

Huawei Investment & Holding Co., Ltd. 2018 Annual Report

Bring digital to every person, home and organization
for a fully connected, intelligent world



Who is Huawei?

Founded in 1987, Huawei is a leading global information and communications technology (ICT) solutions provider. We are committed to bringing digital to every person, home and organization for a fully connected, intelligent world. We have nearly 188,000 employees, and we operate in more than 170 countries and regions, serving more than three billion people around the world.

Who owns Huawei?

Huawei is a private company wholly owned by its employees. Through the Union of Huawei Investment & Holding Co., Ltd., we implement an Employee Shareholding Scheme that involves 96,768 employee shareholders. This scheme is limited to employees. No government agency or outside organization holds shares in Huawei.

Who controls and manages Huawei?

Huawei has a sound and effective corporate governance system. Shareholding employees elect 115 representatives to form the Representatives' Commission. This Representatives' Commission elects the Chairman of the Board and the remaining 16 board directors. The Board of Directors elects four deputy chairs and three executive directors. Three deputy chairs take turns serving as the company's rotating chairman.

The rotating chairman leads the Board of Directors and its Executive Committee while in office. The board exercises decision-making authority for corporate strategy and operations management, and is the highest body responsible for corporate strategy, operations management, and customer satisfaction.

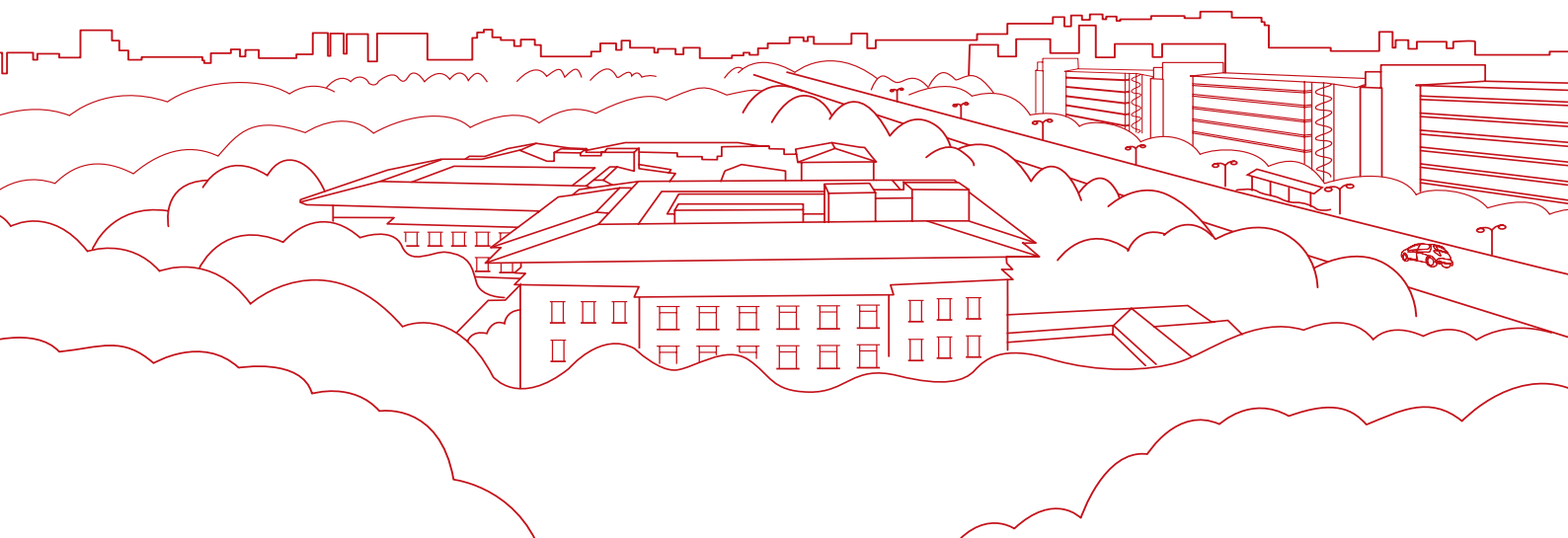
Meanwhile, the Chairman of the Board chairs the Representatives' Commission. As Huawei's highest decision-making body, the Representatives' Commission makes decisions on important company matters, like profit distribution, capital increases, and the elections of members of the Board of Directors and the Supervisory Board.

Who does Huawei work with?

Externally, we rely on our customers. They are at the center of everything we do, and we create value for them with innovative products. Internally, we rely on our dedicated employees. Dedication is a core part of our work ethic. At Huawei, those who contribute more get more.

We work with stakeholders including suppliers, partners, industry organizations, open source communities, standards organizations, universities, and research institutes all over the world to cultivate a broader ecosystem that thrives on shared success. In this way we can help drive advancements in technology and grow the industry as a whole.

We create local employment opportunities, pay our taxes, and comply with all applicable laws and regulations in the countries where we operate. We help local industries go digital, and we openly engage with governments and the media.



What do we offer the world?

We create value for our customers. Together with our partners, we provide innovative and secure network equipment to telecom carriers. We provide our industry customers with open, flexible, and secure ICT infrastructure products. In addition, we provide customers with stable, secure, and trustworthy cloud services that evolve with their needs. With our smartphones and other smart devices, we are improving people's digital experiences in work, life, and entertainment.

We ensure secure and stable network operations. We have made cyber security and privacy protection our top priorities since 2018. Over the past three decades, we have worked closely with our carrier customers to build over 1,500 networks in more than 170 countries and regions. Together, we have connected more than three billion people around the world, and we have maintained a solid track record in security throughout.

We promote industry development. Huawei advocates openness, collaboration, and shared success. Through joint innovation with our customers and partners, we are expanding the value of ICT to develop a more robust and symbiotic industry ecosystem. Huawei is an active member of more than 400 standards organizations, industry alliances, and open source communities, where we work with our peers to develop mainstream standards and lay the foundation for shared success. Together, we are driving the industry forward.

We enable sustainable development. Huawei has contributed significantly to bridging the digital divide and promoting digital inclusion, helping to connect places as remote as Mount Everest and the Arctic Circle. We are keenly aware of the importance of telecommunications in emergency situations. Having faced Ebola in West Africa, nuclear contamination triggered by the tsunami in Japan, and the massive earthquake that struck Sichuan, China, our people hold fast in disaster zones to restore communications networks and ensure the reliable operation of essential telecoms equipment. To further promote sustainability, we prioritize a low-carbon footprint and environmental protection. We are also supporting the development of the next generation of local ICT talent to boost the digital economy.



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Message from the Rotating Chairman



The easiest way to bring down a fortress is to attack it from within and the easiest way to reinforce it is from outside. Moving forward, we will do everything we can to shake off outside distractions, improve management, and make progress towards our strategic goals.

Information communications technology is rapidly working its way into every industry, just like electricity did over 100 years ago. This has triggered a digital, intelligent transformation – the driving force behind our digital economy.

In a digital world where all things are connected, every person and home will have the opportunity to enjoy a highly personalized experience based on data and pervasive intelligence. Every organization will be able to use digital platforms to increase efficiency and develop more forward-looking business models.

Against this backdrop, security and trustworthiness are critical to the long-term prosperity of the digital economy. As a global community, if we can't effectively manage evolving security risks, the digital world we are trying to build will collapse. We need to work together – as a society and an industry – to build an approach to managing cyber security risks based on fact and verification.

We have served our customers with heart and soul for three decades. Working with carriers in different countries, we have helped take advanced communications technology out of the lab and out of the ivory tower, bringing it not only to cities, but also to some of the most remote regions in the world. We now serve more than three billion people, enriching their lives and helping bridge the digital divide.

With 30 years of experience at our backs, we are well positioned to seize the tremendous opportunities presented by digitization and artificial intelligence. This will allow us to create greater value for our customers and society as a whole. As we work towards this goal, we have been explicitly clear: Cyber security and user privacy protection are at the absolute top of our agenda. We believe in building security through innovation and enhancing it through collaboration. This way, we can build a trustworthy digital world together.

In 2018, we continued to focus on ICT infrastructure and smart devices. Our sales revenue rounded off at 721.2 billion yuan, up 19.5% year-on-year. We expect to maintain robust growth in 2019 as well.

In the face of suspicion and exclusion, the trust of our customers is our greatest motivation. We will continue to deliver the best possible products and services, and build trust through action. We are confident that the companies that choose to work with Huawei will be the most competitive in the 5G era. And countries that choose to work with Huawei will gain an advantage for the next wave of growth in the digital economy.

Out-innovating the rest to create greater value for our customers

Ongoing R&D investment: Innovation and research are our lifeblood, and we will continue to invest over 10% of our annual revenue in R&D. In 2018 alone, our R&D investment exceeded 100 billion yuan, ranking fifth globally in *The 2018 EU Industrial R&D Investment Scoreboard*. Our continued investment has produced positive results, giving us the ability to provide our customers with innovative products and more efficient services.

Intellectual property: Long-term R&D investment has made Huawei one of the world's largest patent holders. As of December 31, 2018, our total number of granted patents reached 87,805. Among them, 11,152 core patents were granted in the United States.

Our patented technologies provide significant value to information society on a global scale, including the United States. We actively protect our own intellectual property rights and respect the rights of others. We have signed cross-licensing agreements with many companies around the world.

Leading 5G innovation and commercial deployment: Huawei began researching 5G more than ten years ago and now we have declared 2,570 5G essential patent families to ETSI.

Huawei is the first company to develop large-scale 5G commercial deployment capabilities. We deliver the simplest 5G base stations and the best performance, and make maintenance more intelligent. With these, we can provide our customers with unique value in many respects.

For example, our proprietary core technology enables us to dramatically increase the bandwidth of microwave transmission from 1 Gbps to 20 Gbps. In places where fiber is too difficult or expensive to deploy, we can use microwave solutions for ultra-broadband backhaul. This will make 5G site deployment faster and cheaper, while ensuring the best possible performance.

Our 5G solutions received widespread acclaim the minute they hit the market. As of February 28, 2019, we have signed more than 30 5G commercial contracts with leading global carriers and have shipped more than 40,000 5G sites to different markets around the world.

Building the world's best network connections:

Looking ahead, we will continue to invest heavily in R&D to build the simplest possible networks; we will handle the complicated parts, and leave our customers with simplicity. For standalone 5G, we will work hard to build the simplest network architecture, the simplest sites, and the simplest transaction models. We will make operations and maintenance easier. We will also develop the most secure systems, ensuring the highest levels of network resilience and compliance with the *General Data Protection Regulation* (GDPR). We are committed to developing the most powerful next-generation products – with the best possible quality – and leading the way for 5G innovation.

Embracing standards to develop secure, trustworthy, and high-quality products

Shared responsibility: Cyber security is a global challenge that we all share. To ensure cyber security, industries and regulators need to come together to develop unified standards and verification mechanisms. These should apply to all equipment providers and carriers. Equipment providers are responsible for making secure equipment according to industry standards, and carriers are responsible for ensuring the secure operations of their own networks.

Standards-based equipment security: As a technology provider, Huawei does not operate telecom networks or own customer data. Our responsibility is to make secure, trustworthy, and high-quality products. To fulfill this responsibility, we will continue to improve our software engineering capabilities and practices, and ensure that security and privacy protection requirements are embedded into all activities throughout the lifecycle of product design, development, and delivery. We see this as a strategic priority.

At the same time, we will continue to push for third-party verification, pursue open collaboration, and constantly improve our security capabilities. We have an end-to-end security assurance system. We have not and will never plant backdoors in our equipment, and we won't allow anyone else to do so, either.

Trustworthy processes and results: Over the past three decades, we have built more than 1,500 networks

together with our carrier customers, serving over three billion people in more than 170 countries and regions around the world. We have a solid and proven track record in security. Huawei is now the industry's best when it comes to product anti-attack and anti-penetration capabilities.

Across 12 indicators for software security engineering capabilities, Huawei was given top marks for nine indicators, and above industry average for three. But cyber security threats are evolving, and we need to go to greater lengths to ensure that the results of our cyber security efforts – and the process of producing those results – are both worthy of our customers' trust.

At the end of 2018, our Board of Directors approved a formal resolution to invest an initial budget of two billion US dollars for a companywide transformation aimed at enhancing our software engineering capabilities. As part of this transformation, we will refactor all of our legacy code against future-proof standards, make our code easier to read and upgrade, and build trust and quality into all of our products and solutions.

User privacy protection: Huawei complies with all applicable privacy laws and regulations, including GDPR, and we have embedded compliance requirements into all our business processes. We have not and will never monetize personal data. We provide a robust set of managerial and technical approaches to ensure data security, and we proactively engage with regulators, customers, and users so they can better understand how we collect, process, and protect personal data.

Ensuring business continuity and sustainability

Business continuity: After many years of development, Huawei has established an end-to-end business continuity management system that covers all aspects of our business, including procurement, manufacturing, logistics, and technical services. With the support of effective management teams, processes, and IT systems, we now have mature business continuity and emergency response plans, and conduct regular training and drills to ensure effective management of business risks.

Over the past ten years, Huawei has responded to more than 80 emergencies in a fast and well-organized manner. These include the tsunami in Japan, the flood in Thailand, the earthquake in Nepal, and various ransomware attacks.

Supply continuity: We adopt a supply diversification strategy and ensure supply continuity through multiple technical solutions, multiple suppliers, multiple production bases, and multiple transportation routes. For products already running on live networks, we have warehoused enough spare parts to provide full lifecycle support. We have invested heavily for more than a decade to ensure supply security in even the most extreme conditions.

Collaborating across the ecosystem for shared success

Collaboration and shared success: We advocate sharing value with other ecosystem players and evolving together with the global ICT industry. No single company or country has what it takes to make the digital world prosper. So our goal is to cultivate an open, dynamic, and diverse ecosystem where all players coexist and prosper together.

Growing together with suppliers: With over 30 years of focus and breakthrough, we are in a strong position to make the most of opportunities that are emerging in cloud, 5G, and smart device domains. We collaborate extensively and have established long-term partnerships with more than 13,000 suppliers worldwide. Moving forward, we will continue to drive business success through strategic procurement.

Through mutual trust, support, and the simplest possible transaction models, we innovate together with our suppliers to drive industry development and ensure business continuity. Regardless of any future changes in the external environment, our procurement policy will remain unchanged and we will remain dedicated to working together for shared success.

Promoting industry development: Huawei plays an active role in industry organizations to develop and grow the industry. We are now a member of more than 400 standards organizations, industry alliances, and open source communities, where we serve in more than 400 key positions. In 2018 alone, we submitted more than 5,000 standards proposals, for a growing total of nearly 60,000.

Investing in local communities: We will continue to increase our involvement in the industry and local communities. We are committed to making substantial contributions in the countries where we operate, helping improve infrastructure, speeding up industry development, creating more jobs, and improving people's livelihood.

Compliance as a bulwark against political uncertainty

Independence, openness, and transparency: Huawei is a private company wholly owned by its employees. No government or any third party holds shares in our company or intervenes in our operations and decision-making.

Although Huawei is not a public company, we abide by established standards and norms for public companies, including the publication of this Annual Report, which contains financial statements audited by an independent third-party organization. We do this to help people outside the company understand the real Huawei, our business integrity, and our independence. We actively engage with a wide range of stakeholders, including world governments, the media, and analysts, and our doors are always open to people from all walks of life.

Legal compliance and compliance systems: Legal compliance shields us from the uncertainty of international politics. We strictly comply with all applicable laws and regulations in all the countries where we operate, including export control and sanction laws and regulations of the United Nations, the United States, and the European Union.

