Digital-Intelligent Innovation

Leading in Integrated and Innovative Development

Empowering a Digital-Intelligent Future

As a new wave of technological revolution and industrial reforms continues to reshape the world, information technology has gradually proliferated into every nook and cranny of our economy, society and livelihood, and the digital economy is taking shape at an unprecedented rate, with an unprecedented reach and magnitude. As a backbone of the digital economy, the ICT industry shoulders great responsibility. China Mobile endeavored to drive new infrastructure, integrate new elements, and instigate new growth momentum, thereby promoting development of digital industrialization, advancing digitalized upgrade of industries and paving the way to a vibrant digital economy.

Leading in Integrated and Innovative Development

China Mobile advanced the construction of information infrastructure to help build China into a science and technology superpower. Meanwhile, the Company heavily invested in building capabilities for delivering technological breakthroughs, product innovations and inter-ecosystem synergy, and drove progress in developing information technologies and a mature industry chain to meet the common demand for "online, cloud-based and intelligent" economic and social development.

Constructing New Infrastructure

China Mobile stressed efforts to promote the construction of a high-speed, ubiquitous, intelligent, agile and comprehensive digital information infrastructure that integrates space and ground, and the cloud and the network. The infrastructure is also green, low-carbon, secure and controllable, with a focus on 5G, CFN and smart mid-end platforms, serving as the 'artery' to help information flow throughout the economy and society.

Built nationwide, advanced, and high-quality "double gigabit" networks, promoted co-construction and sharing, and scaled up their rollout in an intensive and efficient manner.

Led and promoted the coordination of business, data and technology mid-end platforms to accumulate capabilities and empower intelligent development.

Provided high-speed, mobile, secure, and universal "connectivity services"

Developed plug-and-play "computing force services"

Offered modular and ready-to-deploy "ability services"

Implemented the national "Eastern Data and Western Computing" policy. We published the *Computing Force Network Whitepaper* and related development initiatives, setting out our vision, philosophy, architecture and path for CFN, speeding up the development of CFN technology, standards, industry and ecosystem.

Accelerating the delivery of connectivity service infrastructure

The Company speeded up building the "information highway" in 2021 to meet the needs of digital-intelligent work and life. By the end of 2021, we were operating the world's largest 5G network with over 730,000 5G base stations, delivering solid 5G coverage in cities, counties, townships, towns and other key regions nationwide; our gigabit fiber rollout reached more than 100 million households, delivering gigabit broadband coverage to all towns above the prefecture level; and a total of more than 1 billion connections had been made to our IoT services.

At 5,374 meters above sea level, Mountain Ganbala in Xizang is the highest inhabitable place for humans. Communication here used to rely on satellite transmission and, occasionally, "unstable signals coming from down the hill". To address the communication needs of the local population, our Xizang subsidiary was able to deploy 5G base stations on Mountain Ganbala in ten days, overcoming a variety of hurdles including long distance and harsh weather conditions, and laid a solid ground for the digital life of the local population.

Researching into and exploring CFN

CFN represents a new information infrastructure that puts computing at its core, with the network serving as the foundation. This infrastructure deeply integrates ABCDNETS (ABCDNETS refers to AI, blockchain, cloud, data, network, edge, terminal and security), making one-stop service possible. The development of CFN showed China Mobile's support and innovation surrounding the national "new infrastructure" strategy and represented a major step by us in facilitating high-quality development of the digital economy.

In 2021, we led the development of international standards for Computing-Aware Networking (CAN) at the ITU Telecommunication Standardization Sector (ITU-T) to advance CAN to be an upcoming major research focus at ITU. Our efforts to advance CFN development in 2021 also included publishing the *Computing Force Network Whitepaper* and formulating the *China Mobile 2022 Implementation Plan for the Development of CFN.*

Our data centers now formed a "4+3+X" nationwide layout. By the end of 2021, our internet data centers (IDC) with external service capabilities had a cabinet capacity of more than 400,000 units and an outlet bandwidth of over 570T, providing infrastructure support for the integration of computing force among data centers across the nation.

Advancing the construction and operation of the smart mid-end platform

We continued to advance our China Mobile Mid-End Platform with an Aaas (Ability as a Service) system, combining the qualities of telecommunications operators with salient features of our own. Internally, this platform has supported our digital-intelligent transformation; externally, we explored potential digital-intelligent applications in wider society. We built a co-creation and win-win eco-system surrounding AaaS on our smart mid-end platform and advanced our abilities to a whole new level.

- "Bringing in": Attracted and brought in premium abilities with our *"Yunshang Yidong"* (mobile cloud), *"Wutong Yinfeng"* ("Wutong" big data platform) and *"Jiutian Lanyue"* ("Jiutian" AI platform) offerings.

- "Going out": Released feature capabilities including communications infrastructure, AI, big data, blockchain, security certification and precise positioning, and offered uniform and flexible capability services to ramp up social value, user value and corporate value.

By the end of 2021, our smart mid-end platform ability service system offered a catalogue of 325 common capabilities, processing over 8.1 billion requests per month on average.

