 to 245 in 2021, and further to 409 in 2022. Further, our total number of users has increased from 125 in the three months ended March 31, 2022 to 147 in the three months ended March 31, 2023.

Our revenue is primarily based on the estimated computing power that AI applications consume on our platform. As users expand AI applications for new use cases on our platform and/or increase usage in existing use cases which require additional computing power, they will purchase additional licenses from us, which allows us to capture additional monetization

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opportunities. During the Track Record Period, our revenue grew by 114.2% from RMB942.2 million in 2020 to RMB2,018.4 million in 2021, and further by 52.7% to RMB3,082.6 million in 2022. Our revenue grew by 33.6% from RMB482.3 million for the three months ended March 31, 2022 to RMB644.4 million for the three months ended March 31, 2023.

Our AI Ecosystem

We have fostered an ecosystem over time which we believe is important to our long-term internal and external development. Our ecosystem is comprised of leading universities, software and AI companies, software developers, AI scientists, solution partners and industry leaders in a number of business sectors. Our AI ecosystem not only helps us continuously improve our technology capabilities, but also empowers users with AI knowledge and our solutions, in turn driving our success in commercialization.

Universities in our ecosystem typically have curriculums in AI, computer science, data science and big data, professors with well-recognized credentials and experience, and strong academic influence. We also cooperate with software and AI companies that have proprietary AI technologies, proven track record of commercial ion, established AI developer team and sufficient industry experience. In addition, we benefit from working with solution partners who typically have strong end-user network, and strong user connections and extensive industry experiences.

For instance, we established “Paradigm Academy” for the purpose of educating enterprises on AI. We established AutoML.ai, an open source AutoML challenge platform, which allows us to interact with and learn from top academic institutions, multinational technology companies and AI scientists in the world. We launched a “Hackathon” in 2019 to encourage companies to discover new AI application use cases and formulate AI solutions. We also partner with other leading providers of AI-enabled solutions in the PRC and around the world to establish AI laboratories, in order to explore and develop innovative AI platforms by leveraging the technical strengths and experience of different market players.

In addition, we made OpenMLDB and OpenAIOS in our Sage AIOS an open source platform to share our achievements in AI operating systems with developers across the world. We launched our enterprise-level AI application store on Sage AIOS in June 2021 which contains a cluster of AI applications developed by both us and our partners in the ecosystem, which mainly include software and AI companies in China on Sage AIOS using our algorithms and standards. The application store enriches the value of our ecosystem at the application level.

COMPETITIVE STRENGTHS

We believe that the following competitive strengths contribute to our success and differentiate us from our competitors.

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Our leading position in platform-centric enterprise AI solutions and core technologies

We were the largest player by revenue in the platform-centric decision-making AI market in China in 2022, according to the CIC Report. We were selected as a Global Representative Vendor of Composite AI in Emerging Technologies and Trends Impact Radar, and a Global Representative Vendor of AutoML in 2020 Top Ten Strategic Technology Trend by Gartner, and we also ranked No. 1 in the China Predictive and Analytics and Machine Learning in 2020 by The Forrester Wave.

We have been leading in the research of advanced AI technologies and the utilization of these technologies in commercial solutions. For example, Dr. Dai and Dr. Yang are the pioneers in transfer learning and are well regarded in the AI industry for their achievements and contributions in steering the direction for the research and development of transfer learning worldwide. In addition, according to CIC, our proprietary AutoML algorithm is a cutting-edge AutoML algorithm in the world, and we were the first in the world to launch a commercialized product using AutoML framework in 2014, and to apply AutoML in a number of use cases across various industry sectors. For example, according to CIC, we launched the world’s first commercialized AutoCV product in 2018. More importantly, being a first-mover means we are well ahead of our competitors in terms of efficiency and accuracy of our algorithms. Accumulation of use cases and experience over the years makes our solutions difficult, if not impossible, to be replicated by our competitors.

Our end-to-end AI solutions with strong value proposition, continuously driving user success

Our focus has always been the value we create for our users and the success of our users. Our end-to-end solutions directly address the challenges faced by enterprises in large-scale deployment of AI. We are different from point solutions providers which offer solutions in predefined use cases and specific industries, making large-scale deployment costly, time-consuming and burdensome. The low- and/or no-code nature of our solutions empowers users in any industry with or without AI experience to implement our solutions easily and rapidly without involvement of AI experts, enabling enterprises to benefit from AI transformation. Hence, we believe that our AI solutions are the key to widespread AI transformation at enterprise level. Our strong value proposition and efforts to enable user success are evidenced by the results we have achieved with our users.

High quality, diverse and loyal user base resulting from our levered go-to-market strategy

Benefiting from a successful go-to-market strategy, we have served a large number of lighthouse users who are market leaders in the respective industries they operate, including but not limited to finance, retail, manufacturing, energy and power, telecommunications, transportation, technology, education, media and healthcare. The purpose of this strategy is to disrupt conventional industry practices by establishing new market standards for enterprise AI implementation through collaboration with market leaders of the specific industries, hence gaining the momentum necessary to subsequently spread our influence to other users in these

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industries. From the users’ perspective, the massive user base covered by these market leaders amplifies the economic impact and reliability of our AI solutions, which later serve as strong proof points for other users in those industries. In 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, we had 47, 75, 104, 49 and 62 lighthouse users, respectively. Our lighthouse users contributed 61%, 51%, 60%, 55% and 52% of our total revenue in 2020, 2021 and 2022 and in the three months ended March 31, 2022 and 2023, respectively.

AI ecosystem to ensure sustainable long-term growth

Our ecosystem connects us to a large number of academic institutions, business partners and AI scientists in China and around the world. Through our vibrant AI ecosystem, our solutions can reach a significantly larger base of end users through both in-house sales efforts and our solution partners. At the same time, we are able to stay abreast with the latest developments in AI technologies through regularly interacting with the top scientists and engineers in the field, enabling us to maintain our leadership in the core technologies. In essence, our ecosystem gives rise to synergy, value and technological advancement that would not otherwise be available if we were to rely solely on our internal R&D and customer services resources. We currently have more than 100 companies and thousands of AI scientists and developers in our ecosystem, and we will continue to expand it.

Strong, experienced and elite management combining academic excellence and business insights

Our management team is composed of both top AI scientists and business veterans. Our founder and Chief Executive Officer, Dr Dai Wenyan, was the first to propose the idea of a general framework for transfer learning that unifies different transfer learning problems. Prior to joining our Company, he served as Chief Research and Development Architect at Baidu, and designed one of China’s earliest AI systems that have achieved significant commercial success. Dr. Dai and Dr. Yang Qiang (our co-founder) are the pioneers in transfer learning and are well regarded in the AI industry for their achievements and contributions in steering the direction for the research and development of transfer learning worldwide. Mr. Tu Weiwei, Principal Scientist and Vice President of our Company, and is a renowned scholar in AutoML. He served as the chairperson and advisor of various international AutoML conferences and workshops, such as the AutoML workshops at the International Joint Conferences on Artificial Intelligence in 2021, the KDD in 2020, and the Conference on Neural Information Processing Systems in 2019 and 2020. Two members of our senior management, including Dr. Dai, were world champions of the International Collegiate Programming Contest (ICPC) held by the Association for Computing Machinery (ACM), one of the most recognized programming competitions at university level internationally. At the same time, we understand we need business talent to bring us to the path of commercialization. Hence, we also have management team members who on average have more than 10 years of management and business experience in various industries. We believe that our talent pool will keep playing key roles in fulfilling our mission as we continue to expand and attract more vision-sharing talent.

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OUR STRATEGIES

We strive to achieve our long-term goal of helping enterprises achieve AI transformation. To achieve this goal, we intend to pursue the following strategies:

Further strengthen our R&D capabilities

Our success is driven by our capabilities to continuously innovate our offering and improve our underlying core technologies. As such, we will continue to invest in our research and development capabilities, particularly with respect to our core technologies, in order to reinforce our leadership position in the industry. We are also focusing on the research and development of other cutting-edge AI technologies such as federated learning technology, which entails training algorithms on local datasets of end users without exchange data samples, thus enhances data security, and cutting-edge technologies such as large language models and generative AI to enhance efficiency and productivity. Moreover, in line with our strategy to create solutions that are easy to use, we intend to introduce additional products, features and functionalities to our solutions and enrich our pre-built application portfolio such that more users within an organization could easily benefit from our AI solutions. For example, in March 2023, we launched SageGPT, an enterprise-grade generative AI product specially designed for business scenarios, which features multimodal interaction and enterprise-ready AI tools.

We also intend to expand our talent pool of data scientists and AI engineers as well as industry vertical veterans on a continuous basis. We believe that qualified and experienced data scientists and AI engineers are crucial to sustain our leadership in the core technologies and the ongoing refinement of our algorithms, platforms and operating systems. We also plans to retain our existing talent pool by offering competitive compensation. In addition, we seek to fully leverage the industry knowledge and experience of these veterans to help us design AI solutions to specifically address future challenges in those industries ahead of time. In addition, we also plan to strengthen our R&D capabilities by establishing new R&D centers, procuring additional high performance servers, among others. See also “Future Plans and Use of [REDACTED].”

Continue to create value for users and establish industry standards

We plan to further our “go-to-market” strategy and continue to create value for our users. We expect our users to continue to expand the number of use cases utilizing our platform-centric solutions, helping us to continuously acquire valuable experience and industry know-how which further set us apart from our competitors. As our existing users (plenty of which are lighthouse users) benefit from our solutions in more and more use cases, we will naturally be able to establish industry standards and attract more new users both in existing verticals and new verticals.

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Strengthen collaboration with business partners within our ecosystem

We will continue to empower and work with market leaders as well as our partners within our ecosystem to develop vertical solutions with industry best practices, which will help us continue to build up industry know-how and domain knowledge. We aim to strengthen our relationships with solution partners to retain and expand our user base across various industries. We also partner with our hardware suppliers to produce industry-tailored integrated solutions – all in an effort to enhance user stickiness of our solutions. We plan to continue investing in our ecosystem to attract more use cases utilizing our solutions, bring greater awareness of our solutions, drive our user net dollar expansion rate and broaden our distribution footprint across both vertical and horizontal markets.

Enhance our commercialization capabilities

To further strengthen our commercialization capabilities, we intend to expand our in-house sales and marketing team by recruiting additional talents with experiences in both sales and marketing and other industries. We believe that these talents can better understand the business needs of potential users of our solutions, and thus help us create value for users. We will also promote our solutions and offerings by engaging in more marketing activities through both offline and online channels. In addition, we plan to expand our user base, enhancing the penetration of our solutions. Furthermore, we also plan to pursue strategic investments and acquisitions that are complementary to our business to strengthen our R&D and deployment capabilities, optimize our solutions and expand our user base.

OUR ENTERPRISE AI SOLUTIONS

Driven by our mission to empower AI transformation and advance AI for all businesses, we have developed Sage Platform, a full suite of end-to-end AI solutions that can be rapidly deployed by enterprises on a large scale to uncover hidden patterns in data and facilitate decision-making beyond human capability. Our innovative Sage Platform empowers enterprises with AI development and management capabilities, and enables them to design, develop and operate AI applications at scale. The plug-and-play and low- and/or no-code nature of Sage Platform lowers the barrier of AI deployment, enabling large-scale deployment within a few days and without involvement of experts or other personnel with significant experience in AI. Sage Platform is primarily composed of (i) an AI operating system, and (ii) AI developer suites, including HyperCycle and Sage Studio.

On top of our Sage Platform, we also offer a large and growing portfolio of scenario-specific AI applications that address a range of mission-critical use cases and can be readily installed and deployed. At our users’ request, we also offer application development services to help them develop customized AI applications on Sage Platform based on their business needs.

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Sage Platform

Sage AIOS

Sage AIOS is an enterprise-level AI operating system. As a flexible, secured and open platform, the role of Sage AIOS is analogous to Windows’ role for personal computers. It connects the underlying IT infrastructure and various AI applications, and provides enterprises with high concurrency, performance and availability to support the development and launch of AI applications. Based on multiple versions of products and underlying technology previously developed by us, we officially launched Sage AIOS in August 2020, an upgraded and integrated AI operating system with expanded features. Specifically, Sage AIOS provides a more user-friendly interface to visualize AI application development and management. Characterized by its user-friendly interface on which users can easily and conveniently design, develop and operate numerous AI applications, Sage AIOS is able to empower enterprises to deploy AI on a large scale. In addition, as compared to the earlier versions, Sage AIOS standardizes the formats of AI data and resources management, thereby further enhancing the efficiency of AI deployment on a large scale. The earlier versions of Sage Platform only supports our proprietary AI developer suites and self-developed applications, while Sage AIOS is able to support applications developed by other parties, and thus enhances our AI ecosystem.



AI operating systems need to address various difficulties in terms of data quality, modeling efficiency, and computing power management and scheduling in the adoption of AI applications. Powered by its data kernel and runtime kernel, Sage AIOS is able to address these needs.

Data Kernel

Data kernel is a platform for AI data. By defining the standards and formats of data that are ready for AI applications, data kernel enables users to comprehensively enhance its data quality and modeling efficiency. Moreover, our data kernel synchronizes data from different sources to ensure consistency. Our data kernel also enables the chronology of data using strict timestamps, which marks the time when data is generated and processed. Moreover, it applies closed-loop feedback mechanism in the modeling process by constantly providing feedback of newly generated business data to train models in real time, thereby enhancing its effectiveness.

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In addition, our data kernel offers functions such as centralized management for data source, storage and processing, addressing the data-related needs for enterprises in developing AI applications. The key component of data kernel is our OpenMLDB, an open-source database designed and optimized to enable data correctness and efficiency for machine-learning-driven applications.

Runtime Kernel

Runtime kernel is a centralized management kernel for multi-layer computation, memory and communication. Leveraging our proprietary container freeze and migration technologies, our runtime kernel is capable of automatically scheduling and managing heterogeneous resources without affecting user experience, thereby enhancing computation resource utilization rates, and optimize the efficiency of developing AI models and applications. The key component of runtime kernel is OpenAIOS, which is able to automatically coordinate AI tasks among heterogeneous devices. Key features of our runtime kernel include:

- *High performance.* Our runtime kernel is able to automatically split tasks for parallel computation, and use different designated computing chips to further accelerate processing, thereby improving the performance of current AI computing framework by 500%, according to CIC.
- *Cost effective.* Our runtime kernel is able to expand memory size through an automatic scaling strategy without modifying of the existing applications and codes. As a result, we are able to reduce the overall memory cost while increasing the success rate of tasks, thereby reducing the TCO for current AI data processing engines by 90%, according to CIC.
- *High utilization rate.* Our runtime kernel is able to offer a low-latency and high-throughput communication framework in the process of machine learning. Combined with our device virtualization technologies, our runtime kernel is able to enhance GPU utilization rate by ten times as compared to other mainstream scheduling frameworks, according to CIC.

AI Developer Suites

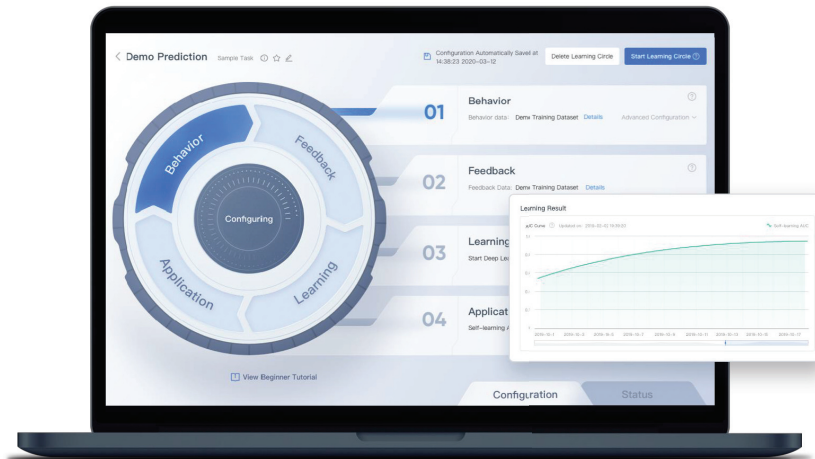
We offer AI developer suites equipped with various development tools to enterprises, assisting them to design and develop AI applications. Based on the needs and background of users, we provide (i) HyperCycle with no-code development tools and (ii) Sage Studio with low-code and no-code development tools.

HyperCycle

HyperCycle is an AI development platform that helps enterprises rapidly design, develop and utilize AI applications. Because of its no-code feature, HyperCycle lowers the barrier to deploy AI by enterprises in their various business operations as developing AI solutions on the platform does not require any knowledge or experience in AI, enabling them to develop standard AI applications at scale.

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We have introduced the HyperCycle methodology which simplifies and standardizes the AI deployment process into four steps, namely behavior, feedback, learning and application. As a result, we are able to lower the barrier of quickly applying AI technologies at scale, empowering the intelligent transformation of organizations.



HyperCycle automatically builds, applies and updates machine learning models throughout the entire development process. Leveraging HyperCycle, users are able to easily develop AI applications within simple clicks on the graphical user interface. HyperCycle provides users with APIs, through which users can connect HyperCycle with their business and operating systems. Then, they configure the parameters for the modeling process, such as the scope of data for learning, the scope of data for evaluation and level of computing power. Once the parameters are set, users can launch the modeling process by a simple click, which will automatically process and analyze the data input, optimize and iterate models, and develop AI applications powered by our AutoML algorithms.

