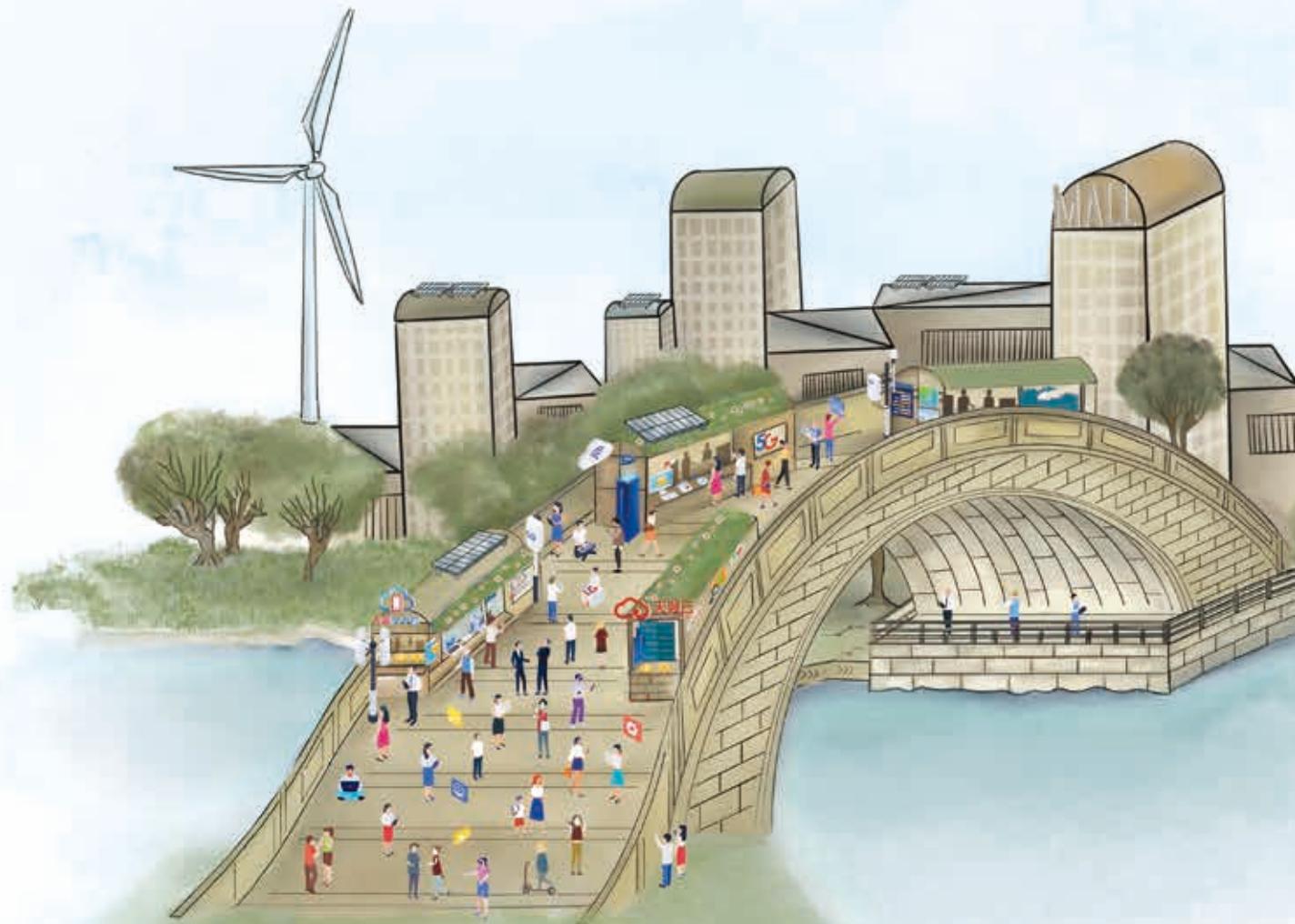


TAKING RESPONSIBILITY THROUGH DIGITAL EMPOWERMENT



TAKING RESPONSIBILITY THROUGH DIGITAL EMPOWERMENT



China Telecom is committed to fulfilling its missions and responsibilities in building Cyberpower and Digital China while maintaining network and information security. Adhering to the customer-oriented approach, the Company endeavors to develop intelligent integrated digital information infrastructure with cloud-network integration as the core feature, to promote the deep integration of digital technologies and the real economy, and thus to provide China with new momentum for economic development and livelihood assurance.