Hebei subsidiary built 5G base stations in Zhangjiakou competition area for the Beijing 2022 Winter Olympics

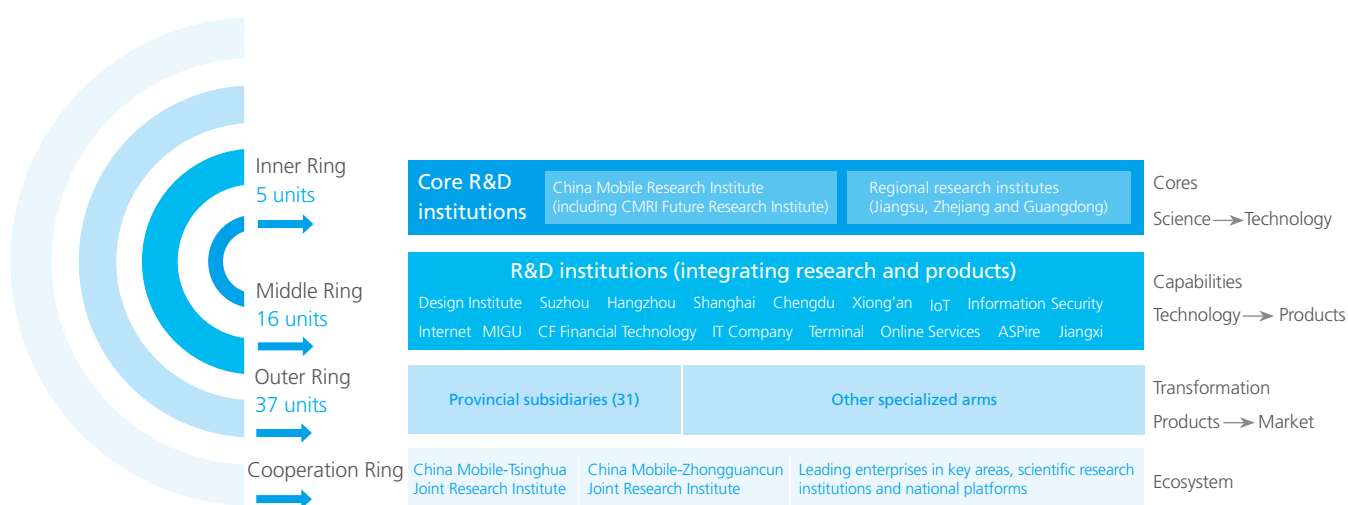China Mobile released the *Computing Force Network Whitepaper*

Strengthening Technological Self-Reliance

China Mobile is committed to independent innovation and continues to evolve its system and mechanism of technological innovation. We continued to lead next-generation information technology development and reforms in business model as we pushed for key technological breakthroughs and strove to develop high-level original technologies and serve as a leader in the modern industrial chain.

Optimizing Technological Innovation System

We introduced the "One System and Four Rings" technological innovation layout, further evolved our joint innovation system and streamlined our innovation management and outcome evaluation systems. We integrated innovations in four areas – industry, academia, research and application – and created an innovation-nurturing environment that encouraged success, accepted failure and fostered all employees' awareness and potential for innovation. We have thus created an innovation landscape driven simultaneously by internal and external innovations, converting more scientific and technological innovations into products.

China Mobile "One System and Four Rings" Technological Innovation Layout

Inner Ring
5 units

Core R&D institutions	China Mobile Research Institute (including CMRI Future Research Institute)	Regional research institutes (Jiangsu, Zhejiang and Guangdong)

Cores
Science ➞ Technology

Middle Ring
16 units

R&D institutions (integrating research and products)
Design Institute Suzhou Hangzhou Shanghai Chengdu Xiong'an IoT Information Security Internet MIGU CF Financial Technology IT Company Terminal Online Services ASPire Jiangxi

Capabilities
Technology ➞ Products

Outer Ring
37 units

Provincial subsidiaries (31)	Other specialized arms

Transformation
Products ➞ Market

Cooperation Ring

China Mobile-Tsinghua Joint Research Institute	China Mobile-Zhongguancun Joint Research Institute	Leading enterprises in key areas, scientific research institutions and national platforms

Ecosystem

Inner Ring: Strengthen research in fundamentals, push for key technological breakthroughs and build a high-caliber scientific research team

Middle Ring: Build leading platforms and products for CHBN markets

Outer Ring: Promote market development with products

Cooperation Ring: Cooperate with national platforms, leading enterprises, universities, and research institutions, and build an evolving innovation landscape characterized by solid internal capabilities and expanding external cooperation

Technological innovation achievements in 2021

10+ R&D institutions

Operated **28** 5G open labs

Maintained our leading status among global telecommunications operators by pushing for key technological breakthroughs in 5G dedicated network, evolution and commercialization, leading **155** 5G international standards projects, submitting **3,600** 5G patent applications, licensing **59** patents to **70+** overseas companies and receiving royalties amounting to over RMB**18** million

Submitted **300+** 6G technology patent applications and ranked first among telecommunications operators in the number of high-quality 6G-related papers

Network Intelligence Capability was included in the **first list of Outstanding AI Achievements** announced by the Ministry of Industry and Information Technology (MIIT)

Introduced our first low-power, high-capacity MCU (micro control unit) chip with **top-tier overall performance**

Our **independently-developed high-precision positioning service platform** offered special single *BeiDou* system operation and sub-meter RTD (Real Time Differential) services to meet the needs for greater precision in positioning

In addition, through the China Mobile Science and Technology Association, we further invested in training and bringing in high-level tech talents, thereby building a strong caliber of technical experts to support continued technological innovation and R&D.

Set up a workstation for research fellows and experts, the first among telecommunications enterprises in China, to bring in and cultivate research fellows and other top scientists and talent through our **"Mount Everest Climbers" plan**.

Furthered the implementation of our "T-H-T" (Ten-Hundred-Thousand) technical expert system, assessment of Group Chief Experts and introduction of new Provincial Technical Experts; created a unified Group-wide expert management system with **10** Group Chief Experts and **2,625** Provincial Technical Experts.