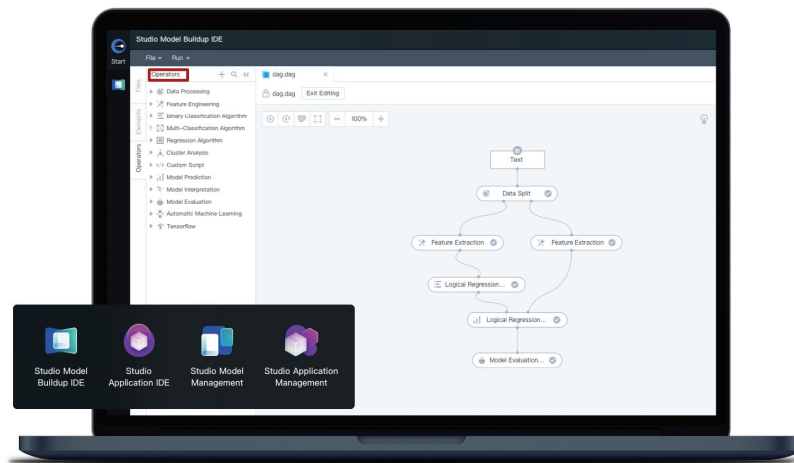
AI applications in different use cases require different types of algorithms. Accordingly, we offer HyperCycle ML, HyperCycle CV, HyperCycle OCR and HyperCycle KB at the users' choice based on the types of AI applications they want to develop. HyperCycle ML is an automated machine learning platform for general AI applications. HyperCycle CV is designed for computer vision algorithms and supports image categorization, target detection and other use cases. HyperCycle OCR is an optical character recognition platform with AI-empowered handwritten text, card and bill recognition capabilities. HyperCycle KB is designed for the development of knowledge base-related applications.

With our proprietary AutoML technologies and guided by the HyperCycle methodology, HyperCycle achieves automatic machine learning of real-time closed-loop data, continuously optimizing and enhancing the performance of algorithm training models. Leveraging world-class capabilities of automatic modeling, real-time deployment and closed-loop data, HyperCycle improves efficiency and reduces labor and IT cost for the development and application of AI technologies.

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Sage Studio

Sage Studio is an end-to-end AI application development platform for developers, assisting them to develop AI applications. At users’ choices, it provides standard, low-code and no-code AI development tools. Sage Studio is able to cover the entire development process from data to model, application, and the deployment and launching of AI applications. Featured with drag and pull development tools, Sage Studio is able to provide one-stop application development and launch management in the fields of machine learning, computer vision, natural language processing and speech, among others.



Key modules of Sage Studio include (i) model exploration, (ii) model management, (iii) application development and (iv) application management. The model exploration module structures and modularizes model training, and offers a series of operating modules (“operator”) for coding, running, data visualization and result feedback. According to CIC, most of the existing machine learning platforms lack the capabilities to support development of AI applications in various scenarios or to ensure performance when processing large data volumes. Sage Studio defines the standards for each operator during the modeling process for AI application in different scenarios, and offers high compatibility. By integrating multiple self-developed AI algorithms, Sage Studio enables users to process massive volumes of data without compromising performance.

Similar to HyperCycle, Sage Studio provides users with APIs, through which users can connect Sage Studio with their business and operating systems. We offer various pre-set templates of flow process and algorithms, enabling developers to design AI models through drag and pull. Supported by our self-developed GDBT framework, a distributed parallel computing framework designed for machine learning computation tasks, we offer a large number of machine learning algorithms for different use cases. As a result, Sage Studio is able to enhance computing power efficiency for machine learning with massive data volume, thereby reducing the total cost of ownership of our users as they scale.

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Furthermore, Sage Studio’s application development module empowers users with the tools to design, develop, test and launch AI applications with various functions, including self-learning, batch forecasting and real-time forecasting. As an open platform, Sage Studio is compatible with various mainstream AI frameworks and algorithms, enabling users to achieve customized development and integration of AI applications in a rapid and cost-effective manner. Sage Studio also provides centralized management capabilities for models and applications from different sources.

Illustrative Example of AI Application Development through HyperCycle ML

Below is an illustrative example of how a hypothetical bank can easily and rapidly deploy customized AI applications through HyperCycle ML:

1. The bank intends to recommend suitable financial products to its mobile bank APP users real-time by developing a precise recommendation model. The first step is to select a suitable template from the homepage of HyperCycle ML.



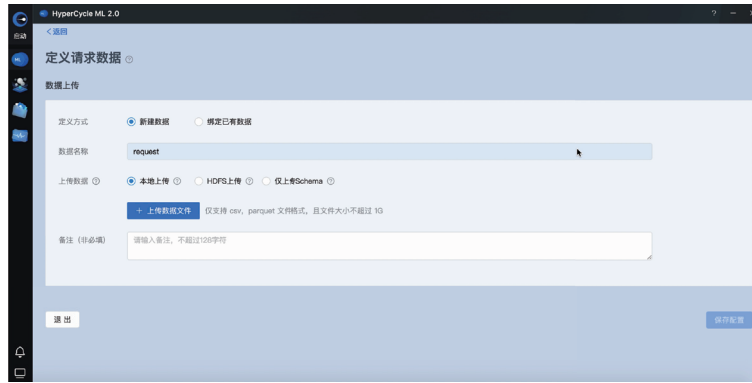
Choosing suitable AI application templates from homepage



Summary of stages of AI application development

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- The bank then needs to input (i) behavior data, such as user information, financial product information and sales record, and (ii) feedback data, being historical purchase decisions made by users.



Input behavior/feedback data

- After relevant parameters are confirmed and learning process is activated, machine will automatically choose the optimal algorithms and start to generate AI models.



Summary of sources of behavior data, feedback data, supplementary data and other relevant parameters



Progress of machine learning

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- After machine learning is completed, the bank’s precise recommendation model is launched by just one click.



Launch of precision recommendation model after completion of machine learning

Sage Applications

On top of our Sage Platform, we also offer a large and growing portfolio of scenario-specific AI applications that address a range of mission-critical use cases and can be readily installed and deployed. Moreover, we launched our enterprise-level AI application store, which is a marketplace for AI applications at the choice of our users. It integrates and is compatible with a cluster of AI applications developed by both us and our partners in the ecosystem on Sage AIOS using our algorithms and standards, thereby addressing users’ needs for intelligent operations in different use cases.

Based on their functions, our Sage Applications are primarily categorized into (i) sales and marketing, (ii) risk management and (iii) operating efficiency applications. The following table sets forth details of our major Sage Applications:

Category	Application	Features
Sales and Marketing	Digital operation platform	We offer a digital operation platform which comprises smart recommendation, smart search, smart push, smart customer service, data governance and other functions. It enables organizations to refine their online operations, optimize user experience and retain their users, and achieve business growth. Empowering organizations with AI technologies, it effectively optimizes the operation of users, which can be reflected in their key operating metrics such as retention rate, repurchase rate, average transaction value and gross merchandise value, among others.

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Category	Application	Features
	Precision marketing	Powered by AI technologies in various scenarios such as recommendations, marketing, maintaining user engagement, user portraits, forecasting, user acquisition and pricing, our precision marketing solution enables organizations to analyze sales statistics and configure marketing strategy, analyze sales statistics, and thereby increase their sales.
	Sales forecasting	Our sales forecasting solution analyzes various types of operating data, including sales, store, marketing, environment and location data. Utilizing our AI technologies, it automatically summarizes rules for sales forecasting, and is able to accurately predict sales volume, sales value and sales flow from store level to SKU level. As a result, we empower users to formulate sales strategies, and to optimize inventory and store location planning.
Risk Management	Anti-fraud	We offer an end-to-end intelligent anti-fraud platform to empower organizations with AI technologies to solve various kinds of risk and fraudulent events. By combining machine learning technology and traditional expert rules, we help users improve the overall accuracy and scope of risk management and anti-fraud management.
	Anti-money laundering	Our anti-money laundering solution is able to intelligently identify, analyze and report suspicious transactions and to sort the flagged transactions according to risk level to improve the efficiency of human review. It also addresses the problems of ‘omission’ and ‘overstatement’ of traditional anti-money laundering methods.

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Category	Application	Features
	Anomaly Prediction	Our anomaly prediction application is able to identify unexpected projects, events or observations, and thereby provide early warnings and trend predictions through data mining. It can be applied in detection and prediction of banking frauds, equipment faults and text errors.
Operating Efficiency	Smart supply chain	By analyzing consumers’ needs and combining with our sales forecasting application, our smart supply chain solution helps enterprises to manage manufacturing, distribution, stocking and warehousing. We believe that this smart supply chain solution is able to empower a number of industries in which accurate pricing, procurement and distribution are key to success, as enterprises rely more and more heavily on AI to make accurate and timely procurement decisions.
	Intelligent customer service	We offer a conversational AI chatbot developed based on deep learning technologies, featuring self-learning, natural language understanding, knowledge graph, intelligent Q&A, task dialogues and other core functions. During communications with end users, the chatbot can carry out self-learning according to the feedback from users, and adjust the communication strategy and the communication result. Our intelligent customer service help organizations reduce costs associated with manual customer services.
	Smart Production Planning	By offering the smart production planning application, we help users make optimized production plans. Powered by AI technologies, it formulates daily production plan for each product line based on users’ orders, manufacturing capacity, manufacturing techniques and raw materials, enhancing their cost efficiency.

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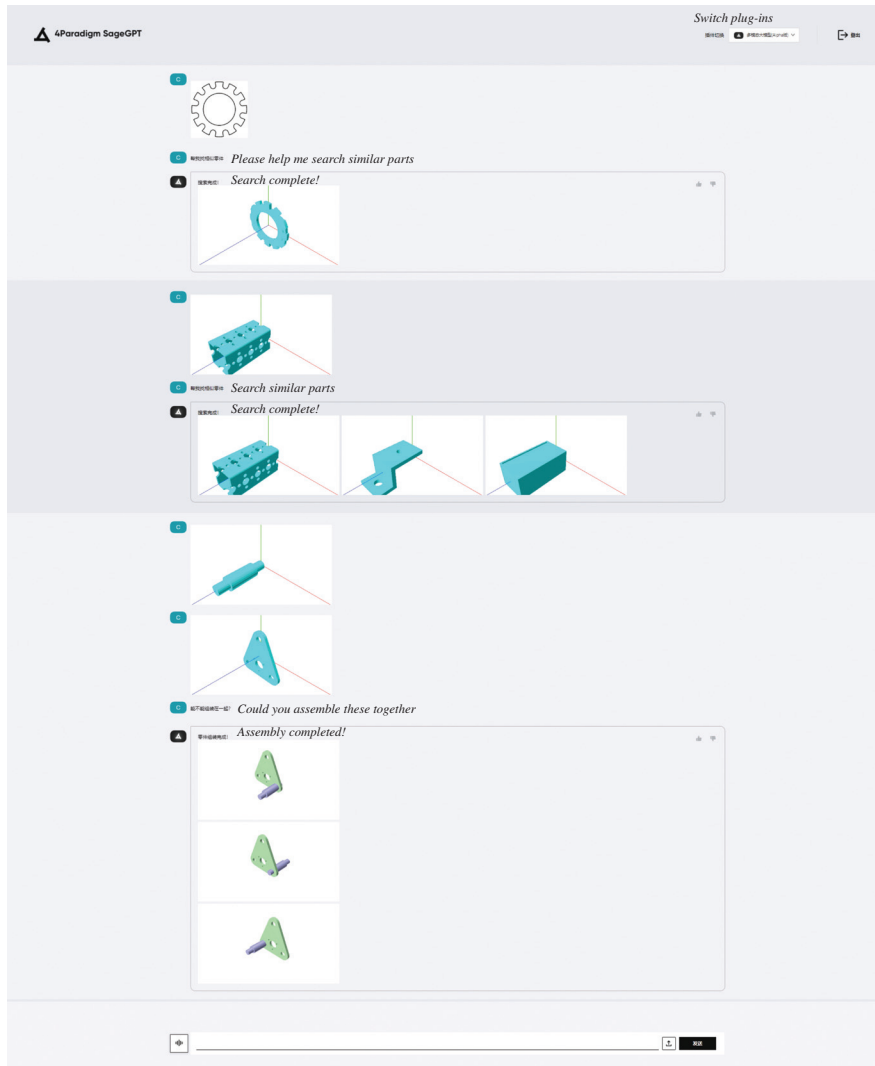
Furthermore, at our users’ request, we also offer application development services to help them develop customized AI applications on Sage Platform based on their specific business needs. For users who have not purchased Sage Platform, customized applications are developed on our Sage Platform, and the applications are then delivered to users. Such applications cannot be altered by the users, while users for Sage Platform are able to alter, update and manage AI models and applications on the platform.

We have been leading in the research of advanced AI technologies and the utilization of these technologies in commercial solutions. For example, in March 2023, in addition to our decision-making AI solutions, we launched SageGPT, an enterprise-grade generative AI product specially designed for business scenarios. SageGPT features multimodal interaction and enterprise-ready AI tools. It re-defines the way employees of our end-users interact with business systems. SageGPT is able to connect with the end user’s existing business systems, AI applications and internal database. With a user-friendly interface, SageGPT is capable of processing queries and tasks in the forms of video, image, voice, text, etc., transmit such queries and tasks to the end users’ existing business systems, AI applications and internal database for processing, and output the responses in requested forms. Similar to Sage Platform and applications, SageGPT can be delivered through (i) license of software installed on-premise at servers of end users, and (ii) sale of servers and other related hardware with pre-installed SageGPT software. Currently SageGPT is not bundled with other products or services offered by us. SageGPT is compatible with users’ existing business systems, AI applications and internal database, and does not require purchase of our other products or services. As of the Latest Practicable Date, SageGPT is still in an early stage of commercialization. Key advantages of SageGPT include:

- Secure data – SageGPT can be deployed on-premise, and does not require large external models. Therefore end users’ data are retained and processed on their premise to ensure security.
- Trusted content – SageGPT process data from trusted source, including end user’s existing AI applications, business systems and internal database. SageGPT supports cross-validation of knowledge graph to ensure the reliability and accuracy of content generated. Original source of the output can be identified for verification.
- Cost-efficiency – As SageGPT is designed for enterprises instead of individuals, we have streamlined the AI models and generating process of SageGPT which requires less computing power. SageGPT does not require significant cost and investment by end users on computing power and hardware.

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Below is a hypothetical and illustrative example of how SageGPT can be used in industrial design:



For risks regarding recent regulatory development that may be relevant to our SageGPT, see “Risk Factors – Risks Related to Our Business and Industry – We may be subject to complex and evolving laws and regulations regarding privacy and data protection. Actual or alleged failure to comply with privacy and data protection laws and regulations could damage our reputation, deter current and potential users from using our solutions and subject us to significant legal, financial and operational consequences.”

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REVENUE MODEL

We generate our revenue primarily from (i) Sage Platform and applications, which are charged based on estimated computing power consumption, and (ii) application development and other services which primarily include application development services to help them develop customized AI applications on Sage Platform based on their business need. Computing power consumption is estimated based on data volume, and complexity or dimensions of the AI models. The following table illustrates the details of our solutions:

Category	Deployment	Pricing
Sage Platform and applications	License of software installed on-premise at users’ servers	Based on estimated computing power consumption – license fees
	SageOne (software-defined “All-in-One” solutions with pre-built Sage Platform and applications on servers and other related hardware)	Based on estimated computing power consumption – purchase price charged based on the number of units of SageOne, and taking into account of license
Application development and other services	N/A	Project-based – taking into account the manpower consumption of the relevant services

The following table sets forth a breakdown of our revenues by types of solutions for the years/periods indicated:

	For the year ended December 31,						For the three months ended March 31,			
	2020		2021		2022		2022		2023	
	RMB	%	RMB	%	RMB	%	RMB	%	RMB	%
	<i>(RMB in thousands, except for percentages)</i>									
	<i>(Unaudited)</i>									
Sage Platform and applications										
Software licensing	157,888	16.8	356,156	17.6	596,001	19.3	87,170	18.1	103,429	16.1
SageOne	461,041	48.9	658,398	32.7	895,850	29.1	160,682	33.3	168,306	26.1
Sub-total	618,929	65.7	1,014,554	50.3	1,491,851	48.4	247,852	51.4	271,735	42.2
Application development and other services										
	323,309	34.3	1,003,845	49.7	1,590,786	51.6	234,409	48.6	372,662	57.8
Total	942,238	100.0	2,018,399	100.0	3,082,637	100.0	482,261	100.0	644,397	100.0

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As a platform-centric AI solution provider, we have been dedicated to updating our solutions to provide end users across different industries with unified development environment, standards and rules and to enhance the compatibility of our solutions. As a result of our continuous iteration and optimization efforts, Sage Platform can be generally applied by end users in different industries which do not require significant customization. Our total revenue increased by 114.2% from RMB942.2 million in 2020 to RMB2,018.4 million in 2021, primarily driven by expansion in our number of users from 156 in 2020 to 245 in 2021 and the increased spending of our users, especially the spending of our lighthouse users, evidenced by the increase of our average revenue per lighthouse user from RMB12.3 million in 2020 to RMB13.7 million in 2021. Our revenue generated from Sage Platform and applications as a percentage of our total revenue decreased from 65.7% in 2020 to 50.3% in 2021, as the percentage of total revenue attributed to our application development and other services increased over the same years, primarily driven by the increased demand for customized AI applications due to the expansion of our user base in 2021. The number of users for our application development and other services increased from 68 in 2020 to 139 in 2021. To a lesser extent, the increase of revenue contribution by our application development and other services was also attributable to the recovery from negative impact of COVID-19. Our total revenue increased by 52.7% from RMB2,018.4 million in 2021 to RMB3,082.6 million in 2022, primarily driven by expansion in our number of users from 245 in 2021 to 409 in 2022. Our revenue generated from Sage Platform and applications as a percentage of our total revenue decreased from 50.3% in 2021 to 48.4% in 2022, primarily due to the decrease of revenue contribution of SageOne, which requires more on-site services than our other segments, and thus was more affected by the recurrence of COVID-19 in 2022. Our revenue generated from Sage Platform and applications as a percentage of total revenue decreased from 51.4% in the three months ended March 31, 2022 to 42.2% in the three months ended March 31, 2023 primarily due to the increased revenue contribution from application development and other services over the same periods, driven by the increased demand for customized AI applications.