Taking Responsibility through Digital Empowerment

CONSOLIDATING DIGITAL FOUNDATION

China Telecom further reinforces the development of cloud-network integration 3.0, focuses on support for industrial digitalisation development and accelerates the construction of the intelligent integrated digital information infrastructure with cloud-network integration as the core feature.

Developing ubiquitous computing power

The Company consistently implemented the national project of “East-to-West Computing Resource Transfer”, continued to optimise the “2(2)+4+31+X+O” ubiquitous computing power infrastructure layout and built a four-level intelligent computing power system, pursuant to which, 1.7EFLOPS of computing power was increased for the China Telecom Cloud, with the total scale of computing power reaching 3.8EFLOPS, representing an increase of 81% over the previous year.

In terms of computing power infrastructure, the Company has built a new generation of cloud foundation, China Telecom Cloud 4.0, which supports large scale and multiple availability zones (AZs) in central nodes of regions of Beijing-Tianjin-Hebei, Yangtze River Delta, Guangdong-Hong Kong-Macau and Chengdu-Chongqing, providing users with highly available cloud services. The Company built “One-City-One-Pool” nodes in 241 cities, providing customers with better distributed cloud service featuring data localisation and ultra-low latency. It strengthened the construction of industry-dedicated cloud and customers’ private cloud capabilities to create a secured and reliable cloud foundation for digital transformation of numerous walks of life. More than 700 IDC sites, 800 edge DCs and 36,000 integrated access offices have been built across the country, forming a “centre + edge” integrated layout of datacentres. The total number of IDC cabinets reached 513,000, with an increase of 45,000 during the year, maintaining the industry-leading position in terms of scale.



Taking Responsibility through Digital Empowerment



[Lingang Information Park – Building a new highland of the global network hub]

The Lingang Information Park is a key project for China Telecom to implement the national projects of building new information infrastructure and the “East-to-West Computing Resource Transfer”, and is also an important node to support Shanghai to become a global digital highland. Relying on China Telecom’s cloud-network integration capabilities, the Lingang Information Park capitalises on cloud, AI, Big Data and IoT technologies to build a smart site with “digital and intelligent management” and create a green, low-carbon, smart and open high-quality information park.



