
INDUSTRY OVERVIEW

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SOURCE OF INFORMATION

We have commissioned Frost & Sullivan to conduct market research and analysis of selected industries and prepare a report entitled *Independent Market Research on China Telecom Software Product and Related Service Industry*, which is referred to in this prospectus as the Frost & Sullivan Report. Frost & Sullivan is an independent global market research and consulting firm founded in 1961 in New York that offers industry research and market strategies. We were charged RMB630,000 by Frost & Sullivan in connection with its preparation of the Frost & Sullivan Report, which we believe reflects market rates for reports of this type. Our payment of such fee is not contingent upon the results of its research and analysis.

In preparing the Frost & Sullivan Report, Frost & Sullivan conducted detailed primary research which involved in-depth telephone and face-to-face interviews with industry participants and secondary research which involved reviewing annual reports, industry publications and data based on its own research database. Projected data, including market size estimates, were obtained from historical data analysis with reference to macroeconomic data and specific industry-related factors. Frost & Sullivan's forecasting methodology integrates several forecasting techniques with its internal analytics of critical market elements investigated in connection with its market research work. These elements include, among others, identification of market drivers and restraints and integration of expert opinion. In preparation of the Frost & Sullivan Report, Frost & Sullivan assumed: (i) the social, economic and political environment of PRC is expected to remain stable from 2018 to 2022, and (ii) key industry drivers are expected to continue to affect the market from 2018 to 2022.

Except as otherwise noted, all of the data and forecasts contained in this section have been derived from the Frost & Sullivan Report.

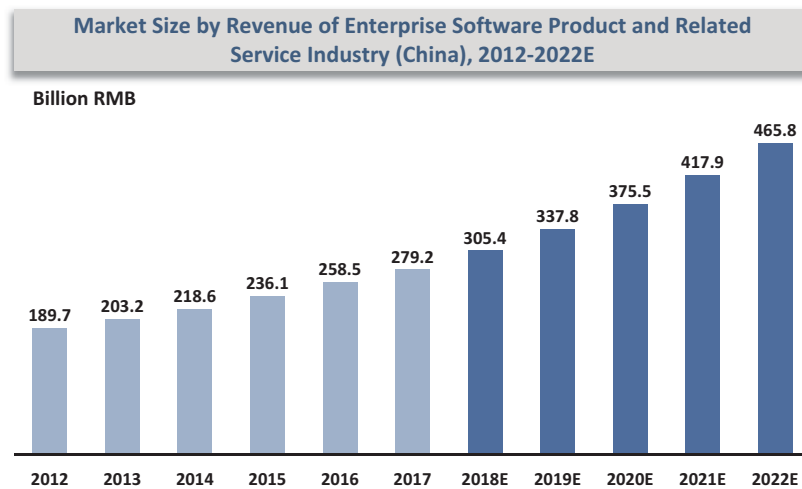
CHINA'S ENTERPRISE SOFTWARE PRODUCT AND RELATED SERVICE MARKET

Enterprise software products refer to software systems designed to operate in corporate environments, primarily including customer relationship management (CRM) products, charging and billing products, enterprise resource planning (ERP) products, supply chain management (SCM) products, manufacturing operations management (MOM) products, big data products and business

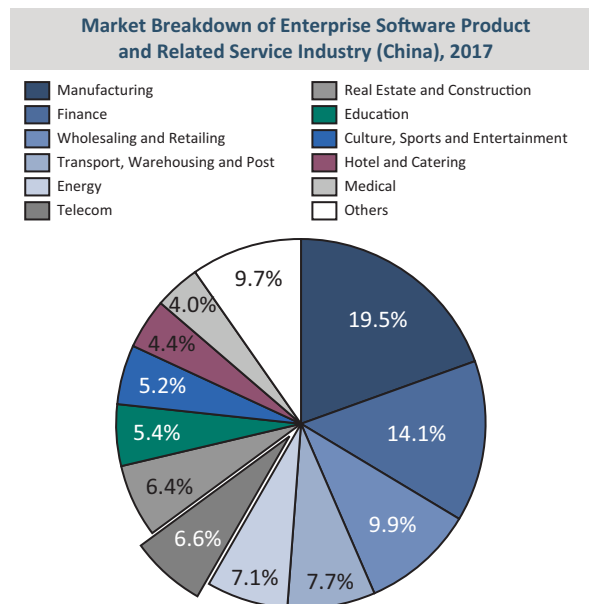
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intelligence (BI) products. Enterprise software services refer to enterprise software related services ranging from system integration and configuration, operation and maintenance to system upgrade and expansion. Enterprise software products and related services are more complex than services targeting individual users and require deep understanding of the relevant enterprises' business as well as extensive software development capabilities.