Included **scientific and technical experts and teams in the employee honor system** to promote their sense of belonging, honor and satisfaction.

Shouldering the Mission of Industrial Innovation

As always, we fully recognized the strategic significance and priority of scientific and technological innovation and placed it at the center stage of our overall development. As such, we constantly improved our scientific and technological innovation capabilities and drove the high-quality development of the mobile information industry.

Technological Breakthroughs

- Achieved technological breakthroughs in a number of areas including IoT chips and IoT operating systems.
- Filled a number of industry gaps and matched world-class solutions in a number of areas including network intelligence and vehicle-road coordination.
- Introduced our first 5G small cell and UPF (User Plane Function) products through systematic efforts in independent R&D of network-level products, taking it from zero to one.

Industry Advancement

- Led the formation of the 5G Innovation Coalition, and working together with 13 enterprises (including China Telecom and China Unicom) and 70+ key industrial, academic, research and application units, we established four breakthrough layouts and eight work systems, formed world-leading 5G+ industrial network foundation and universal capabilities, and produced numerous 5G pilot applications for the industry.
- Launched the "Mobile Information Modern Industry Chain Cooperation Plan", kicking off six major actions and joining hands with industry partners to build a high-quality mobile information modern industry chain.
- Set up two joint R&D laboratories with our partner enterprises with a focus on wireless communication chips and industry-oriented 5G core network products, whereby we jointly invested and conducted R&D, shared risks, achievements and outcomes, so as to speed up product launch and strengthen market leadership.

Ecosystem Construction

- Established the Joint Innovation Plus scheme R&D cooperation system, drew-up the *R&D Cooperation Map*, set up key and reference R&D partner catalogues consisting of 29 R&D partners, advanced our new model of joint R&D, formed 12 school-enterprise collaborations and eight joint laboratories with our partner enterprises, advanced research-procurement and research-investment collaboration and drove the close integration of the innovation chain, capital chain and supply chain.
- Led the establishment of the ICT Chip Industry Chain Innovation Center in collaboration with 20+ partners along the industry chain to drive breakthroughs in core technologies in the ICT sector including chip R&D, testing, application and ecosystem construction; integrated upstream and downstream resources along the industry chain spanning across all areas of "industry, academia, research and application" through our innovative technology cooperation platform to catalyze key technological breakthroughs and global cooperation in the chip industry.
- Published the 5G-Advanced Double-Chain Integration Action Plan, setting the objectives and key steps of integrating 5G-Advanced innovation chain and industry chain, thereby constantly driving the healthy development of the industry and the digital-intelligent transformation of our society.

Frontier Research

- Jointly established the National Natural Science Foundation of China – China Mobile Enterprise Innovation and Development Fund with a focus on eight major research areas including next-generation network infrastructure.
- Furthered strategic R&D cooperation with national-level laboratories such as the Peng Cheng Laboratory and universities such as Tsinghua University, Beijing University of Posts and Telecommunications and Southeast University, and launched explorational studies on topics such as 6G and space-air-ground integrated networks.

Building Systematic Security Safeguards

China Mobile continued to strengthen bottom-line thinking and risk awareness and infused security practices into all processes and across all areas in our production and operations to effectively prevent and address all kinds of major risks under the leadership and coordination of our network security leadership group.

Putting Up Cybersecurity Defense

We implemented and operated in compliance with the requirements of relevant laws and regulations including the *Data Security Law of the People's Republic of China*, the *Personal Information Protection Law of the People's Republic of China*, and the *Regulation on Protecting the Security of Critical Information Infrastructure*. We launched the "Cut-Off", "Spring Thunder", "Spring Farm" and "Peach-of-Mind" operations, and strove to build a cloud-network integrated network security protection system that provided for a safe information and communications environment.

"Cut-Off" Operation	"Spring Thunder" Operation	"Spring Farm" Operation	"Peace-of-Mind" Operation
We formulated "Cut-Off 2.0" and "Modem Fraud Crackdown" actions plans, set up Group-level and subsidiary-level anti-fraud squads, and published 27 issues of national *Weekly Work Report on Telecom Fraud Crackdown*. By the end of 2021, we had provided more than 25 million telecom fraud prevention reminders, handled over 4.33 million cases of machine-card separation; we had blocked 220 million and 140 million scam calls and scam messages respectively, achieving a 40% year-on-year decrease in terms of average monthly count of phone numbers involved in fraud cases.	We defined minimum and necessary scope of personal information collection for our popular apps and assessed the legitimacy of access; conducted a comprehensive review of our own Apps; upgraded our third-party mobile applications security testing platform, carried out automatic and manual inspections on all submitted Apps and rectified all issues identified.	We performed attack simulations and vulnerability tests on 50 internal units, adopting an innovative approach of "mutual offense-defense testing" and leveraging our network security "cloud" expert resources. We received a total of 1,620 attack reports and 708 defense reports, and discovered and rectified 689 network security risks.	Internally, we compiled the *Warning and Education: Telecommunications Fraud and Other Criminal Cases Involving Insiders* and organized close to 5,000 study sessions with 1.2 million employee participants over the year. Externally, we summarized and raised public awareness for 51 typical fraud schemes and sent 8.19 billion SMS (Short Message Service) fraud alerts; jointly with local public security bureaus, our grid personnel conducted over 30,000 anti-fraud awareness campaigns in communities, campuses and enterprises covering nearly 12 million people.