More than a decade of continuous investment in both organization and resource management has enabled us to establish a compliance system based on industry best practices. From company policy to systems, organization, processes, culture, training, and communications, we incorporate compliance management and control requirements into all of our business processes. Our employees undergo regular training for awareness and evaluation.

Promoting an equitable business environment: We will challenge inequitable treatment to the full extent of the law.

Pushing through adversity for a successful 2019

Focusing on ICT infrastructure and smart devices:

Moving forward, our carrier business needs to seize the first wave of business opportunities for 5G. We need to leverage our end-to-end strengths to achieve strategic leadership and enhance trust. As always, we need to strive to create greater value for our customers. We need to use innovative business solutions to help them increase profitability.

Our enterprise business needs to focus on a specific set of application scenarios, starting with customer pain points and working with our partners to provide competitive solutions. Let's make "Huawei Inside" a practical reality, and integrate with local communities by working more closely with governments, industries, and enterprises.

Our cloud business needs to further develop its AI capabilities and hone its competitive edge in enterprise services. It needs to establish a stronger presence in e-government, automotive ICT components, and safe city domains, and maintain high-speed growth with healthy gross margins.

With smartphones as the pillar and AI as the driver, our consumer business will continue to develop an ecosystem that builds on chip-device-cloud synergy for both hardware and services, improve its brand image, and deliver a better experience. We aim to become a leader in delivering an intelligent, connected lifestyle across all scenarios.

Inspiring passion, growing the harvest, and cultivating long-term business fertility:

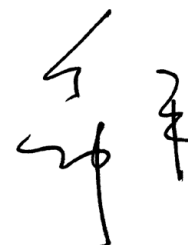
We must have highly capable teams and well-organized business structures. We need to focus on frontline teams and equip them with the tools and capabilities they need to succeed. Our top leaders need to come from outstanding "generalists" who have strategic insight, the ability to think structurally, and a successful track record.

To make this happen, we need to get rid of organizational formalities, have less coordination, reduce decision-making layers, hold fewer and shorter meetings, and reduce the number of non-operational personnel. We won't survive without these changes.

Our organization needs to be structured in a way that's conducive to business operations and success. All of our teams need to focus on growing the harvest and cultivating long-term business fertility. We also need to remove unnecessary organizational layers and processes, because perfectionism is likely to interfere with our ability to seize the strategic high ground.

The easiest way to bring down a fortress is to attack it from within and the easiest way to reinforce it is from outside. Moving forward, we will do everything we can to shake off outside distractions, improve management, and make progress towards our strategic goals.

We're in a race against time to make our vision a reality: To bring digital to every person, home and organization for a fully connected, intelligent world.



Guo Ping

Rotating Chairman

Business Highlights in 2018



Driving Ubiquitous Connectivity

- We launched the industry's first full range of 5G end-to-end commercial products and solutions that comply with 3GPP standards. In addition, we conducted 5G tests with 182 carriers worldwide, signed more than 30 commercial contracts for 5G, and shipped more than 40,000 5G base stations to markets around the world.
- In the Internet of Things (IoT) domain, we rolled out 53 NB-IoT networks and 16 eMTC networks, supporting millions of connections.
- We worked with 25 leading customers through our NetCity joint innovation program, and fully upgraded our Intent-Driven Network Solution. We maintained our place as a leader in the areas of intelligent data centers, intelligent campuses, premium home broadband, and high-quality private lines. In addition, our 5G transport solution was commercially deployed by more than 40 carriers.



Delivering a Personalized Experience

- We achieved many breakthroughs in domains such as device performance, photography, AI, communications capabilities, and design. These breakthroughs have significantly enhanced the competitiveness and experiences of our consumer products, and helped us maintain our position among the world's top three smartphone makers.
- A more robust ecosystem that delivers an intelligent experience across all scenarios: In the smart home domain, we worked closely with more than 150 brands through the HiLink smart home platform, involving more than 500 product models. In the connected vehicle domain, we provided stable and reliable connected vehicle services to tens of millions of drivers. In the health and fitness domain, we served more than 100 million users.
- A more prosperous Huawei Mobile Services ecosystem: The number of registered developers exceeded 560,000 worldwide, and we worked with these developers to create a robust application service ecosystem.



Enabling Pervasive Intelligence

- We announced our AI strategy as well as a full-stack, all-scenario AI portfolio, which included our Ascend series of AI chips – the world's first AI IP and chip series designed for a full range of scenarios – and products and cloud services that are built on Ascend chip capabilities. We also provide the SoftCOM AI solution to carriers and the HiAI solution to consumers, and serve our enterprise and government customers through the Huawei Cloud Enterprise Intelligence (EI) platform.
- We launched the Atlas intelligent computing platform, powered by our Ascend series of AI chips. This platform integrates various types of products, such as modules, cards, boards, edge stations, and appliances, building an all-scenario AI infrastructure that covers devices, edges, and clouds.
- We launched our new Advanced RISC Machine (ARM)-based CPU Kunpeng 920. We also released our TaiShan series servers, powered by Kunpeng 920. The TaiShan servers are built for big data, distributed storage, and ARM-native application scenarios.



Building a Digital Platform

- We built an intelligent, converged, open, and secure digital platform featuring device-pipe-cloud synergy, which helps customers go digital faster. By the end of 2018, more than 700 cities and 211 Fortune Global 500 companies – 48 of which are Fortune 100 companies – selected Huawei as their partner for digital transformation.
- We released industry-leading, full-stack cloud solutions, which provide strong support in all aspects – including chipsets, hardware, software, solutions, and the industry ecosystem – for the digital transformation of enterprises. We also focused on building full-stack platform capabilities, end-to-end service capabilities, and comprehensive ecosystem partnerships. In addition, we provided a wide array of hybrid cloud solutions that support homogeneous and heterogeneous architectures.

Five-Year Financial Highlights

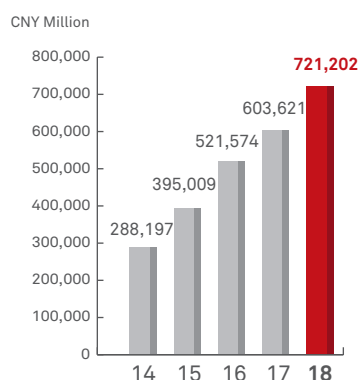
	2018		2017	2016	2015	2014
	(USD Million)	(CNY Million)		(CNY Million)		
Revenue	105,191	721,202	603,621	521,574	395,009	288,197
Operating profit	10,689	73,287	56,384	47,515	45,786	34,205
Operating margin	10.2%	10.2%	9.3%	9.1%	11.6%	11.9%
Net profit	8,656	59,345	47,455	37,052	36,910	27,866
Cash flow from operating activities	10,889	74,659	96,336	49,218	52,300	41,755
Cash and short-term investments	38,777	265,857	199,943	145,653	125,208	106,036
Working capital	24,921	170,864	118,503	116,231	89,019	78,566
Total assets	97,109	665,792	505,225	443,634	372,155	309,773
Total borrowings	10,201	69,941	39,925	44,799	28,986	28,108
Equity	33,994	233,065	175,616	140,133	119,069	99,985
Liability ratio	65.0%	65.0%	65.2%	68.4%	68.0%	67.7%

Notes: 1. Converted into United States dollars ("USD") using the closing rate at the end of 2018 of USD1.00 = CNY6.8561

2. Starting from January 1, 2018, the Group applied IFRS 15 and IFRS 9 and related amendments in preparation of its financial statements. Details about the changes to related accounting policies are discussed in notes 3, 4, and 5 of the consolidated financial statements summary. As permitted by the standards, the cumulative effect caused by the adoption of new standards was recognized as an adjustment to the balance of equity at January 1, 2018. Comparative information has not been restated.

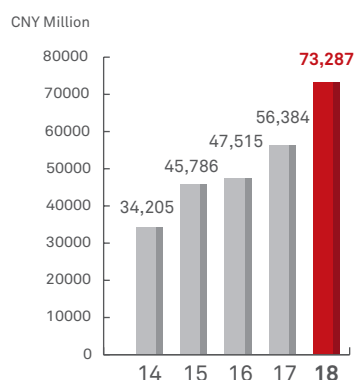
Revenue

CAGR: 26%



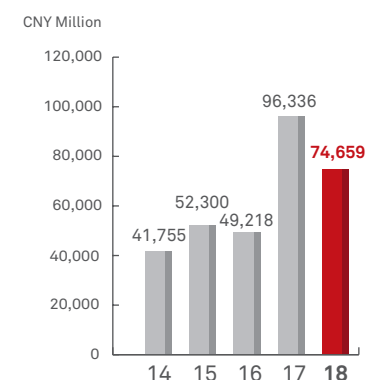
Operating profit

CAGR: 21%



Cash flow from operating activities

CAGR: 16%



Message from the Chairman



The world is changing and we are facing new challenges. But Huawei will stay the course. We will work with our customers and partners to build an ecosystem that thrives on shared success. And we will do our best to push the limits of technology and promote social progress along the way.

Driving digital inclusion in a changing world

Huawei's vision and mission is to bring digital to every person, home and organization for a fully connected, intelligent world. This is what drives us. And as we work to build this future, we want to do so in a way that is open, collaborative, and beneficial for everyone involved. That means working closely with partners to create greater value for our customers, contributing to industry development, and giving back to local communities.

The ICT industry is overflowing with potential, and we will see countless opportunities to generate new value and accomplish great things. With nonstop breakthroughs in 5G and AI, along with more widespread adoption of

digital technology in general, ICT is evolving from a vertical industry to a platform industry that underpins society as a whole. This will enable all industries to go digital and intelligent, and trigger a new revolution in technology, creating infinite opportunities for growth.

At present, however, a great cloud of political and economic uncertainty looms over global markets. The world is changing and we are facing new challenges. But Huawei will stay the course. We will work with our customers and partners to build an ecosystem that thrives on shared success. And we will do our best to push the limits of technology and promote social progress along the way.

Advancing technology for every person, home, and organization

Digitization and intelligence have created new worlds of opportunity. However, these opportunities remain out of reach for many people. Huawei is committed to bridging the digital divide across the globe. Through continuous innovation in ICT infrastructure and smart devices, we are making technology simpler, more convenient, and more affordable, giving more people access to the benefits of digital technology. Our ultimate goal is to improve people's quality of life and promote socioeconomic development.

According to the ITU and GSMA, 66.3% of the world's households remain unconnected, and half of the world's population has no Internet access. This is an ongoing challenge that stems from insufficient investment in ICT infrastructure and low affordability. On top of this, more than two billion people around the world lack reliable mobile broadband service, and a significant number of them live in urban areas.

We have launched multiple solutions to bridge this digital divide.

Our RuralStar solution helps increase network coverage in underserved rural areas. We have deployed this solution with over 40 carriers in more than 20 countries and regions, including Thailand, Ghana, Indonesia, Nigeria, South Africa, and China. With RuralStar, millions of previously unconnected people are now able to access mobile networks for the first time.

Our PoleStar solution promotes the sustainable growth of urban mobile networks. By reusing and repurposing existing urban infrastructure, this solution reduces the costs and difficulties associated with the traditional methods of base station deployment. Major cities in countries like China, Thailand, Indonesia, the Philippines, and Kenya have already seen large-scale application. With PoleStar, cities

can save tremendous amounts of space and provide far better connectivity.

Our WTTx broadband access solution delivers a fiber-like service experience with fixed wireless connections. WTTx is cost efficient, easy to deploy, and boasts wide coverage. This helps solve last-mile access issues that traditional fixed-line solutions typically face in densely populated urban areas and sparsely populated rural areas. To date, Huawei has deployed WTTx on over 180 networks in more than 120 countries and regions, giving more than 40 million households access to stable, high-speed broadband services.

In 2018, our RuralStar, WTTx, and PoleStar solutions respectively won the GSMA's Best Mobile Innovation for Emerging Markets award, the ITU's Global Corporate Award for Sustainable Development, and the GSMA's Outstanding Mobile Contribution to the UN SDGs in Asia award.

On the device side, our innovation focuses on providing greater value for consumers and delivering an intelligent, inspired experience across all scenarios. We design our smart devices to empower people and help them achieve their full potential. For instance, systematic innovation in our hardware and software helps even the most inexperienced photographers take professional-quality pictures with their smartphones.

But our innovation doesn't stop at entertainment. Working together with the European Union of the Deaf, we launched an AI-powered app called StorySign. StorySign is designed to help deaf children overcome barriers when first learning how to read. All they have to do is hold their device up to a book, and a cartoon avatar will appear on the screen to help translate the book into sign language. This bridges the gap between phonetics and written language, and helps deaf children and their families enjoy more interactive story time together.

Prioritizing cyber security and privacy protection

We believe that, as a technology provider, it's our responsibility to build security through innovation, enhance security through collaboration, and work together to shape a digital world that everyone can trust. In 2018, Huawei's Board of Directors made it clear that cyber security and privacy protection are and will remain Huawei's top priorities. Our Global Cyber Security and User Privacy Protection Committee (GSPC) has been operating since 2010.

Over the past 30 years, we have built more than 1,500 networks together with telecom carriers, providing network services to over three billion people in more than 170 countries and regions. Throughout this time Huawei has maintained a solid track record in security. Moving forward, we are keenly aware that technology will become increasingly complex and networks increasingly open. This will raise the bar for security. We will continue to increase our investment in security, and work with customers to keep our track record strong.

We will continue to engage governments, local communities, and our customers in active, open, and transparent dialogue. Together, we will make ICT infrastructure more secure and maximize its value. We have long-term, effective mechanisms in place to facilitate collaboration and regular communications on cyber security challenges with national governments in the UK, Canada, Germany, France, and other nations. To bolster these efforts, we opened a Cyber Security Transparency Centre in Brussels in March 2019. Moving forward, we will continue to promote this open and transparent approach to security management in other parts of the world.

Huawei has a proven track record in security, and our cyber security practices have earned the trust of our partners across the global value chain. Our products, solutions, and services are certified by independent third-party security organizations. According to a recent report from CFI Group, an independent consulting agency, the system stability and reliability of Huawei equipment has performed far above industry average for three consecutive years.

Huawei complies with all applicable privacy protection laws in the countries and regions where it operates, including GDPR in the European Union. To better identify and mitigate potential privacy risks in our business activities, we adhere to Privacy by Design practices and integrate privacy impact assessments into all product and service development processes.

Giving back to local communities

We work in more than 170 countries and regions around the world, and we are committed to being an active, productive member of the communities where we operate. Together with governments, customers, enterprises, and non-profit organizations, we actively invest our time, resources, and expertise to give back to local communities. Our initiatives include a range of community support programs, running our business in an environmentally friendly way, training local ICT talent, and giving to local charities.

Localized operations are important to us. Wherever Huawei goes, we create new employment opportunities, provide solutions for education and healthcare, and help drive economic growth. We serve local communities through ICT training and ICT talent cultivation.

We will continue to enhance our collaboration with universities and research institutes around the world. We sponsor university professors and scientists who conduct basic research and explore the future of humanity, but we are not after their intellectual property. Instead, we want to support their research in a way that lights the way forward for everyone.

2018 marked the 10th anniversary of our flagship CSR program – Seeds for the Future. This program is designed to cultivate local ICT talent, enhance knowledge transfer, promote a more in-depth understanding of ICT, and encourage greater participation in digital communities. By the end of 2018, we have implemented Seeds for the Future in 108 countries and regions. Through this program, more than 4,700 top college students have been given the opportunity to visit and study at Huawei's headquarters in China.