Sage Platform and Applications

The Sage Platform and applications are delivered primarily through (i) license of software installed on-premise at servers of our end users and (ii) SageOne, our “All-in-One” solutions with pre-installed software on servers and other related hardware, both of which allow our users to develop their own AI applications on Sage Platform. Our Sage Platform and applications are offered as a bundle. Users select the types of Sage Platform and applications and the delivery method based on their needs.

Our Sage Platform and applications are primarily offered through software license and sale of SageOne, rather than on a subscription basis. We are dedicated to creating value for users and addressing their business needs with our solutions. After we help them identify the critical issues, provide solutions and achieve the objectives of business improvement, they will make repeated purchases from us after identifying incremental business needs for AI application within their operations, and expanding their use of our solutions. As our users develop more AI applications for new use cases on our platform and/or increase usage in

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existing use cases which require more computing power, they will need to purchase additional licenses from us for additional computing power, which in turn allows us to capture additional monetization opportunities on a recurring basis. Our ability to create value for users is evidenced by a net dollar expansion rate of 167%, 140% and 126% for our lighthouse users in 2020, 2021 and 2022, respectively. The pricing of Sage Platform and applications are primarily based on the estimated computing power consumption. Based on communications with users, we understand their business needs and estimate the computing power consumption based on the complexity of the use cases, dimensions of the AI models, and the estimated amount of data involved therein.

- The price of our software license is primarily based on the estimated computing power consumption by reference to the AI applications our users plan to deploy. We consider data volume and other specific requests such as the latency, concurrency, queries per seconds, and the number of replicas, among others.
- To complement the sales of software, we also offer SageOne, our software-defined “All-in-One” solutions with pre-built Sage Platform and applications on servers and other related hardware. We charge customers of SageOne by taking into account the number of hardware units, license fees of our software and cost of hardware based on respective model. Hardware units of SageOne refer to units of different models of servers.

We closely communicate with our users to understand their specific business needs for AI deployment in order to estimate the amount of computing power that will be consumed by such clients. Computing power consumption is primarily measured as the number of CPU cores of servers needed to support our software. For software license, we provide software to be installed on-premise at servers of our end users. For SageOne, we offer hardware with pre-built Sage Platform and applications.

In general, computing power consumption is estimated based on a variety of considerations in relation to the specific use cases and applications that users intend to develop. Key considerations include (i) estimated data volume, queries per second (being the number of times a request is sent per second), concurrency (being the number of concurrent tasks) and number of replica (being the number of copies of data), (ii) types of AI algorithms (such as content recommendation, forecasting, fraud detection, etc.), and (iii) other use case-specific requests (such as whether the user is developing an online or offline application, or whether the analytics is real-time or delayed, etc.). In addition to the key parameters, our estimated computing power consumption is also, to a lesser extent, affected by other additional parameters such as the estimated network gateway, latency, the complexity of feature engineering, among others. Typically, more computing power is required for applications with larger data volume, more requirements on other parameters, more complex algorithms and certain specific features such as real-time analytics.

- For software license, we charge customers software license fees based on the required number of CPU cores multiplied by the agreed license fee for each CPU core.

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- For SageOne, based on the estimated computing power consumption and the optimisation effect that could be realised our hardware, we propose to our clients the appropriate model, configuration and number of hardware required for their needs. Price for SageOne is charged based on the number of hardware units, which already covers the license fees for our software. As a result, the price for hardware units may vary significantly based on the configuration of hardware selected by the users. As users are increasingly selecting more advanced servers with higher performance to meet their growing business needs, the price for our Sage One solutions have increased during the Track Record Period.

We also provide pricing adjustments to our clients based on a myriad of factors including spending budgets of clients, business relationship and market conditions. When users have additional needs for our solutions which will require more computing power, they shall purchase additional licenses for our software to be installed on more CPU cores or additional units of hardware accordingly.

In 2020, 2021, 2022, and in the three months ended March 31, 2022 and 2023, the number of our users for software licensing was 70, 96, 88, 42 and 35, respectively, and average revenue per user was RMB2.3 million, RMB3.6 million, RMB6.6 million, RMB2.1 million and RMB3.0 million, respectively. Driven by our comprehensive commercialization of SageOne, in 2020, 2021, 2022, and in the three months ended March 31, 2022 and 2023, the number of our users for SageOne was 57, 66, 83, 24 and 18, respectively, and average revenue per user was RMB8.1 million, RMB8.8 million, RMB11.0 million, RMB6.7 million and RMB9.4 million, respectively. We have experienced growth in the number of users for our software licensing and SageOne from 2020 to 2022, primarily due to our effective go-to-market strategy and business expansion efforts. The average revenue per user for our software licensing and SageOne also increased rapidly during the Track Record Period, which was mainly due to their increased spending of our solutions as they identify incremental business needs for AI within their operations and expand their use of our solutions, reflecting our continuous value creation to users.

Application Development and Other Services

At our users’ request, we primarily offer application development services to help them develop customized AI applications on Sage Platform based on their business needs. We charge them on a project basis, the pricing of which is primarily based on the manpower consumption of the relevant services. As our users’ demand for AI applications increases with their business expansion, they will continue to procure our application development services, allowing us to capture more service fees on an on-going basis.

BUSINESS

USE CASES OF OUR SOLUTIONS

We emphasize value creation. At our users’ request and based on their business needs, we work closely with users and help them develop scenario-specific AI applications. Our solutions have created value for enterprises in a myriad of industries, including, but not limited to finance, retail, manufacturing, energy and power, telecommunications, transportation, technology, education, media and healthcare. The following sets forth certain examples of the key use cases of our solutions:

AI + Finance

According to CIC, the strategy of customer-centered cost optimization and risk control in the finance industry is getting increasingly important. Our AI solutions help financial institutions achieve enhanced customer marketing management, internal operation optimization and risk control while increasing income and reducing expenditure. Since we first entered into the finance sector in 2015, we have served many of China’s large state-owned banks and joint stock banks, and other financial institutions such as securities companies and insurance companies.

Case study

Bank A is one of the largest state-owned banks in China. We started our collaboration with Bank A since 2017 and have maintained a close business relationship with it ever since. We provided Bank A with Sage Platform through both software licensing and SageOne, and offered application development services. Due to its massive number of transactions, Bank A has devoted significant resources to identifying and preventing fraudulent activities. We help Bank A establish risk control AI models by analyzing its users’ historical transaction information, current transaction information and other relevant data, enabling Bank A to unveil the risks behind each transaction more effectively. According to the results of an internal test, the accuracy of our AI fraudulent detection model is approximately 83%, which is over three times more accurate than Bank A’s original model based on expert rules before using our solution.

Specifically, to identify and prevent fraudulent transactions, we helped Bank A develop AI applications to estimate the potential fraudulent risks. Utilizing Sage Studio, Bank A analyses data such as transaction records, historical fraudulent transactions, account information, among others. Using Sage Studio, Bank A extracts the characteristics from such data and re-combines them for model training. Powered by our AutoML technology, we help Bank A train the anti-fraud model using logic regression algorithms, which improve the reliability of model training in scenarios with large amount of discrete variables. Our Sage Studio successfully helped Bank A establish a machine learning model, and enabled Bank A to develop anti-fraud applications to automatically identify and prevent fraudulent transactions with AI capabilities. Bank A is able to easily launch and manage its AI applications on Sage AIOS.

BUSINESS

AI + Retail

We help retail enterprises build an overall decision-making framework supported by our AI technologies, empowering them to formulate operational strategies based on users’ business needs. We enable AI transformation of the entire business process of users, optimizing their decision-making process and operational efficiency.

Case study

Company X is a famous chain store operator, and has used our solutions since 2019 as part of its digital transformation strategy. We provided Company X with Sage Platform through both software licensing and SageOne, and offered application development services. Utilizing our AI-enabled sales and marketing solutions, we empower Company X with big data analytics capabilities to formulate precision marketing strategies and deploy AI at scale. Based on the preferences of different users, our solutions enable Company X to make real-time and personalized recommendations for promotion activities. Utilizing Sage Platform, Company X analyses its user information for model training, such as purchase orders, products added to shipping carts and efficacy of historical product recommendations. Powered by our AutoML technology, our AI developer suites help Company X develop a personalized recommendation engine to predict user preferences and make targeted recommendations and promotions accordingly. The effectiveness of our solutions is evidenced by the increase in Company’s per customer transaction amount by 2%, and the increase in its total sales amount by hundreds of millions of RMB.

BUSINESS

AI + Manufacturing

We enable AI transformation across the entire manufacturing process, thereby helping our users optimize quality control, arrange and manage manufacturing schedules, and identify errors and defects.

Case study

Company Y is one of the largest lithium-ion battery manufacturers in the world. Their products are widely used in electronic vehicles (“EV”) and energy storage facilities. We have developed a strategic partnership with Company Y since 2020. We provided Company Y with Sage Platform through both software licensing and SageOne, and offered application development services. Company Y is seeking to upgrade their factories and ensure product safety with AI technologies to maintain their competitive edges. We offered Sage Platform as their main infrastructure for large-scale AI applications, supporting various AI application scenarios, such as computer vision quality inspection and equipment controlling. Our Sage AIOS enables Company Y to better manage the massive amount of operational data. Such data is extracted and analyzed by our AI developer suites to discover the patterns which can be applied in optimizing Company Y’s product quality, production safety and customer service quality, among others. In addition, Sage AIOS enables Company Y to easily launch and manage its AI applications at a large scale. Furthermore, our AI scientists are working with Company Y on AI-powered predictive analysis of product safety, trying to address one of the most difficult challenges faced by the EV industry.

AI + Energy and Power

Using big data and machine learning technologies, we enable users to enhance operation safety and reliability, better manage equipment and other assets, and identify and prevent market risks.

Case study

Company Z operates a large-scale hydropower in China. To ensure safety operation, Company Z established over 100,000 inspection points. Its inspection staff need to closely monitor thousands of variable operating data on a daily basis. Company Z endeavors to effectively identify risks, make predictions and early warnings, and enhance decision making from such data.

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We started collaboration with Company Z in 2019. We provided Company Z with Sage Platform through SageOne, and offered application development services. Utilizing our Sage Platform, Company Z developed a forecasting model utilizing historical data such as the temperatures of rotors and bearing bush. Leveraging our AI developer suites, Company Z discovers the correlation among the operating condition of equipment and temperatures of rotors and bearing. Such correlation will be changed in the event of anomaly. Therefore, our solutions enable Company Z to efficiently monitor operation safety and enhance the accuracy and timeliness of anomaly alerting. Benefiting from our solutions, Company Z increased its accuracy of anomaly alerting by more than two times. As a result, Company Z is able to identify and prevent equipment errors and avoid significant losses arising from operation disruptions. We also assist Company Z to establish a data-driven decision making mechanism, ensuring long-term stability of its core business operations. In addition, Sage AIOS enables Company Z to easily launch and manage its AI applications at a large scale.

BUSINESS SUSTAINABILITY AND PATH TO PROFITABILITY

Introduction

We were loss-making during the Track Record Period. In 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, we incurred net loss of RMB750.2 million, RMB1,802.1 million, RMB1,653.4 million, RMB268.2 million and RMB303.9 million, respectively. The net losses were primarily due to the substantial amount of: (i) research and development expenses incurred to develop and enhance our solutions and technology stacks, see “– Research and Development,” (ii) selling and marketing expenses incurred to increase our brand awareness and expand our user base, (iii) general and administrative expenses, which are mainly attributable to share-based compensation paid to our employees, and (iv) interest expense on redemption liabilities in relation to certain preferred rights granted to our investors, which is non-recurring in nature. In 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, our adjusted net loss (a non-IFRS measure), which is defined as loss for the year by adding back share-based compensation, interest expense on redemption liabilities and [REDACTED] expenses, amounted to RMB390.3 million, RMB559.1 million, RMB504.3 million, RMB66.8 million and RMB65.1 million, respectively. As we are still at a relatively early stage of our monetization efforts, we have been focusing on continuously optimizing our solutions and expanding our user base.

We plan to continue to enhance our financial performance by (i) effectively attracting and retaining our users, (ii) continuing to create value for users to further monetize our solutions, and (iii) effectively managing our cost and expenses, and enhancing operating leverage. Despite our continued expansion in user base, increase in average revenue per lighthouse user and enhanced capability to manage our cost and expenses, **we may continue to incur net losses and net operating cash outflow in the near future, including the year ending December 31, 2023**, mainly due to our continued investments in research and development of our technologies and solutions, marketing initiatives as well as share-based compensation.

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Effectively attracting and retaining our users

Effectively attracting and retaining our users is crucial to driving revenue growths, and ultimately our ability to achieve profitability. The following table sets forth the numbers of our users and lighthouse users for the years/periods indicated:

	For the year ended December 31,			For the three months ended March 31,	
	2020	2021	2022	2022	2023
Number of users	156	245	409	125	147
Number of lighthouse users for the previous year	32	47	75	N/A	N/A
Additions	21	33	36	N/A	N/A
Less ⁽¹⁾	6	5	7	N/A	N/A
Number of lighthouse users for the year/period	47	75	104	49	62

Note:

- (1) Refers to lighthouse users in the previous year that ceased to be regarded as our lighthouse users in the given year. However, the business relationship with such users has not been terminated. We have been providing ongoing supporting services to such lighthouse users under our standard service arrangement. Such users ceased to be our lighthouse users in the given year solely because we did not generate revenue from such users in such year from an accounting perspective.

As a result of our effective go-to-market strategy, we had 47, 75, 104, 49 and 62 lighthouse users in 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, respectively. In 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, we acquired 21, 33 36 new lighthouse users, respectively, illustrating the value of our solutions and our ability to expand our business. Our lighthouse users contributed 61%, 51%, 60%, 55% and 52% of our total revenue in 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, respectively. Therefore, growth in revenue from lighthouse users is a key driver in our overall revenue growth. Moreover, our expanding base of lighthouse users also help us to attract other users, which in turn further drives our revenue growth. Our initial success with lighthouse users enables us to further penetrate the respective industry and provide solutions to other players in the industry efficiently. As a result, we have accumulated a strong and rapidly growing total user base including both lighthouse users and other users, with 156, 245, 409, 125 and 147 users in 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, respectively. The effectiveness of our go-to-market strategy is evidenced by the rapid growth in the number of other users during the Track Record Period, representing a CAGR of 67.3% from 2020 to 2022, as compared to a CAGR of 48.8% for lighthouse users during the same years, reflecting our ability to penetrate into a larger user base following initial success with lighthouse users.

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We plan to further implement our “go-to-market” strategy by strengthening our relationships with lighthouse users and further penetrate into a larger user base. We also work closely with third-party solution partners and leverage their understanding of end users’ demands, thereby developing tailored marketing strategies and to acquire more users. As our existing users (plenty of which are lighthouse users) benefit from our solutions in more and more use cases, we will naturally be able to establish industry standards and attract more new users both in existing verticals and new verticals. We are able to leverage our experience and success in existing industry and scenario to expand into new industries with similar scenario. For example, successes in intelligent recommendation scenario in the restaurant industry can be leveraged when we are entering into other industries, such as fashion, which also have demands for intelligent recommendation. In addition, we will further optimize and enhance the functions of our solutions so that they can be applied in new scenarios and verticals. Moreover, we plan to recruit and retain talents with in-depth industry knowledge to strengthen our sales and marketing team, thereby leveraging their industry-specific sales experiences to expand users in new industries.

Continuing to create value for users to further monetize our solutions

We are dedicated to creating value to our users. As a result, we are able to explore additional monetization opportunities to help us scale up our revenues and to achieve profitability.

We plan to continue to create value for users and address their business needs by optimizing our solutions, innovating our technologies, providing satisfying customer services, among others. After we help them identify the critical issues, provide solutions and achieve the objectives of business improvement, they usually identify incremental business needs for AI within their operations and expand their use of our solutions. Moreover, as our users develop more AI applications for new use cases on our platform and/or increase usage in existing use cases which require more computing power, they will need to purchase additional licenses from us for additional computing power, which in turn allows us to capture additional monetization opportunities after the initial sale. Our ability to create value for users is evidenced by a net dollar expansion rate of 167%, 140% and 126% for our lighthouse users in 2020, 2021 and 2022, respectively. Moreover, the average revenue per lighthouse user amounted to RMB12.3 million, RMB13.7 million, RMB17.9 million, RMB5.4 million and RMB5.4 million in 2020, 2021, 2022, and in the three months ended March 31, 2022 and 2023, respectively, illustrating our ability to further monetize our solutions. For the years ended December 31, 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, our revenue generated from existing lighthouse users amounted to RMB445.8 million, RMB808.2 million, RMB1,300.4 million, RMB199.4 million and RMB267.0 million, respectively, representing 77.0%, 78.5%, 70.0%, 74.8% and 79.4% of total revenue generated from lighthouse end users for the same years, respectively. Driven by our successful value creation for lighthouse users, our overall average revenue per user amounted to RMB5.8 million, RMB6.9 million, RMB7.5 million, RMB3.9 million and RMB4.4 million in 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, respectively.