As enterprises from a wide variety of industries continue to invest in enterprise software products and related services that enable them to enhance operating efficiency and flexibilities and facilitate effective communication with an expanding customer base, the total market size of China's enterprise software product and related service market by revenue increased from RMB189.7 billion in 2012 to RMB279.2 billion in 2017, representing a CAGR of 8.0%, and is expected to reach RMB465.8 billion by 2022, representing a CAGR of 11.1% from 2018 to 2022.



Enterprise software products and related services are widely used across different industries in China. The telecom industry contributed 6.6% of China's enterprise software product and related service market's market share in terms of 2017 revenue.



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Market Drivers and Trends

The key drivers and trends for China's enterprise software product and related service market include:

Favorable Industry Policies. The Chinese government has promulgated numerous favorable policies in recent years, such as (i) the NDRC's Thirteenth Five Year Plan for the National Economic and Social Development (《中華人民共和國國民經濟和社會發展第十三個五年規劃綱要》), which sets forth various measures to promote internet as a national strategy and deepen the integration of internet with different sectors, (ii) Guidance of the Ministry of Industry and Information Technology on Accelerating and Promoting Independent Innovation in the Information Industry (《關於加快推進信息產業自主創新的指導意見》), which proposes to enhance independent innovation in the information industry, and (iii) Notice of the Ministry of Finance on Issues concerning Preferential Enterprise Income Tax Policies for the Software and Integrated Circuit Industries (《關於軟件和集成電路產業企業所得稅優惠政策有關問題的通知》), which provides preferential tax treatments for the software industry. These favorable industry policies have accelerated the enhancements and upgrades of enterprise software products and related services and are expected to drive sustainable growth in the enterprise software product and related service market.

Business Transformation and Digitalization. To stay competitive in the dynamically-changing digital era, it is essential for Chinese enterprises to achieve business transformation and digitalization and build digital ecosystems which help them interact with customers and business partners and improve performance. As such, there has been an increasing demand for high-performance, mission-critical enterprise software products and related services that enable Chinese enterprises to establish or upgrade their business and operation support systems to accelerate time-to-market, diversify revenue streams, enhance operating efficiencies and achieve cost savings.

Emerging Technologies. The emergence of new technologies such as cloud computing, microservices, docker, big data, AI, machine learning, IoT and SDN/NFV have provided Chinese enterprises with opportunities to increase revenue, enhance operating efficiency and/or achieve cost savings. For example, cloud computing technology releases enterprises from the significant costs and complexities associated with establishing and managing on-premise infrastructure, and as a result help them achieve increased business flexibility, faster time-to-market and cost savings. The increased application of big data technologies have enabled enterprises to reduce manual operations and organize their management, production, sales and marketing and other aspects of their business operations in a more intelligent, agile manner. Enterprises are therefore prompted to upgrade or reconstruct their existing IT systems to accommodate these new technology trends, which will in turn accelerate the development and innovation of enterprise software products and related services.

Customization. In order to stay competitive in a rapidly changing business environment, Chinese enterprises are in high demand of software that enables real-time response to customer requests and rapid launch of products and related services. Mass market, standardized software is often unable to completely match the unique requirements and characteristics of different enterprises. To maintain a competitive edge, it is essential for enterprise software providers to design, develop and deliver software products tailored to an enterprise's specific IT and network structure as well as business and operational needs and at the same time offer a comprehensive range of related services that maximize the value of these software products, such as system installation and configuration, operation and maintenance and system upgrades.