Committed to operational compliance

At Huawei, we believe that legal compliance is a bulwark against the uncertainties of international politics. We conduct business with integrity, observing international conventions and all applicable laws and regulations in the countries where we operate. This is the cornerstone of operational compliance at Huawei. We require all subsidiaries and departments around the world to strictly comply with local laws and all other applicable regulations.

Building on industry best practices, we have developed a robust system of compliance over 10 years of hard work and investment. We embed compliance controls in all of our business processes to manage and oversee the compliance of end-to-end business operations.

Moving forward, we remain committed to strengthening compliance across multiple business domains, including trade, finance, bribery prevention, as well as protection of intellectual property and trade secrets. We will continue to cultivate a culture of compliance by driving awareness and embedding compliance-related requirements in all business activities.

Improving corporate governance

A sound corporate governance system is the cornerstone of sustainable development. It is also the basis of our long-term cooperation with external stakeholders. We continue to optimize our corporate governance structure, enhance the design of governance-related organizations and roles, and streamline our corporate governance operation mechanisms. We aim to maintain a solid foundation for ongoing customer centricity, sustainable business development, and effective management of internal and external risks.

In January 2019, Huawei's shareholding employees elected new members of the Representatives' Commission, producing 115 Representatives and 18 Alternate Representatives. The Commission exercises rights on behalf of all shareholding employees.

Moving forward, we will focus on continuous innovation in ICT infrastructure and smart devices. We will work with partners to create greater value for our customers – and share more value throughout the process. We are committed to building a fully connected, intelligent world, where every person, home, and organization can enjoy the benefits of new advancements in technology. We will work hard to make the digital economy more inclusive and sustainable, and give back to the global community.

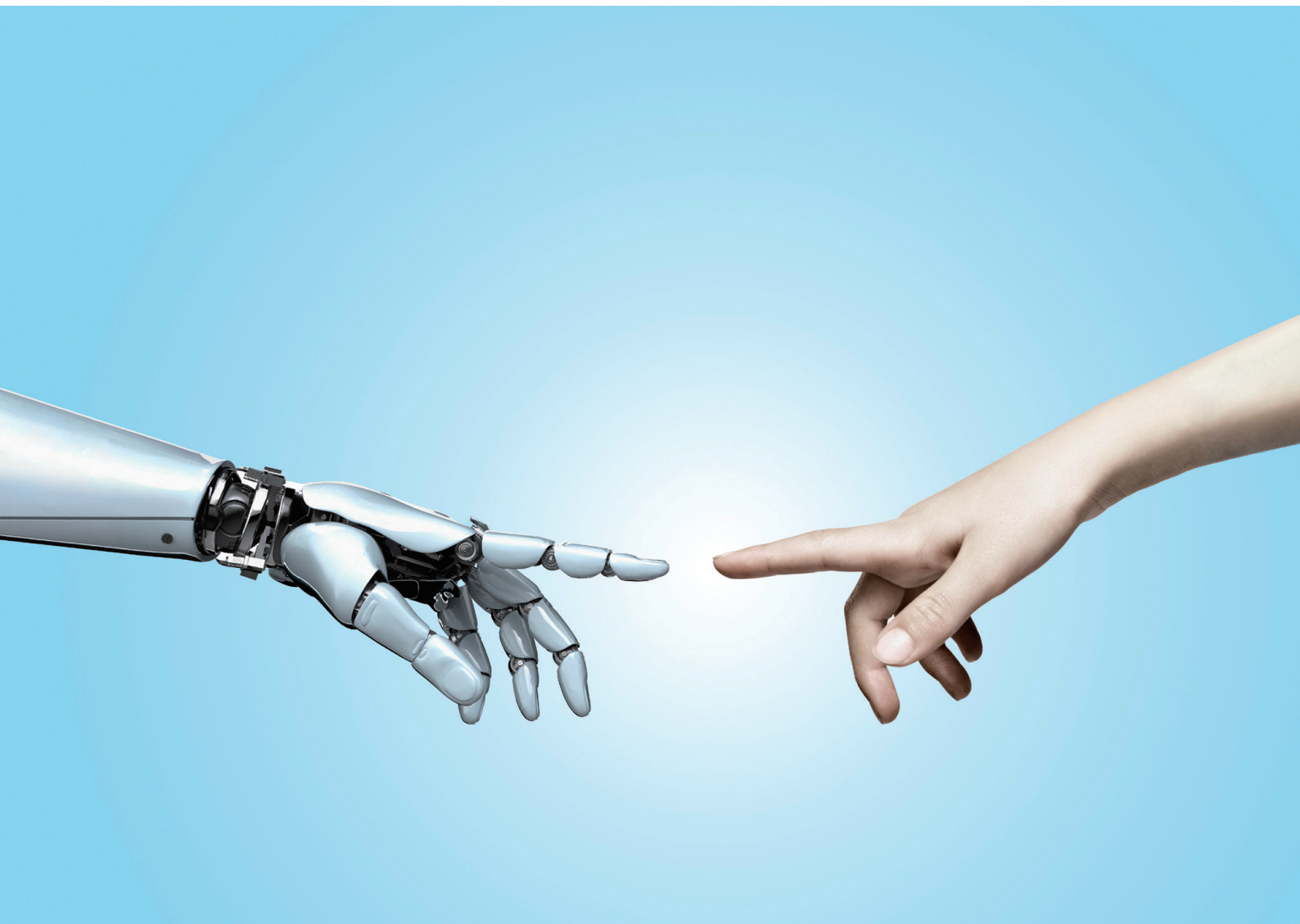


Liang Hua

Chairman of the Board
Huawei Technologies

Industry Trends

Embracing +Intelligence, Shaping the Future



Advanced technologies – AI and cloud computing in particular – are ushering in the Fourth Industrial Revolution. These technologies are opening the door to a new world where all things can sense, all things are connected, and all things are intelligent, which will lead to big changes for how we live, work, learn, and communicate. We are shifting gears and moving into the +Intelligence fast lane. Every economy and industry around the world is rushing to embrace AI and get an edge on the competition. On the supply side, we have ICT infrastructure, which can provide intelligent platforms when ICT is integrated with AI. On the user side, there are industries that are modernizing themselves with intelligent connectivity. Digital transformation will break down barriers, and synergy across industries will become the new normal.

All industries are exploring how to make themselves more personal and user-centric by revamping products, services, and experiences. Industries are also rethinking their business models, and they are creating intelligent twins and new types of businesses. These developments will be the seeds of growth for the next economic boom. The *Digital Spillover* report – a joint publication by Huawei and Oxford Economics – predicts that the new opportunities created by the next economic boom will be worth US\$23 trillion, and will bring benefits for every person, home, and organization.

Your Smart Device Knows What You Need Wherever You Are

As smart devices come into wider use, packed with a multitude of apps, we want to share, manage, and secure our information in more ways than ever before. New technologies, especially AI, are making our devices more intelligent so that they can assist us with increasing effectiveness.

Traditionally, devices like smartphones, smart home appliances, and smart speakers work independently, storing data locally, learning from it locally, and applying new knowledge locally. AI will change this by linking these devices to enable more power through connectivity, more power through synergy, and more power through knowledge. The new architecture is built around the smartphones, accessible through tablets, personal computers, wearables, TV sets, speakers, and in-car devices, with IoT control over home appliances, lighting, security, audiovisual, and surveillance. This tightly-knit fabric of smart devices creates an intelligent environment, centered on the users, that knows what they need.

More than 6 million apps are about to be connected together. Data fragments from every user will be collected and mined so that the system can feel the users in real time, predict their needs, and deliver the perfect apps. Communication will become more natural and efficient, whether it's person-to-person, person-to-machine, or even machine-to-machine. Users will get the services they want quicker, and service providers will have a valuable window into the changing needs of their market.

How will this work in vehicles? Your smartphone's smart digital assistant will recognize as soon as you enter a vehicle, and will instantly provide the services you need – intelligent noise reduction, lock screen bypass, and hands-free operations – all linked directly to the car's inbuilt screen. The phone's AI engine will also sense your needs and provide you with a smart travel experience.

In the home, doorbells, cameras, robot vacuums, refrigerators, and washing machines will be linked to a central hub, allowing you to easily manage all of your home services from anywhere.

5G Is Now: Ubiquitous, Ultrafast

We are expanding connectivity, making connections faster, wider, and deeper, and laying the foundations for a fully connected world. 2019 marks the beginning of the 5G era. 5G will enable ultra-broadband connections so fast that users will be swimming in a “Pacific Ocean” of data, without having to stay in their own lanes.

Huawei’s Global Industry Vision (GIV) predicts that the percentage of global population living in areas covered by 5G networks will reach 58% by 2025. 5G will be a major technology of connectivity, and it will turn connectivity into a platform. With 5G, you will never again need to connect your smart home appliances or wearables, because 5G will make “always-online” the new default.

When all things go online, going all cloud is the next step. With 5G, there will be real-time transfer speeds between cloud and device, with zero lag. Therefore, the response time for computation and storage will be the same for both cloud and device.

5G will redefine devices. Future devices will be able to stay online at all times. They will be smarter and more naturally interact with users and the environment. These devices will understand us better and anticipate our needs. Time and space will no longer be barriers: 5G will help converge the digital and physical worlds and transform the user experience.

5G will also make entirely new experiences possible. With a single digital ID, the network will travel with you wherever you go. Your content and services will travel with you, and your experience flow seamlessly: a truly context-sensitive, intelligent experience.

New Technologies Overcome the Computing Bottleneck

As Moore’s law approaches its limits, the industry is constantly on the lookout for new computing architectures and algorithms that can deliver faster computing speeds. Due to the growing diversity of apps, data is becoming more diverse. Smartphones, smart homes, IoT, and smart cars use a range of different forms of data, including numerical, text, images, and video. Data volumes are also growing. The amount of global data generated and stored annually, including data copied, will reach 180 zettabytes in 2025, a 20-fold increase of the current amount. To cope with this explosion of data, we will need to grow global AI computing capacity by 10 times every year.

To that end, we will need intelligent computing architectures that offer high concurrency and extremely low power consumption. There will be x86 architecture, dedicated GPUs for graphic processing, NPUs for AI, and DSPs for signal processing. No single architecture is effective in every scenario, so diversified architecture is the right way forward. In addition, breakthroughs in quantum computing and neuromorphic computing will take computing power to a whole new level.

Application-level AI and Intelligent Twins Create New Business Opportunities

AI, as a general-purpose technology, is a new engine for economic growth and will be widely used in all industries. AI will raise productivity in all industries by a projected 0.8%-1.4%. Huawei predicts that by 2025, the global AI market will be worth US\$380 billion, 90% of which will come from the enterprise market.

Every industry has data assets that can be mined to raise productivity and applied in many different scenarios: repetitive and high-volume tasks like image recognition and evaluation; tasks that require expertise (e.g., cancer screening); and tasks that require multi-domain coordination like smart urban transport.

Intelligent twins powered by AI will connect the physical and digital worlds more efficiently. Vehicles will no longer just be a means of transport: They will be smart, self-driving devices that can sense their surroundings using video, audio, and IoT technologies.

Manufacturers will be able to respond swiftly to consumer demands: Intelligent twins, such as flexible manufacturing robots, will eliminate the need for trade-offs between scale and scope, or between price and quality. In smart homes, household robots will free up the time of the younger generation, and help resolve the difficulties of ageing populations.

Where physical equipment depreciates with use, the value of intelligent twins increases over time. Take deep learning systems for example. As they absorb more data, industry databases become richer, and intelligent twins become more powerful. According to Huawei's GIV, 14% of homes will have robots by 2025. In the global manufacturing industry, the number of installed industrial robots per 10,000 employees will reach 103. AI will be a key driver in reshaping business models, improving user experience, and boosting future growth.

Trustworthiness, Openness, and Collaboration: Driving Inclusive Development

New technologies can lead to entirely new types of businesses. But they also raise concerns: Will new types of businesses replace the old? Will our privacy remain secure? Will traditional industries resist development out of fear of becoming obsolete?

We should remember that new opportunities always come with challenges. If we don't embrace new technology with an open mind, we may miss out on a new space and new opportunity for growth. When the Fourth Industrial Revolution arrives, we will need new institutions and laws to manage new types of

businesses. These will help to protect every economy, industry, and individual as we step into the fast lane of intelligent growth.

During this process, the ICT industry will need to become more open and more collaborative. We will need to work together to build secure and trustworthy networks that deliver secure and trustworthy connections, applications, and digital platforms for all. These networks are the key to inclusive development, because they bring digital to every person, home and organization for a fully connected, intelligent world.

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Our Vision, Mission, and Strategy

Huawei's vision is to bring digital to every person, home and organization for a fully connected, intelligent world. To this end, we will:

- Provide ubiquitous connectivity to give everyone equal access to connections;
- Provide pervasive intelligence to drive businesses forward;
- Build digital platforms to help all industries and organizations become more agile, efficient, and vibrant;
- Deliver a personalized experience to all, respecting the unique character of everyone, and enabling the full potential of every person to be realized.

Building a Fully Connected, Intelligent World

 Ubiquitous Connectivity	 Pervasive Intelligence	 Personalized Experience	 Digital Platform
Connectivity is a basic right of all people, and the foundation for human progress and economic growth. Connectivity will become a natural and ubiquitous resource, through networks that proactively sense our needs and the changing environment. These networks will offer intelligent, seamless, and secure connections to people and things whenever and wherever they want. With the advent of 5G, we begin a new chapter in the story of connectivity.	The Fourth Industrial Revolution, powered by AI, is already under way. As a general-purpose technology, AI will be used in every part of our society. It will be embedded into all industries, products, and solutions, changing how businesses operate and create value. AI will also make our networks more resilient, providing security for mission-critical services and data.	Using AI, cloud, and big data technologies, businesses will better understand their customers' needs, and with agile innovation, they will provide a more personalized experience for every customer. Coordination and collaboration across industries will drive innovation at scale. A personalized experience will be available to all, respecting the unique character of everyone, and enabling the full potential of every person to be realized.	A new digital wave is sweeping the globe. Digital and AI technologies are helping all governments and businesses become more agile, efficient, and vibrant. Open, secure, flexible, and easy-to-use digital platforms will facilitate innovation and transformation in all industries. They will be the bedrock and the fertile soil from which our digital society will flourish.

Ubiquitous Connectivity

We are moving towards an intelligent world, where all things will be able to sense and connect. Connectivity is the prerequisite for – and foundation of – this world. It is also a basic right of all people.

Huawei is committed to connecting all people, homes, and organizations that are still offline. We are also driving the adoption of broadband and ultra-fast broadband. In addition, we are infusing AI into connectivity so that our networks can adapt to the changing needs of people and connected things. Going forward, intelligent networks will need to adjust bandwidth and latency in real time, so that they can deliver the consistent, user-centric experience that network customers expect.

In the three main areas (individual users, homes, and organizations), Huawei enables ubiquitous connectivity, whether it's person-to-person, person-to-thing, or thing-to-thing. With our focus on user experience, we bring AI into networks so that they can proactively sense our needs and the changing environment. These networks will offer intelligent, seamless, and secure connections to people, homes, and organizations, whenever and wherever they want.

To make this a reality, Huawei is constantly innovating. We have developed a range of cutting-edge connectivity technologies that work in any scenario and over any media – Wi-Fi, copper, fiber, cable, microwave, Small Cell, 3G, 4G, 5G, and IoT. We are also leveraging big data and AI to develop intelligent

connectivity solutions for individual users, homes, and organizations. Examples include the Huawei SmartWi-Fi, HiLink, OceanConnect, and SoftCOM AI solutions.