BUSINESS

Effectively managing our cost and expenses, and enhancing operating leverage

Our ability to manage and control our costs and operating expenses is critical to the success of our business and our profitability.

Our cost structure is affected by the mix of our solution offerings. For example, with the launch of SageOne, we incurred an increased cost of finished goods sold as a percentage of revenue during the Track Record Period. We expect our cost of revenues as a percentage of revenue may vary from period to period in the short term as a result of the mix of our solution offerings, while it will generally decrease in the long term due to the following factors:

- As we continue to optimize our algorithms and to enhance the compatibility of software and hardware, we expect to improve the computing efficiency of our solutions, which enables us to enhance user experience while optimizing cost structure; and
- We have invested heavily in developing technology capabilities and infrastructure, in order to provide highly scalable, standardized and flexible solutions for our users. The solutions we offer are highly modularized, which allows us to address users’ customized demands effectively and efficiently, and in turn, enabling us to achieve significant overall cost and operating efficiency.

Our selling and marketing expenses (excluding share-based compensation) accounted for 24.1%, 17.7%, 13.1%, 16.7% and 12.9% of our total revenue in 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, respectively. We expect that our sales and marketing expenses as a percentage of total revenue will generally decrease in the long term due to the following factors:

- Our go-to-market strategy starts with market leaders in each industry we target to enter who are also early adopters of AI. We are able to leverage our experience and success in existing industry and scenario to expand into new industries with similar scenario. We demonstrate the value of our solutions through one or a few entry projects. Once our value has been proven, we are then able to expand our services quickly to address other business needs of our users. As a result of our go-to-market strategy, after we succeed with the lighthouse users, we leverage our understanding of the industries, our reputation established through collaborating with industry leaders, and our AI ecosystem to further enhance our influence in such industries, enabling us to further penetrate and provide solutions to other players, without incurring significant sales and marketing efforts;
- We expect to accumulate a larger user base and higher user stickiness as we continuously solidify our market leadership. We expect this to enable us to attract and retain users and, in the long-term, reduce spending on promotions and advertisements. As our users develop more AI applications for new use cases on our platform and/or increase usage in existing use cases which require more computing

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power, they will need to purchase additional licenses from us for additional computing power, which in turn allows us to capture additional monetization opportunities with low marginal cost after the initial sale and improve our profitability. Our ability to create value for users is evidenced by a net dollar expansion rate of 167%, 140% and 126% for our lighthouse users in 2020, 2021 and 2022, respectively;

- We expect to benefit from more efficient user acquisition through word-of-mouth referrals and enhanced brand awareness. With our established brand reputation and large use bases, we expect to continuously generate significant word-of-mouth referrals and organic user growth; and
- We plan to strengthen our relationships with solution partners to retain and expand our user base across various industries, which will help improve our sales and marketing efficiency in the long run.

Our general and administrative expenses (excluding share-based compensation) accounted for 12.7%, 8.6%, 8.1%, 17.2% and 15.7% of our total revenue in 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, respectively. We expect that our general and administrative expenses as a percentage of total revenue will generally decrease in the long term, as the major expense component, employee benefit expenses, generally do not increase proportionally with our revenue growth.

Our research and development expenses (excluding share-based compensation) accounted for 57.3%, 55.3%, 48.8%, 46.8% and 37.5% of our total revenue in 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, respectively. While we will continue to invest in research and development capabilities to support our long term growth, we expect that our research and development expenses will generally decrease as a percentage of total revenue in the long term, as (i) we expect to have stronger bargaining power against our suppliers for outsourced R&D services as we scale up, and are thus able to obtain more favorable pricing terms, and (ii) the major expense component, employee benefit expenses, generally do not increase proportionally with our revenue growth, and thus we are able to enjoy economies of scale as we scale up. We plan to (i) further strengthen our existing core technologies, and (ii) invest in the research and development team of new areas which may lead to the next generation of AI technologies. For example, we are dedicated to developing technologies in the area of data privacy protection, including privacy preserving learning, which is able to enhance data privacy in the process of machine learning, and federated learning which entails training algorithm on local datasets without exchange data samples, thereby enhancing data security and privacy. For details, see “Business – Research and Development.”

Our future profitability is uncertain and subject to various factors, including our ability to develop new technologies, enhance user experience, establish effective monetization strategies, compete effectively and successfully, and continuously grow revenues and our user base in a cost-effective way by improving our operational efficiency. For details, see “Risk Factors – Risks Related to Our Business and Industry – We have recorded net losses, net liabilities and operating cash outflow during the Track Record Period, and we may not be able to achieve or subsequently maintain profitability.”

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OUR TECHNOLOGY

We create and apply advanced technologies to drive the development of our AI solutions. We believe that our technology is at the core of our innovative solutions and we have made significant investments in technologies to ensure our market leadership. We believe that our technologies enable us to deliver more efficient and more cost-effective solutions with higher performance to users. We have been leading in the research of advanced AI technologies and the utilization of these technologies in commercial solutions. Being a first-mover means we are well ahead of our competitors in terms of efficiency and accuracy of our algorithms. Accumulation of use cases and experience over the years makes our solutions difficult, if not impossible, to be replicated by our competitors.

Our core technologies include AutoML, transfer learning, environment learning and AutoRL. These technologies are embedded as operating modules (“operators”) in our AI developer suites, underlying the AI applications designed and developed by our users. Each of our core technology is a sub-category of machine learning with different focuses, and we do not own, collect or process data of our users on our servers during the machine learning process. AutoML automates the process of machine learning; transfer learning is able to “transfer” the machine learning process conducted in one scenario to another with similarity; environment learning and AutoRL optimizes the machine learning process in dynamic, uncertain, and potentially complex environment. Based on their scenario-specific needs, developers select operators based on different technologies for module training. Specifically, AutoML are used in general decision making scenarios, transfer learning is able to optimize modeling processes in scenarios with insufficient or incomplete samples, and AutoRL together with environment learning are typically used in scenarios such as optimized manufacturing planning, agile supply chain and logistics scheduling.

AutoML

Our AutoML technology automates the process of machine learning and enables algorithms to automatically discover new patterns, hence minimizing the ongoing involvement of AI engineers responsible for developing, adjusting, maintaining and refining the AI models. Conventional AI solutions are mostly specific to individual application scenarios and require AI experts to develop the model from ground up and to continuously refine it. Moreover, the development of AI algorithms requires complex and time-consuming modeling process, and the correct deployment of AI requires consistent data to ensure the model in production performing as good as in the offline modeling process. Specifically, AutoML are used in general decision making scenarios. Powered by AutoML technology, our AI developer suites enable AI models to continuously learn and improve by themselves through discovering new patterns, hence directly reducing the cost, effort and complexity of implementing AI solutions. It also allows large-scale deployment of AI by enterprises because significant involvement of AI experts is no longer required. Our AutoML enables our AI developer suites to automatically refine data, thereby enhancing the efficiency and results of modelling processes. It helps developers screen and extract useful characteristics from data. During the model training process, leveraging AutoML technology, our AI developer suites automate parameter tuning and help users greatly reduce human efforts and costs. It is also constantly self-improving, hence lowering the barriers for deep learning and significantly improving the training quality of our AI developer suites.

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As compared to similar technologies applied by our competitors, our proprietary AutoML algorithm is a cutting-edge AutoML algorithm in the world, according to CIC. With our AutoML algorithms, we broke the world records of two Open Graph Benchmark (“OGB”) tasks in April 2021. OGB is a globally recognized collection of benchmark datasets for machine learning on graphs that AI companies and research institutions utilize to test and evaluate their AI model performance. Participants of the OGB tasks include world-famous innovative enterprises and research institutes, such as Facebook, Alibaba, Stanford University and Cornell University. Our AutoML algorithm also ranks top 1% in Kaggle Structured Data and Image Classification Competition 2019. See “– Awards and Recognition.” According to CIC, we were the first in the world to launch a commercialized product using the AutoML framework in 2014, and to apply AutoML in a number of use cases across various industry sectors. For example, according to CIC, we launched the world’s first commercialized AutoCV product in 2018. Our technology leadership and first-mover advantage have contributed to our initial success in acquiring lighthouse users, which in turn enable us to further penetrate and provide solutions to other players in different industries.

Transfer Learning

Our transfer learning technology expands application of AI to industries in which data is sensitive or scarce and resolves privacy issues surrounding application of AI in fields involving sensitive data subjects. Due to the lack of labeling data to meet business needs, as well as the need to improve model effectiveness, transfer learning is now being increasingly recognized. It equips our AI developer suites with the ability to “transfer” analysis conducted and patterns discovered in one industry or scenario to another with similarity, hence being able to provide AI solutions even where data is not readily available or accessible. Transfer learning enables our AI developer suites with capabilities of taking knowledge learned on one problem, and leveraging them on a new, similar problem. For instance, with transfer learning technology on our AI developer suites, knowledge from a model that has learned to recommend books for people may be useful to kick-start a model meant to recommend music. This facilitates AI transformation among enterprises because it reduces the scope of data required for our AI developer suites to produce valuable output and broadens the range of business fields and scenarios in which AI could make a positive impact. Dr. Dai and Dr. Yang Qiang (our co-founder) are the pioneers in transfer learning and are well regarded in the AI industry for their achievements and contributions in steering the direction for the research and development of transfer learning worldwide. Moreover, Dr. Yang currently has the most paper citations in the field of transfer learning, according to CIC. Therefore, as compared to some of our competitors applying similar technologies in China’s platform-centric decision making AI market, our transfer learning technology is better recognized in the industry, which contributes to our competitive advantages in acquiring new customers.

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Environment Learning

Our environment learning technology reduces the cost of model training and ensures safety by training models in a simulated environment. It combines technologies such as simulation, supervised learning and derivative-free optimization, and learns the simulation rules and parameters which cannot be performed by humans in a data-driven approach. Traditional simulation technologies heavily rely on the domain knowledge and expertise of developers, and thus may not be applied in environment which requires significant domain knowledge is available. As compared to traditional simulation technologies, our environment learning technology is able to build a high-precision simulated environment without complete domain knowledge, enabling users of our AI developer suites to apply intelligent decision-making technologies in more use cases. Our environment learning technology applies a data-driven approach to learn simulation rules and parameters that cannot be determined by human.

AutoRL

Our AutoRL technology automates the process of reinforcement learning, which refers to the training of machine learning models to make a sequence of decisions in a dynamic, uncertain, potentially complex environment. Traditional reinforcement learning technologies require significant cost of learning, development and application, which limits the application value of reinforcement learning. Our AutoRL operator embedded on our AI developer suites provides end-to-end and automatic suite of tools for reinforcement learning. The effectiveness of reinforcement learning is highly dependent on the structure of underlying models, which require significant scenario-specific knowledge from developers. Powered by AutoRL technology our AI developer suites are able to automatically generate the structure of neural network, which refers to a set of algorithms designed to recognize patterns, and effectively improving the quality of model training. As a result, users are able to develop reinforcement learning algorithms without extensive prerequisite background or knowledge. Our AI developer suites enable users to input their actual business needs, and integrate advanced AutoRL algorithms with AutoML and other technologies such as derivative-free optimization. In addition, AutoRL equips our AI developer suites with features such as automatic algorithm selection and dynamic parameter tuning, and enables our AI developer suites to accurately tune parameters in real-time. AutoRL operator embedded on our AI developer suites enables users to significantly reduce human efforts while improving the effectiveness of reinforcement learning while reducing TCO. As a result, our AI developer suites enable users to realize automatic and refined decision-making at multiple levels in a dynamic, uncertain, potentially complex environment.

According to CIC, we are currently the pioneer in China’s platform-centric decision-making AI market that applies environment learning and AutoRL technologies in its operations, which are rarely applied by other competitors. Thus we are better positioned to acquire new users with demand for AI application in complex environment.

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Technology Infrastructure

Our information technology infrastructure is designed to satisfy the requirements of our operations, support the growth of our business and ensure reliability of our operations as well as security of information on our platform.

We are supported by servers in geographically dispersed areas across China, including various locations in Beijing and Inner Mongolia which enables the high availability of our technology infrastructure. In addition, we have in place a comprehensive set of contingency plans to manage potential risks of any emergency or service disruption. For example, we back up our operating data regularly, and our staff responsible for database management perform daily inspection on our backup record to make sure all the operating data is properly archived. We also test the data recovery capability of our systems, which help us ensure our backup data can be completely retrieved. We did not experience any material service disruptions during the Track Record Period and up to the Latest Practicable Date.

We also adopt a highly scalable, cloud-based technology architecture through our cooperation with trusted cloud computing service providers in China. In addition, the compatibility of our existing technology architecture and software solutions allows for swift transition and effective integration across different cloud computing service providers. Therefore, we do not expect any material technological issues or other hurdles for us to switch cloud computing service providers. Our cloud-based technology architecture allows us to process large volumes of data on a real-time basis and ensure high-speed and stable performances on a large scale to accommodate and support the increased complexity and diversity of our business operations. We have been enhancing our technology architecture by increasing the investment in third-party cloud computing services to ensure our cloud architecture can effectively address our growing business needs.

SALES AND MARKETING

Sales

We believe that our solutions speak for themselves. We are dedicated to creating value for users as we ultimately share their success. Our go-to-market strategy starts with market leaders in each industry we target to enter who are also early adopters of AI. We demonstrate the value of our solutions through one or a few entry projects. Once our value has been proven, we are then able to expand our services quickly to address other business needs of our users. The number of our lighthouse users increased from 47 in 2020 to 75 in 2021, and further to 104 in 2022. The number of our lighthouse users has increased from 49 in the three months ended March 31, 2022 to 62 in the three months ended March 31, 2023. Our average revenue per lighthouse user has increased from RMB12.3 million in 2020 to RMB13.7 million in 2021, and further to RMB17.9 million in 2022. For the three months ended March 31, 2022 and 2023, our average revenue per lighthouse user stayed stable at RMB5.4 million.

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After we succeed with the lighthouse users, we leverage our understanding of the industries, our reputation established through collaborating with industry leaders, and our ecosystem to further enhance our influence in such industries, enabling us to further penetrate and provide solutions to other players, without incurring significant sales and marketing efforts.

Our sales cycle primarily consists of initial communications with users, project evaluation and design, proof of concept and contracts execution. As we primarily focus on providing services to large-scale lighthouse users, we may spend significant time on communications with users, project evaluation and design, thereby resulting in longer sales cycles. We leverage both our in-house sales team and third-party solution partners to promote our solutions. We have established a professional in-house sales team. Our employees have deep knowledge of the industries and users that they are responsible for. Our in-house sales team works closely with our product team to ensure that they can propose the best solutions to address the pain points faced by market participants in the relevant industry verticals. To encourage and incentivize our in-house sales team, we have designed a compensation structure that includes a fixed component as well as a performance-based component. We set specific performance targets for each team member. We evaluate such employee’s performance every year and pay out performance-based compensation accordingly.

We also work closely with third-party solution partners, which primarily consist of system integrators, and leverage their understanding of end users’ demands, thereby developing tailored marketing strategies. For details, see “– Customers and Customer Support” in this section.

Marketing

We enhance the awareness of our brand and promote our new and existing solutions through both offline and online channels. We participate in various offline events, such as industry conferences, product launches and industry salons to showcase our technological advancements and develop relationships with industry participants. We have collaborated with several media partners to promote our brand and technology in news reports.

RESEARCH AND DEVELOPMENT

As AI technology continuously undergoes rapid advancements, our abilities to create new technologies, design new solutions and enhance existing solutions are critical to maintaining our market leadership. Therefore, we invest substantial resources in research and development activities. Our research and development expenses were RMB565.7 million, RMB1,249.5 million and RMB1,650.0 million in 2020, 2021 and 2022, respectively. Our research and development expenses increased from RMB225.7 million for the three months ended March 31, 2022 to RMB241.5 million for the three months ended March 31, 2023, representing 46.8% and 37.5% of our total revenue during the same periods, respectively. During the Track Record Period, our investment in research and development was primarily to (i) develop commercialized products and solutions using our core technologies, demonstrated by, for

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example, our launch of Sage AIOS in 2020, and our launch of enterprise-level AI App Store in 2021, see also “– Our Enterprise AI Solutions,” (ii) design and test features of our Sage Platform modules, (iii) develop versatile modules for Sage Platform and applications to accommodate industry-specific demand for AI applications, and (iv) enhance fundamental research and explore new areas which may lead to the next generation of AI technologies, such as federated learning and technologies in the area of data privacy protection, and cutting-edge technologies such as large language models and generative AI to enhance efficiency and productivity. See also “– Our Technology.” In the future, we will continue to invest in research and development activities to enhance our technological capabilities and solution development. See “Future Plans and Use of [REDACTED].” Our research and development staff comprises computer scientists, researchers and other technology professionals. As of March 31, 2023, our research and development staff consisted of 1,442 employees, representing 76% of our total employees.

Dr. Dai and Dr. Yang Qiang (our co-founder) are the pioneers in transfer learning and are well regarded in the AI industry for their achievements and contributions in steering the direction for the research and development of transfer learning worldwide. Our research and development staff is led by Mr. Chen Yuqiang, our Chief Research Scientist and a pioneering scholar in the field of transfer learning and AutoML. His works have been published at renowned academic conferences, including NIPS, AAAI, ACL and KDD.

We focus on building and maintaining a large pool of talented researchers to drive our research and development efforts. We conduct targeted recruitment among contestants in high profile programming competitions. Our employees include gold medal winners in prestigious international programming competitions such as ACM. We provide rigorous training to new recruits to familiarize them with our platform and thereby closely integrate them into our research and development staff.