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Mobilization. Real-time communication and information delivery is key for enterprises to succeed in this information era. With the proliferation of mobile internet and workforces becoming increasingly mobile, there has been an increasing demand for enterprise software that enables real-time, reliable and efficient communication both internally and with customers via mobile channels, allowing workers to always have access to customer and other data and stay connected while working on the move. Software providers with extensive telecom-related knowledge and expertise are therefore likely to gain a competitive edge and receive higher level of recognition.

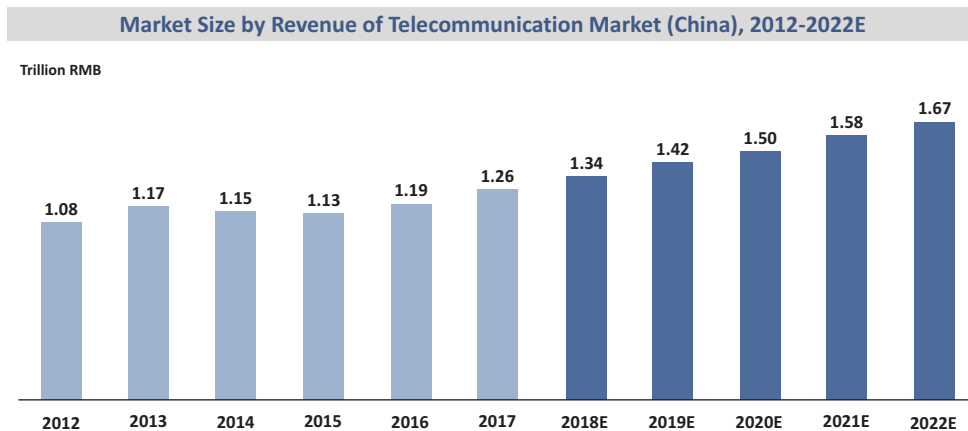
Localization. Cloud technologies are gradually being adopted by Chinese enterprises to achieve increased operating flexibility, faster time-to-market and cost savings. Compared to public clouds, private clouds are quickly gaining popularity among Chinese enterprises, especially large Chinese enterprises who demand utmost level of privacy of business data, because of their localized deployment, greater privacy, more simplified management and maintenance and more reliable performance. The wider adoption of private clouds among Chinese enterprises is expected to fuel the future development of enterprise software products that can be deployed on private clouds.

CHINA'S TELECOM SOFTWARE PRODUCT AND RELATED SERVICE MARKET

China's Telecom Industry

China's telecom industry is dominated by China Mobile, China Unicom and China Telecom. China Tower is also a major player in this industry. Chinese telecom operators provide a wide variety of telecom services ranging from traditional fixed and mobile phone services to value-added services.

The market size of the telecom industry in China grew from RMB1.08 trillion in 2012 to RMB1.26 trillion in 2017, representing a CAGR of 3.2%. As Chinese telecom operators continue to compete intensively on, and invest significantly in, product upgrades and 5G network developments, the market size of China's telecom industry is projected to grow at a higher CAGR of 5.7% from 2018 to 2022, reaching RMB1.67 trillion in 2022.