Cracking down on telecom fraud and safeguarding everyone's wallets

We have set up anti-fraud squads at our headquarters and all 31 provincial subsidiaries, forming a top-down and internal-external collaborative anti-fraud system and enabling comprehensive crackdown efforts against telecom fraud.

- **Strict risk control:**
  We were the first in the industry to establish a nationwide centralized management system over users with bad credit and restricted their access to our network; introduced real-name re-authentication requirement and invalidated dormant cards; timely identified and suspended fraud-related numbers through analyzing their connection and calling activity, location and other information on our anti-fraud big data platform.

- **Joint crackdown:**
  We identified fraud-related WeChat accounts, QQ accounts, etc. from a vast amount of data and worked closely with professional institutions to deal with these accounts; strengthened scenario-based anti-fraud big data analysis to accurately detect and prevent covert fraud cases, identify fraud-vulnerable groups and support joint actions against fraud; strengthened collaboration with the National Anti-Fraud Center of the Ministry of Public Security to promptly shut down phishing websites and deliver timely alerts to visitors.

- **Independent innovation:**
  In response to the increasing use of GoIP devices for fraudulent purposes, we have set up an innovative GoIP Monitoring and Early-Warning Platform to promptly invalidate fraud-related cards; we have monitored network and information security information in the public domain with a focus on new types of fraud, security threats, etc. to take timely preventive measures.

- **Anti-fraud and security services:**
  We developed Frequent Nuisance and Fraud Callers Blocking, Family Color-Printing, Green Internet and other innovative security services to safeguard our customers against different types of fraud. For instance, using our cloud-based blocking technology, our Frequent Nuisance and Fraud Callers Blocking service had offered free-of-charge and App-free blocking service to 40.35 million users by the end of 2021.

Providing Emergency Communications Support

China Mobile has put in place a four-level – Group, regions, provinces and prefecture-level cities – emergency support system, formulated emergency contingency plans and a number of management systems to enhance our network infrastructure's resilience against disaster and damage. We also upgraded our emergency communications equipment to ensure rapid response to emergencies. In 2021, despite strict requirements, tight schedule and heavy load, we provided reliable communications and cybersecurity support for numerous major events, including the celebrations of the 100th anniversary of the founding of the Communist Party of China, the 14th National Games of China and the 4th China International Import Expo, and achieved our established target of "no major network failure, no major cybersecurity incident and no major customer complaint".

Providing key communications support for the celebrations of the 100th anniversary of the founding of the Communist Party of China

We set up a dedicated leadership group to provide reliable communications and cybersecurity support for the celebrations of the 100th anniversary of the founding of the Communist Party of China. We strictly adhered to the principles of the "highest standard, fullest coverage, strictest implementation and fastest response" and built an efficient and coordinated nationwide support system as a solid foundation for our support work.

- Constructed boutique networks in key areas: Carried out network upgrades in core support areas in Beijing; deployed 16 emergency stations at the Tiananmen Square to ensure reliable communications services under extreme demands. For instance, we were able to offer 5G download rate at close to 1Gbps during the fireworks show.

- Fully leveraged our strengths in offering systematic and innovative emergency communications: Set up 4/5G ultra-dense networks at the Tiananmen Square and the National Stadium that could meet the demand of 91,000 users; fully accommodated six service support requirements of China Media Group and other government and business customers, providing internet access for both ToB and ToC users.

We deployed a total of 32,000 personnel on-site. There was no major network equipment failure. Our efforts played an important role in ensuring the success of the celebrations of the 100th anniversary of the founding of the Communist Party of China.

○ China Mobile provided support at the celebrations of the 100th anniversary of the founding of the Communist Party of China

Creating a Clear and Bright Cyberspace

China Mobile has always cared about the health and well-being of its young and teenage users. We have introduced the Youth Mode on MIGU Music, MIGU Video, MIGU Reading, MIGU Circle and other platforms, and introduced full real-name authentication and anti-addiction measures on MIGUPlay, doing our best to create a clear and bright cyberspace and a nurturing environment for the youth.

In particular, MIGU Video under the Youth Mode only offered programs appropriate for underage. It did not offer interaction, marketing, paid or any social networking functions. It also imposed a time limit to prevent addiction and required a password after 40 minutes of use per day. We upgraded the reporting function on MIGU Video and added a special option for reporting "content harmful to young people" to enhance supervision and handling of such content.