The development of our AI solutions are underpinned by our strong R&D capabilities. Our continuous investments in research and development activities result in a wealth of intellectual properties. As of the Latest Practicable Date, we had over 260 patents registered with the National Intellectual Property Administration of the PRC and over 320 pending patent applications in the PRC. With our proprietary AutoML algorithms, we broke the world records of two Open Graph Benchmark (“OGB”) tasks in April 2021. OGB is a globally recognized collection of benchmark datasets for machine learning on graphs that AI companies and research institutions utilize to test and evaluate their AI model performance. Participants of the OGB tasks include world-famous innovative enterprises and research institutes, such as Facebook, Alibaba, Stanford University and Cornell University. Our AutoML algorithm also ranks top 1% in Kaggle Structured Data and Image Classification Competition 2019. See “– Awards and Recognition.” In addition, we have developed other advanced core technologies including transfer learning, environment learning and AutoRL. For details, See “– Our Technology.”

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In addition, we are exploring new areas which may lead to the next generation of AI technologies. For example, we are exploring advanced technologies in the area of AutoML, including automated graph learning which is designed for analyzing graph data, and automated semi-supervised learning which is designed for analyzing unlabeled data together with labeled data to enhance modeling efficacy. We are also dedicated to developing technologies in the area of data privacy protection, including privacy preserving learning, which is able to enhance data privacy in the process of machine learning, and federated learning which entails training algorithm on local datasets without exchange data samples, thereby enhancing data security and privacy.

DATA PRIVACY AND SECURITY

We do not own, nor do we collect data of our users. Instead, we offer platform and algorithm based on which our users run their own AI models on their own data. Also, we provide enterprise-level AI solutions to organizations and do not serve individuals. Specifically, (i) we are a provider of AI solutions for corporate users, and our primary business is to provide privatization deployment solutions, in which we will not access any data owned or held by corporate users; (ii) for cloud-based subscriptions, we offer Sage Platform and other ready-to-use applications through public cloud services offered by third party vendors and we are only provided with the administration access which allows us to help users with coding and system integration upon users’ request for the sole purpose of assisting the users to utilize our solutions, and not in any way participating or assisting the corporate users with data processing activities, and we do not access or process any data of our users; and (iii) our core technologies are sub-categories of machine learning and are embedded as operating modules (“operators”) in our AI developer suites, and we do not own, collect or process data of our users on our servers during the machine learning process. Based on the foregoing, we and our PRC Legal Advisor are of the view that both the Company’s existing products and solutions, and the products and solutions that are being developed, and their data privacy features as mentioned above comply with data privacy and cybersecurity laws in the PRC effectively in all material respects.

Data security and protection are among our highest priorities. In this regard, we have designed strict data protection and information security policies to ensure strict compliance with applicable laws, regulations and prevalent industry practice. We have implemented comprehensive internal policies on protecting data privacy and security under the supervision of our Chief Architect, with the purpose to ensure data and information security, optimize data governance, protect the benefits of our users, business partners, employees and other third parties, and ensure compliance with all applicable laws and regulations. We have established a Data and Information Security Committee, members of which include the responsible persons in various departments such as IT, R&D, Solution Deployment, Human Resources and Compliance. The committee is responsible for formulating data and information security strategies, and decision-making in material data and information incidents. We also engage external legal counsel to review and update our internal policies and ensure continuous compliance with all applicable laws and regulations.

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We implement a robust internal authentication and authorization system to ensure that our confidential and important data can only be accessed for authorized use and by authorized personnel. We have clear and strict authorization and authentication procedures and policies in place. Our employees only have access to data which is directly relevant and necessary for their responsibilities and for limited purposes and are required to verify authorization upon every access attempt.

We have established an all-round information system in reference to data security requirements, national standards and industry best practices and intend to continually invest heavily in data security and privacy protection. Our information system applies multiple layers of safeguards, including both internal and external firewalls, to identify and protect us against security attacks. We have completed various information security, privacy and compliance certifications/validations, proving the security and reliability of our data protection technologies. For example, in December 2020, we passed ISO27001 (international standard for information security) and obtained the “Information Safety Management System Certification,” and in February 2020, our Sage Platform obtained the ePrivacyseal, which illustrates our commitment to comply with the requirements of the GDPR.

During the Track Record Period and up to the Latest Practicable Date, we have not received any claim from any third party against us on the ground of infringement of such party’s right to data and privacy protection as provided by any applicable laws and regulations in the PRC or other jurisdictions. Our PRC Legal Advisor is of the view that the current data protection practice of the Company meets the requirements of laws and regulations in effect in material respects, based on the followings: (i) the Company currently does not directly obtain or store customers’ or users’ information in its primary business; (ii) in the Company’s primary business, it mainly accesses the personal information of its employees and business contacts and does not purchase or obtain in any other way any personal information, or carry out any other form of cooperation in respect of exchange, cleaning and processing of personal information; (iii) the Company has not received any complaint relating to data privacy or security measures, nor has it been subject to any government investigation, enquiry, action or penalty; (iv) the Company has implemented comprehensive internal policies on protecting data privacy and security under the supervision of our Chief Architect, with the purpose to ensure data and information security and ensure compliance with all applicable laws and regulations; (v) during the Track Record Period and as of the Latest Practicable Date, there had been no material incident of data or personal information leakage, infringement of data protection and privacy laws and regulations, and there had been no investigation or other legal proceeding, to the best knowledge of the Company, pending or threatened against the Group initiated by competent government authorities or third parties, that will materially and adversely affect the Company’s business operations; and (vi) the Company will continue to pay close attention to the legislative and regulatory developments in data security and comply with the latest regulatory requirements. Based on the currently available information and upon (i) discussing with the management of the Company to understand its business nature and internal policies on data security, (ii) interviewing the major customers of the Group, and (iii) discussing with the PRC Legal Advisor and reviewing the PRC Legal Advisor’s analysis set out above, nothing has come to the attention of the Sole Sponsor as non-legal experts that would render them to cast doubt on the PRC Legal Advisor’s conclusion above.

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CUSTOMERS AND CUSTOMER SUPPORT

We have two main categories of customers: (i) direct customers who are end users purchasing our solutions directly; and (ii) solution partner customers, who are mainly third-party system integrators that embed our solutions into their offering to cater for end users’ specific needs. In 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, revenue generated from direct customers accounted for 15%, 43%, 32%, 33% and 22% of our total revenue, respectively. We typically grant a credit term ranging from 3 to 6 months for direct customers.

Certain end users of our solutions, especially those in the finance industry, use system integrators when selecting suppliers or service providers, to save them from the trouble of directly negotiating with a large number of different suppliers or service providers and to benefit from the various other services provided by such system integrators. Such end users typically lay out the goals they plan to achieve and the budget for their projects and engage third-party system integrators, instead of engaging us directly. These system integrators typically embed our solutions into their offering to cater for end users’ specific needs, and provide various other services to end users, such as implementation services. According to CIC, engagement with end users through solution partner customers is an industry norm. In 2020, 2021, 2022 and in the three months ended March 31, 2022 and 2023, revenue generated from such solution partner customers accounted for 85%, 57%, 68%, 67% and 78% of our total revenue, respectively. We typically grant a credit term ranging from 3 to 6 months for solution partner customers.

Although a portion of our customers are solution partners, which mainly are system integrators, not the end users, we do not believe that our business model is a distributorship model. As discussed above, solution partners are not distributors that we engage to broaden our sales channels; instead, they are selected by our end users to implement their projects, and the ultimate decisions as to which service provider to choose are primarily made by the end users. When we enter into a contract with a solution partner, we recognize such solution partner, instead of the relevant end user, as our customer. As such, we do not believe that the solution partners are our distributors, and we do not believe that our business relationship with them raises any concern in relation to inventory risk, cannibalization or recoverability of accounts receivables.

We are dedicated to creating value for users as we ultimately share their success. Our go-to-market strategy starts with market leaders in each industry we target to enter who are also early adopters of AI. We demonstrate the value of our solutions through one or a few entry projects. Once our value has been proven, we are then able to expand our services quickly to address other business needs of these market leaders. After our influence in the business vertical is established, we collaborate with our solution partners to offer our solutions to other long-tail users to achieve market penetration.

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We established a dedicated sales team comprising of sales personnel with work experiences in leading software companies and consulting firms. Our sales team targeting direct customers is usually industry-focused, whereas our sales team targeting solution partners is usually region-focused. We have different approaches of establishing relationship with our target customers depending on our existing commercial relationship with them. We use a “top-down” strategy for certain customers, where our sales team contacts potential customers’ decision-making level personnel and establish strategic cooperation to design comprehensive solutions to empower such customers’ enterprise AI transformation. For target customers with which we have not yet established strong relationship at top level, we use a “bottom-up” strategy, where our sales personnel contact working level personnel of the customers and design solutions on a scenario basis.

The following tables set forth a summary of our five largest customers for the periods indicated.

Five Largest Customers for the Year Ended December 31, 2020	Background	Objects of Transaction	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB'000)	Percentage Contribution to the Company's Total Revenue	Customer Type	Registered Capital
Customer A	A company focused on information technology	(i) Sage Platform and applications and (ii) application development and other services	2020	49,345	5.2%	Solution partner	USD272.3 million
Customer B	A company focused on e-commerce	Sage Platform and applications	2020	35,990	3.8%	Solution partner	RMB100.0 million
Customer C	A company focused on information technology	Sage Platform and applications	2020	27,973	3.0%	Solution partner	RMB60.0 million
Customer D	A company focused on information technology	Sage Platform and applications	2020	26,022	2.8%	Solution partner	RMB100.0 million
Customer E	An institute focuses on science and technology	Application development and other services	2019	25,022	2.6%	Solution partner	N/A

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Five Largest Customers for the Year Ended December 31, 2021	Background	Objects of Transaction	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB'000)	Percentage Contribution to the Company's Total Revenue	Customer Type	Registered Capital
Customer F	A company focused on electronic technology	Sage Platform and applications	2021	55,874	2.8%	Direct customer	RMB50.0 million
Customer G	A company focused on information technology	Application development and other services	2021	54,864	2.7%	Solution partner	RMB22.3 million
Customer H	A company focused on information technology	Sage Platform and applications	2019	38,445	1.9%	Solution partner	US\$130.0 million
Customer I	A company focused on information technology	Sage Platform and applications	2021	38,153	1.9%	Solution partner	RMB30.0 million
Customer J	A company focused on information technology	Sage Platform and applications	2021	37,468	1.8%	Solution partner	RMB58.0 million

Five Largest Customers for the Year Ended December 31, 2022	Background	Objects of Transaction	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB'000)	Percentage Contribution to the Company's Total Revenue	Customer Type	Registered Capital
Customer K	A company focused on transportation solutions	Sage Platform and applications	2021	295,683	9.6%	Solution partner	RMB110.0 million
Customer L	A company focused on information technology	Application development and other services, Sage Platform and applications	2021	138,731	4.5%	Solution partner	RMB54.9 million
Customer H	A company focused on information technology	Application development and other services, Sage Platform and applications	2019	136,509	4.4%	Solution partner	US\$130.0 million
Customer M	A company focused on information technology	Sage Platform and applications	2022	130,245	4.2%	Solution partners	RMB35.0 million
Customer N	A company focused on information technology	Sage Platform and applications	2019	93,858	3.0%	Solution partner	RMB62.8 million

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Five Largest Customers for the Three Months Ended March 31, 2023	Background	Objects of Transaction	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB'000)	Percentage Contribution to the Company's Total Revenue	Customer Type	Registered Capital
Customer K	A company focused on transportation solutions	Sage Platform and applications	2021	108,402	16.8%	Solution partner	RMB110.0 million
Customer H	A company focused on information technology	Sage Platform and applications	2019	70,442	10.9%	Solution partner	US\$130.0 million
Customer O	A company focused on information technology	Application development and other services	2022	47,453	7.4%	Solution partner	RMB90.0 million
Customer P	A company focused on information technology	Application development and other services	2022	37,359	5.8%	Solution partner	RMB100.0 million
Customer Q	A company focused on information technology	Sage Platform and applications	2023	33,527	5.2%	Solution partner	RMB50.0 million

Our top five customers in each year or period during the Track Record Period in aggregate accounted for 17.4%, 11.1%, 25.8% and 46.1% of our total revenues in 2020, 2021, 2022, and in the three months ended March 31, 2023, respectively. Our largest customer in each year or period during the Track Record Period accounted for approximately 5.2%, 2.8%, 9.6% and 16.8% of our total revenue for the respective year or period.

We enter into written agreements with our direct customers or solution partners. Regardless of whether our contracts were entered into directly with our end users or with solution partners, there was no material difference in the contract terms and the scope of our services. The value of our contracts with customers can vary substantially from customer to customer, depending on their business needs. The salient terms and conditions of our agreements with customers are set out below:

- **Deliverables:** For sales of our Sage Platform and applications, we typically provide non-exclusive licenses of use rights of our solutions and maintenance services related to the solutions. For application development and other services, we typically develop customized applications based on the customer’s specification.
- **Pricing:** The price of our software license is primarily based on the estimated computing power consumption by reference to the AI applications our users plan to deploy. We charge users of SageOne by taking into account the number of hardware,

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required computing power, license fees of our software and service fees for deployment, operation and maintenance. For application development and other services, we typically charge customers on a project basis, the pricing of which is primarily based on the manpower consumption of the relevant services.

- **Customer Support:** We typically provide free technical support for one year after the sale of our solutions and free training to help our customers learn to use and maintain our solutions.
- **Ownership:** All intellectual property rights relating to the solutions that we deliver under the agreement, including but not limited to copyrights, patents ownership of the proprietary technologies and trademarks, belong to us. The other party may not conduct any reverse engineering, decompiling, disassembly or use other methods to obtain the source code and underlying algorithms of the software, hardware and related technologies provided by us or to otherwise engage in activities that may harm our proprietary rights.

To the best of our knowledge, during the Track Record Period and up to the Latest Practicable Date, our customers were Independent Third Parties. As of the Latest Practicable Date, none of our Directors, their associates or any of our shareholders (who or which to the knowledge of the Directors owned more than 5% of our issued share capital) had any interest in any of our five largest customers.

In our ongoing efforts to enhance user satisfaction and improve service quality, we maintain a dedicated customer support and service team that is focused on real-time problem-solving with the ultimate goal of increasing user experience and stickiness. In addition, we also gather feedback on how to improve our solutions and respond to user suggestions.

As a matter of policy, only hardware products with defects may be returned. Our rigorous quality control procedures ensure that our products are properly examined before being sold. As a result, we experienced an immaterial level of product returns during the Track Record Period. We typically offer a limited warranty for our hardware products. Warranty coverage typically runs for three to five years after our delivery or customers' or users' examination. Pursuant to the agreement with our third party vendors who supply certain standardized components for hardware products of SageOne, our third party vendors should compensate us for liabilities caused by product defects and typically offer us full warranty on the hardware products affected. Such full warranty coverage typically runs for three to five years from the time of purchase by us.

During the Track Record Period, major end users of our solutions include companies in finance, retail, manufacturing, energy and power, telecommunications, transportation, technology, education, media and healthcare industries, among others.

The following tables set forth a summary of our ten largest end users for the periods indicated and to the best of the Company's knowledge.