Overview of China's Telecom Software Product and Related Service Market

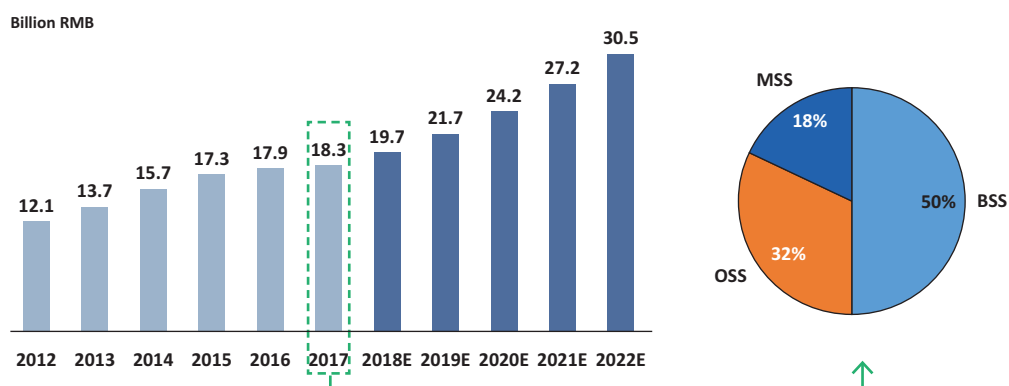
Telecom software products and related services are designed to provide telecom operators with business capability and support their daily operations. The market size of China's telecom software product and related service market by revenue reached RMB18.3 billion in 2017, representing a CAGR of 8.6% from 2012 to 2017. The growth in market size slightly slowed down between 2015 and 2017, primarily due to the shift in telecom operators' investment and strategic focus from developing and

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optimizing the 3G and 4G networks to constructing the 5G networks. The demand for telecom software products and related services is forecasted to experience accelerated growth, driven by (i) telecom operators' increased investment in the development of the 5G networks, as encouraged by new government policies (such as the Notice on the 3-Year Action Plan of Expanding and Upgrading of Information Consumption (2018-2020) 《擴大和升級信息消費三年行動計劃（2018-2020年）》 released by the MIIT and NDRC), (ii) Chinese telecom operators will continue to expand their business and conduct system upgrades and expansions to keep abreast of new technology trends, and (iii) to cater to each enterprise's specific business model and customer needs, tailored operation and integration services are becoming increasingly favored by Chinese telecom operators. As a result, the market size of China's telecom software product and related service market by revenue is expected to amount to RMB30.5 billion by 2022, representing a CAGR of 11.5% from 2018 to 2022.

Market Size by Revenue of Telecom Software Product and Related Service Industry (China), 2012-2022E

Market Breakdown of Telecom Software Product and Related Service Industry (China), 2017



Telecom software products and related services can be divided into the following three categories:

- **BSS products and services.** BSS products and services refer to software products and services that telecom operators use to run their business operations towards customers, such as CRM, charging and billing and big data products and services;
- **OSS products and services.** OSS products and services refer to software products and services that telecom operators use to manage their networks so as to better serve customers, such as network management and network optimization products and services; and
- **MSS products and services.** MSS products and services refer to software products and services that telecom operators use to manage various domains of their businesses, such as financial management and procurement management products and services.

In 2017, the market size of China's BSS, OSS and MSS software products and related services markets by revenue accounted for 50%, 32% and 18% of China's telecom software product and related service industry, respectively.

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Entry Barriers

The key barriers for entering into China's telecom software product and related service market include:

Mission-Critical Systems. Telecom operators require high-performance, mission-critical software systems which are able to address their increasingly complex business and operational needs and serve as vital connections between these telecom operators and their customers. Only telecom software product and related service providers with a large amount of advanced, proprietary technologies (such as real-time data processing, concurrent data processing, distributed computing and big data analysis) that are familiar with China's telecom industry and telecom operators' business and technology environments are able to develop and deploy these mission-critical systems.

Complex Integration. Telecom software systems are often intricately connected and complement each other. For instance, a telecom operator's big data platform analyzes data generated from its CRM and charging & billing systems, and extract value and intelligence from these data to optimize the operations of the CRM and charging & billing systems. As such, a telecom operator generally prefers to source telecom software product and related services from the same vendor in order to maintain system continuity and compatibility and minimize the risks and costs related to integrating disparate systems from multiple vendors.