Empowering a Digital-Intelligent Future

The digital economy is profoundly reshaping every aspect of our economy and society. We continued to promote the proliferation of digital-intelligent transformation across sectors and industries. We incorporated digital-intelligent capabilities into our own customer service systems and, at the same time, amplified, compounded and multiplied the benefits of information technology on economic development to propel the robust and sustainable growth of the digital economy.
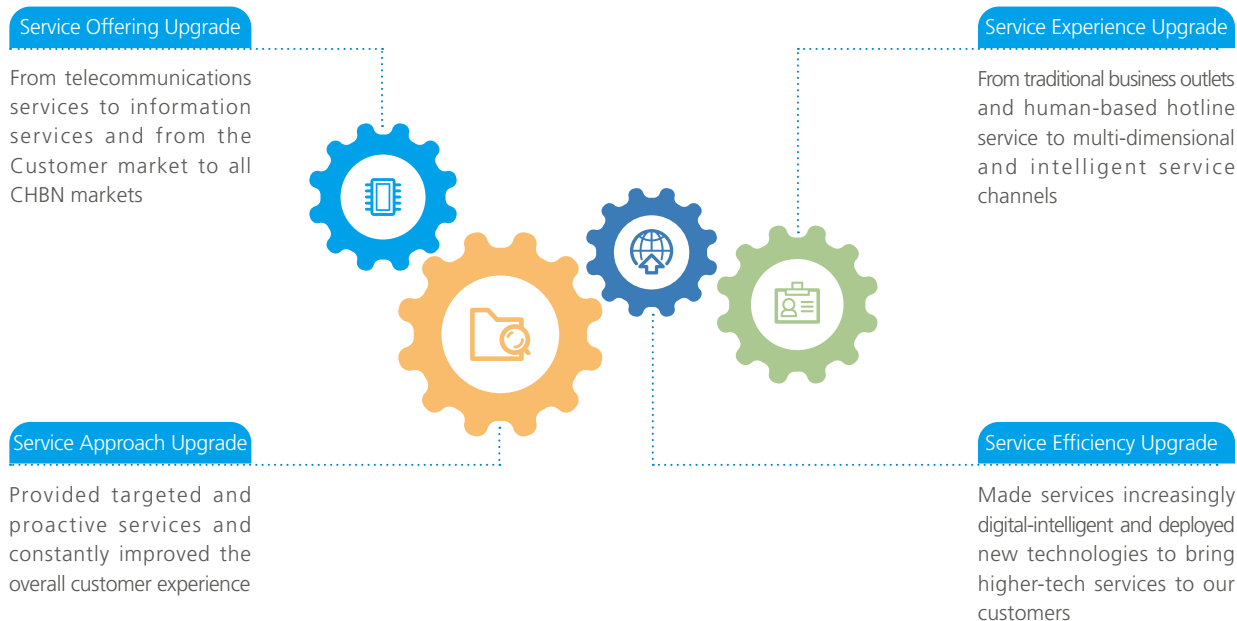
Serving an Enriching Digital Life

We have always operated with a "customer-first" approach and served our customers with full dedication. We have continued to use digital-intelligent means to upgrade our customer service capabilities and taken steps to enhance customers' satisfaction.

Speeding Up Service System Building

We have speeded up our efforts in building the service system that covers every aspect of services and processes and engages every member of staff. In 2021, we launched our "Heartwarming Service" customer service brand. We offered premium services including information services, smart and inclusive services, convenient services, transparent services, security services and emergency services, and endeavored to offer service experience that brought our customers "heart-felt comfort, heart-felt sweetness and heart-felt warmth".

China Mobile's Service Upgrade System

Service Offering Upgrade

From telecommunications services to information services and from the Customer market to all CHBN markets

Service Experience Upgrade

From traditional business outlets and human-based hotline service to multi-dimensional and intelligent service channels

Service Approach Upgrade

Provided targeted and proactive services and constantly improved the overall customer experience

Service Efficiency Upgrade

Made services increasingly digital-intelligent and deployed new technologies to bring higher-tech services to our customers

Shanxi subsidiary's General Manager Customer Reception Day

Guizhou subsidiary sent Spring Festival greetings to customers

Making customer service more tailored, convenient and efficient with innovative digital-intelligent technologies

We deployed a wide variety of intelligent technological tools to provide high-quality, convenient and efficient services for our customers to meet their personalized needs in this digital era.

- Our data-driven, AI-powered *Dayin* (a customer perception improvement management platform) offered insights into customer perception and made service quality manageable, visible and controllable.

- We upgraded the 10086 integrated smart service gateway of our 31 provincial subsidiaries nationwide to provide an interactive voice response service to all customers, on all businesses and at all times, serving 200 million calls per month on average.

- We led the industry by launching video customer service, providing card reissuance and replacement, service suspension and resumption and other advanced services to customers at home; with additional functions such as self-help troubleshooting, video customer service also improved our service efficiency.

- With the China Mobile App, the 10086 WeChat service account and our Alipay life account, we had provided online service on multiple channels. By the end of 2021, we provided more than 6.7 billion online service sessions through our level-1 electronic service channels.

Improving Service Quality

We put customer satisfaction at the heart of our service quality management system and have achieved whole-process service management encompassing "Standards – Reviews – Complaint Handling".

Pre-Sales │ Setting Service Quality Standards

We drew up and updated 21 service standards and specifications and integrated them into our business processes. We also introduced a pre-marketing plan review system to promote early-stage service management.

During Sales │ Conducting Satisfaction Reviews

We conducted 194 rounds of satisfaction reviews during the year and introduced the innovative "Quick Review" under 49 business scenarios, reaching 150 million customers per month on average. We valued our customers' opinions and feedback and tried our best to identify and resolve issues before they arose.

After-Sales │ Prompt Complaint Handling

We continued to upgrade our 10080 complaint handling centers and improve efficiency in complaint handling. In 2021, the complaint handling timeliness rate increased by 3 percentage points compared to that of 2020, and repeated complaint rate decreased by 1.8 percentage points. With each instance of complaint, we tried to trace the complaint down to its roots and address the source of the issue.

Meanwhile, we undertook the "Leading Service Action", the "Peak Cut Action" and the "Sunshine Action" for the third consecutive year, making considerable progress in improving our service quality.