Pervasive Intelligence

AI is a new general-purpose technology that will trigger transformation in all industries, and in some cases, it may even disrupt industries. AI will change how every organization works, leading to higher efficiency and lower costs. For households and individual users, AI will bring completely new experiences.

These changes have only just begun.

AI will be built into every aspect of our lives. It will find its way into all industries, products, solutions, business operations, and processes, changing how organizations work and create value. AI will be an engine for value creation in a digital world. Data, computing power, and algorithms are the three fundamental resources that make AI work. Huawei's GIV forecasts that by 2025, 90% of smart devices will have smart assistant functionality, 14% of families will own smart robots, and 86% of enterprises will be using AI.

However, there are still many obstacles to the adoption of AI. For example, existing algorithms are still inefficient, many users lack access to sufficient computing power, and there are not many practical applications. In addition, synergy between AI and other technologies is currently low, as is coordination within the industry ecosystem. As a result, AI is still expensive and scarce.

To address these obstacles, Huawei has launched a full-stack AI portfolio that serves all scenarios. From ideation to strategy, from chips to applications, and from consumer (HiAI) to enterprise (HUAWEI CLOUD EI), as well as Huawei's autonomous driving network solution for telecom carriers (SoftCOM AI). In terms of technology, business, and ecosystem, Huawei is taking action to turn pervasive intelligence into reality.

Personalized Experience

The physical and digital worlds are converging increasingly quickly. Mass production is giving way to mass customization, leading to greater business innovation, collaboration across ecosystems, and richer user experiences.

The smart devices of the future will be able to stay online at all times, and interact with users and the environment in a more natural way. These devices will understand us better and know what we want. In addition, with the support of AI across cloud, networks, and chips, devices will no longer go into standby, but be awake at all times: not plug & play, but plug & think.

Huawei's GIV forecasts that there will be 40 billion personal smart devices in the world by 2025. 20% of people will own more than 10 smart devices. 86% of companies will be using AI, and data utilization will skyrocket to around 80%. There will be 440 million augmented reality (AR) and virtual reality (VR) users. All of these developments will mean innovations for people, homes, and organizations.

The hardware and software of smart devices will be better structured and more modular. This will allow us to easily add new capabilities to smart devices, like connectivity, sight, hearing, touch, sensing, language, perception, and even cognition. We can stack new features in a modular fashion – putting them together like building blocks. These smart devices will enable users to extend their senses beyond the physical world and into the digital. Businesses will use new technologies like AI and cloud to understand their customers' needs and power agile innovation in services, allowing them to deliver more personalized experiences. Coordination and collaboration across industries will drive innovation at scale.

Digital Platform

Data is coming from more sources and in more forms, from personal data and consumption data to video data and industrial data. These fragments of data can be integrated only with the help of digital platforms.

During digital transformation, enterprises face the challenge of how to deploy and integrate new technologies, including cloud, AI, and big data. To keep pace with changes, enterprises also need to adapt their strategies, organizational structures, processes, R&D, manufacturing, marketing, and services. This is where powerful digital platforms come into play. These platforms will enable enterprises to harness new technologies and agilely innovate in order to deal with changes and new competitive forces.

Digital platforms are essential to successful digital transformation.

Buildings, factories, production lines, and utilities are the physical platforms necessary for organizations to operate. Using information technology, companies can manage their physical platforms more efficiently than ever before, and streamline their business operations. This process is what we call digitization.

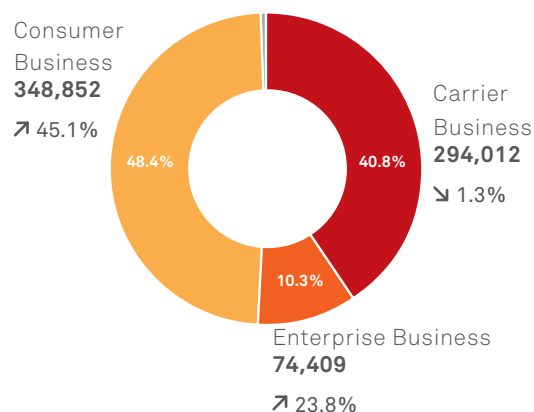
More advanced IT technologies, such as the Internet, cloud computing, and AI, are changing how companies work and leading to the creation of new business models. This process is digital transformation. The IT systems and operational methods that accompany them form a company's digital platform.

Together with our ecosystem partners, Huawei provides leading, innovative digital platform solutions as well as relevant technologies and products. Our offerings are ideal for helping customers build open, secure, flexible, and easy-to-use digital platforms. By empowering data integration, business coordination, and agile innovation, these digital platforms will pave the way for successful digital transformation.

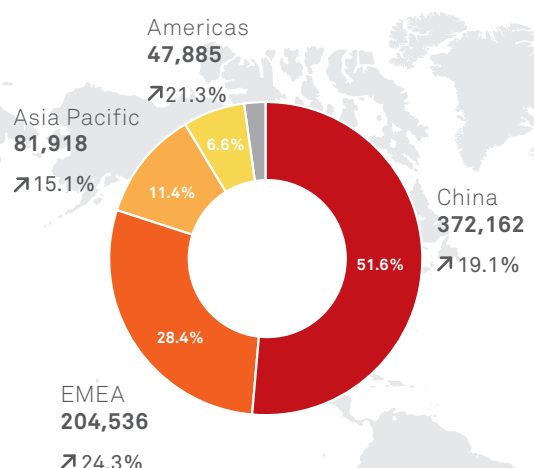
Business Review 2018

In 2018, the global economy saw relatively stable growth, but was facing a possible slowdown. We stayed focused on ICT infrastructure and smart devices, and continued investing to create value for our customers, deliver better experiences to consumers, and improve the quality of our operations. Our annual revenue was CNY721,202 million, up 19.5% year-on-year.

(CNY Million)	2018	2017	YoY
Carrier Business	294,012	297,838	(1.3)%
Enterprise Business	74,409	60,091	23.8%
Consumer Business	348,852	240,372	45.1%
Other	3,929	5,320	(26.1)%
Total	721,202	603,621	19.5%



(CNY Million)	2018	2017	YoY
China	372,162	312,532	19.1%
EMEA	204,536	164,603	24.3%
Asia Pacific	81,918	71,199	15.1%
Americas	47,885	39,470	21.3%
Other	14,701	15,817	(7.1)%
Total	721,202	603,621	19.5%



- In the Chinese market, our flagship smartphones enjoyed continued growth, our mid-range smartphones became more competitive, and we created more local sales channels. Our enterprise business was presented with opportunities related to digital and intelligent transformation, and our capabilities in developing industry-based solutions improved. Thanks to these factors, Huawei earned CNY372,162 million in revenue from the Chinese market, up 19.1% year-on-year.
- As a result of the growing sales of our high-end and mid-range smartphones, a growing share of the smartphone market, and the accelerated pace of digital transformation in our enterprise business, Huawei earned CNY204,536 million in revenue from Europe, the Middle East, and Africa (EMEA), up 24.3% from 2017.
- In the Asia-Pacific Region, our consumer business saw greater synergy between its dual brands, our mid-range and low-end products became much more competitive, and the rate of digital transformation increased in our enterprise business. Thanks to these factors, Huawei maintained strong growth momentum and earned CNY81,918 million in this region, up 15.1% year-on-year.
- In Latin America, enterprises were building new digital infrastructure and our mid-range consumer products were more competitive. As a result, Huawei's revenue from the Americas grew to CNY47,885 million, up 21.3% from 2017.

Carrier Business

We are in an age of surging innovation. The time for large-scale 5G deployment is now. Artificial intelligence (AI) has become a new general-purpose technology, and technologies like the Internet of Things (IoT) and cloud computing are more important than ever.

As the cornerstone enabling the global digital economy and an intelligent world, the telecom industry is faced with tremendous opportunities. Carriers around the world are actively adopting new technologies, especially 5G and AI, to push the boundaries of their business and achieve greater success.

Huawei is committed to enabling carriers' continued business growth and digital transformation with innovative technologies and solutions. We are accomplishing this by focusing on typical business scenarios and resolving customer issues. Specifically:

- We deliver simplified networks and simplified operations & maintenance (O&M) for 5G with industry-leading end-to-end 5G capabilities. We are driving the large-scale commercial rollout of 5G, and building a mature 5G ecosystem.
- We enable autonomous driving networks and intelligent operations with the SoftCOM AI solution, boosting energy efficiency, network performance, O&M efficiency, and user experience.

- We help carriers achieve new growth with innovative business solutions, including B2C, premium home broadband, cloud-network convergence, and IoT solutions.

In 2018, we maintained solid performance in our carrier business, generating revenue of CNY294,012 million. In the face of new opportunities and challenges, our approach is to take on complexity ourselves and create simplicity for our customers. Through heavy investment and continuous innovation, we will continue to work with our carrier customers and partners to drive the robust and rapid development of the telecom industry.

5G Is ON

The time is right for carriers around the world to deploy 5G. By the end of February 2019, we had signed more than 30 commercial contracts for 5G with leading global carriers, and shipped more than 40,000 5G base stations to markets around the world.

At the Mobile World Congress (MWC) 2018, Huawei launched the world's first device chipset supporting the 3GPP standard for 5G and the first 5G Customer Premise Equipment (CPE) powered by the chipset.

In September 2018, Huawei was the first vendor to complete all three phases of China's 5G technology R&D test on non-standalone (NSA) and standalone (SA) 5G architecture organized by the IMT-2020 (5G) Promotion Group. The test results showed that Huawei outperformed other vendors in all areas.

By the end of 2018, Huawei worked with major industry vendors to complete the first interoperability testing between 5G devices, networks, and chipsets, laying a solid foundation for carriers' large-scale deployment of 5G.

Huawei's best end-to-end 5G solutions feature simplified sites, simplified architecture, simplified protocols, and simplified O&M. These solutions will help carriers achieve rapid, large-scale rollout of high-performance 5G networks, significantly reduce network rollout and O&M costs, and increase ROI.

In recognition of Huawei's 5G technologies and products, more than 50 carriers around the world, including Vodafone, Telefónica, China Mobile, China Unicom, and China Telecom, have partnered with Huawei on 5G commercial tests to drive the commercialization of 5G.

In addition, Huawei has been actively exploring new applications for 5G. We have teamed up with more than 280 industry-leading partners on more than 50 projects. We are working with partners in industries including electricity, manufacturing, transportation, and fishing to deploy innovative 5G solutions in real-world scenarios. The value that 5G can deliver has been fully recognized.

SoftCOM AI Building Autonomous Driving Networks

To help our carrier customers continue to reduce OPEX and improve efficiency and competitiveness, we launched our SoftCOM AI solution, bringing full-stack, all-scenario AI technologies to All-Cloud networks to enable autonomous driving networks. This has helped our customers maximize energy efficiency, network performance, O&M efficiency, and user experience. Some highlights are listed below.

In **energy efficiency**, Huawei uses AI to improve the energy efficiency of networks and help build green networks:

- Our SmartSite solution improves site energy efficiency by more than 28% through maximum power point tracking (MPPT) and smart equipment shutdown while meeting all KPI targets.
- Our iCooling data center energy solution precisely optimizes energy efficiency in real time based on load and environment changes, and reduces the energy consumed by central equipment rooms and data centers by 15%.

In **performance improvement**:

- Our AI Fabric solution uses the industry's first data center switch powered by an AI chip. The solution also uses the innovative iLossless algorithm, improving the computing efficiency of data centers by 50%.
- Our Capacity Booster solution improves spectrum efficiency by around 10% based on autonomy in layers and coordination between the MBB Automation Engine (MAE) and site AI. MAE improves performance optimization efficiency by 100% thanks to closed-loop automation.

In **network operations efficiency**, Huawei has launched the intelligent operations services AUTIN™ based on big data and AI technologies. Through automation and intelligent capabilities, these services help customers improve operations efficiency and gradually evolve to zero service outage, zero NOC intervention, and zero network risk.

In **user experiences**:

- Huawei has integrated AI voice recognition, image recognition, and intelligent translation functions into the intelligent conferencing system to help companies enhance collaborative work.
- Our intelligent customer service solution uses a voice chat robot to humanize language interactions, significantly improving user experience.

Huawei is actively building full-stack, all-scenario AI capabilities, targeted at the telecom industry, aiming to provide customers with abundant and affordable computing power. This includes our Ascend series of AI chips and our Atlas intelligent computing platform, which supports a full range of scenarios, including clouds, edges, and devices. We have also adopted AI in our all-flash and distributed cloud storage services to help customers build an efficient and intelligent foundation of data.

Innovation Inspiring New Growth

Huawei has continued innovating in networks, services, and business models to help carriers redefine the boundaries of their business and achieve new growth by targeting individuals, homes, and enterprises. Some highlights are listed below.

In the **B2C** domain:

- We enabled hundreds of millions of users in emerging markets to upgrade their mobile broadband services more quickly. This was achieved in many ways, such as helping carriers precisely identify users through big data analytics and increase the efficiency of sales channels.
- We helped carriers monetize traffic and create value through digitalized end-to-end traffic management and precise investment planning.
- We deployed the RuralStar solution together with more than 100 carriers around the world, bringing mobile services to tens of millions of previously unconnected people in remote areas.

In the **B2H** domain, commercial deployment of 4K, 8K, and Cloud VR services has gained traction, representing higher requirements for the quality of home broadband services. We launched the 5-Star Premium Home Broadband Solution, which improves network construction efficiency and reduces TCO from end to end. In 2018, we did the following:

- Huawei's 10G PON solutions were applied commercially by more than 30 leading carriers.
- Our Optical Distribution Network (ODN) served more than 80 carriers.
- We worked with more than 10 carriers worldwide through our NetCity joint innovation program to provide premium home broadband services.

In **carrier B2B** services, by adopting the "Cloud + Network + X" model, our cloud-network convergence solution has brought together a robust ecosystem. This solution helps carriers develop the ability to provide end-to-end one-stop-shop cloud-network services and build digital service platforms for B2B. It also helps carriers overhaul existing business models by shifting the focus from resources to business and services. As a result, they can achieve new growth in the carrier B2B market.

The **IoT** industry is growing increasingly faster around the world, driving the rapid development of smart

cities. Huawei has helped carriers roll out 53 NB-IoT networks and 16 eMTC networks. We deliver IoT services in the form of cloud services so that they are available around the world upon launch. This helps our customers and partners rapidly deploy applications in a cost-effective way.

Video has become a core service for carriers, and more than 150 carriers around the world have launched their video service packages. Huawei has been working to develop capabilities in the areas of business, network, O&M, and ecosystem building to help carriers the world over accelerate their development of video services, increase user loyalty and O&M efficiency, monetize video services, and achieve greater business success.

Wireless Networks

Huawei has built efficient, agile, and automated mobile broadband networks targeting the 5G era and helped carriers drive the digital and intelligent transformation of industries. We have also increased carriers' ROI and helped them maximize network value in the areas of sites, spectrum, and continuous network evolution. Our scenario-specific solutions enable mobile networks to carry more services.

In **5G**, Huawei has continued to build core capabilities. Some of our achievements are as follows:

- We have become an industry leader in Massive MIMO, a key technology for 5G, and our 5G microwave has kicked off full commercial deployment.