Long-Term Relationship. Telecom operators tend to stick with telecom software product and related service providers with whom they have worked on a long-term basis. These telecom software and product service providers have in-depth understanding of the telecom operators' business models and are able to provide customized products and related services based on their demands. In addition, these providers are often responsible for providing ongoing operation and maintenance services for the software systems deploying their products, which allow them to remain in close contact with the telecom operators to secure additional cooperation opportunities. This long-term, trust relationship makes it difficult for new entrants to replace the existing telecom software product and related service providers in a short period of time.

Participation in Technical Standard Formulation. Telecom operators have formulated detailed technical standards for their BSS/OSS and other telecom software systems. Leading telecom software product and related service providers are often invited to participate in the formulation of these technical standards, which enables them to direct their R&D efforts and formulate product roadmaps accordingly, effectively setting them apart from new entrants who may not have a thorough understanding of these technical standards when developing their products and related services.

Market Drivers and Trends

The key drivers and trends for China's telecom software product and related service market include:

Business Model Innovation. Traditional telecom services primarily include voice call and text message services, which only telecom operators are able to provide, enabling them to dominant the telecom industry. However, with the proliferation of the internet in China, the overall telecom industry value chain and ecosystem is undergoing fundamental changes: smart terminal manufacturers can now directly face customers and content and service providers are beginning to expand their roles across the telecom industry value chain. In response to these changes, telecom operators are innovating their

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business model in order to cooperate with business partners across the telecom industry value chain (such as the establishment of specialized companies and divisions focusing on specific operational aspects or customer groups), generating substantial demands for telecom software products and related services tailored to the internet business model.

Technological Innovation. The emergence and deployment of new technologies such as artificial intelligence, big data analytics, IoT, SDN/NFV, cloud computing and docker is continuously reinventing the way telecom operators operate. For example, the application of artificial intelligence technologies help telecom operators provide better customer services through data analytics, data mining and customer behavior predictions. Telecom operators are propelled to upgrade their existing business and operation support systems or building new ones in order to adapt to these emerging technologies, generating significant demand for corresponding software products and services. For example, access through a massive amount of smart terminals would require telecom operators to have higher data processing capabilities, which in turn prompts telecom software product and related service providers to develop big data products with higher data processing capabilities.

Reorganization of Network Infrastructure. Telecom operators used to rely solely on communication technology (CT) to provide traditional telecom services and have constructed network infrastructure accordingly. The continuous development of network technologies such as SDN/NFV has provided opportunities for enterprises to operate in a more agile and highly efficient manner by integrating CT and IT. Providers of telecom software products and services that facilitate telecom operators' reorganization of network infrastructure to a converged CT and IT network infrastructure are therefore expected to secure additional business opportunities.

5G and Internet of Things. Telecom operators are prompted to upgrade their business and operation support systems in order to adapt to new business models powered by 5G and Internet of Things. For example, 5G will enable different pricing models for different terminals, which would generate substantial demand for charging & billing products with more complex capabilities. Telecom operators will also require software platforms with larger scale and greater computing capabilities in order to adapt to the proliferation of Internet of Things, creating business opportunities for providers of corresponding telecom software products.

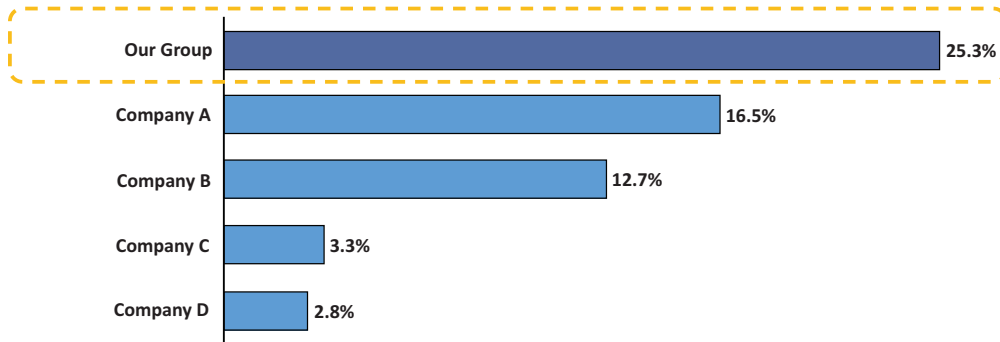
Digital Transformation. Digital transformation is the main component for the future development of telecom industry in China. Cloud computing will continue to revolutionize the way telecom operators operate, and telecom operators will continue to move certain aspects of their business operations into the cloud to achieve centralized management of resources and significant cost savings. In addition, big data technologies will be widely applied to extract information and intelligence extracted from massive amount of data. Demand for telecom software products and related services facilitating this digital transformation will continue to rise.