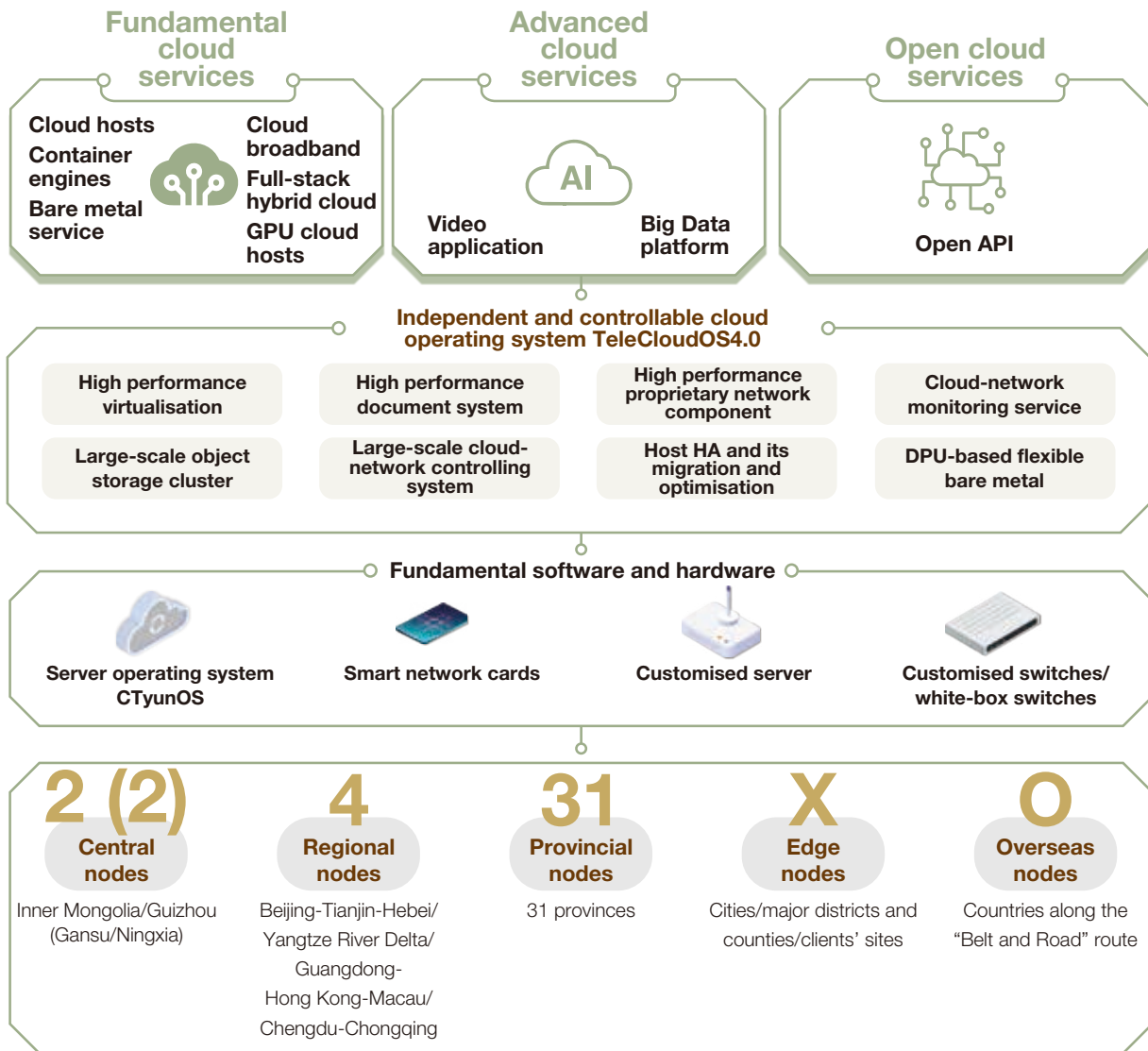
[Successful topping-off of the Qingyang cloud computing big data centre, a hub node in Gansu under the national integrated big data centre project]

On 24 November 2022, the topping-off of civil construction of Qingyang cloud computing big data centre, a hub node in Gansu under the national integrated big data centre project, was successfully completed. The total planning site of the project is about 200 mu, with a planned GFA of 400,000 square metres, providing a total capacity of approximately 40,000 cabinets. In particular, this phase of the project covers an area of 14 mu with a GFA of 17,400 square metres, which will be able to provide a capacity of about 2,000 8kW cabinets.

In terms of cloud capabilities, the Company achieved breakthroughs in a series of key core technologies such as cloud operating system and distributed databases, and independently developed the TeleCloudOS4.0, with integrated cloud foundation, distributed cloud capabilities and trusted cloud platform as core, to form full-stack cloud product capabilities. Zijin DPU (Data Processing Unit) realised breakthroughs in the network and storage offload acceleration technology to significantly improve computing power and efficiency. The Company also successfully achieved breakthroughs in key technologies of cloud terminal, enabling the provision of full-chain localisation and IT innovative application related solutions. In Shanghai and Sichuan, the Company pioneered in achieving the trial commercialisation of the 5G Core three-layer decoupled network based on proprietary virtualisation, promoting network cloudification continuously, and creating a benchmark for innovation in the industry. The Company deepened the construction of the new generation cloud-network operating system, promoted the integrated and intelligent channelling of cloud-network and realised cloud-led network resource allocation and cloud-led network channelling, providing customers with intelligent and agile cloud-network integration service capabilities.