Installation of Huawei's 5G 64T64R AAU; Huawei's all-scenario 5G sites facilitate rapid, large-scale deployment of 5G worldwide

- Huawei's simplified 5G sites have helped carriers make the most of legacy site assets in terms of base stations, antennas, energy, and transmission to reduce investments and quickly activate 5G sites.
- Our innovative energy saving solutions have helped carriers reduce site power consumption and build green 5G sites.

In **LTE**, this all-service foundation network has continued to evolve, winning high acclaim from major carriers around the world. Highlights include:

- Huawei's multi-frequency, multi-channel, and multi-sector solution increases network capacity and coverage, and maximizes spectrum efficiency. Delivering 5G-like experiences, this solution provides assurances for ultra-high-speed mobile Internet services, and lays a solid foundation for 5G's commercial deployment.
- By the end of 2018, we had deployed LTE-Advanced Pro (4.5G) networks for 182 carriers worldwide, and worked with more than 1,000 partners from around the world to build a sustainable ecosystem for our industry. We have incubated new services like IoT, AR, and VR to help carriers seize new business growth.

Our **WTTx** wireless broadband solution supports efficient deployment and delivers fiber-like wireless connectivity to home users. Some of our achievements with this solution include:

- By the end of 2018, we had deployed the WTTx solution on more than 180 networks in more than 120 countries and regions, connecting more than 40 million home users.
- We have provided over a million households in the Philippines, South Africa, and Japan with access to high-quality wireless home broadband services.

WTTx supports continuous evolution toward 5G. Its higher speeds and larger capacity mean that everyone can enjoy mobile ultra-broadband services. The WTTx solution is expected to be widely adopted in multiple scenarios, including households, small- and medium-sized enterprises, and wireless verticals.

Fixed Networks

The ultra-broadband industry is booming. New services including ultra-HD video, Cloud VR, and cloud-network convergence are driving ongoing network upgrades and evolution.

Carriers are now facing fierce competition from OTT and IT players. In response to carriers' new requirements, Huawei has helped build converged transport networks that are automated, intent-driven, and support ultra-high bandwidth. With these networks, carriers can provide high-quality broadband and private line services that meet SLAs to achieve high-value growth.

In the cloud era, carriers are in urgent need of digital transformation. Data centers and cloud-network convergence services can enable significant business growth for carriers. In 2018, progress in these two areas included:

- By the end of the year, Huawei's CloudFabric solution had been commercially deployed in more than 1,200 data centers in more than 120 countries and regions, building flexible, open, and secure intelligent data centers. This solution has helped carriers and enterprises remain competitive in the cloud service market.
- Huawei helped leading global carriers build one-stop-shop service solutions featuring cloud-network convergence. The solutions provide premium private line services by reducing service provisioning time from weeks to days and allowing users to subscribe to services in just minutes on their own.

As we enter the 5G era, the construction of 5G transport networks has gained traction. Huawei's 5G-ready transport solution adopts simplified network architecture, simplified SRv6 protocols, and simplified NCE O&M to minimize the cost per bit, improve configuration efficiency, and automate the full lifecycle. With the many benefits it delivers, the solution prepares carriers for the capacity and O&M challenges that may emerge in the 5G era. Our 5G transport solution has been commercially deployed by more than 40 carriers around the world, continuously spearheading the construction of 5G transport networks.

Cloud Core Networks

Huawei's simplified 5G core network solutions are fully converged, intelligent, autonomous, and microservice-oriented. They enable carriers to quickly construct networks and support service innovation.

Huawei's cloud-based core network solutions adopt an innovative Cloud Native software architecture and support smooth evolution toward 5G core networks. They help carriers speed up service launches, improve the efficiency of network operations, and maximize resource utilization. We have signed more than 480 NFV commercial contracts around the world.

Our VoLTE solution helps carriers fully leverage high-value spectrum and lays a foundation for 5G voice services. We have put more than 50 VoLTE networks into commercial use, serving more than 300 million users.

The Huawei Envision video solution features device-cloud synergy and cloud-edge synergy. The former delivers an inspired video experience while the latter supports the commercial deployment of ultra-HD 4K and 8K VR services. The solution uses cloud services to help carriers develop video services. Building on this solution, we also developed the first ultra-HD video service based on 5G, creating an inclusive, quality digital lifestyle for users.



Huawei is committed to customer-centricity and open innovation. The C&C08 was a large-capacity digital SPC switching system developed by Huawei that integrated switching and transmission, wired and wireless, and narrowband and broadband. The C&C08 delivered a wide range of services, supported flexible networking, and was widely used in international offices, toll offices, gateway offices, tandem offices, and local offices of carriers, as well as dedicated communications networks in a number of industries. First launched in 1993, the C&C08 ended its run in 2018. During its 25-year lifecycle, it served hundreds of millions of users across more than 100 countries and regions.

Huawei helps carriers expand connectivity, explore the value of connectivity, and enable industry development. Based on the OceanConnect IoT platform, China Telecom and Huawei jointly deployed the full-stack eCloud IoT platform, offering a wide array of device management and application enablement services. With this platform, both companies are working to build an ecosystem and incubate business applications. The number of connections on this platform has exceeded 100 million.

IT

In the IT domain, Huawei is committed to being an innovator of cloud data centers in the 5G and AI eras. We jointly innovate with our customers and partners in the areas of cloud computing, big data, and AI in order to accelerate carriers' digital and intelligent transformation.

In the cloud computing domain, Huawei's cloud computing solutions have a unified architecture for private clouds, public clouds, and hybrid clouds. We have deployed cloud platforms for more than 270 carriers and their subsidiaries worldwide.

In the storage domain, two Huawei storage products stand out:

- The OceanStor Dorado V3 all-flash storage system: Targeting carriers' mission-critical services, the system has a latency that is only one-tenth of traditional storage systems, with the TCO reduced by 60%. The system has been deployed in the mission-critical services of more than 150 carriers around the world, and earned the recommended ranking from market research firm DCIG.
- FusionStorage distributed cloud storage solution: This solution helps deal with the massive amount of data that will be generated in the 5G era. It supports a maximum of 4,096 nodes in a cluster and builds a centralized storage pool to host hundreds of petabytes of data.

In the intelligent computing domain, Huawei launched its Atlas intelligent computing platform, an all-scenario AI solution that provides superior computing power to meet customer expectations. This platform features cloud-edge synergy and all-scenario coverage, and supports integrated solution delivery. We have partnered with the Shenzhen Traffic Police to build an intelligent "traffic brain", which can search for photos from its library of 1 billion photos in just seconds and analyze the video clips provided by more than 20,000 cameras in real time. The "traffic brain"

has boosted road capacity in Shenzhen by around 8% and resulted in a tenfold increase in law enforcement efficiency, redefining traffic management with intelligent technologies.

Network Energy

Huawei is committed to providing carriers with network energy solutions that are efficient and reliable, and enable smart O&M. We strive to continue to lead energy digitization for a smart and sustainable world.

To adapt to the 5G era, Huawei launched the industry's first 5G Power Solution, spearheading the application of the "one band, one blade" and "one site, one cabinet" site construction models. By adopting innovative technologies including intelligent synergy between energy and networks, intelligent peak shaving, and dynamic voltage boosting, the solution reduces deployment costs, improves network energy efficiency, and ensures faster, simpler, and more cost-effective network evolution toward 5G.

In the data center energy domain, our prefabricated modular data center has been widely applied by 40 carriers worldwide and become the mainstream model for carriers in the Middle East, Latin America, and Africa to build hyperscale data centers. At the same time, Huawei has driven the standardization of power usage effectiveness (PUE) testing for data centers. We have worked with industry organizations including the Green Grid, and received the world's first PUE test certificate for indoor modular data center products.

Global Services

Huawei continues to increase investments in the services domain, building a unified digital platform and expanding our ecosystem partners. We have developed a wide array of scenario-specific solutions that are integrated into carriers' business processes, including network planning, building, O&M, optimization, and operations, to help them accelerate their digital transformation and achieve greater success.

Highlights include:

- Our Premium Ultra Broadband Solution improves user experience by integrating carriers' end-to-end business processes.
- Our CWR@Digital Solution enables the digital transformation of network operations and has been deployed in more than 40 projects for carriers including VIVA in Kuwait and China Unicom Shandong.
- We have used the HUAWEI SmartCare® CEM solution to construct and help operate more than 60 service operations centers (SOCs) around the world, improving the service quality of more than 160 networks.

Another highlight is our intelligent operations services AUTIN™. They leverage the Operation Web Services (OWS) platform and operations expertise to make operations automated and intelligent and increase their efficiency and quality. By the end of 2018, more than 30 carriers, including China Mobile, Celcom in Malaysia, and MTN South Africa, signed contracts for commercially deploying AUTIN with Huawei, and over 6,600 operations developers worldwide used the OWS platform for innovation and development.

In preparation for the 5G era, Huawei leverages digital technologies, including site digital twin, digital survey, and AI acceptance, to integrate processes and share data streams from end to end. This supports faster, large-scale 5G deployment. At the same time, we use AI and other technologies to help carriers move toward ultra-simplified operations in the 5G era.

Huawei continues to build a robust delivery ecosystem. We promote digital delivery models featuring centralization, sharing, and convergence. With our Integrated Service Delivery Platform (ISDP), we have successfully delivered more than 10,000 projects worldwide. Our high-quality professional services have ensured the stable operations of more than 1,500 networks in more than 170 countries and regions, and supported network stability for our customers during more than 200 key events around the world.



Huawei's service staff and partners check site installation safety (photo taken by Togrul Murtuzayev).

In the telecom industry, a great new era is just around the corner. Moving forward, Huawei will remain committed to openness, collaboration, and shared success. Together with our customers and partners across the globe, we will forge ahead and build a fully connected, intelligent world.

Enterprise Business

An intelligent world where all things can sense, all things are connected, and all things are intelligent is fast approaching. In the enterprise business, Huawei adheres to a “Platform + Ecosystem” strategy, where we provide platforms and stress the importance of ecosystem support.

Together with our partners, we are delivering ubiquitous connectivity and pervasive intelligence to our government and enterprise customers. We have also built a digital platform integrating new ICT technologies including cloud computing, artificial intelligence (AI), the Internet of Things (IoT), big data, integrated communications, video, and geographic information system (GIS). Our goal is to enable customer digitization and bring digital to every organization.

We are actively working with customers, partners, developers, industry alliances, and standards organizations to build an interdependent ecosystem that fosters shared growth. We continue to share value with our partners, and support them in the joint innovation of solutions, marketing, talent cultivation, finance, supply chains, and IT systems. In addition, we have worked to facilitate the development of industry standards and cut the costs of digital transformation. Through these efforts, we aim to jointly create value for customers, grow the industries we support, and achieve sustainable development.

In 2018, we continued to innovate in products and solutions in domains such as cloud computing, IoT, AI, intelligent computing, campus networks, and data centers. We also worked to promote wider adoption of our innovative products and solutions in digital government and safe city projects, as well as in sectors such as finance, energy, transportation, and manufacturing. By the end of 2018, 211 Fortune Global 500 companies – 48 of which are Fortune 100 companies – selected Huawei as their partner for digital transformation.

In 2018, revenue from our enterprise business was CNY74,409 million, a year-on-year increase of 23.8%. Our enterprise business is gradually becoming a major engine behind Huawei’s growth.

Competitive Digital Platform Technology

Huawei aims to further accelerate the digital transformation of industries and create more customer value. To achieve this, we have built a digital platform

that covers technologies such as AI, big data, cloud computing, IoT, and integrated communications. This platform enables data integration, business collaboration, and agile innovation. It has become an essential tool helping industries go digital and building a foundation for the future digital world.

Building Ubiquitous Connectivity

We have driven wide adoption of our Intent-Driven Network Solution by enterprises, and fueled the digital transformation of governments and public utilities as well as sectors including finance, Internet Service Providers (ISPs), and retail. Huawei was named a Leader in *The Forrester Wave™: Hardware Platforms For Software-Defined Networking*, a report released by Forrester Research. Some of our success stories include the following:

- ETH Zurich, the Swiss Federal Institute of Technology Zurich, has chosen Huawei to provide stable, high-performance wireless campus networks, advancing its “learning anytime, anywhere” strategy.
- The Industrial and Commercial Bank of China (Asia) has adopted Huawei’s SDN-based data center network solution, which allows multiple services to share one set of network hardware. This helps maximize resource utilization and launch services faster.

In response to rapidly changing industries, Huawei has launched multiple wireless private network solutions that have been applied extensively. Some of these solutions include:

- Huawei’s eLTE solution has seen wider adoption in regions rich in natural resources, including South America, southern Africa, and the Middle East. The solution makes production more secure, efficient, and eco-friendly.
- Huawei remains a leader in private broadband networks for safe cities, and has helped countries including Thailand and Egypt achieve efficient collaboration between government departments.
- Our IoT-G 230 MHz solution has been applied in areas across China, including Hunan, Anhui, Hebei, and Shanghai, and we have encouraged many mainstream communications vendors to support the IoT-G standard. We have established strategic partnerships with multiple leading companies

in the electricity sector and driven the rapid development of the 230 MHz electricity private network ecosystem.

- Our eLTE-U solution has helped build the second intelligent management network for Line 17 and Line 18 of Chengdu Metro in China's Sichuan province. This was the world's first ultra-high-speed metro trackside network. Our eLTE-U solution was also commercially deployed on the first high-speed rail in Africa, run by Morocco's national railway operator, ONCF.

Delivering Pervasive Intelligence

In the intelligent era, Huawei has been deeply integrating AI technology with IT products and solutions, and conducting joint innovation with our customers and partners in government, public utilities, finance, large enterprises, and other sectors. This joint effort has accelerated digital and intelligent transformation. Some success stories include the following:

- China Merchants Bank partnered with Huawei to develop FinTech-level distributed databases and use FinTech to transform into a genuine "FinTech bank" that provides users with faster, more convenient, and more personalized services.
- BYD used Huawei's OceanStor Dorado all-flash system to upgrade its Enterprise Resource Planning (ERP) system. The latency of the storage system was shortened to less than 1 ms, the time needed to query materials was reduced from 14 minutes to 4 minutes, and overall system efficiency improved five-fold.

In Gartner's Magic Quadrants report, Huawei's storage products have remained in the Leaders quadrant for the third time. In a report by Forrester Research, the HUAWEI CLOUD FusionInsight Big Data Solution was listed among the More Viable players, in terms of sustainable competitiveness, in computer vision software for AI in China. According to reports released by market research firm IDC, the Huawei FusionAccess Desktop Solution and our hyper-converged infrastructure, FusionCube, held the largest market share in China.

Huawei also uses AI technology to maximize the value of ICT infrastructure. We released our Smart DC 3.0 @ AI solution, which uses AI technology to build smarter data centers. This solution features i³ (iCooling, iPower, and iManager):

- iCooling reduces power usage effectiveness (PUE) by enabling the cooling system to automatically optimize power consumption.
- iPower improves reliability through preventative maintenance.
- iManager improves the resource utilization of hyperscale data centers by around 20%.

Our data center energy solutions have been adopted on a large scale in governments as well as industries such as finance, ISPs, and energy. Huawei's prefabricated modular data center solution and modular UPS continue to hold the largest market share globally, and we won DCD's global annual Living at the Edge award.

In the photovoltaic (PV) domain, Huawei has been integrating ICT and AI with PV technologies to drive the PV industry to become fully intelligent, further reduce the Levelized Cost of Energy (LCOE) of PV plants, and make grid parity a reality sooner. According to reports from market research firm IHS Markit, shipments of Huawei smart PV inverters have ranked No. 1 globally for three consecutive years.