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Competitive Landscape

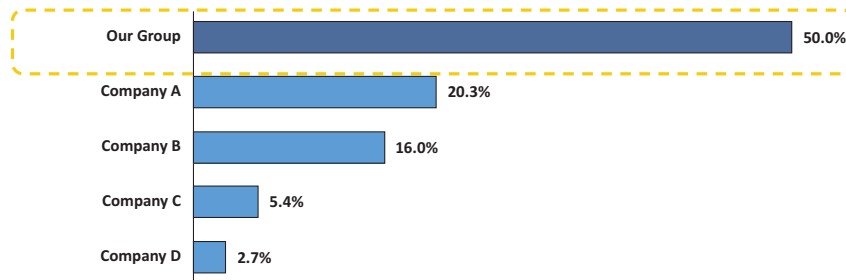
The market size of China's telecom software product and related service market by revenue reached RMB18.3 billion in 2017 and the top five players accounted for an aggregate of 60.6% of the market share as measured by revenue in 2017.

Top 5 Telecom Software Product and Related Service Providers by Revenue (China), 2017



The market size of China's BSS software product and related service market by revenue reached RMB9.2 billion in 2017 and the top five players accounted for an aggregate of 94.4% of the market share as measured by revenue in 2017.

Top 5 BSS Software Product and Related Service Providers by Revenue (China), 2017



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The following table sets forth details of the top five players in China’s telecom software product and related service market and China’s BSS software product and related service market by revenue in 2017:

Industry Ranking (by 2017 revenue)	Company Name	Listing Venue	Major Business
1	Our Group	To be listed on the Stock Exchange of Hong Kong Limited	Telecom software products and services with a focus on BSS/OSS software products and services
2	Company A	unlisted	Communications technology (ICT) infrastructure and smart devices with integrated solutions covering telecom networks, IT, smart devices and cloud services, among others.
3	Company B	The Stock Exchange of Hong Kong Limited; Shenzhen Stock Exchange	Communications technology (ICT) infrastructure and related solutions, cloud computing and IT solutions, among others.
4	Company C	Shenzhen Stock Exchange	Application software products for telecom, public security, financial and other industries
5	Company D	Shenzhen Stock Exchange	Collection, management, data analysis as well as provision of related application products, services and solutions

CHINA’S NON-TELECOM ENTERPRISE SOFTWARE PRODUCT AND RELATED SERVICE MARKET

Non-telecom enterprise software products and related services refer to enterprise software products and related services developed for the finance, manufacturing, medical, retail, energy and other non-telecom enterprise sectors:

- **Finance sector.** Enterprise software systems for the finance sector include deposit management, loan management, risk management, foreign exchange trading and other application systems. These systems are highly integrated so that they can be accessed through any online or offline channel, such as bank counter, online banking or telephone banking. CRM systems are crucial to the finance sector as they analyze unstructured customer data, create comprehensive customer profiles and help enterprises in the finance sector expand their customer base and conduct precision marketing. In particular, the market size by revenue of enterprise software products and related services in China’s banking industry reached RMB14.4 billion in 2017. This industry is very fragmented with over 2,000 industry participants providing related products and services. The market size by revenue of enterprise software products and related services in China’s insurance industry reached RMB7.9 billion in 2017. This industry is very fragmented with approximately 800 to 1,500 industry participants providing related products and services.
- **Manufacturing sector.** Enterprise software systems for the manufacturing sector evolve around ERP systems, and include CRM, technical expertise management, finance management and SCM systems.