Taking Responsibility through Digital Empowerment



[Consolidating the computing power foundation of China Telecom Cloud]

Guizhou branch and China Telecom Cloud joined hands to build the "2+9+X" cloud datacentre infrastructure in Guizhou, equipping the China Telecom Cloud Guizhou resource pool with 1.5 million core of computing power resource that are available for channelling and nearly 1,600PB of storage. Gui'an Information Park has made deployment in 23 core cities across the country with direct connection circuits, providing users in the eastern China with secure, high-speed and convenient network interconnection channel.



Reinforcing the network foundation

The Company accelerates the construction of dual-Gigabit networks. In terms of mobile network, the Company completed the construction of the world's first co-built and co-shared superior 5G SA network with the largest scale and fastest network speed. The number of activated 5G co-shared base stations reached 1 million. The Company realised technological breakthroughs in multi-frequency coordination involving high, medium and low frequencies. It has basically achieved contiguous outdoor coverage in developed townships and above, hotspot coverage in high-traffic administrative villages, and deep indoor coverage in medium and high business scenes, providing application demonstration for the global 5G SA deployment. In terms of broadband network, the Company completed the construction of the world's largest Gigabit fibre network with 2,500,000 newly-built 10G PON ports, and the Gigabit fibre network covers more than 250 million households, effectively supporting the development of Gigabit services in thousands of cities.

The Company accelerated the upgrade of all-fibre network. The Company operated ChinaNet, the world's leading broadband Internet, and completed a new plane for the superior CN2 carrying networks with a 23% latency reduction on average. It has built a domestic optical cable backbone network with a total length of over 330,000 cable kilometres, and developed the world's largest, converged all-fibre ROADM network. Besides, it completed the construction of the first full G.654E landline optical backbone cable in China connecting Shanghai and Guangzhou, acted as the pioneer in China to complete the experiment of the ultra-long distance WDM transmission system at the speed of 400Gb/s, realised powerless relay transmission of over 1,900 kilometres and built a nationwide superior OTN network for government and enterprise customers.



[Accelerating the construction of direct fibre optic cable for the “East-to-West Computing Resource Transfer” project]

Our regional branches in Guizhou, Guangxi and Guangdong provinces cooperated to speed up the construction of direct fibre optic cable from the Guizhou node (the national computing hub) to the node in the Guangdong-Hong Kong-Macau, using the new G.654E fibre optic cable throughout the entire route to meet the demand for low latency, high capacity and high reliability cloud-network connection between the nodes under the “East-to-West Computing Resource Transfer” project and to support the high-quality development of the digital economy.



[Completing full 5G coverage in newly built subway stations]

In December 2022, Shanghai branch completed the full network coverage for Metro Lines 14 and 18 in just over 20 days, applying dual-band 5G network for the first time, expanding 5G capacity and providing smooth network experience for users.



Taking Responsibility through Digital Empowerment



[Creating a city enjoying 5G VoNR ultra-high definition video calls]

Based on the full coverage of 5G signal, the Shenzhen branch pioneered in achieving full coverage of VoNR capability, which makes Shenzhen one of the first batch of cities to realise 5G VoNR (ultra-high definition video calls) by China Telecom. The ultra-high definition video calls through application of the 5G VoNR technology of the Company has various advantages, which include, among others, instant connection upon dialing, ultra-high definition without lagging, and no need to download and install software.

EMPOWERING DIGITAL ECONOMY

Focusing on major areas such as smart manufacturing, smart agriculture and smart healthcare, China Telecom accelerates platform development and data application, promotes the integration of 5G with cloud, AI, security and digital platforms, assists informatisation development with digitalisation, and promotes enterprises in conversion of the old and new dynamics and their industrial transformation and upgrading as well.