Building a Digital Platform That Integrates New ICT Technologies

To address the core requirements of industry customers, Huawei has integrated new ICT technologies such as cloud computing, AI, IoT, big data, integrated communications, video, and GIS to build an intelligent, open, flexible, easy-to-use, and secure digital platform.

To provide IoT services to enterprises, Huawei has enabled digital transformation across all industries through expanded connections, cloud services, and AI. In 2018, we released IoT Cloud Service 2.0. This new service provides pre-integrated industry suites, and offers platform cloud services such as Intelligent Transportation, Connected Vehicle, Smart City, and Smart Campus services.

Huawei and Deutsche Post DHL have jointly developed industrial logistics solutions. Working together, both companies have innovated in the areas of logistics, transportation, "last mile" delivery, and warehousing management. This partnership has significantly improved efficiency, safety, and customer service in the global logistics industry.

Huawei and China's State Power Investment Corporation Limited signed a comprehensive partnership agreement to collaborate over the long

term. The companies will work closely together, at both corporate and regional levels, in the areas of Industrial Internet platforms, smart campuses, and PV energy. This partnership aims to deeply integrate the Internet, big data, and AI with the real economy, maximize the strengths of both companies, and achieve shared success and common development.

Huawei has also extensively explored the industrial and automobile domains, and has deepened collaboration with the Airbus China Innovation Centre, HBIS Group, FAW Group, Dongfeng Motor, Chongqing Changan Automobile, SAIC Motor, BAIC Group, and GAC Group in the areas of Industrial IoT, intelligent transportation, and connected vehicles. We have provided solid support for the digital transformation of numerous industrial customers and partners.

At IoT Solutions World Congress 2018, Huawei's OceanConnect IoV Platform, which helped Groupe PSA become a leader in mobility services, won the award for Business Transformation. Together with our partners, we launched a city-wide LTE-V2X network in Wuxi, China, marking the world's first city-wide deployment of a commercial LTE-V2X solution. This project won the Special Award for Technologies, New Products, and New Applications at the 2018 World Internet of Things Exposition – the highest honor presented at this event.

Huawei's enterprise communications technology has accelerated the digitization of enterprise office work. Examples include the following:

- The Umbria Regional Government in Italy used Huawei's HD videoconferencing platform and RP Series Telepresence system. This platform and system ensure more effective communication between government departments, and ultimately improved the image of public administrations.
- Huawei developed an end-to-end videoconferencing solution for Air China, which greatly improved communication efficiency between Air China HQ and branches and helped the company provide superior services.

IDC reports show that Huawei's videoconferencing products have ranked first in China and third globally in terms of market share for several years.

We launched our software-defined camera (SDC) and CloudIVS 3000 video cloud platform. With device-cloud

synergy and network-wide intelligence, the camera and platform can meet security requirements in numerous scenarios, including safe cities, transportation, and campus networks. Mauritius used Huawei's intelligent video surveillance and intelligent road surveillance systems to improve safety. Huawei's products help the country implement proactive monitoring, provide early warnings, strengthen public safety management, and optimize traffic.

A Wealth of Experience in Helping Governments and Enterprises Go Digital

Driven by business needs and starting with top-level designs, Huawei focuses on creating customer value, and works with leading global enterprises and governments to continuously explore and implement best practices for digital transformation. We have helped our customers build an agile and intelligent foundation upon which to join the digital business revolution.

Smart City

Huawei launched the Smart City Digital Platform, which is powered by our full-stack, all-scenario AI portfolio. The platform integrates digital urban resources such as IoT, big data, geographic information, video cloud, and integrated communications to enable data sharing, business collaboration, and agile development.

Huawei played an active role in the development of China's national standard for smart cities, *Smart city – Top-level design guide (GB/T 36333-2018)*, which took effect on January 1, 2019. The Intelligent Operation Center (IOC), a solution developed by Huawei that functions as the "brain" of the smart city, has been deployed in more than 10 cities around the world, and has become the leader in the global IOC domain. Some highlights of Huawei's contributions to smart city development are as follows:

- In Saudi Arabia, Huawei helped Yanbu make its digital transformation blueprint a reality. As a result, resident satisfaction increased to 90%.
- In South Africa and Thailand, the Huawei Government Cloud Solution helps governments share resources, integrate data, and continuously increase the adoption of ICT.

- In Brazil, Huawei's e-tax solution has helped double the number of electronic invoices issued, and helped the country implement its tax reforms.
- In China, Huawei has participated in more than 60 smart city projects, including in Beijing, Shanghai, Tianjin, Shenzhen, Suzhou, Jilin, Yiyang, and Gaoqing. We have used the latest technologies such as 5G, cloud computing, and IoT to help customers build new types of governments, which enable smarter city administration and foster a more people- and business-friendly environment.
- Huawei's e-customs solution has assisted customs in 12 countries digitize operations and improve customs clearance efficiency, facilitating international trade.

Huawei has helped more than 160 cities in over 40 countries and regions implement smart city projects.



At the Smart City Expo World Congress (SCEWC) 2018, the city of Gaoqing in China's Shandong province won the Digital Transformation Award for successfully going digital with Huawei's Smart City Digital Platform and serving as a role model for building a smart city that can be replicated by small- and medium-sized cities. Rustenburg, South Africa won the finalist award for the Governance & Finance Project for creating a smarter and more secure digital ecosystem with the help of Huawei.

Safe City

Huawei is a leader in the digital transformation of the public safety industry and a pioneer of the global public safety ecosystem. We are committed to bringing safety to every citizen and every city, and establishing interconnected, intelligent, and collaborative safe cities.

We have worked with more than 100 leading solution partners around the world to develop innovative safe

city solutions using ICT technologies such as AI, cloud computing, big data, and IoT. Our Safe City Compact Solution has been used to protect citizens in small- and medium-sized cities like Chia in Colombia and Vitacura in Chile. Other achievements include the following:

- With our solution, the city of Lahore in Pakistan has decreased the average time it takes to respond to public safety incidents from 30 minutes to 10 minutes, and shortened the average time it takes police officers to resolve a case from 45 days to 2 days.
- We helped police officers in Côte d'Ivoire resolve more than 10,000 cases in one year, and supported stable network operations during key events including the African Union-European Union Summit and the Games of La Francophonie.

Huawei's safe city solutions now serve over 700 cities across more than 100 countries and regions, including Brazil, Mexico, Serbia, Singapore, Spain, South Africa, and Turkey.

Finance

Huawei has continued to work with top financial institutions, research institutes, and independent software developers worldwide to accelerate the transformation of financial institutions. 2018 highlights include the following:

- Huawei's all-flash storage solution helped CSS Insurance in Switzerland to improve the processing performance of its business systems and provide convenient and efficient insurance services to millions of customers.
- Huawei's Financial Big Data Solution helped China Merchants Bank and China Pacific Insurance achieve data-driven intelligent risk control, reducing the total number of fraud cases by around 50% and preventing potential annual losses by more than CNY1 billion.
- Huawei's Financial Active-Active Solution helped Italian bank Widiba build a high-availability data storage and management platform to provide customers with uninterrupted online financial services.

Huawei and Deloitte released a white paper aimed at the finance industry titled *Combining Experience and Technology for Boundless Smart Banking*. In addition, Huawei and IDC jointly released the *Leading with Digital in Banking* white paper. These white papers provide guidance for building smart banks and offer models and methodologies that help financial institutions comprehensively evaluate the maturity of their digitization process.

Huawei currently serves more than 300 large financial institutions, including 20 of the world's top 50 banks.

Energy

Huawei strives to become a one-stop-shop ICT solution provider for the electricity industry and a preferred partner for smart grid development. Our smart grid solutions have been extensively deployed by over 190 customers in the electricity sector, including Italian multinational energy company Enel, the Provincial Electricity Authority (PEA) of Thailand, and State Grid Corporation of China. Highlights include the following:

- Huawei and State Grid Corporation of China jointly launched the innovative eLTE-DSA 230 MHz solution, which focuses on narrow-band discrete spectrum and helps efficiently carry power distribution and consumption services.
- Huawei's Value-added Power Communications Network Solution for the electricity sector helped Saudi Electricity Company (SEC) and the Dubai Electricity and Water Authority (DEWA) strategically transform into smart city infrastructure service providers.
- The 1901.1-2018 – IEEE Standard for Medium Frequency (less than 12 MHz) Power Line Communications (PLC) for Smart Grid Applications, which Huawei helped establish, has been officially released.

In the oil and gas industry, Huawei has worked with partners to provide solutions such as exploration and production cloud, oil and gas IoT, digital pipeline, and intelligent refinery. Some achievements include the following:

- Huawei's cloud data center helped the largest oil and gas company in North Africa go digital.
- Huawei's HPC solution was deployed for petroleum exploration in Mexico and Malaysia.
- Huawei's transmission networks have helped ensure secure and stable operations of oil pipelines in Russia and North Africa.

We have also explored the adoption of AI, big data, edge computing, and other technologies in the oil and gas industry. This experience will allow us to help many companies, such as China National Petroleum Corporation, improve their oil exploration efficiency.

Transportation

Huawei strives to apply intelligent technologies to foster a thriving transportation industry. With this in mind, we have adopted big data, video cloud, IoT, Integrated Communications Platform (ICP), and other new technologies to drive the digital transformation of the transportation industry.

In the **aviation** domain, Huawei launched the Smart Airport 2.0 Solution. Focusing on three core requirements – security, high-quality service, and efficiency, the solution helps build a smart airport where operations management is refined and visualized, passenger services are personalized and precise, operations are intelligent and efficient, and resources and equipment are fully connected. Two notable examples are:

- We worked with Shenzhen Airport Group to establish a digital transformation platform and build an airport that will deliver the best possible experience.
- We provided a highly reliable and hyper-converged IT architecture for Aeronautical Radio of Thailand.

In the **rail transport** domain:

- In Australia, Huawei has been contracted to build a world-leading 3GPP compliant LTE-based mission-critical voice communication system for the Public Transport Authority (PTA) of Western Australia.
- We worked with Shenzhen Metro, Hohhot Metro, and Zhengzhou Metro in China to build smart urban rails and create an urban rail cloud ecosystem.

In the **highway** domain, Huawei successfully conducted joint LTE-V2X tests on coordination between vehicles and infrastructure in China and Europe.

In the **public transportation** domain, Huawei helped Shanghai Jiushi Public Transportation Group Limited build a smart bus cloud platform to make bus operations smarter.

In the **logistics** domain, Huawei has provided information infrastructure for global logistics service providers, such as Deutsche Post DHL, to help them build a logistics system that is visualized in the end-to-end process.

We serve over 230,000 km of railways and highways, more than 70 urban railway lines, and more than 60 customers in the aviation industry.

A Thriving Enterprise Ecosystem and Global Delivery Capabilities

We are actively working with customers, partners, developers, industry alliances, and standards organizations to build an interdependent ecosystem that fosters shared growth. We adhere to the Being Integrated strategy and strive to achieve shared success with our partners by consistently following fair, just, transparent, and simple policies.

Huawei has established a global partner ecosystem that includes channel partners, solution partners, service partners, talent alliances, and investment and financing partners. By the end of 2018, we had more than 20,000 channel partners, 1,000 solution partners, 3,600 service partners, and 650 talent alliance partners working with us around the world to deliver solutions to enterprises. Our partners include many industry-leading companies such as SAP, Accenture, Honeywell, Siemens, Alstom, Hexagon, VST ECS, Synnex, ALSO, Redington, Arrow ECS, CNBM Technology, and Digital China.

As a key initiative for implementing our “Platform + Ecosystem” strategy, Huawei has set up OpenLabs to target the enterprise market in cities including Suzhou, Munich, Paris, Mexico City, Singapore, Dubai, Bangkok, Delhi, Cairo, Johannesburg, Moscow, and Istanbul. In these labs, we work with our customers and partners in different domains around the world to develop the best possible industry-specific solutions, enrich local ICT industry ecosystems, and help our customers go digital.

At the same time, we provide our partners with strong support in the joint innovation of solutions, marketing, talent cultivation, finance, supply chains, and IT systems. We work closely with them to continuously improve their capabilities and drive their transformation for shared success.

We are committed to providing consistent, high-quality services to our customers. We develop global service capabilities that target industry customers, and build intelligent service platforms to continuously improve customer experience. Key areas of our investment include professional service solutions (e.g., industry cloud enablement services, customer support and industry O&M services, and industry solution services) and a unified cloud-based tool platform. Our annual investment has grown by more than 40%. By the end of 2018, Huawei worked with more than 3,600 service partners, providing services to over 45,000 customers around the world and helping them go digital.

Working with universities, training institutions, and industry associations, we have established the Huawei Certification system, which covers all ICT domains. Awareness of the Huawei Certification brand has grown around the world. To date, more than 130,000 engineers have received this certification, and over 7,700 of them are Huawei Certified Internetwork Experts (HCIEs). Our certification system has produced high-quality ICT talent prepared to support industry digitization.

Cloud Service

2018 was a year of rapid growth for HUAWEI CLOUD. The online cloud services provided by HUAWEI CLOUD are injecting new vitality into Huawei's 30 years of experience in ICT infrastructure. HUAWEI CLOUD has picked up the pace of its innovation and is delving into the artificial intelligence (AI) era, boosting productivity in a wide variety of industries. Together, Huawei Cloud and AI will create a better future for homes, enterprises, and society at large.

AI is empowering industries to become intelligent, and profoundly changing every industry. Intelligence has become one of the strongest driving forces behind the migration of industry applications to the cloud. However, two bottlenecks are hindering the widespread adoption of AI: inefficiency and high costs. Inefficiency is seen in the time-consuming process from early data labeling and model training to AI application. High costs mean the high price of computing power – a much-needed resource for AI algorithms – and models and other resources are complex and difficult to obtain.

Huawei has a wealth of experience in basic research in the AI domain, in everything from chipsets to algorithms. We are well positioned to build open platforms with devices, edges, and clouds. Working with our ecosystem partners and with the help of AI technology, we will help industries become intelligent, and enable more enterprises to benefit from AI.

Bringing Intelligence to Industries

By the end of 2018, HUAWEI CLOUD's portfolio consisted of more than 160 cloud services and more than 140 solutions, such as HUAWEI CLOUD Stack, SAP, and HPC.

Building on chips, Huawei Cloud significantly upgraded its full-stack services in all scenarios on Enterprise Intelligence (EI). By the end of 2018, 56 services and 159 functions were available on the EI platform. In 2018, Huawei Cloud released a one-stop-shop AI development platform, which mainly consists of EI ModelArts and HiLens. The platform focuses on addressing inefficiency and high costs that hinder AI adoption.

Huawei Cloud has implemented over 200 projects across 10 industries. We have combined industry insight with AI in three scenarios to improve efficiency, pass on expertise, and push the limits of human intelligence. Building on our experience in these scenarios, we have become the new engine driving the intelligent transformation of industries. The three scenarios are:

- Performing repetitive and high-volume work: Huawei Cloud EI services help TukuChina automatically import and cross-check hundreds of thousands of copyrighted images and tens of millions of images from the Internet every day.
- Performing tasks that require expertise: Huawei Cloud EI has been working closely with KingMed Diagnostics, a company that provides medical diagnostic testing. This collaboration has produced breakthroughs in the pathological examination of cervical cancer.
- Carrying out work that requires multi-domain coordination: In Shenzhen, Huawei Cloud EI services have reduced the average waiting time of vehicles at the intersections where these services are deployed by 17.7%, and have increased average vehicle speeds remarkably.