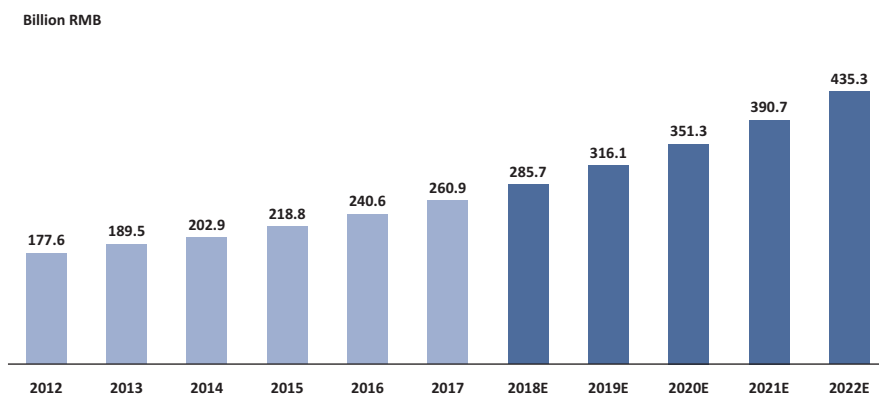
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- **Medical sector.** In addition to conventional office automation (OA) systems, enterprise software systems in the medical sector include CRM systems, product lifecycle management (PLM) systems and ERP systems.
- **Wholesale and retail sector.** Enterprise software systems in the wholesale and retail sector mainly include CRM systems, ERP systems and SCM systems.
- **Energy sector.** Enterprise software systems in the energy sector focuses on the security of the production process, and primarily include ERP systems, operation and production management systems and supervision systems. ERP systems manages equipment, commodities and materials in production procedures. The market size by revenue of enterprise software products and related services in China's energy sector reached RMB19.8 billion in 2017. The sector is very fragmented with over 2,000 industry participants providing related products and services.
- **Postal sector.** Enterprise software systems in the postal sector are deployed around CRM systems, campaign management systems, channel management systems and ERP systems. Management supporting systems such as visual operation and maintenance management systems, cost management platform database systems and remote centralized monitoring systems are also widely used in this sector. The market size by revenue of enterprise software products and related services in China's postal sector reached RMB6.5 billion in 2017. This sector is very fragmented with approximately 800 to 1,500 industry participants providing related products and services.
- **Cable TV sector.** Software products such as CRM and ERP products enable cable TV enterprises, especially large-size broadcasting and cable TV groups to achieve convenient information communication, effective, paperless office and strengthen control of group companies. The market size by revenue of enterprise software products and related services in China's cable TV sector reached RMB3.6 billion in 2017. This sector has approximately 500 to 700 industry participants providing related products and services.
- **Transportation sector.** The market size by revenue of enterprise software products and related services in China's transportation sector reached RMB7.8 billion in 2017. This sector is very fragmented with approximately 1,200 to 1,500 industry participants providing related products and services.

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In 2017, the market size of China's non-telecom enterprise software product and related service market by revenue reached RMB260.9 billion, representing a CAGR of 8.0% from 2012 to 2017. With the development of the Chinese economy and the blooming of numerous industries, there will be rising demand for enterprise software system upgrades to keep abreast with the latest information technology. The demand for non-telecom enterprise software products such as ERP, HRM, CRM and billing system is forecasted to experience continuous growth in the future. According to the Frost & Sullivan Report, the market size of China non-telecom enterprise software product and related service market by revenue is expected to reach RMB435.3 billion by 2022, representing a CAGR of 11.1% from 2018.

Market Size by Revenue of Non-Telecom Enterprise Software Product and Related Service Industry (China), 2012-2022E



Entry Barriers

The key barriers for entering into China's non-telecom enterprise software product and related service market include:

Customer stickiness. Replacing an enterprise's entire existing back-end system is costly and time-consuming, therefore enterprises tend to work with the same software and related service providers in terms of system upgrade and expansion instead of switching to new providers. Enterprises also exhibit high brand loyalty, especially toward leading software product and related service providers with nationwide coverage. It requires significant capital investment as well as investments in building sales and marketing, customer services and other capabilities for new entrants to attract customers that have already established deep relationship with leading providers.