In 2022, the Company recorded more than 3,200 new 5G customised network projects, representing a year-on-year increase of over 150%, with the cumulative number of 5G customised network projects exceeding 4,800 and 5G DICT projects reaching 15,000. Based on the NICES1.0 product system for 5G customised network, with the 5G customised network operating platform and 5G capability magic cube as the core, the Company focused on new products and services such as network enhancement, end-to-end security, 5G terminals and applications-on-demand to build and enhance the NICES2.0 product system.

5G+smart manufacturing



[Developing a full 5G-connected smart factory]

Giving full play to the advantages of industrial Internet, Big Data, smart simulation and other technologies, Hubei branch worked together with Midea Group to build a full 5G-connected smart factory, which enables the factory to achieve an increase of 52% in labour productivity, a reduction of 25% in lead time, a reduction of 64% in quality defects and an increase of 11% in customer satisfaction. The full 5G-connected smart factory reflects the latest achievements in industry digital transformation and has been selected as one of the 8th batch of “Global Lighthouse Network” by the World Economic Forum in 2022.



Taking Responsibility through Digital Empowerment



[Empowering a smart textile factory]

By fully capitalising on its own technical advantages, Jinjiang branch helped Fujian Yongu Group to build a 5G+textile smart park. In 2022, the park set up a dedicated 5G network to fully realise intelligent supervision of textile machines in the workshop, automatic machine insert, closed-loop management of temperature and humidity in plants, intelligent management of production energy efficiency and other intelligent upgrades. The product pass rate increased to 97% and overall operating costs decreased by 15%.

5G+smart agriculture



[5G+cloud+AI enables paddy to talk]

China Telecom uses the Xinghe AI empowerment platform (星河AI赋能平台), the Tianshu 5G UAV platform (天枢5G无人机平台) and the China Telecom Cloud to facilitate standardised paddy production at the Taihe Farm in Nanjing, Jiangsu Province. Through AI deep learning, the Company continuously optimises the prediction model and identification algorithm of paddy at different growth stages, makes accurate analysis and provides feedback, and achieves intelligent link with the irrigation and drainage monitoring system in real time to understand the “words” of paddy. The yield of organic paddy per mu increased by 40%, the cost of cultivation decreased by about 50% and the income per mu increased by 50%.



[Building smart agriculture use cases]

Yunnan branch accelerated the construction of digital information infrastructure featuring cloud-network integration, continued to promote the development of Gigabit broadband network and 5G network in rural areas, and used information technologies such as cloud computing, Big Data and IoT to empower agricultural production through customised dedicated networks and high-speed 5G wireless network, thereby creating multiple smart agricultural use cases integrating production, operation management and services, providing functions such as real-time monitoring data, data of transaction, planting guidance, agricultural product management and smart equipment management, and providing powerful support for the modernisation of agriculture and rural areas.



Taking Responsibility through Digital Empowerment

5G+smart healthcare



[Building an integrated 5G+care platform for acute and critical illness]

China Telecom gave full play to its technology advantage in building “an integrated 5G+care platform for acute and critical illness”, pursuant to which, 5G technology is utilised to transmit patient information and vital signs in real time, realising that “information arrives ahead of the patient”. Moreover, video can be transmitted in real time from the ambulance, realising “hospitalisation upon getting on the ambulance” through remote command and consultation for medical treatment, which greatly shortens the response time for resuscitation. At present, the platform has linked the acute and critical care centre with six specialist centres, including chest pain, stroke, trauma, poisoning, neonatal and high-risk maternity, to achieve the whole process management of patients from call to treatment, inpatient to discharge.

5G+smart education



[5G interactive online teaching facilitating the balanced development of urban and rural education]

Shandong branch cooperated with the People’s Government of Zibo Municipality to develop “an interactive online teaching system”. Lively and interesting “online classes” were held simultaneously in the classrooms of primary schools in rural villages and the county townships, where famous teachers’ lessons can be shared among the children with no delay nor lag throughout the whole class, effectively promoting the balanced development of urban and rural education.