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Ten Largest End Users for the Year Ended December 31, 2020	Background	Solution/service provided	Examples of major use cases (to the best knowledge of the Company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User A	An energy company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent supply chain inventory prediction platform	77,984
User B	A financial institution	Sage Platform and applications	Intelligent product recommendation and big data decision-making analytics	44,635
User C	A retail company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent product recommendation and intelligent supply chain management system	38,099
User D	A public service organization	Sage Platform and applications	Big data decision-making analytics platform	35,990
User E	A transportation infrastructure company	Sage Platform and applications	Risk control and big data decision-making analytics platform	27,973
User F	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Anti-money laundering platform, intelligent product recommendation and OCR note recognition	27,107
User G	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Anti-fraud platform, intelligent product recommendation and OCR note recognition	24,768

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Ten Largest End Users for the Year Ended December 31, 2020	Background	Solution/service provided	Examples of major use cases (to the best knowledge of the Company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User H	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Intelligent product recommendation and big data decision-making analytics platform	23,600
User I	A technology research institute	Application development and other services	High performance computing solutions	23,456
User J	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Anti-fraud platform and OCR note recognition	22,496

Ten Largest End Users for the Year Ended December 31, 2021	Background	Solution/service provided	Examples of major use cases (to the best knowledge of the Company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User A	An energy company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent electricity dispatching, operation and maintenance solutions	127,862
User F	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Anti-fraud platform and big data decision-making analytics platform	81,498
User H	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Intelligent product recommendation and big data decision-making analytics platform	56,659

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Ten Largest End Users for the Year Ended December 31, 2021	Background	Solution/service provided	Examples of major use cases (to the best knowledge of the Company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User K	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Anti-fraud platform and intelligent recognition platform	47,100
User L	A public service organization	(i) Sage Platform and applications and (ii) application development and other services	Intelligent education cloud system	43,393
User B	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Anti-fraud platform and intelligent recognition platform	42,747
User M	An energy company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent audit system and big data decision-making platform	42,680
User N	A telecommunications company	(i) Sage Platform and applications and (ii) application development and other services	Supply chain management, intelligent operation and maintenance	42,360
User O	A retail company	Sage Platform and applications	Software platform	33,285
User J	A financial institution	(i) Sage Platform and applications and (ii) application development and other services	Anti-fraud platform and intelligent recognition platform	32,675

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Ten Largest End Users for the Year Ended December 31, 2022	Background	Solution/service provided	Examples of major use cases (to the best knowledge of the Company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User A	An energy company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent operation and maintenance	169,359
User P	A railway vehicle and equipment manufacturer	Sage Platform and applications	Intelligent operating efficiency	122,743
User Q	An energy company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent operation and maintenance	112,666
User R	A railway vehicle and equipment manufacturer	Sage Platform and applications	Intelligent operating efficiency	97,135
User S	An energy company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent operating efficiency	91,423
User T	A telecommunications company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent operation and maintenance	87,873
User M	An energy company	(i) Sage Platform and applications and (ii) application development and other services	Risk management/ operating efficiency	80,745
User U	A telecommunications company	(i) Sage Platform and applications and (ii) application development and other services	User behavior analysis and intelligent recommendation	74,529

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Ten Largest End Users for the Year Ended December 31, 2022	Background	Solution/service provided	Examples of major use cases (to the best knowledge of the Company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User N	A telecommunications company	(i) Sage Platform and applications and (ii) application development and other services	User behavior analysis and intelligent recommendation	63,831
User V	A transportation service company	(i) Sage Platform and applications and (ii) application development and other services	Intelligent operation and maintenance	59,564
Ten Largest End Users for the Three Months Ended March 31, 2023	Background	Solution/service provided	Major use cases (to the best knowledge of the company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User V	A transportation service company	(i) Sage Platform and applications (ii) Application development and other services	Intelligent operating efficiency	70,070
User E	An energy company	(i) Sage Platform and applications (ii) Application development and other services	Intelligent operating efficiency and decision making	44,332
User W	A transportation service company	(i) Sage Platform and applications	Intelligent operating efficiency	35,414
User U	A telecommunications company	(i) Sage Platform and applications	Intelligent operating efficiency	33,527
User X	An equipment manufacturing company	(i) Application development and other services	Intelligent operating efficiency and decision making	26,038
User Y	An airline organisation	(i) Application development and other services	Intelligent operation and risk management	25,161

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Ten Largest End Users for the Three Months Ended March 31, 2023	Background	Solution/service provided	Major use cases (to the best knowledge of the company)	Transaction Amounts (either directly with the Company or through solution partners) (RMB'000)
User Z	A banking equipments provider	(i) Sage Platform and applications	Intelligent operating efficiency	23,009
User P	A railway vehicle and equipment manufacturer	(i) Sage Platform and applications	Intelligent operating efficiency	22,924
User AA	An insurance company	(i) Sage Platform and applications	User behavior analysis and intelligent recommendation	21,416
User AB	A transportation service company	(i) Application development and other services	Intelligent information system development	19,075

The following table sets forth the revenue contribution by industry of our end users during the Track Record Period.

	For the year ended December 31,						For the three months ended March 31,			
	2020		2021		2022		2022		2023	
	Transaction Amounts (RMB'000)	Percentage of Total Revenue	Transaction Amounts (RMB'000)	Percentage of Total Revenue	Transaction Amounts (RMB'000)	Percentage of Total Revenue	Transaction Amounts (RMB'000)	Percentage of Total Revenue	Transaction Amounts (RMB'000)	Percentage of Total Revenue
Energy and Power	138,294	14.7%	441,964	21.9%	626,549	20.3%	104,591	21.7%	73,196	11.4%
Finance	292,469	31.0%	576,550	28.6%	519,630	16.9%	92,737	19.2%	127,782	19.8%
Transportation	nil	nil	nil	nil	405,016	13.1%	35,293	7.3%	193,238	30.0%
Telecommunication	73,145	7.8%	175,380	8.7%	328,372	10.7%	50,981	10.6%	47,686	7.4%
Technology	64,496	6.9%	138,482	6.9%	298,988	9.7%	46,218	9.6%	33,589	5.2%
Education	66,665	7.1%	124,228	6.2%	235,170	7.6%	36,318	7.5%	42,017	6.5%
Manufacturing	23,833	2.5%	102,461	5.1%	201,686	6.5%	2,107	0.4%	44,981	7.0%
Retail	100,812	10.7%	176,758	8.8%	132,172	4.3%	25,080	5.2%	23,024	3.6%
Healthcare	nil	nil	57,359	2.8%	101,876	3.3%	45,203	9.4%	402	0.1%
Media	53,955	5.7%	134,660	6.7%	29,698	1.0%	16,307	3.4%	21,809	3.4%
Others	128,569	13.6%	90,556	4.5%	203,480	6.6%	27,425	5.7%	36,672	5.7%
Total	942,238	100.0%	2,018,399	100.0%	3,082,637	100.0%	482,261	100.0%	644,397	100.0%

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SUPPLIERS AND PROCUREMENT

Our suppliers primarily consist of (i) providers of research and development services, (ii) providers of implementation services and (iii) others, such as providers of servers and cloud services and providers of other professional services. Our top five suppliers in each year or period during the Track Record Period in aggregate accounted for 13.7%, 21.7%, 26.4% and 38.3% of our total purchases in 2020, 2021, 2022 and in the three months ended March 31, 2023, respectively. Our largest supplier in each year or period during the Track Record Period accounted for approximately 3.4%, 6.5%, 10.1% and 14.7% of our total purchases in 2020, 2021, 2022 and in the three months ended March 31, 2023, respectively.

Key terms of our agreements with providers of research and development services are set out below:

- *R&D services.* Our suppliers provide research and development services based on our requirements as specified in the agreement.
- *Delivery and inspection.* Our suppliers shall complete the project within the prescribed time period, and deliver all relevant software and documents. We are entitled to inspect their work products and provide written comments for suppliers to address.
- *Copyright.* We are entitled to all copyrights in relation to the R&D projects, including but not limited to the technical materials, documents, source codes and applications.
- *Termination.* The agreement may be terminated upon mutual consent between the parties.

Key terms of our agreements with providers of implementation services are set out below:

- *Implementation services.* We shall provide detailed requirements and explanations in written for our suppliers to provide implementation services accordingly. We are entitled to change the implementation cycle, alter the services or terminate the agreement with prior written notice.
- *Pricing and payment.* Prices of implementation services are based on the estimated manpower consumption as agreed by both parties. Fees are typically settled on a monthly basis.
- *Indemnification.* Each party shall indemnify the other party for any damages caused by its fault.
- *Termination.* The agreement may be terminated upon mutual consent between the parties, or unilaterally terminated by each party due to breach of agreement by the other party. In addition, we are also entitled to terminate the agreement with prior written notice, provided that we shall pay the suppliers all fees and expenses they have incurred as of the termination date.

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We have established a set of internal measures on selection of suppliers. We take into account various factors in selecting our suppliers, which primarily include (i) the candidates’ technology skillsets and capabilities, (ii) commercial terms offered by the candidates, (iii) business background, results of operations and financial positions of the candidates, and (iv) project-specific demands. When engaging suppliers, our procurement department is primarily responsible for reviewing the procurement agreements in accordance with our contract management protocols, which set forth, among others, that procurement exceeding RMB6 million must be subject to approvals by legal department, finance department or the chief executive officer.

During the Track Record Period, we have not experienced any significant fluctuation in prices set by our suppliers, material breach of contract on the part of our suppliers or delay in delivery of our orders from our suppliers.

As of the Latest Practicable Date, none of our Directors, their associates or any of our shareholders (who or which to the knowledge of the Directors owned more than 5% of our issued share capital) had any interest in any of our five largest suppliers.

The following tables set forth a summary of our five largest suppliers for the periods indicated.

Five Largest Suppliers for the Year Ended December 31, 2020	Background	Major Services/ Products Purchased	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB’000)	Percentage of the Company’s Total Purchases	Registered Capital
Supplier A	A company focused on financial data services	Hardware	2020	62,504	3.4%	RMB50.0 million
Supplier B	A company focused on information technology	Development services	2019	54,689	3.0%	RMB50.0 million
Supplier C	A company focused on information technology	Deployment services	2019	50,599	2.7%	RMB34.0 million
Supplier D	A company focused on electric power	Development services	2018	49,395	2.7%	RMB42.6 million
Supplier E	A company focused on information technology	Development services	2020	36,390	2.0%	RMB80.0 million

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Five Largest Suppliers for the Year Ended December 31, 2021	Background	Major Services/ Products Purchased	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB'000)	Percentage of the Company's Total Purchases	Registered Capital
Supplier D	A company focused on electric power	Development services	2018	170,716	6.5%	RMB42.6 million
Supplier F	A company focused on information technology	Development services	2020	135,215	5.2%	RMB80.0 million
Supplier C	A company focused on information technology	Deployment services	2019	119,364	4.6%	RMB34.0 million
Supplier G	A company focused on information technology	Deployment services	2019	77,004	2.9%	RMB64.3 million
Supplier H	A company focused on information technology	Development services	2020	66,378	2.5%	RMB390.3 million

Five Largest Suppliers for the Year Ended December 31, 2022	Background	Major Services/ Products Purchased	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB'000)	Percentage of the Company's Total Purchases	Registered Capital
Supplier F	A company focused on information technology	Development services	2020	342,672	10.1%	RMB80.0 million
Supplier D	A company focused on electric power	Development services	2018	220,697	6.5%	RMB42.6 million
Supplier I	A company focused on construction services	Hardware	2022	153,226	4.5%	RMB100.0 million
Supplier J	A company focused on industrial manufacturing	Hardware	2022	102,246	3.0%	RMB10.0 million
Supplier H	A company focused on information technology	Development services	2020	75,064	2.2%	RMB390.3 million

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Five Largest Suppliers for the Three Months Ended March 31, 2023	Background	Major Services/ Products Purchased	Year of Commencement of Relationship with the Company	Transaction Amounts (RMB'000)	Percentage Contribution to the Company's Total Purchases	Registered Capital
Supplier I	A company focused on construction services	Hardware	2022	107,945	14.7%	RMB100.0 million
Supplier D	A company focused on electric power	Development services	2018	49,388	6.7%	RMB42.6 million
Supplier F	A company focused on information technology	Development services	2020	44,512	6.1%	RMB80.0 million
Supplier J	A company focused on industrial	Hardware	2022	40,539	5.5%	RMB10.0 million
Supplier H	A company focused on information technology	Development services	2020	38,905	5.3%	RMB390.3 million

Our five largest suppliers shifted from a mix of hardware vendors and development service providers in 2020 to consisting entirely development service providers in 2021, primarily because of our increased demand for third party technology services driven by our enhanced research and development efforts and the expansion of our business.

Our Directors confirmed our negotiations with these companies were on an arm's length basis. In addition, the terms of transactions with these companies are in line with market practice and similar to those with our other customers and suppliers. Except as disclosed above, none of our other top five suppliers during the Track Record Period were also our customers, and none of our other top five customers during the Track Record Period were also our suppliers.

COMPETITION

We face competition in China's decision-making AI market from other AI solution providers. The principal competitive factors in our industry include functionality, scope and performance of solutions, scalability and reliability of services, technology capabilities, marketing and sales capabilities, user experience, pricing, brand recognition and reputation. In addition, new and enhanced technology may further increase competition in our industry. We believe that we are well positioned to compete effectively on the basis of the foregoing factors.

Nevertheless, some of our existing competitors have greater name recognition, broader global footprint, longer operating histories, larger user bases as well as greater financial, technical and other resources. See “Risk Factors – Risks Related to Our Business and Industry

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– If we fail to compete effectively, our business, financial condition and results of operations may be materially and adversely affected” in this Document. For more information on the competitive landscape of our industry, see “Industry Overview.”

INTELLECTUAL PROPERTY

Intellectual property rights are fundamental to our business. We currently hold many intellectual properties related to our core solutions, and we devote significant time and resources to their development and protection. We rely on a combination of patent, trademark, copyright, domain name, trade secret and other proprietary rights protection laws in China and other jurisdictions as well as confidentiality procedures and contractual provisions to protect our intellectual properties. During the Track Record Period, our core technologies were patented. Such patents are typically valid for 20 years.

As of the Latest Practicable Date, we had over 260 patents registered with the National Intellectual Property Administration of the PRC and over 320 pending patent applications in the PRC. We also had ten registered patent overseas. As of the Latest Practicable Date, we had over 520 trademarks registered in the PRC, European Union, Singapore and Hong Kong. As of the Latest Practicable Date, we had over 450 copyrights registered with the National Copyright Administration of the PRC. See “Appendix VI – Statutory and General Information – Further Information About Our Business – Intellectual Property Rights” for details of our material intellectual property rights.

During the Track Record Period and up to the Latest Practicable Date, we did not have any material disputes or any other pending legal proceedings regarding intellectual property rights with third parties.

EMPLOYEES

We had 1,904 employees as of March 31, 2023. The following table sets forth a breakdown of our employees by function as of March 31, 2023.

Function	Number of Employees	Percentage (%)
Research and development	1,442	76
Sales and marketing	208	11
General and administrative	254	13
Total	1,904	100

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Substantially most of our employees are based in the PRC, primarily located at our headquarters in Beijing, with some of the rest located in Shenzhen, Shanghai, Guangzhou, Wuhan and Changchun.

Our success depends on our ability to attract, retain and motivate qualified personnel, and we believe that our high-quality talent pool is one of the core strengths of our company. We adopt high standards and strict procedures in our recruitment, including campus recruitment, online recruitment, internal referral and recruitment through executive search, to satisfy our demands for different types of talents.

We provide regular and specialized training tailored to the needs of our employees in different departments. Our employees can also improve their skills through our development of solutions and mutual learning among colleagues. New employees will receive pre-job training and general training.

We offer competitive compensation for our employees. In addition, we regularly evaluate the performance of our employees and reward those who perform well with higher compensation or promotion.

As required by PRC laws and regulations, we participate in various employee social security schemes organized by municipal and provincial government, including pension, maternity insurance, unemployment insurance, work-related injury insurance, health insurance and housing provident fund. We are required under PRC laws and regulations to make contributions to employee social security schemes at specified percentages of the salaries, bonuses and certain allowances of our employees, up to a maximum amount specified by the local government from time to time. We also procure that subsidiaries we acquired comply with applicable labor-related laws and regulations.

We enter into standard contracts and agreements regarding confidentiality, intellectual property, employment, commercial ethics and noncompetition with our executive officers and full-time employees. These contracts typically include a noncompetition provision effective during and up to two years after their employment with us and a confidentiality provision effective during and after their employment with us.

None of our employees are currently represented by labor unions. We believe that we maintain a good working relationship with our employees, and we have not experienced any significant labor disputes or any difficulty in recruiting staff for our operations during the Track Record Period.

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INSURANCE

We consider our insurance coverage to be adequate as we have in place all the mandatory insurance policies required by PRC laws and regulations and in accordance with the commercial practices in our industry. Our employee-related insurance consists of pension insurance, maternity insurance, unemployment insurance, work-related injury insurance and medical insurance, as required by PRC laws and regulations. We also purchase supplemental commercial medical insurance for our employees.

In line with general market practice, we do not maintain any business interruption insurance or product liability insurance, which are not mandatory under PRC laws. We do not maintain key man life insurance, insurance policies covering damages to our network infrastructures or information technology systems or any insurance policies for our properties. See the section headed “Risk Factors – Risks Related to Our Business and Industry – Our limited insurance coverage could expose us to significant costs and business disruption” in this Document. During the Track Record Period, we did not make any material insurance claim in relation to our business.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE MATTERS

We are committed to be a responsible corporate citizen, to abide by applicable laws and generally accepted ethical principles and to increase the wellness of the society. As we vision ourselves to provide world-leading AI platforms and solutions that catalyze progression of society and growth of enterprises, we attach great importance to environmental, social and governance matters, including environmental sustainability, social responsibility and governance (“ESG”).

Environment, Climate and Sustainability

Given the nature of our business, we do not operate any production facilities or otherwise impose any material threats to the environment or the climate. Therefore, we are not subject to significant environmental or climate-related risks. Nonetheless, we have made significant efforts towards environmental protection, change and sustainability.

AI for Low Carbon

As we optimize our algorithms, coupled with distributed architecture design and our all-in-one design, we are able to shorten the training time needed for our AI model and utilize the hardware resources efficiently, thereby achieving the same results with less computing power and, in turn, saving electricity consumption. We also strive to empower enterprises to achieve carbon neutrality and emission peak via our AI solutions. For example, the accuracy of load forecasting has a huge impact on costs of any power system, and our decision-making AI solutions, by utilizing technologies such as environmental learning and high-dimensional computing, are able to significantly reduce the error rate in such forecast, intelligently plan and

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allocate resources within the power system to save power consumption effectively. Moreover, we believe that as AI and its application develop and mature, AI can solve problems more efficiently than traditional technologies, ultimately resulting in less energy consumption.

In addition, we make efforts to save electricity energy in our daily office life as a part of our corporate culture. We operate most of our businesses digitally and utilize cloud-based services to reduce consumption of paper and renovate our offices with environmental-friendly materials, in an effort to keep our carbon consumption low. For example, we paint our offices in light colors and make sure the curtains are open during daytime to reduce use of lighting. We also arrange our office superintendents to inspect the building regularly and turn down the lights in empty rooms. We have imposed office policies for air conditioning with considerations to season, weather and use scenario to manage the energy consumption of air conditioning and displayed notices adjacent to the air conditioners to remind our employees of the environmental impact.

In line with our vision for sustainable development, we oversee our environmental protection performance in aspects such as the use of electricity and water. During the Track Record Period, our costs of electricity consumption were RMB0.4 million, RMB0.6 million, RMB1.4 million and RMB0.2 million, in 2020, 2021, 2022 and in the three months ended March 31, 2023, respectively. During the Track Record Period, our costs of water consumption were RMB0.09 million, RMB0.05 million, RMB0.08 million and RMB0.01 million, in 2020, 2021, 2022 and in the three months ended March 31, 2023, respectively. We are dedicated to enhancing the efficiency of electricity and water consumptions in our operations to fulfill our environmental and social responsibility. The table below sets forth our electricity and water consumptions and consumption efficiencies during the Track Record Period.