Huawei Cloud infrastructure services are leading the intelligent era with full-stack data center capabilities. Huawei Cloud has fully upgraded computing power. We launched C3 and C3ne cloud servers and multiple AI instances in line with our Ascend chips to better meet customer needs for diversified computing power in the intelligent era. We also launched HUAWEI CLOUD Stack, a hybrid cloud solution that can help government and enterprise customers go digital faster.

Leveraging core technologies including Cloud Native containers and microservices, Huawei Cloud launched 18 application services, including an industry-leading intelligent cloud application platform, an intelligent edge platform, the ROMA platform, and blockchain services. These services make it simpler to migrate enterprise applications to the cloud and enable more efficient and agile operations.

Security is and will always be the top priority for Huawei Cloud. In 2018, Huawei Cloud released more than 20 service products, including our security AI platform Miranda. Throughout the year, we added more than 2,000 security features, received more than 10 global authoritative compliance certifications, and blocked more than 10 billion malicious attacks.

Ramping up Innovation Efforts

Thanks to our technological strengths, full-stack product capabilities, outstanding local services, and a robust ecosystem, HUAWEI CLOUD entered the Leaders quadrant in a 2018 report from market research firm Forrester. The firm evaluated the most popular vendors in China that provide full-stack public cloud development platforms.

Huawei Cloud is also expanding on the global stage. In 2018, our cloud data centers were launched in Hong Kong, Russia, Thailand, and South Africa, and we worked with our partners to serve customers worldwide with 40 availability zones across 23 regions.

Huawei Cloud has developed an innovative intelligent O&M and service platform, which is built on a process system that is based on our years of experience in serving enterprise customers. In addition, we have received the ISO 20000 and ISO 22301 certifications, which recognize the stability of our services.

We have teamed up with partners in the public cloud domain around the world to provide innovative solutions that help enterprises go digital in the cloud era. These solutions include public cloud and hybrid cloud solutions, as well as solutions that combine cloud, network, and digital services.

Building an Open, Collaborative Cloud Ecosystem

Developers are the builders of the future intelligent world. In 2018, Huawei released its AI Developer Enablement Program and full-lifecycle AI development platforms and tools. To cultivate a developer ecosystem, we established a Cloud Community and Cloud Academy for developers on our official website. Huawei Cloud works with developers to explore the practical applications of AI and accelerate the development of the cloud and AI industries.

In 2018, Huawei Cloud actively contributed to an open, collaborative cloud ecosystem founded on shared success. We launched a global partner program, HUAWEI CLOUD Partner Network (HCPN), which is designed to help partners develop services and solutions. There are more than 2,800 applications in the cloud market, and we currently have more than 6,000 partners.

Consumer Business

In our Consumer BG, everything we do begins and ends with consumers. In 2018, we carried on our commitment to creating value for our consumers through innovation, striving to deliver an inspired, intelligent experience across all scenarios.

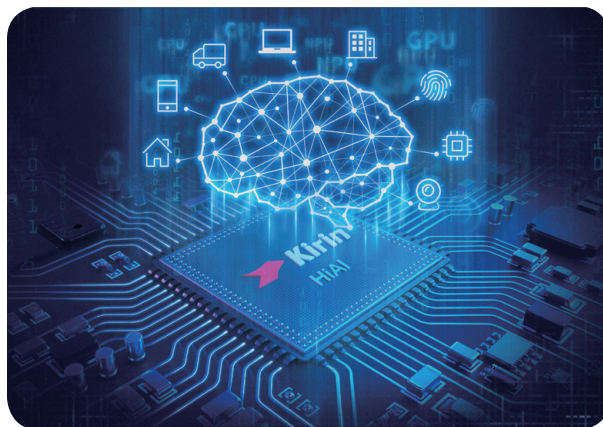
Our hard work has paid off. We have reinforced our position as a premium global brand. In 2018, revenue from our consumer business was CNY348,852 million, a year-on-year increase of 45.1%.

Creating consumer value through innovation and pursuing an inspired experience

Huawei's Consumer BG is committed to creating value through non-stop innovation. We have achieved many breakthroughs in domains such as device performance, photography, artificial intelligence (AI), communications capabilities, and design. With significantly enhanced competitiveness and experiences, our products have been well received by mainstream media and consumers the world over.

Some major breakthroughs we achieved in 2018 include:

- **Kirin 980:** Manufactured using the advanced 7nm process and incorporating the powerful Cortex-A76-based CPU and Mali-G76 GPU, our Kirin 980 chipset offers improved energy performance and an unprecedented smooth user experience, making smartphones smarter than ever.



Manufactured using the 7nm process, the Kirin 980 chipset fits 6.9 billion transistors within a die the size of a fingernail. Huawei has designed an innovative 3-level efficiency architecture that consists of two ultra-large cores, two large cores, and four small cores. This grants the CPU the flexibility to allocate the optimal amount of resources to heavy, medium, and light tasks for unprecedented levels of energy efficiency, simultaneously improving the performance of phones and enhancing battery life.

- **GPU Turbo:** This revolutionary graphics processing acceleration technology overcame the processing bottlenecks between Huawei's EMUI operating system and smartphone GPUs/CPU. It makes graphics processing much faster and enables the System on a Chip (SoC) to use less energy, achieving an optimal balance between performance and power consumption.
- **Leica triple camera:** Supported by AI, this camera redefines intelligent smartphone photography, allowing anyone to effortlessly capture professional-quality images.
- **Cooling:** The HUAWEI SuperCool system uses a combination of graphene film and vapor chambers to deliver outstanding cooling performance. The CPU and GPU can remain at full throttle for an extended period of time and deliver a maximally smooth and enjoyable gaming experience.
- **Charging:** Our three cutting-edge charging technologies – 40W HUAWEI SuperCharge, 15W quick wireless charging, and reverse wireless charging – have received security certifications from TÜV Rheinland, providing users with rapid and safe charging.

Further reshaping the global high-end market with strong flagship smartphone performance

Thanks to these innovations, Huawei's flagship smartphones, including the HUAWEI P20 Series, HUAWEI Mate 20 Series, and HUAWEI Mate 10 Series, have spearheaded overall growth across our entire smartphone portfolio, and won extensive acclaim from mainstream media and authoritative industry organizations worldwide.

The HUAWEI P20 Series and HUAWEI Mate 20 Series respectively won 23 and 16 prestigious annual awards from top international tech media and authoritative industry organizations. The HUAWEI P20 Pro received the highest score ever received by a phone from DxOMark, an independent website that scientifically assesses the image quality of smartphones, lenses, and cameras. The HUAWEI Mate 20 Pro was selected

as the Most Exciting Smartphone of 2018 by British gadget magazine *Stuff*.

The HUAWEI Mate 20 Series leads industry innovation in multiple areas, including AI, performance, battery life, charging, camera function, and appearance. Global shipments of the HUAWEI Mate 20 Series exceeded 5 million units within just two months of launch.

The HUAWEI P20 Series takes smartphone photography to a whole new level. By the end of 2018, total shipments had exceeded 16 million units, setting a new sales record for Huawei flagship phones.

Exploring the beauty of technology and winning over fashion-conscious female consumers and young consumers

In 2018, Huawei's Consumer BG studied the habits and preferences of female and young users and explored how to combine technology with fashion and art. We have won over fashion-conscious female consumers and young consumers and expanded our user base.

The HUAWEI P20 Series features an all-new, exclusive gradient color option, Twilight, which has attracted extensive attention from fashion-conscious female consumers around the world. This striking, fashion-forward aesthetic is achieved by applying several layers of Non-conductive Vacuum Metalizing (NCVM) optical coatings underneath the glass back, so light hitting the surface refracts and creates a vivid, yet gradual change of hue.

The HUAWEI nova Series has drawn extensive attention from young people worldwide for its stylish designs. Featuring bold colors and innovations specifically for selfies, the HUAWEI nova 3 was one of the most popular selfie phones in 2018. Continuing the stylish designs of the HUAWEI nova Series, the HUAWEI nova 4 was the first phone to adopt the next-generation Punch FullView display technology.

The Honor 10, with Beauty in AI as its overarching proposition, sets a trend for fashionable consumers, and leads Huawei's rise in the overall mid-range smartphone market together with the HUAWEI nova Series.



The HUAWEI Mate 20 Pro comes with the 16 mm Leica Ultra Wide Angle Lens. This wider perspective creates a sense of spaciousness and a three-dimensional effect in the images. The new camera system also supports macro distance, which produces crisp images of objects that are placed as close as 2.5 cm from the lens. The added ultra-wide angle lens and macro support complete the feature set of the camera system, elevating it to a truly all-around camera that is ready to capture any and all action. Left: the Bund in Shanghai, taken with the Leica Ultra Wide Angle Lens (By Fang Zhonglin); upper right: flowers and ants taken with the macro mode (By Cheng Bin); lower right: portraits taken in dark light (By Li Xin)

Key breakthroughs in the all-scenario strategy and rapid growth in newer areas of business

Even more excitingly, in 2018 Huawei's Consumer BG made crucial progress in delivering an intelligent experience across all consumer scenarios. Over the past year, we have achieved key breakthroughs in our newer areas of business.

PCs: The HUAWEI MateBook X Pro features a FullView design and a hidden camera, and received high acclaim from *PC World* and many other authoritative tech media outlets. This new device has driven rapid enhancement of our PC brand image. In 2018, Huawei's PC shipments grew by more than 330% year-on-year.

Tablets: Our tablet revenue continued to grow despite the global tablet market's year-on-year decline. Shipments in 2018 increased by 14% compared with 2017.

Wearables: Shipments saw a year-on-year increase of more than 120%. Other highlights include:

- HUAWEI WATCH GT, powered by an innovative dual-core processor, can stay powered for up to two weeks. Sales have remained strong after launch, boosting awareness of Huawei wearables.

- Our sales of audio and smart accessories grew by over 100% over the previous year. Our TWS earphones were the first to adopt bone conduction biometrics technology and also comply with the Hi-Res Wireless Audio (HWA) industry standards, leading the way for stylish audio technology.

A more robust ecosystem that delivers an inspired, intelligent experience across all scenarios

We will soon enter an era where everything that can be connected will be connected and intelligent experiences will be delivered across all scenarios. Smart devices that revolve around a wide array of application scenarios have become important portals that bring consumers intelligent experiences.

Against this backdrop, Huawei's Consumer BG has put forward a "1 + 8 + N" all-scenario ecosystem strategy. "1" stands for mobile phones, which will serve as the primary portal to intelligent experiences; "8" stands for eight support portals, including AI speakers, tablets, PCs, wearables, connected vehicles, AR/VR, smart earphones, and smart HD; and "N" stands for ubiquitous IoT devices, including lighting, security protection, and environment-related devices.

With this strategy, we aim to deliver an intelligent experience to consumers across all scenarios, including smart home, connected vehicles, as well as health and fitness.

In the **smart home** domain, Huawei's HiLink smart home protocol has been breaking down barriers between smart devices from different vendors, allowing them to "talk" with each other and fully transfer and share information. Through the HiLink smart home platform, Huawei is working closely with more than 150 brands, involving more than 500 product models in more than 100 product categories. To deliver a more consistent experience to consumers, Huawei teamed up with top vendors to launch Huawei ZHIXUAN, Huawei HiLink's IoT ecosystem brand, in June 2018. We also opened the Ark Lab, which aims to provide a joint innovation platform for partners, allowing them to incubate products, explore new scenarios, showcase their offerings, and deliver a superior home experience.

In the **connected vehicle** domain, Huawei has established partnerships with the world's top car brands, including Audi, Mercedes-Benz, Volkswagen, Toyota, and General Motors. We are providing stable and reliable connected vehicle services to tens of millions of drivers.

In the **health and fitness** domain, Huawei has established productive partnerships with more than 100 well-known companies, universities, and research institutes. Users of Huawei's Health app have topped 100 million.

AI will be the key to user experience in the intelligent era. It has become a part of life for Huawei smart device users. The number of monthly active users of Huawei AI services, including HiVoice, HiVision, and HUAWEI Assistant, has exceeded 190 million. On average, each user uses these services six times a day.

A more prosperous Huawei Mobile Services ecosystem for developers

In application services, the Consumer BG has built an open, intelligent global ecosystem through Huawei Mobile Services. We launched our Shining-Star Program, established the DigiX Innovation Lab, and built the HUAWEI Ability Gallery to encourage innovation. Together with our partners and developers, Huawei Mobile Services aims to offer high-quality, intelligent applications and services that cover all

scenarios for our consumers. In 2018, the number of registered developers of the Consumer BG exceeded 560,000 worldwide, and the revenue of our partners more than doubled year-on-year, a testament to a more prosperous ecosystem.

Huawei Mobile Services is providing high-quality digital experiences to more than 500 million Huawei device users in more than 170 countries and regions, covering everything from data to applications, travel, and entertainment. We have turned smart devices into personal assistants and digital extensions of our consumers, creating a better digital life for them.

We offer a wide array of Huawei Mobile Services, including HUAWEI Mobile Cloud, HUAWEI Assistant, HUAWEI AppGallery, Huawei Pay, HUAWEI SkyTone, HUAWEI Life Service, HUAWEI Video, HUAWEI Music, HUAWEI Reader, HUAWEI Themes, and HUAWEI Browser. These services are preferred by an increasing number of consumers. Achievements in 2018 include the following:

- More than 150 million photos were uploaded to HUAWEI Mobile Cloud every day.
- The HUAWEI AppGallery became available in 139 countries and regions, providing secure and reliable high-quality apps for users, with more than 120 billion downloads throughout the year.
- Huawei Pay supported 90 banks, and can be used for public transportation payment in more than 160 cities in China. New functions including door keys and membership cards became available. Huawei Pay also became the first payment service provider to support China's eID on mobile phones.
- HUAWEI SkyTone provided overseas data service in over 80 countries and regions. With this service, consumers can access mobile Internet around the world without a SIM card. HUAWEI SkyTone also provides efficient and quality outbound travel services like hotel booking, car rental, and travel guidance.
- Our video, audio, and entertainment services attracted more consumers. Monthly active users of HUAWEI Video exceeded 80 million. Monthly plays on HUAWEI Music exceeded 4.2 billion. More than 600,000 books were available on HUAWEI Reader, and annual downloads from HUAWEI Themes exceeded 730 million.

Improving customer satisfaction with an upgraded offline sales and service system

To improve every aspect of consumers' purchasing experience, the Consumer BG has bolstered and upgraded its retail network to create a simple, compelling, and inspired high-end experience that makes purchasing more convenient and efficient for consumers. As of December 2018, Huawei had more than 60,000 retail stores, display zones, and display counters around the world, including more than 4,000 experience stores.

In customer service, we are committed to building and improving our basic service capabilities, focusing on three service platforms: offline services, online services, and self-services. Throughout 2018, we provided services to over 40 million consumers. As of the end of 2018, the Consumer BG had over 2,000 offline service centers in 105 countries and regions, providing convenient and fast repair services to consumers. In 2018, global customer satisfaction with Huawei's services increased by 14 percentage points compared with 2017, and Huawei accepted 473 consumer suggestions and requests for the optimization of Huawei products and services.



Huawei has explored and built all-new retail models by taking into account technology, the human touch, and environmental protection. We have established three HUAWEI Smart Life Stores in Taiyuan, Shanghai, and Hangzhou, China. Focusing on delivering a smart life experience, these centers aim to create an all-new retail model and provide consumers with a more pleasant shopping experience through quality services. Pictured above is the HUAWEI Smart Life Store in the Aegean Place shopping mall in Shanghai.