[5G dedicated networks empowering new smart education application]

Shaanxi branch, together with Xi’an Jiaotong University, made use of the pilot project of “5G+Smart Education” launched by the Ministry of Education and the Ministry of Industry and Information Technology to develop the networking solutions of 5G customised dedicated networks integrating wireline, wireless, IoT and 5G for the first time, and built new smart education application scenes featuring three-dimension, full-scenes and intelligence, so as to realise the target of sci-tech innovation in teaching, examination, evaluation and management and establishing demonstration application of smart education. Through integration of resources in “government, enterprises, academia, research and application”, the Company accelerated the transformation of sci-tech achievements, and promoted the establishment of an industry chain driven by convergence of education and 5G.



5G+smart culture and tourism



[Leveraging 5G+MEC+VR technologies to experience the culture of the Xia dynasty]

China Telecom used 5G+MEC, cloud and XR digital technologies to turn Luoyang Erlitou Archaeological Site Museum into the first 5G+MEC smart site museum in China, and guided the audience to "travel" through time and space to participate in the process of discovering, identifying, exploring and restoring cultural relics through multiple digital means such as immersive digital projection space, semi-landscaping three-dimensional digital theatres and radar interactive projection walls based on the 5G+4K ultra-high definition immersive VR digital technology.



[Developing a comprehensive culture and tourism service platform named "Enjoying a wonderful tour in Gansu with one mobile phone"]

Gansu Province is located on a prime section of the Silk Road, which preserves a large number of valuable caves and temples, Great Wall passes, buildings, monuments, ancient city relics and historical heritages. China Telecom offered assistance to the Department of Culture and Tourism of Gansu to build a comprehensive culture and tourism service platform named "Enjoying a wonderful tour in Gansu with one mobile phone", which utilised Big Data, cloud computing, XR and other emerging technologies to provide tourists with catering, accommodation, transportation, shopping and entertainment integrated services under the basic positioning of "premium tour guide, caring butler, cultural tutor, all-round shopping guide". The platform not only provided travel convenience for tourists, but also promoted the tourism development in Gansu.



Taking Responsibility through Digital Empowerment

SERVING DIGITAL SOCIETY

China Telecom adapts to the new trend of full integration of digital technology with social interactions and daily lives, and launched various scene-based digital services and applications to build a better digital life for the whole society.

Upgrading digital home

Relying on its cloud-network integration capabilities, the Company upgraded its digital home products system to meet the increasing needs of users for a better life and to benefit thousands of households and industries. Focusing on the three major needs, namely network connectivity, home security and convenient living, it provided users with home networking solutions with Gigabit high-speed, full-coverage, and scene-based whole-home WiFi, to effectively solve the problems of low speed, poor coverage and difficult networking. It created e-Surfing HD digital entertainment centre to provide a large-screen viewing experience with quality video, education and games contents. The Company conducted comprehensive upgrade in whole-home smart products and cloud storage products, and launched various smart household products and whole-home customised solutions focusing on scenes such as home security, elderly care, home appliance control and digital assets.



[Breakthrough was made in the scale development of household business]

The e-Surfing Housekeeper App, China Telecom's unified portal for digital home service, has over 130 million subscribers. The total number of whole-home WiFi subscribers exceeded 100 million, while the number of e-Surfing HD subscribers reached 140 million. The number of household ubiquitous smart terminal connections exceeded 300 million. The picture shows that on 27 April 2022, an employee of the Company and the 100 millionth registered user of e-Surfing Housekeeper App took a photo to commemorate the moment.



Constructing smart communities

Leveraging on the smart community platform, the Company provides video viewing, entrance management, property management fee payment, smart CPC development, convenient services and other informatisation applications for streets, communities, properties and residents, empowering the digital governance of grassroot-level governments while meeting the digital needs of residents. The number of serviced streets and communities exceeded 64,000.



[Building smart community bases]

Jiangsu branch actively promotes the construction of smart communities in the province and three smart community bases were built in Zhenjiang, Nanjing and Suzhou respectively, which effectively created a link among the government, properties and households, and strongly supported the development and operation of smart communities in the province. 9,000 communities have been contracted in the province in 2022, and 3,697 new standard smart communities have been served to meet the needs of the government, properties and residents for community informatisation.