Technology barrier. Enterprises prefer to work with software and related service providers that are able to provide advanced software products and end-to-end, professional services, which require strong technology and R&D capabilities. It takes significant time and resources for new entrants to build up such technology capabilities.

Deep understanding of industry- and company-specific needs. The needs and requirements of non-telecom enterprises in terms of software products and related services differ significantly from industry to industry. Software product and related service providers who have accumulated deep insights of non-telecom enterprises' industry environment and business models over years of collaboration with these enterprises are able to provide tailored software products and related services catering to the enterprises' industry- and company-specific needs and requirements. Such capabilities are difficult for new entrants to replicate.

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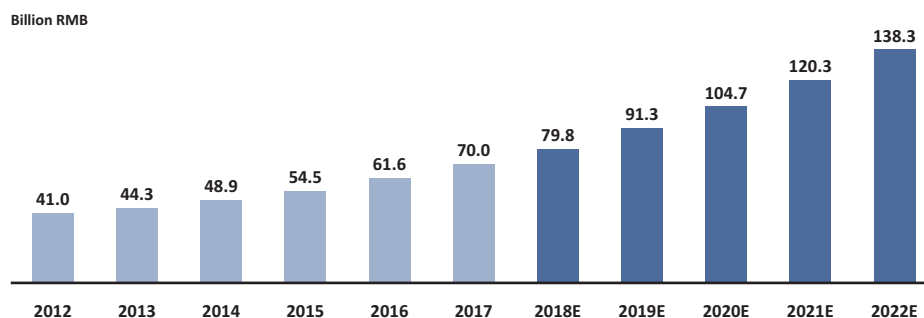
CHINA'S DATA-DRIVEN OPERATION SERVICE MARKET

Data-driven operation services refer to the comprehensive data operational analytics services provided for the purpose of analyzing customer behavior and increasing operational efficiency and customer value by leveraging the service providers' strong data analytical skills, deep insights in operation scenarios and extensive industry expertise and technical capabilities.

The market size of China's data-driven operation service market by revenue has experienced strong growth in recent years and reached RMB70.0 billion in 2017, representing a CAGR of 11.3% from 2012 to 2017. The market size of China's data-driven operation service market by revenue is expected to reach RMB138.3 billion in 2022, representing a CAGR of 14.7% from 2018 to 2022. The key drivers behind this strong growth include:

- there are rising demands for enterprises across industries to increase the value of their existing customers (including telecom operators' government and enterprise customers), attract new customers and explore new business opportunities. This requires seamless collaboration with enterprise software product and service providers with strong data analytics and service capabilities and extensive industry know-how that are able to provide data-driven operation services that more efficiently monetize their data and resources, such as more comprehensive analysis of customer profiles, characteristics and lifecycles that increases sales and marketing efficiency; and
- over years of collaboration with enterprises, enterprise software product and service providers have cumulated extensive data analytics and service capabilities and industry know-how. The rendering of data-driven operation services enables enterprise software product and service providers to deepen their relationship with enterprises, adapt to new business models in the dynamically changing digital world and diversify both theirs and the enterprises' revenue streams.

Market Size by Revenue of Data-driven Operation Service Industry (China), 2012-2022E



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The finance and government sectors have experienced increased demand in data-driven operations services in the past few years, a trend that is expected to continue. In 2017, data-driven operation service revenues contributed by the finance and government sectors reached RMB14.7 billion and RMB8.2 billion, respectively, accounting for 21.0% and 11.7% of the total data-driven operation services revenue, respectively. Data-driven operation service revenue contributed by these two sectors are projected to grow at a CAGR of 21.8% and 16.7% from 2018 to 2022, respectively, reaching RMB38.7 billion and RMB17.6 billion in 2022, respectively.