"Leading Service Action"	With a focus on key services and products such as 4G/5G and home broadband, we optimized our coordination mechanism, made improvements in a closed-loop process and introduced proactive services to household broadband customers, assuming leadership in customer satisfaction for both mobile and household broadband services.
Complaint "Peak Cut Action"	We focused on tackling focal and tough issues. In 2021, our overall average monthly complaint rate per 10,000 persons decreased by 55.6% from 2018, and average monthly complaint rate per 10,000 persons over household broadband network quality, mobile internet quality and business marketing issues also decreased by 37.4%, 64.4% and 21.7%, respectively, compared to 2019.
"Sunshine Action" for customer rights protection	With a focus on combating activation of services without customer consent, we set up a mechanism of thorough investigation of and accountability for complaints, achieving a further 76.3% year-on-year decrease in our already-low average monthly complaint rate over service subscription disputes.

We respect our customers' legitimate right to number porting and facilitate this process by offering porting services, improving porting quality, strengthening customer support and promoting industry collaboration, among other measures.

Leading a Digital-Intelligent Experience

In 2021, we built a customer benefits supermarket that was industry-leading in scale, product catalogue and experience, offering "refined, useful and convenient" customer benefits services with a focus on specialty services such as "and-Caiyun", MIGU Video, 5G Messaging, video connecting tones, Super SIM Card and VR/AR. Meanwhile, we continued to iterate and upgrade our GoTone, M-Zone, and Easy Own brands to meet the needs of over 1 billion users for a high-quality, digital-intelligent life.

Based on technological innovation, we constantly met, led and created demand for information services under different use cases ranging from music, video, reading to sports, thereby creating an enriching, digital-intelligent life for our users.

🎵 Music

Our 5G Cloud Music Hall brought a 5G immersive sound experience to users with features such as high bit-rate quality, 3D effects, aurora sound effects and music visualizer. The innovative 5G Cloud Performance offered multi-angle, multi-window viewing experience across devices. Meanwhile, cloud recording + cloud editing, visual audience-performer interaction and other functions offered an innovative and immersive experience of technology and performance, enabling real-time interaction between audience and performers. We also continued to expand and enrich the catalogue of our video connecting tones and garnered a user base of 242 million.

⊗ Video

Leveraging the "cloud, edge and network" capabilities of 5G network, we provided ultra-high-definition live streaming and specialized and distinctive 5G services for sports events and live performances. In 2021, MIGU Video presented the first 5G+4K cloud broadcast of the Peking Opera *Dragon and Phoenix Bringing Prosperity* and offered novel features like Cloud Reward and Cloud Box. We also capitalized on strong IPs such as the Euro Cup and the Olympic Games and created a zero-distance online watching experience for users.

📖 Reading

We incubated our own IPs and developed high-quality audiobooks. We upgraded sound quality and offered 24-bit depth sampling audio, providing users with Hifi (high fidelity) experience anywhere and anytime. We also used AI technology to offer a smart read-aloud feature integrating reading and listening experience. Furthermore, our cloud bookstore upgraded its after-sales service experience by various means such as refining the book card expiration reminder function.

🏃 Sports

We promoted online fitness programs for all by licensing-in and launching over 5,000 well-known local and international training programs on MIGU Run, including Les Mills, UFC (Ultimate Fighting Championship), Jung Da-yeon and Pamela Reif. We also developed new digital-intelligent features like AI-based rope-skipping and scientific training systems to bring a whole new fitness experience to our users.

○ M-Zone 2021 China Street Dance League Campus Contest

○ MIGU Cloud Bookstore hosted a lecture on Chinese culture for children at the Longhu Tang'e Community Bookstore

Creating an immersive sports games experience for users with 5G+Tokyo 2020 Olympic Games

As an official broadcaster of the Tokyo 2020 Olympic Games, we provided live streaming coverage of all events by deploying our leading technologies and ultra-high-definition capabilities, and made an exemplary model of "5G + all events + full-scenario ecology + all-media distribution".

- **Technology support:** Secured premium and stable network services throughout the event with our high-performance 5G networks; expanded the use of 4K/8K high-definition videos and the widespread application of innovative technologies such as multi-angle and multi-channel commentary in event production, bringing users a spectacular tech-rich visual feast.

- **Content creation:** Invited 128 professional commentators and produced nearly 2,000 ultra-high-definition live broadcasts of the games; achieved production and delivery of trendy content within as less as 1.5 minutes; and offered ultra-high-definition videos at scale to meet the diversified content demand of different user groups.
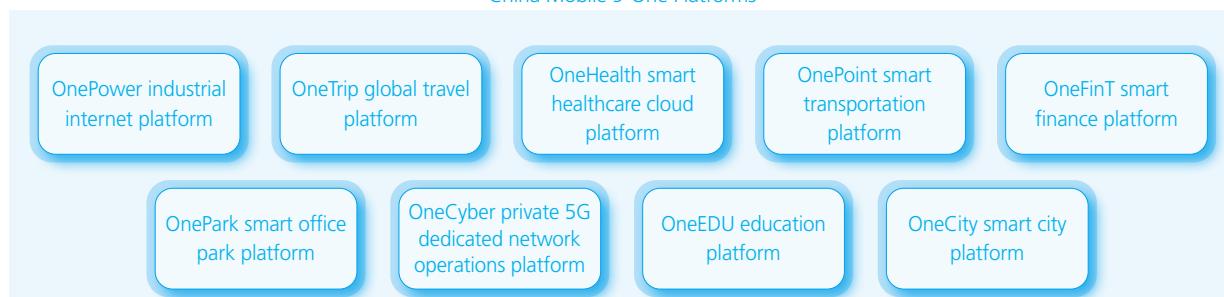
During the Tokyo Olympics, we made over 47.6 billion distributions of Olympic content, and 310 million users made a total of over 13.4 billion views of our Olympic content. What's more, MIGU Video led all Olympic broadcasters by a wide margin with a score of 92 according to Sina's review of Olympic broadcasters during the game. We proudly ignited the passion for the Olympics among hundreds of millions of viewers, who witnessed the "Strength of China" through our comprehensive live streaming services.