Developing the e-Surfing Internet of Video Things (IoVT)

The Company makes active efforts in building the e-Surfing IoVT, the fifth network of the Company, based on the nationwide cloud-network integration resources foundation and with its capabilities in video access, storage and AI intelligent analysis to meet daily video viewing, video convergence, unified supervision and other basic needs of various customers. It also provides services such as face recognition, mask recognition, drowning prevention and monitoring to meet customers' personalised intelligent management needs.



[Promoting the development of e-Surfing IoVT]

Zhejiang branch has developed the "Sunshine Series" applications such as Kitchen Monitoring and Sunshine Factory, promoted applications for "rural areas and communities" such as cultural halls and garbage sorting, and developed over 10 standardised IoVT applications at the provincial level. An additional of 450,000 subscribers were secured in 2022.



SUPPORTING DIGITAL GOVERNMENT ADMINISTRATION

China Telecom strengthens data application, promotes the construction of digital government with government administration clouds as the core, participates in the construction of government administration clouds and digital platforms of various provinces and cities, and applies cloud, Big Data and AI technologies in areas such as government administration and urban management, further enhancing the market position of China Telecom Cloud in the government administration sector.



[Data products supermarket served Hainan Free Trade Port]

China Telecom actively cooperated with the People's Government of Hainan Province to build a data supermarket. Leveraging on its proprietary data trading platform, the Company carried out data product development and production, supply and demand matching, circulation and trading through the orderly opening of public data resources and integrating social data resources. Currently the supermarket accesses to over 100 billion pieces of government administration data and over 1 billion pieces of social data, with more than 800 data products available to serve the construction of the Hainan Free Trade Port.

The Company focuses on the nation's overall objective and requirement for social governance modernisation, deeply integrates the existing informatisation construction achievements around the country, widely shares and aggregates data and information from the government, society and the public, and builds a social governance platform that integrates "intelligent supervision, intelligent services, intelligence-assisted decision-making, public participation and governance on specific areas" to promote regional governance capability. Currently, the social governance platform covers 31 provinces and more than 240 municipalities across China, covering all levels of provinces, cities, counties, districts, townships and streets, and rural communities, assisting the building of a safe China and the rule of law in China.



[Big Data and AI intelligent analysis enables modernised social governance]

Quanzhou branch joined hands with the Nan'an Political and Legal Affairs Commission to build a social governance platform in Nan'an. Focusing on solving problems in grassroots-level social governance which included overlapping management, repeated construction, insufficient coordination between various departments, and weakly coordinated governance, the branch explored the operation models featuring "CPC development + grid", "online + offline", "human defence + technical defence" to develop a new grid-based grassroots-level social governance system in Nan'an.



PROVIDING HEARTFELT SERVICES TO CUSTOMERS

China Telecom adheres to the philosophy of “Customer First, Service Foremost” and strengthens service awareness to protect customers’ rights and interests in accordance with the law, enhances customer experience, and comprehensively fosters a brand image of “China Telecom is trustworthy”.

Protecting the rights and interests of customers

The Company conscientiously implements the relevant laws and regulations, such as the *Civil Code of the People’s Republic of China*, the *Law of the People’s Republic of China on Protection of Consumer Rights and Interests* and the *Advertising Law of the People’s Republic of China*, enhances the internal system relating to brand publicity such as the *Administrative Measures for China Telecom on Brand Publicity*, provides products and services in compliance with laws and regulations, regulates tariff management, continuously optimises the service registration displayed to customers, strengthens digital management capability, enhances the integrated review and approval procedure relating to the price of goods, and makes prompt response to market and customers demands. It also further strengthens the compliance management of advertising and publicity, regulates wording for publicity, and clearly stipulates that false publicity, exaggerated publicity, and comparative publicity are strictly prohibited, thus maintaining a good brand image.