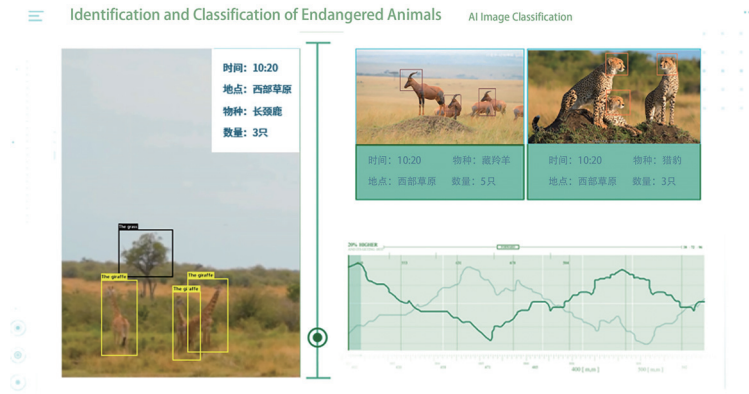
	Year ended December 31,			Three months ended
	2020	2021	2022	March 31, 2023
Total electricity consumption (kWh'000)	359	514	1,434	230
Electricity consumption (kWh'000)/revenue (RMB in millions)	0.38	0.26	0.47	0.36
Total water consumption* (liter'000)	118	71	103	14
Water consumption* (liter'000)/revenue (RMB in millions)	0.13	0.04	0.03	0.02

* Our water consumption comprises primarily of the cost of purchasing bottled water in each year indicated, as other expenses relating to water consumption is negligible.

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AI for Biodiversity

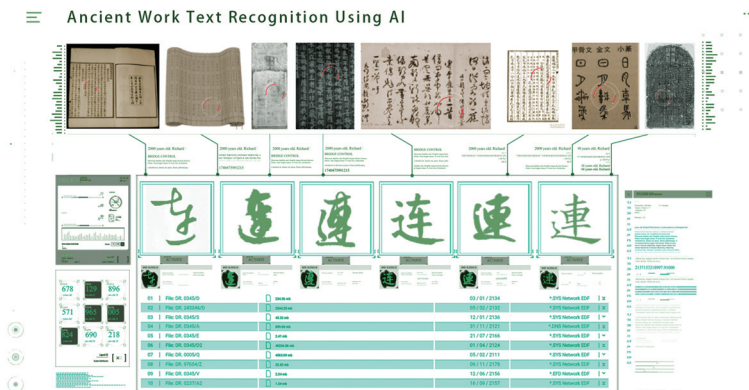
We use our AI technologies to facilitate preservation of biodiversity. Our AI technologies enable people to identify, analyze and capture images of endangered wild animal with high accuracy, providing invaluable information sources for animal behavior study, discovery of wild animal's living pattern and the environmental ecosystem in general.



Social Responsibility

AI for culture

Significant portions of the history and culture of human being are recorded in antiques and ancient books. However, we may lost the information embedded in a large number of ancient books because of technical difficulties in physically preserving these books and in identification of ancient texts. Learning ancient texts is an extremely difficult tasks for human beings, whereas AI technologies are at an advantage: By processing large amounts of illegible texts, our AI solutions are able to discover patterns and rules and therefore learn to identify the texts in an accurate and efficient manner. For example, our AI solutions empowered the recovery of ancient Tripitaka.



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AI for education

We established “Paradigm Academy” for the purpose of educating enterprises on AI. We established AutoML.ai, an open source AutoML challenge platform, which allows us to interact with and learn from top academic institutions, multinational technology companies and AI scientists in the world. We made OpenMLDB and OpenAIOS in our Sage AIOS an open source platform to share our achievements in AI operating systems with developers across the world. In addition, we are dedicated to nurturing AI talents. We were certified as a cooperating training center by the China Electronic Information Application Education Center (CEIAEC) in 2021. We also cooperate with various education and research institutions to provide AI courses and trainings to teachers and students. In addition, we made a RMB330 thousand donation to the University of Chinese Academy of Sciences Education Foundation to establish the “4Paradigm Scholarship,” awarding graduate students with good character who show academic excellence in fields including but not limited to computer science, mathematics, automation and software engineering.

Employee care

We believe that having a balanced lifestyle is crucial to achieving a good mindset at work. Therefore, we encourage employees to maintain good mental and physical health by participating in sports and recreational activities. With respect to our safety policy, we require all employees to follow our safety rules and receive safety training, which includes fire drills and video on evacuation and other fire safety measures.

We nurtured a friendly and inspirational corporate culture that we believe is attractive to the talented scientists who are keen to our success, and we invest heavily in training and retaining them. We provide adequate resources to help them succeed, including easy access to our rich internal resources for training and studying, our invaluable industry-related insights and opportunities to work in an inclusive community with our similar-minded scientists.

Governance

ESG Governance Scheme

As part of our efforts to promote corporate social responsibility and sustainable development, we are in the process of optimizing our corporate governance on environmental, social and corporate governance. We plan to adopt a comprehensive ESG policy and establish an ESG committee responsible for overseeing and guiding our ESG initiatives. In addition, we intend to set up an ESG task force led by our legal department, which would be responsible for the formulation, implementation and evaluation of our ESG initiatives and report to our ESG committee regularly. Moreover, we plan to engage professional external ESG consultants to help us establish and improve our ESG policies and standards.

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Each year, the ESG task force will perform identification and evaluation of ESG risk factors each year, weighing the risks of different ESG factors, including environmental, social and climate-related risks, by evaluating aspects such as affected scope, frequency of occurrence, recovery costs, predictability and social awareness, so that we can pinpoint the key ESG risk factors and formulate mitigation measures accordingly. In such assessment, we may also use metrics such as percentage of renewable energy used for our solutions, employee air travel emissions, percentage of suppliers that have an environmental program in place, potable water use per square foot and/or waste to landfill per square foot.

AI Code of Ethics

We intend to adopt an AI code of ethics that addresses our beliefs in the key ethical values in the development and use of AI, primarily including integrity and virtuousness, respect for intellectual property rights and data security and protection.

We upheld integrity and virtuousness as the principles that guide our daily operations, business engagements, development and use of AI and technologies. We believe technology is a force for good, we abide by applicable laws and generally acceptable moral values, and we strive to create value to our users and the society as a whole.

As an innovation-driven company, we are highly committed to protection of intellectual property rights. We have designed and adopted strict internal procedures to ensure the protection of our intellectual property rights as well as to operate our business without violating others. See “– Risk Management and Internal Control – Compliance and Intellectual Property Risk Management” for details of our data protection policy and measures.

Data security and protection are among our highest priorities. We have implemented comprehensive internal policies on protecting data privacy and security, including establishing a Data and Information Security Committee, members of which include the responsible persons in various departments such as IT, R&D, Solution Deployment, Human Resources and Compliance. We do not own nor do we collect data of our users in our business operations. See “– Data Privacy and Security” for details of our data protection policy and measures.

Environmental Management System

Worldwide environmental issues such as climate change, natural resources depletion and species loss are becoming increasingly prominent. Despite that our operations do not involve any production facilities or otherwise impose any material threats to the environment, we still make our best effort to minimize our impacts on the environment. We intend to adopt a company-wide environmental management system (“EMS”) that aligns with customary international standards. The ESG committee will be responsible for overseeing, and the ESG task force will be responsible for implementing the EMS.

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During the Track Record Period and up to the Latest Practicable Date, we had not been subject to any fines or other penalties due to noncompliance in relation to health, work safety or environment regulations and had not had any incident, or received any claim for personal or property damage made by our employees, which had materially and adversely affected our financial condition or business operations. Given that we operate our business primarily in the office, and that a majority of our operations are conducted online, we leave limited impact on the environment with a small carbon footprint. In light of such business nature, environmental-related and social-related risks and climate-related issues are not likely to have material negative impacts on our business, strategy and financial performance going forward. During the Track Record Period and up to the Latest Practicable Date, we had not incurred material capital expenditures or compliance costs related to climate and environmental protection. In 2020, 2021 and 2022 and the three months ended March 31, 2023, our annual capital expenditures and compliance costs in this regard amounted to no more than RMB1 million. We also do not anticipate to incur material capital expenditures or compliance costs related to climate in the foreseeable future.

PROPERTIES

We occupy certain properties in mainland China, Hong Kong and Singapore. These properties are used for non-property activities as defined under Rule 5.01(2) of the Listing Rules. Our headquarters are based in Beijing. According to section 6(2) of the Companies (Exemption of Companies and Prospectuses from Compliance with Provisions) Notice, this Document is exempted from compliance with the requirements of section 342(1)(b) of the Companies (Winding Up and Miscellaneous Provisions) Ordinance in relation to paragraph 34(2) of the Third Schedule to the Companies (Winding Up and Miscellaneous Provisions) Ordinance, which requires a valuation report with respect to all our interests in land or buildings, for the reason that, as of March 31, 2023, none of the properties leased by us had a carrying amount of 15% or more of our consolidated total assets.

We do not own any properties. As of the Latest Practicable Date, we primarily leased fourteen properties in Beijing, Shanghai, Shenzhen, Changchun, Guangzhou, Wuhan, Chengdu, Nanjing, Changsha and Wuxi, with an aggregate gross floor area of approximately 20,134.42 square meters in mainland China as our office space. We believe that there is sufficient supply of properties in mainland China and we do not rely on the existing leases for our business operations. In addition, we leased several work stations in Hong Kong and Singapore. Our technology infrastructure is supported by servers in geographically dispersed data centers across China, including various locations Beijing and Inner Mongolia, that are fault-tolerant, which ensures the high reliability of our platform. We believe that we could relocate these servers to new properties without material disruption to our business, because we have made data backup in our servers in Beijing, which enables recovery of our system within a few hours in the event of any disruptions, including relocations of to these servers.

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For more information about the risks with respect to our leased properties, see “Risk Factors – Risks Related to Our Business and Industry – Failure to renew our current leases at reasonable terms or to locate desirable alternatives for our offices and facilities could materially and adversely affect our business and results of operations.”

Furthermore, ten of our leased properties for our business operations in China have not been registered with the relevant PRC government authorities. As advised by our PRC Legal Advisor, failure to register such lease agreements with relevant PRC government authorities does not affect the effectiveness of the lease agreements, but the relevant PRC government authorities may order us to, within a prescribed time limit, register the lease agreements. Failure to do so may subject us to a fine ranging from RMB1,000 to RMB10,000 for each lease agreement. See “Risk Factors – Risks Related to Our Business and Industry – Certain of the lease agreements of our leased properties have not been registered with the relevant PRC government authorities as required by PRC law, which may expose us to potential fines.”

Though none of our leases have been terminated or voided during the Track Record Period, if any of our leases are terminated or voided as a result of challenges from third parties or the government, we would need to seek alternative premises and incur relocation costs. We believe that there are alternative properties at comparable rental rates available on the market, the use of which would not materially and adversely affect our business operations.

U.S. EXPORT CONTROL LAWS AND REGULATIONS

Effective March 2, 2023, the U.S. Department of Commerce’s Bureau of Industry and Security (“BIS”) added certain entities to the entity list (the “Entity List”), including “4Paradigm Technology Co., Ltd.” with aliases “4Paradigm,” “4th Paradigm,” and “Fourth Paradigm”. The address of such entity was provided as “Building 1, No. 66 Qinghe Middle Street, Haidian District, Beijing, China.” Out of an abundance of caution and unless or until we receive further clarification from BIS, we will assume that all entities located at the address provided in the Entity List are subject to the Entity List restrictions in order to comply with the relevant restrictions. These entities specifically include: Beijing Fourth Paradigm Technology Co., Ltd., Fourth Paradigm (Beijing) Data & Technology Co., Ltd., Beijing Paradigm Empowerment Enterprise Management Co., Ltd., Beijing Xuexian Intelligent Technology Co., Ltd., Beijing Yuntian Xinrui Technology Co., Ltd., Beijing Future Paradigm Technology Co., Ltd., Zhongyuan Putai (Beijing) Intelligent Technology Co., Ltd., and Zhimei Xinchuang (Beijing) Technology Co., Ltd. (the “Listed Entities”). For more details of these entities, see “History, Development and Corporate Structure – Our Principal Subsidiaries” and Note 1 to the Accountant’s Report in Appendix I to this Document. However, it is possible that not all Listed Entities are subject to the restrictions.

The addition of the Listed Entities to the Entity List restricts those entities’ ability to purchase, acquire, or otherwise access any items subject to Export Administration Regulations, 15 C.F.R. Parts 730-774 (“EAR”) without a license from BIS. Specifically, absent a license from BIS, it is prohibited to export, reexport, or transfer any items subject to the EAR when any Listed Entity is a party to the transaction, including as purchaser, intermediate consignee,

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ultimate consignee, or end-user. That is, even if the Listed Entity is not the intended end user of the item(s) involved, the restrictions would still apply to the extent the Listed Entity is the purchaser or otherwise involved in a given transaction. License applications to the Listed Entities will be reviewed with a presumption of denial for all items subject to the EAR. For further information, see “Regulatory Overview – U.S. Export Control Laws and Regulations.”

As concluded by Jacobson Burton Kelley PLLC (“JBK”), our legal opinion counsel as to U.S. export control laws, the Entity List restrictions do not apply to non-listed entities in our Group that are legally distinct from the Listed Entities (the “Non-listed Entities”). That is, BIS has explicitly advised that “the licensing and other obligations imposed on an entity by virtue of being listed on the Entity List do not per se apply to its subsidiaries, sister companies, or other legally distinct affiliates that are not listed on the Entity List.” However, a Non-listed Entity (or any other person) may not act as an agent, a front, or a shell company for a Listed Entity in order to facilitate transactions that would not otherwise be permissible with the Listed Entity.

Further, the Entity List restrictions applicable to the Listed Entities apply to items subject to the EAR only where such items would be imported, procured, or obtained by the Listed Entities as of the effective date of the designation on the Entity List. For example, if the Listed Entities obtained an item subject to the EAR prior to March 2, 2023, the Listed Entities would not be prohibited from continuing to access or use such item post-Entity List designation. However, the Listed Entities would be prohibited from obtaining additional quantities of, or updated versions of, such item as of March 2, 2023.

JBK confirmed that U.S. and non-U.S. persons/companies would not be prohibited from continuing to export, reexport, or transfer (in-country) items subject to the EAR to the Non-listed Entities as long as (i) the hardware, software, or technology are not exported, reexported or transferred, directly or indirectly, to the Listed Entities; (ii) such U.S. origin items not diverted to the Listed Entities by any other person; and (iii) the Listed Entities are not the purchaser, intermediate consignee, ultimate consignee or end-user of the items subject to the EAR. In addition, U.S. or non-U.S. suppliers may continue to provide items even to Listed Entities provided that: (i) the items are not subject to the EAR; or (ii) the parties obtain the necessary export licenses from BIS (subject to a licensing policy of denial). Based on JBK’s legal analysis and conclusions made after reviewing the information we provided and relevant U.S. law, we do not anticipate that the addition to the BIS Entity List will have a material effect on our business or research and development operations.

The Listed Entities purchased (prior to the Entity List designation) certain office software products which are U.S.-origin items. These office software programs are mostly required for our Group’s day-to-day operations and are not directly used to create and develop our solutions. These office software programs do not contribute to the revenue of our Group directly and procurement of such office software programs accounted for nil, 0.004% and 0.013% of our total procurement in 2020, 2021 and 2022, respective. Following the Entity List designation, the Listed Entities will source this type of software from an alternative Chinese manufacturer/supplier in the future and are already sourcing such non-U.S. software from

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suppliers in China. Further, the Entity List restrictions would not prohibit even the Listed Entities from purchasing from U.S. office software suppliers any products and services that are not subject to the EAR or where no export, reexport, or transfer occurs (*e.g.*, certain Software-as-a-Service products).

The Listed Entities previously purchased U.S.-branded office computers and monitors. Procurement of such office computers and monitors accounted for 0.04%, 0.03% and 0.04% of our total procurement in 2020, 2021 and 2022, respectively. Although we have reason to believe certain of these products may not be subject to the EAR, should the Listed Entities need to purchase any additional quantities of such products in the future, they will confirm with the manufacturers in writing that such products are indeed not subject to the EAR. Even if these products are subject to the EAR, (i) the Listed Entities are not prohibited from continuing to use those items subject to the EAR which were procured *prior* to the Entity List designation; (ii) we believe that going forward, the Listed Entities can source equivalent products not subject to the EAR from alternative suppliers at a comparable price and in a timely manner; and (iii) these particular products are used by the Listed Entities only for day-to-day operations and are not directly used to create and develop our software or technology. For these reasons and based on information we provided to JBK, JBK concluded that it did not expect the potential inability of the Listed Entities to source the above-mentioned office computers and monitors would have a material adverse impact on our business or operations.