Shaping a Digital-Intelligent Society

China Mobile continued to explore new formats and models of information services catering for a more digital-intelligent society and lifestyle, and strove to be an engine of innovation propelling digital-intelligent transformation in our economy, society and lifestyle.

Our digital-intelligent infrastructure that offered "connectivity, computing force and ability" supported our continuous exploration of 5G applications in all verticals and fueled their commercialization. In 2021, we upgraded our cloud-network integration, industrial service abilities, digital-intelligent applications and ecosystem integration. We also advanced our 9-One platforms into the 2.0 era. By the end of 2021, we had developed more than 6,000 pilot 5G industrial applications, permeating 5G into every sector of our society and empowering cloud migration, digitalization and intelligent transformation of all industries.

China Mobile 9-One Platforms

OnePower industrial internet platform	OneTrip global travel platform	OneHealth smart healthcare cloud platform	OnePoint smart transportation platform	OneFinT smart finance platform
OnePark smart office park platform	OneCyber private 5G dedicated network operations platform	OneEDU education platform	OneCity smart city platform	

Advancing construction of "Digital Yangtze River" and delivering smart shipping communications with 5G

The Yangtze River is the world's largest navigable river in terms of transport volume and plays a key part in transportation between eastern and western China. Our Hubei subsidiary introduced the "5G+*BeiDou*" smart shipping use case and brought full coverage of 5G dedicated networks across the 37.5km waters of the Yichang section of the Yangtze River. This led to better performance of water-transport equipment, higher data transmission stability and greater quality in high-definition video transmission. Meanwhile, our Hubei subsidiary deployed a number of innovative applications to meet the demand for dynamic vessels management, shipments monitoring and information services, among other things, contributing to the high-quality development of the Yangtze River Economic Belt.

- **From "vessels looking for berths" to "berths waiting for vessels"**: In the past, vessels had to look for berths while roaming in an anchorage, leading to greater collision and management risks. With the coverage of China Mobile 5G dedicated networks, crew members may check the availability of berths using the ship-borne 5G+*BeiDou* intelligent terminal or the "Smart Parking" ("Huibo") App so that they could navigate straight to an available berth.

- **Doubling the efficiency of maritime law enforcement**: The high-precision positioning abilities of "5G+*BeiDou*", coupled with emerging technologies such as cloud computing and edge computing, enabled real-time alert and early-warning push notifications of vessels that were off course or had entered restricted areas. It also enabled one-touch query and filing of maritime law enforcement records, and promoted dynamic and efficient maritime law enforcement.

"5G+" empowered industrial internet and accelerated the transformation and upgrade across sectors and industries

Known as the "Hometown of Crafts", Jinhua City in Zhejiang Province has an economy characterized by vibrant industries, productive clusters, developed small and micro-economies and an active foreign trade economy. To help speed up the digital transformation of traditional manufacturing enterprises, our Zhejiang subsidiary set up Zhejiang's first cross-regional, cross-sectoral 5G+industrial internet platform in Jinhua City. The platform brought into play 5G's cloud-network abilities; focusing on building "5G+smart factories", the platform connected devices, production lines, products, factories, warehouses and suppliers with 5G network, and brought synergy to the industry chain.

For instance, we worked with a leading company in the domestic surface grinder industry. Our "5G+smart factories" technologies enabled visual management through an internet platform, digital "twin" factories and 5G video monitoring, and increased overall production line efficiency by 21%.

By the end of 2021, our "5G+industrial internet platform" had established 49 5G smart factories, connected to 1,003 enterprises and 5,880 devices across ten industries from smart home to machine tool manufacturing, offering solid support to the digital-intelligent transformation of industries in Jinhua City.

Building an internet hospital empowered by digital-intelligent technologies: improving medical services and assisting in pandemic response

In collaboration with the Peking Union Medical College Hospital, we introduced a pilot 5G smart hospital that offered smart healthcare, smart management and smart services, further advancing our 5G joint innovation efforts and the integrated development between information technology and healthcare.

Meanwhile, our Jiangsu subsidiary and the Jiangsu Hospital of Traditional Chinese Medicine ("the Hospital") jointly introduced the first full-service internet hospital in China. Bringing together the Hospital's existing premium medical resources as a Tertiary A-Level hospital and China Mobile's world-leading technologies, the internet hospital served as a one-stop "internet + healthcare" health service platform, offering enhanced medical service experience and improving the Hospital's service quality and efficiency.

- **Tele-clinic:** The online hospital provided a continuum of online services ranging from intelligent guidance, appointment and queuing, mobile payment, cloud clinic, report inquiry, drug delivery to electronic invoicing so that patients could receive diagnosis and treatment without attending the Hospital at all. Since the outbreak of COVID-19, our Jiangsu subsidiary has helped the Hospital set up a series of online services including fever and COVID-19 consulting, counseling, cloud clinic for specific diseases and online night clinic by well-known doctors. By the end of 2021, the cloud clinic system had offered 150,000 service sessions.

- **Tele-consultation:** We built a tele-consultation system based on the China Mobile ViLin video platform that allowed sharing of resources among medical consortia, medical alliances and international cooperation organizations for better diagnosis and treatment. Since the outbreak of COVID-19, the tele-consultation system has allowed the Hospital to take part in multidisciplinary joint diagnosis and treatment and remote consultation with designated hospitals aiding Hubei, medical consortia, specialist alliances and overseas traditional Chinese medicine (TCM) institutions.