The Company carries out integrated governance on communications fraud, harassing calls and spam text messages. During the year, the Company intercepted a total of 3.176 billion harassing calls and 2.85 billion spam text messages by continuously enhancing its technical prevention capabilities, strengthening control of communications resources for major businesses, and optimising the complaint handling process. The Company also promoted the application of e-Surfing Anti-Harassment, a harassment-call intercepting service that can be set up by individual users, with a user base of 270 million. Through measures such as the further enhancement of technical prevention capabilities and the strengthening of monitoring and treatment for major businesses, a total of 499 million messages suspicious of fraud were intercepted in the year. Besides, 5,982,100 domain names suspicious of fraud were blocked and 19,400 numbers involved were shut down. The integrated online and offline fraud-prevention campaigns carried out by the Company cumulatively covered 24 million person-times. In 2022, the Company’s phone numbers involved in frauds were the lowest in the industry, and the number of harassing calls and spam text messages reported continued to remain low in the industry.



Taking Responsibility through Digital Empowerment



["96110 e-Surfing Security Anti-fraud (96110翼安反诈)" service]

The "96110 e-Surfing Security Anti-fraud" service provides early warning and interception of fraudulent calls and messages, including daily intelligent promotion, precautionary alerts, fraudulent website interception and countermeasures, precautionary fraud message clue analysis, 96110 anti-fraud dissuasion cloud call-out. More than 8,000 models were introduced to identify fraudulent websites. The efficiently-centralised platform has provided services to 73 regions in 19 provinces.



[Digital capabilities enhance anti-fraud effectiveness]

Zhangzhou branch fully utilised cloud resources and Big Data technology to build the "Zhangzhou Anti-Fraud Big Data Platform", and enhanced the effectiveness of anti-fraud practice with multi-dimensional data models, automated processing processes, differential shutdown and restore and other digital means, assisting the municipal anti-fraud centre to enhance the ability of targeted combat and effectively curb the high incidence of telecom and Internet fraud offences. As at 31 December 2022, it participated in the early warning and dissuasion efforts for a total of 86,742 parties.



Enhancing customer experience

Adhering to the customer-oriented principle, the Company further promoted the “customer-centric” system development and procedure transformation. It continued to carry out “upgrade service satisfaction action” during the year, with a focus on the shortcomings in mobile and broadband services, and pushed forward the hot region rectification, poor digitalisation restoration, transparent consumption, and proactive services through the green channel mechanism. The Company proactively launched six “Good Service as You Wish” service initiatives, targeted at customers’ major rights and interests as well as their concerns, explored proactive solutions for customers, and promoted the transformation of service attitude from passive response to proactive provision. The 10009 hotline for government and enterprise customers was launched to support the rapid development of the new core businesses, while the customer hotline 10000 achieved continuous enhancement in terms of digital and intelligent service capabilities including efficiently-centralised operation, online business handling and cross-province handling. The Company’s leading advantage in customer service was hence consolidated, achieving a leading position in the overall customer satisfaction in 2022, with the lowest user complaint rate and the lowest complaint rate of mobile number portability.



[Digitalisation of China Telecom App]

In 2022, China Telecom App completed its brand upgrade, which enabled AI digital human verbal interaction and age-appropriate caring services. It also realised full online cross-provincial services handling, enabling users to handle broadband and other businesses for their parents in hometowns at far. It was granted the “APP Security Certification” issued by the China Cybersecurity Review Technology and Certification Centre (CCRC) to assure network and information security. The Company applied the “e-Surfing Connect (翼相連)” function from the innovative technology of P-RAN to realise inter-user connection, as well as sharing, access and relay of data traffic.



[Ensuring a high-quality Internet experience]

Based on the AI-backed intelligent troubleshooting capability, the Digital Life Company supported Hunan branch to carry out special action on rectifying poor quality, targeting at 10,000 users suffering from poor experience in Changsha, and the elimination rate of poor quality reached 95%, solving customers’ poor Internet experience problems and improving the same effectively.