To our knowledge, servers and related products incorporating U.S.-branded chips, are the only items procured by the Listed Entities which may incorporate components subject to the EAR. These servers and graphic cards include central processing units (CPUs) and AI accelerators, both of which are hardware components of our SageOne products. CPUs are general processors and essential for computing workloads, and AI accelerators are components for improving the speed and efficiency of AI workloads. Our separate U.S. export control counsel helped us prepare supplier certificates, aimed at collecting the information needed from the Listed Entities' suppliers to ascertain whether items supplied to the Listed Entities may be subject to the EAR or whether these suppliers otherwise expect their supply of items to the Listed Entities to be affected by Entity List restrictions on the Listed Entities. Information requested in such certificates included whether items supplied to the Listed Entities were manufactured or produced in the United States, transited through the United States, incorporated U.S.-origin components, or the "direct products" of certain controlled U.S.-origin software or technology (or are the direct product of a plant or major plant component that is itself the direct product of such controlled U.S.-origin software or technology). Where the items incorporated U.S.-origin components, suppliers were asked to provide information on the relative value of the U.S. components, and the particular version or model of the U.S. items incorporated in the product supplied to us. These supplier certificates were completed and returned by 19 of the top 20 suppliers of goods and services to the Listed Entities (the "Top Suppliers"). Purchases from these Top Suppliers represented 47.8% of our Group's total procurement in 2022. Based on the supplier certifications completed by the Top Suppliers, it appears that of this set of suppliers, only the suppliers of servers and graphics cards may incorporate components subject to the EAR.

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We do not believe that the Entity List restrictions regarding U.S.-branded chips in servers and graphics cards procured by our Group will have a significant effect on our Group's operations and services. As an initial matter, our suppliers report that they do not believe the U.S.-branded chips incorporated into such products were manufactured in the United States. If the U.S.-branded processors and devices are not of U.S.-origin, those components should not be included in the *de minimis* analysis. As a result, the servers containing such U.S.-branded chips should not be subject to the EAR. However, should the Listed Entities need to purchase any additional quantities of such products in the future, they will re-confirm with our suppliers that such products are indeed not subject to the EAR.

Even if the servers procured by the Listed Entities were subject to the EAR, *e.g.*, because the processor and devices incorporated within them are of U.S.-origin, the suppliers of such servers have reported that there are alternative Chinese-origin processors and devices that can be used in place of any U.S.-origin items. The Listed Entities are able, therefore, to source servers containing only chips that are neither U.S.-origin nor otherwise subject to the EAR. Moreover, SageOne is a software-defined product, designed to optimize computing, network and storage resources. Where the value of the SageOne products contributed by us primarily comes from the software developed by us, we optimize the design and architecture of such AIO solution, we do not significantly rely on the performance of CPUs and AI accelerators from specific suppliers.

One type of SageOne products already used servers incorporating exclusively Chinese-origin processors, the functions of which are equivalent to products using servers incorporating U.S.-branded processors. Moreover, for the year ended December 31, 2022 and the three months ended March 31, 2023, none of our contracts with customers specifically states that U.S.-origin chips or processors are required. We also believe it would not cause a significant delay to begin sourcing servers with only Chinese processors. As stated above, our suppliers can and already do supply certain products with only Chinese-origin processors and, therefore, the Listed Entities would need only change the products procured from our existing suppliers and would not need to seek new suppliers as a result of the Entity-List Designation.

Moreover, sales of AIO products which do not contain U.S.-branded chips accounted for more than half of sales of our AIO solutions for each of the year ended December 31, 2022, and the three months ended March 31, 2023. Users of our products which do not contain U.S.-branded chips include well-recognized companies, demonstrating that such models are suitable for, and respected by, such lighthouse users. In addition, according to CIC, many Chinese-manufactured chips have demonstrated comparable performance with U.S.-branded chips, and the supply of such Chinese chips is adequate. We also conducted our own analyses comparing the relative performance of AIO products containing Chinese chips and AIO products containing U.S.-branded chips, and concluded that the performance of these AIO products are comparable. Moreover, based on the comparison between AIO products containing Chinese chips and AIO products containing U.S.-branded chips, there is no material difference between these products in terms of performance, functionality, set-up time, procurement costs, replacement frequency or maintenance costs. For these reasons, we believe replacing the U.S.-branded processors and devices with Chinese-origin alternatives would not have a material adverse impact to our Group's business operations or financial performance.

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Based on the facts provided and JBK's legal analysis under the U.S. export control laws, JBK was of the view that any potential inability of the Listed Entities or their non-listed affiliates to purchase or procure servers containing U.S.-origin content should not have a significant adverse impact on the Listed Entities or their affiliates.

The Listed Entities do not plan to procure U.S.-origin items, or other items subject to the EAR in the future, unless they can do so in compliance with U.S. export controls. We were unable to identify any items subject to the EAR not currently sourced or used by the Listed Entities which they would need to use or plan to use in future research and development, operations, or production activities.

Regarding our research and development activities, we are able to rely on only Chinese-produced items. Our research and development activities do not rely on U.S.-origin hardware or software, or hardware or software that is otherwise subject to the EAR.

In light of the above, our Directors are of the view that the Entity List designation of the Listed Entities should not have any material adverse impact on our business and financial performance. Such conclusion is made based on a number of conservative assumptions, including (i) we assumed that all entities located at the address listed on the U.S. Entity List are subject to the Entity List restrictions. However, it may be the case that the restrictions do not apply to all such Listed Entities; (ii) we assessed the likely impact of the designation of the Listed Entities to the U.S. Entity List based on the assumption that servers procured by the Listed Entities are subject to U.S. export controls, e.g., because the chips used are of U.S.-origin.; and (iii) we considered the risk that the BIS Entity List designation could be expanded to cover additional entities in our Group beyond those currently identified. As of the date of this Document, none of our material investors, customers, or suppliers have withdrawn their investment, ceased doing business with us due to the BIS Entity List designation, or notified us in writing or otherwise of their intention to do so. In addition, based on our best knowledge, we are not aware of (i) any existing customers/suppliers that decided to terminate their business relationship that or reduce their purchases/supplies from us due to the Entity-List addition, or due to the restrictions on the Listed Entities' ability to purchase, acquire, or otherwise access items subject to the EAR without a license from BIS, or (ii) any potential customer that chose not to cooperate with us due to the Entity-List addition, or due to the restrictions on the Listed Entities' ability to purchase, acquire, or otherwise access items subject to the EAR without a license from BIS. We are also not aware of any litigation or arbitration proceedings or other legal actions arising from or in connection with the BIS Entity List designation. According to CIC, after the Entity-List designation, there is no change in the overall competitive landscape or our potential market share due to the Entity-list designation considering that the Entity List designation of the Listed Entities should not have any material adverse impact on our business and financial performance.

In sum, based on the information provided to JBK for their review and legal compliance analysis, as supplemented by information provided by our suppliers, JBK concluded that: (i) many of the hardware and software items procured by the Listed Entities from the Top Suppliers do not appear to be subject to the EAR; and (ii) those items procured by the Listed Entities that do appear to be subject to the EAR (or which the Company cannot definitively confirm are not subject to the EAR) are either not material to the development of the

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Company's products, or can be replaced with alternative and equivalent items not subject to the EAR, at a comparable price and in a timely manner. For this reason, JBK is of the view that the designation of the Listed Entities to the Entity List should not have a material impact on the business or operations of our Group.

Based on the due diligence performed by the Sole Sponsor, and considering the Directors' and JBK's views mentioned above, nothing has come to the attention of the Sole Sponsor that would cause it to cast any doubt on the views of the Directors, or on the views of JBK.

Internal Control Measures

We have recently established a series of export control compliance measures to address and mitigate risks related to U.S. export controls, including the following:

- We engaged outside U.S. export controls compliance counsel (separate from JBK) to advise on the development of a trade controls compliance program to mitigate the risk of violation U.S. export controls and sanctions.
- On April 7, 2023, we adopted a Global Trade Controls Compliance Policy, as well as standard operating procedures addressing sanctions and export controls compliance. The policy and each set of procedures were formally approved by our management and leadership team.
- On April 7, 2023, our management circulated to all Group employees a management commitment statement, outlining and restating our commitment to compliance with applicable export controls. We are in the process of implementing the measures outlined in the policy and procedures.
- We also adopted standard language for use in our sales contracts and purchase contracts addressing compliance with applicable export controls and sanctions laws and regulations. The contractual language requires the Group's business partners to comply with all applicable export control and economic and trade sanction laws, regulations and resolutions formulated by China, the United States, and other applicable jurisdictions and to disclose to us any connections to restricted persons.
- Our customers must also attest to the accuracy of the information provided regarding the end-use and end-users of our products, and refrain from selling or exporting our products to restricted persons or persons in sanctioned or high-risk countries or for prohibited end uses.
- The Company's suppliers must attest to the accuracy of the information provided in the supplier certificates, and that the items supplied are not supplied in violation of U.S. export control laws.

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- We screened our current customers, suppliers, business partners of the Listed Entities, and other third parties with which these companies currently do business, against sanctions and export control restricted party lists maintained by the EU, United States, and U.K. and determined that none of our existing business partners are listed on any such lists.
- Our outside U.S. export controls compliance counsel recently conducted two separate training programs for us on compliance with U.S. sanctions and export controls. These training programs were attended by our senior executives and management. Pursuant to the Global Trade Controls Compliance Policy we adopted, we will continue to conduct trade controls compliance training on a regular basis.

JBK has undertaken a desk-top review of our recently adopted trade controls compliance measures and are of the view that the trade controls compliance program, upon implementation and if properly enforced, should provide a reasonable internal control framework for us to identify and mitigate any material risk relating to the Listed Entities having been added to the BIS Entity List.

Our Directors, after consulting with its outside U.S. export controls compliance counsel, are of the view that the trade controls compliance program, upon implementation, is adequately tailored to address and mitigate the risk of violating U.S. export controls, and the relevant compliance measures, if properly implemented and enforced, will provide a reasonable internal control framework for the Company to identify and mitigate any material risk relating to the Entity List Designation.

LEGAL PROCEEDINGS AND COMPLIANCE

During the Track Record Period and up to the Latest Practicable Date, we had not been involved in any actual or pending legal, arbitration or administrative proceedings (including any bankruptcy or receivership proceedings) that we believe would have a material adverse effect on our business, results of operations, financial condition or reputation and compliance.

According to our PRC Legal Advisor, the business operations we engaged in had been carried out in compliance with applicable PRC laws and regulations in all material respects during the Track Record Period and up to the Latest Practicable Date.

LICENSES AND PERMITS

The following table sets forth the details of the material licenses and permits necessary for the business operations in which we engaged in China.

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License/Permit	Entity Holding the License/Permit	Grant Date	Expiration Date
Customs Record Receipt of Consignees and Consignors of Imported and Exported Goods	4Paradigm Beijing	June 21, 2019	Long-term
Work Safety Permit	Guangzhou Jianxin	December 03, 2021	December 03, 2024
The Construction Enterprise Qualification Certificate	Guangzhou Jianxin	December 24, 2021	December 31, 2023*
Guangdong Province Qualification Certificate for Design, Construction and Maintenance of Safety Technology Protection System	Guangzhou Jianxin	September 27, 2021	September 26, 2023*

* We plan to file application to renew the Construction Enterprise Qualification Certificate and the Guangdong Province Qualification Certificate for Design Construction and Maintenance of Safety Technology Protection well in advance of these certificates' expiration. We do not expect any legal impediment to the renewal of these certificates.

During the Track Record Period and up to the Latest Practicable Date, we had obtained all material licenses, permits, approvals and certificates necessary to conduct our actual business operations from the relevant government authorities in the PRC, and such licenses, permits, approvals and certificates remained in full effect.

RISK MANAGEMENT AND INTERNAL CONTROL

We have established and currently maintain risk management and internal control systems consisting of policies and procedures that we consider to be appropriate for our business operations. We are dedicated to continually improving these systems. We have adopted and implemented comprehensive risk management policies in various aspects of our business operations. Our Board of Directors is responsible for the establishment and updating of our internal control systems, while our senior management monitors the daily implementation of the internal control procedures and measures with respect to each subsidiary and functional departments.

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Financial Reporting Risk Management

We have adopted comprehensive accounting policies in connection with our financial reporting risk management, such as financial management, budget management and financial statement preparation. We also have procedures in place to carry out such accounting policies, and our finance department reviews our management accounts in accordance with such procedures. In addition, we provide ongoing training to our finance staff to ensure that these policies are well-observed and effectively implemented.

Information System Risk Management

Sufficient maintenance, storage and protection of our data and other related information are critical to our success. We have implemented relevant internal procedures and controls to ensure that our data is protected and that leakage and loss of such data are avoided.

We have implemented comprehensive internal policies on protecting data privacy and security under the supervision of our Chief Architect, and we have established a Data and Information Security Committee, members of which include the responsible persons in various departments such as IT, R&D, Solution Deployment, Human Resources and Compliance. The committee is responsible for formulating data and information security strategies, and decision-making in material data and information incidents. We also engage external legal counsel to review and update our internal policies and ensure continuous compliance with all applicable laws and regulations.

We implement a robust internal authentication and authorization system to ensure that our confidential and important data can only be accessed for authorized use and by authorized personnel. We have clear and strict authorization and authentication procedures and policies in place. Our employees only have access to data which is directly relevant and necessary for their responsibilities and for limited purposes and are required to verify authorization upon every access attempt.

We have established an all-round information system in reference to data security requirements, national standards and industry best practices and intend to continually invest heavily in data security and privacy protection. Our information system applies multiple layers of safeguards, including both internal and external firewalls, to identify and protect us against security attacks. We have completed various information security, privacy and compliance certifications/validations, proving the security and reliability of our data protection technologies. For example, in December 2020, we passed ISO27001 (international standard for information security) and obtained the “Information Safety Management System Certification,” and in February 2020, our Sage Platform obtained the ePrivacyseal, which illustrates our commitment to comply with the requirements of the GDPR.

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During the Track Record Period and up to the Latest Practicable Date, we did not experience any material information leakage or loss of our data. See “– Data Privacy and Security” in this section for more information about our information security procedures and policies.

Compliance and Intellectual Property Risk Management

We have designed and adopted strict internal procedures to ensure the compliance of our business operations with the relevant rules and regulations, as well as the protection of our intellectual property rights. Our legal department examines the contract terms and reviews all relevant documents for our business operations, including licenses and permits obtained by the counterparties or us to perform contractual obligations and all the necessary underlying due diligence materials, before we enter into any contract or business arrangements. There was no material and systemic non-compliance during the Track Record Period and as of the Latest Practicable Date.

We have in place detailed internal procedures to ensure that our in-house legal department reviews our solutions and services, including upgrades to existing solutions, for regulatory compliance before they are made available to the general public. Our legal department is also responsible for obtaining any requisite governmental pre-approvals or consent, including preparing and submitting all necessary documents for filing with relevant government authorities within the prescribed regulatory timelines and ensuring all necessary application, renewals or filings for trademark, copyright and patent registration have been timely made to the competent authorities.

Internal Control Risk Management

We have designed and adopted strict internal procedures to ensure the compliance of our business operations with the relevant rules and regulations. We maintain internal procedures to ensure that we have obtained all material requisite licenses, permits and approvals for our business operation, and conduct regular reviews to monitor the status and effectiveness of those licenses and approvals. We obtain requisite governmental approvals or consents, including preparing and submitting all necessary documents for filing with relevant government authorities within the prescribed regulatory timelines.

Human Resources Risk Management

We have established internal control and risk management policies covering various aspects of human resource management such as recruitment, training, work ethics and legal compliance. We maintain high standards in recruitment with strict procedures to ensure the quality of new hires and provide specialized training tailored to the needs of our employees in different departments. We also conduct periodic performance reviews for our employees, and their remuneration is performance-based. We monitor the implementation of internal risk management policies on a regular basis to identify, manage and mitigate internal risks in relation to the potential incompliance with our code of conduct, work ethics, and violations of our internal policies or illegal acts at all levels of our Group.

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In particular, we have in place a set of comprehensive anti-corruption and anti-bribery policies within our company (the “Anti-corruption Policy”) to promote and support the compliance with applicable anti-corruption laws and regulations, providing guidance on anti-corruption and anti-bribery practices, the whistleblowing channel, as well as the responsibilities for implementing the policies. All of our employees and third-party agents are required to understand and comply with the Anti-corruption Policy, and we from time to time provide anti-corruption trainings to our employees and third-party agents. Under our current whistleblowing policy, one who becomes aware of any possible violations of applicable law or the Anti-corruption Policy should report the relevant incidents to the legal department immediately. Such reports will be treated with confidentiality, and the reported matter will be investigated and handled in a prompt, independent and fair manner.

Investment Risk Management

Our investment department is responsible for investment project sourcing, screening, execution and portfolio management. The department sources investment projects in accordance with our investment strategy, and conducts thorough pre-investment due diligence to assess the risks, business synergies and potential return of the investment projects.

AWARDS AND RECOGNITION

The following table sets forth major awards and recognitions we received as of the Latest Practicable Date.

Award/Recognition	Award Year	Awarding Institution/Authority
Ranked 1st in the IDC 2022 Market Share of Machine Learning Platforms in China	2022	International Data Corporation (IDC)
Ranked 1st in the Market Share of Machine Learning Platforms in China	2021	International Data Corporation (IDC)
Ranked 1st in the Market Share of Intelligent Decision-Making Solutions in China	2021	International Data Corporation (IDC)
Global Representative Vendor of Composite AI Emerging Technologies and Trends Impact Radar™	2020	Gartner
Global Representative Vendor of AutoML in 2020 Top Ten Strategic Technology Trends™	2020	Gartner

BUSINESS

Award/Recognition	Award Year	Awarding Institution/Authority
Ranked No. 1 in the China Predictive and Analytics and Machine Learning Wave™	2020	The Forrester Wave
World’s 50 Smartest Companies	2020	MIT Technology Review
World Champion of KDD Cup AI 100	2020	KDD Presidium
Ranked Top 1% in Kaggle Structured Data and Image Classification Competition	2019 & 2020	CB Insights
Wu Wenjun AI Science and Technology Award First Prize	2019	Kaggle
	2016	Chinese Association for Artificial Intelligence