- **Tele-education:** We hosted China's first international tele-education platform for traditional Chinese medicine, the "TCM Community" ("Huizhongyi"). Together with the Hospital's TCM professionals, as well as other domestic and international TCM Professionals, we organized over 30 free lectures, academic exchanges and live broadcasts on public health, and promoted TMC culture. For instance, our overseas live streaming lecture on collective efforts to combat COVID-19 held during the pandemic offered tips and experience for coping with psychological stress using TMC with nearly 2,000 overseas Chinese in the United States, Australia and other places.

Using 5G messaging + AICDE to improve the preservation of giant panda habitats and maintain the sustainable development of forest ecosystem

Innovatively bringing together 5G messaging and AICDE technologies, our Sichuan subsidiary created an integrated smart cultural tourism solution at the Giant Panda National Park in Sichuan, taking an important step towards building a new 5G messaging ecosystem.

- **Monitoring and protection:** Collected, stored, and analyzed giant panda behavior with video surveillance, 5G messaging, AI and edge computing, offering intelligent protection to giant pandas.

- **Research and analysis:** Deployed edge computing centers and mobile cloud, and utilized big data analysis and open capabilities of our edge cloud, to store, analyze and advance scientific research in monitoring data.

- **Service experience:** Integrated 5G messaging and big data into the business system of the park to help it deliver novel, digital marketing and offer a more immersive and intelligent experience to tourists.

- **Education and training:** Made use of the integration function of 5G messaging to provide services at the park such as sharing knowledge on animal and environmental protection.

- **Environmental restoration:** Set up the Panda Fund with the Nature Conservancy and contributed a portion of our proceeds from 5G messaging to the fund for research in ecosystem conservation and construction of local ecosystem.

Helping Gansu serve individuals and businesses better with smart government

We strive to be a first-class designer, builder and operator of digital government. We were able to offer an integrated platform for government services, public utilities services and basic livelihood support services drawing on our strengths in cloud-network resources. Our independently developed OneCity platform offered core abilities covering digitalized design, construction and operations of industries. We undertook a digital government development project for Gansu Province. With our OneCity smart city platform, we created a unified access to municipal services, ensured the consistency of municipal services in style and standard and provided a more intelligent search experience. Our solution offered "one-stop" services – addressing needs in "one visit", allowing universal recognition of "one registration" and enabling universal acceptance of "one qualification". These upgrades guaranteed efficient, standardized and personalized government services to individuals and businesses in Gansu.

Cultivating an Ecosystem of Open Cooperation

With a commitment to openness and cooperation, leveraging its strengths in technology and platform, China Mobile has continued to build partnerships along the industry chain, jointly creating a new ecosystem of industrial collaboration.

Encouraging Innovation and Entrepreneurship

Since 2016, China Mobile has been advancing the construction of National Mass Innovation and Entrepreneurship Demonstration Bases. We have built a unique innovation and entrepreneurship model of "Crowd Innovation, Crowdsourcing, Crowdfunding and Crowd Review". We launched an innovation and entrepreneurship ecosystem collaboration plan – the "Star Plan" – towards the end of 2019 to explore ways for large enterprises to assist in the growth of SMEs (small- and medium-sized enterprises) and for them to share resources and engage in collaborative development.

Providing high-quality support for incubating innovation and entrepreneurship

Set up nine "HeChuang Incubation" hubs in eight cities, focusing on specialized areas such as digital home, smart city, IoT and digital content. Equipped with full-time staff, these hubs provided our own employees, MSMEs (micro-, small- and medium-sized enterprises), makers in the community and others with end-to-end incubation and collaboration services ranging from office service, technical support, design and promotion, marketing to start-up tutoring.

Stimulating internal and external innovation and creativity

Hosted the first "Wutong Cup" Big Data Application and Innovation Competition. 1,194 teams from 208 domestic and international universities took part in the competition, through which we promoted the close integration of big data across industry, academia, research and application; hosted the in-house "Independent Development Competition" for the seventh consecutive year, involving 20,000 employee participants; hosted the "China Mobile Maker Hackathon" for the sixth consecutive year, receiving a total of more than 13,000 innovative projects and solutions from SMEs and social developers and involving over 40,000 makers.

China Mobile Collaborative Innovation Day

The final of the China Mobile Maker Hackathon

Furthering Collaboration with Third Parties

We continued to expand and further strategic collaboration with local governments and large enterprises. In 2021, we signed strategic collaboration agreements with nine local governments (including Beijing, Zhejiang and Hainan) and the Yangtze River Delta Region (Shanghai, Jiangsu, Zhejiang and Anhui), as well as 20 large enterprises (including Sinopec, JD.com, China Railway Group and China Energy Engineering). Together, we would cooperate on multiple levels – including co-construction, joint operations and joint R&D – in a variety of areas ranging from new information infrastructure, cloud computing, smart city, AI, smart home to 5G+ verticals.

Meanwhile, we proactively fulfilled our responsibilities as a member of a long list of international organizations, including the Global Reporting Initiative (GRI), the United Nations Global Compact (UNGC), the International Telecommunication Union (ITU), the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), the Institute of Electrical and Electronics Engineers (IEEE), the Global System for Mobile Communications Association (GSMA), the 3rd Generation Partnership Project (3GPP), the Global TD-LTE Initiative (GTI) and more, to further international dialogues and cooperation and to build mutually beneficial and win-win partnerships.