Higher brand awareness and better business performance bring us closer to our goal of becoming an iconic global tech brand

Thanks to nonstop innovation in the Consumer BG, our brand awareness, recognition, and reputation are growing among global consumers, and our market share has risen rapidly. We have taken a solid step forward on our journey to becoming an iconic global tech brand.

In 2018, we shipped 206 million Huawei and Honor smartphones, up 35% year-on-year. According to a report from market research firm IDC, Huawei and Honor smartphones together occupied 14.7% of the global market share in 2018, maintaining our position among the top three smartphone makers in the world.

Honor maintained its leadership position in the Chinese online smartphone market. At the same time, it saw large-scale, rapid growth in markets outside China, with revenue up by more than 170% year-on-year. Honor transformed in 2018, taking on a new brand image characterized by vibrant colors and exciting technology. This new image will help bring Honor to more fashion-conscious consumers around the world.

A report from brand research firm Ipsos showed that overall global brand awareness of Huawei had increased to 88%, and brand consideration among global consumers had increased to 46%, up from 44% in 2017. According to this report, the number of consumers considering a Huawei device saw a year-on-year increase of over 50% in multiple countries outside China. Our net promoter score ranked first in China for the third consecutive year, and among the top 3 in countries including Germany, Italy, Spain, Russia, Poland, and Mexico. Global consumers have come to view Huawei as a trustworthy brand that keeps moving forward and boldly innovating.

As we have always stressed, everything we do in the Consumer BG begins and ends with consumers. With this in mind, in 2019 we will continue to innovate in core technologies – including 5G, AI, AR, and VR – and adopt an ecosystem strategy that covers all scenarios. Our ultimate goal is to lead the transformation of the smart device industry and deliver an inspired, intelligent experience to consumers across all scenarios.

Research and Development

Huawei focuses on three domains – fully-connected networks, intelligent computing, and innovative devices – and continues to invest in products, technologies, basic research, and engineering capability improvement. We aim to support customers in their digital transformation and lay the cornerstone of an intelligent world. We branch out into multiple paths in multiple waves and across multiple scenarios, building continuous leadership in solution competitiveness.

Commitment to Overcoming Technical Bottlenecks: Develop Leading ICT Infrastructure Solutions to Deliver Ubiquitous Connectivity

Wireless Networks

In this domain, we made breakthroughs thanks to a consistent focus on innovation. To be specific, we:

- Launched a full range of end-to-end 3GPP-compliant 5G commercial products and solutions. Based on our proprietary chips and antenna technologies, these offerings deliver the best performance, with full range as the defining characteristic. These offerings are the first to pass all tests conducted by IMT-2020 (5G) Promotion Group, putting them ahead of all other solutions.
- Unveiled our 5G-oriented SingleRAN Pro solution and built our Long Term Evolution (LTE) + New Radio (NR) strategy for future target networks. The 10-fold increase in network capacity, enabled by SingleRAN Pro, will help carriers tap into new sources of revenue, and our simplified networks will help carriers reduce expenditure.
- Released a three-layer architecture for automating networks through Wireless AI. With this architecture, powered by AI, we will gradually enable autonomous driving wireless networks.
- Launched innovative solutions to support sustainable development. These solutions include multi-RAT antennas, the Digital Indoor System (DIS), 5G microwave, and the 5G Power solution.
- Released RuralStar, PoleStar, TubeStar, and other scenario-specific solutions to further bridge the digital divide.
- Were awarded a First Class Progress in Science and Technology Prize for 2018 for unveiling the blade base station.



As part of smart-city infrastructure, Huawei PoleStar2.0 supports a diverse range of services from just a single pole, including 5G mobile communications, smart lighting, smart surveillance, Internet of Things (IoT), smart environmental protection, and city news.

Carrier and Enterprise Networks

In this domain:

- Through the NetCity joint innovation program, Huawei worked with customers to define business scenarios and use cases. Our Intent-Driven Network (IDN) solution was successfully rolled out by 25 world-leading carriers and enterprises. The use of intelligent technologies helps customers address network issues and boost O&M efficiency.
- We debuted the CloudEngine 16800 series data center switches. Powered by AI, the CloudEngine 16800 chassis has the industry's largest capacity of 768-port 400GE, providing ultra-high-speed and intelligent connections for the growing traffic and AI applications.
- We were the first to launch Wi-Fi 6 commercial products, which enable 10 Gbps connections for campus users.

- We deployed the Optical Cross Connection (OXC) solution, which features all-optical switching, for commercial use on a large scale. We also enabled the commercial use of 400GE backbone routers. Our whole series of routers supports SRv6. All of these new solutions help carriers overcome challenges related to data traffic and connections in the age of 5G and cloud computing.
- We launched the Flex-PON 2.0. This solution enables one service board to support a maximum of six PON modes, helping carriers smoothly evolve their networks to XG(S)-PON.

Software

In this domain, we are dedicated to building a cloud-native, open, and agile operating software platform, which will help carriers go digital faster. Specifically, we:

- Continued to evolve the Convergent Billing System (CBS) to make it 5G-ready. In 2018, we contributed a major proportion of the proposals on 5G charging standards to the 3rd Generation Partnership Project (3GPP).
- Partnered with China Mobile to forge an agile, open, and secure CM IoT operating platform. The platform can activate a batch of 100,000 SIMs within 30 minutes and invoke three billion application programming interfaces (APIs) each month. This helps carriers deal with the explosive growth of connections in the age of IoT.

Cloud Core Networks

In this domain, we:

- Debuted the simplified 5G core network solution to support smooth evolution from cloudification to 5G.
- Were the first to complete all of the IMT-2020 (5G) Promotion Group's core network tests for 5G non-standalone (NSA) and standalone (SA).
- Introduced AI to the deployment of mobile network resources and to the U2020 element management system, allowing U2020 to support smart O&M. This enabled the AI-driven deployment of resources and U2020 to be employed for commercial use.
- Launched IoT Cloud Service 2.0 to enable industrial IoT by combining connectivity, cloud, and intelligence.

- Unveiled the CloudLink series of collaborative telepresence products, which will lead enterprise communication and collaboration to the threshold of the intelligent world.

Diverse Computing Architectures and Pervasive Intelligence

- In the cloud computing domain, we released an industry-leading solution – HUAWEI CLOUD Stack Full-Stack Hybrid Cloud. This solution:
 - Provides strong support to enterprises going digital, from aspects such as chips, hardware, software, solutions, and the industry ecosystem.
 - Enables collaboration between different players in the ecosystem by centering on full-stack platform capabilities and end-to-end service capabilities.
- In the cloud service domain, we:
 - Launched several types of future-oriented cloud services, including:
 - The Intelligent Edge Cloud, which can extend the reach of a public cloud to the edge.
 - Blockchain Service (BCS), which makes Huawei the first company in China to offer blockchain database storage services.
 - Actively gave back to the industry. For example:
 - In regard to the fast-growing cloud-native project of Kubernetes, we are the third largest contributor worldwide and largest contributor in China.
 - The Huawei ServiceComb project, which works on an open-source and microservice framework, has successfully completed Apache incubation and graduated as the first Top-Level Project for microservices of Apache.
- In the intelligent computing domain, we:
 - Released the Atlas intelligent computing platform, powered by the Huawei Ascend series AI chips. With various types of AI products, such as modules, cards, boards, edge stations, and appliances, Huawei has built an AI infrastructure portfolio that covers all scenarios, including devices, edges, and clouds. This portfolio leads the industry with its unparalleled computing power.

- Unveiled the Kunpeng 920, an Advanced RISC Machine (ARM)-based processor, and TaiShan series of servers powered by Huawei Kunpeng 920. The new series of servers is designed to boost the development of computing in big data, distributed storage, and ARM-native application scenarios.
- In the storage domain, we:
 - Launched the high-end intelligent all-flash array, OceanStor Dorado18000 V3, for enterprise data centers. This is the first all-flash array to support the non-volatile memory express (NVMe) architecture across the range.
 - To address the latest needs of companies in big data analytics, mobile applications, and cloud-native applications, our converged and distributed storage solution FusionStorage is a complete upgrade in terms of cloudification, flash-based design, and intelligence.
 - Launched the FusionROBO Solution for Branches. This solution is designed for Remote Offices/Branch Offices (ROBOs) of large enterprises. It integrates all IT resources required by ROBOs in a single cabinet. When deployed in an edge cloud of the enterprises, the solution will enable central management of IT resources.
- In the network energy domain, where data centers are becoming large and highly dense, we:
 - Launched a series of 1,200 kVA uninterruptible power supply products, helping data centers enable high integration and boost energy efficiency.
 - Released our machine learning-based iCooling solution, helping cooling systems of large data centers shift to “smart cooling”. With this solution, Huawei has taken power usage effectiveness (PUE) to a new level.
 - Debuted the latest generation of FusionSolar Smart PV Solution, and continued to deliver higher yields and lower maintenance costs.
- In the intelligent video and data analytics domain, we:
 - Released the M/X series software-defined cameras (SDCs), driving intelligent upgrades throughout the industry.
 - Were also the first to launch the iCAN security intelligence rating system. With five ratings (Not Intelligent, Primary Intelligence, Limited Sensing Intelligence, All-sensing Intelligence, and Automated Intelligence), the system makes security intelligence standardized, definable, and measurable.

Chip-Device-Cloud Synergy Creates an Intelligent and Personalized Experience Across All Scenarios

- In the smartphone domain, Huawei unveiled the HUAWEI Mate 20 Series intelligent phones.
 - The HUAWEI Mate 20 Series is powered by Huawei’s AI-driven system on a chip (SoC) – the Kirin 980. With a dual NPU design, the SoC is at the core of the smartphone, and is essential to its performance and efficiency. Manufactured with a cutting-edge 7nm process, the SoC fits 6.9 billion transistors within a die the size of a fingernail. Compared to Kirin 970, the latest chipset is equipped with a Cortex-A76-based CPU that is 75% more powerful and consumes 58% less energy, as well as a Mali-G76 GPU, which is 46% more powerful and consumes 178% less energy.
 - With the GPU Turbo 2.0 technology, this series of smartphones can reduce overall power consumption by 20% and deliver 60% better performance, even when used to play the most FPS-intensive games on the market.
 - The Matrix Camera array on the back of the smartphones features three cameras. When coupled with the AI-powered intelligent chip, the HUAWEI Mate 20 Series delivers a staggering experience for shooting at night even when holding the phone in your palm, and supports a variety of shooting modes such as super wide angle, super macro, and multiple focal lengths.

- The HUAWEI Mate 20 series is shipped with the EMUI 9 operating system. With optimized compilation of code for the underlying layer, the operating system improves overall performance by 20%.
- The HUAWEI Mate 20's multi-turn, multi-domain dialog management technology brings a new and intelligent experience to users.
- In the PC domain, we unveiled our MateBook X Pro, a star product. Defining features of this new laptop include:
 - The optimized structural design and hidden camera create an almost borderless display.
 - 3K Low Temperature Poly-silicon (LTPS) display and quad-speaker Dolby sound system deliver an incredible audiovisual experience.
 - A fingerprint scanner embedded in the power button enables one-button startup, directing users to the working interface immediately.
 - A combination of Near Field Communication (NFC), Bluetooth, Wi-Fi, and other communications technologies allows cross-device file transfers to be completed within seconds with just one touch.
- In the tablet domain, we debuted the HUAWEI MediaPad M5.
 - Four speakers with Harman Kardon professional tuning are acoustically engineered to support Hi-Res audio quality and produce a completely immersive virtual surround sound experience. The tablet makes users feel like they are in a cinema.
 - The laptop also comes with the latest HUAWEI M-Pen, giving users an even more intuitive way to interact with their tablet.
- In the smart wearable domain, we unveiled the HUAWEI WATCH GT.
 - This device featured a slim design and double chipset architecture, and offers a 2-week battery life.
 - HUAWEI TruSeen™ 3.0 heartrate monitoring technology provides more efficient and accurate

real-time measurements of your heartrate.

This allows uninterrupted, scientific advice for workouts and support for sleep monitoring and all-day stress tracking.

- Water-resistant up to 50 meters, HUAWEI WATCH GT can recognize what kind of swimming stroke the wearer is using.
- The watch can also acquire users' fitness data when they are running, riding, swimming, climbing, or cross-country running.
- Huawei Mobile Services complies with the *General Data Protection Regulation* (GDPR) and all other applicable laws and regulations. We adopt differential privacy technology and hold the protection of user privacy as our paramount principle. In 2018:
 - We began working with the industry to establish the Android green alliance. This alliance uses AI to detect malicious behavior, such as viruses, spam advertising, spoofing, and infringements upon privacy, guaranteeing higher application security for users.
 - Working with various partners, Huawei Pay became the first to release several innovative features, including the smartphone shield, NFC tag payment, a combination of NFC payment and QR code payment, and eID loading to smartphones.



Huawei has one of the largest patent portfolios in the world.

As of December 31, 2018

Total number of patents granted to Huawei

87,805

Patents granted in China

43,371

Patents granted outside China

44,434

Driving Industry Development Through Exploration and Breakthroughs in Basic Research

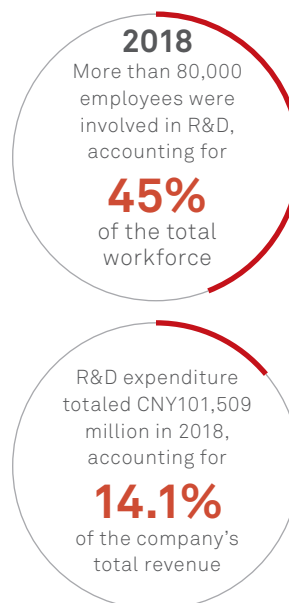
- In network theory research, we proposed theoretical challenges in rolling out future networks based on our vision of a digital and intelligent future. These challenges include:
 - A complicated system for a fully connected world. To address this, we put forward a bio-like network architecture and built a theoretical model for it.
 - Low latency and high bandwidth are required for future machine control and immersive digital communications. To address this, we built a theoretical model to actively control distributed networks, and demonstrated and launched this model at Globecom 2018.
 - Future wireless network challenges. To address these challenges, we proposed the cell-free network architecture based on our theoretical paper on *IEEE Transactions on Wireless Communications (IEEE TWC)*, enabling efficient wireless networking.
- In network technology research, we:
 - Launched AI Fabric technology, which will help build an intelligent and lossless data center network with low latency.
 - Were the first to debut the open and unified packet switching architecture. This architecture is capable of delivering performance equal to that of a closed cell switching network within a traditional router.
 - Implemented a deterministic forwarding technology that can ensure microsecond-level jitter bound at the IP layer, enriching the services that IP technologies can deliver.
- In optical network research, we:
 - Continuously increased the rate of single-wavelength and broaden the fiber spectrum for long-haul optical transmission, doubling single-fiber capacity.
- Proposed a data center network architecture based on a high-density fiber-level OXC system, enabling low-latency, low-energy-consumption, and large-capacity OXC-based data center networks.
- Created an industry-leading ultra-large-capacity (Pbps) wavelength-level OXC system, which has seen large-scale commercial use within the core switching nodes of backbone networks.
- In advanced wireless network research, we:
 - Actively researched how to boost full-band spectrum efficiency, ensure wide-area and three-dimensional coverage, create a heterogeneous network architecture that can connect all vertical services, and on potentially fundamental technologies.
 - Persistently explored end-to-end vertical slicing solutions, and completed pre-commercial trials in several industry scenarios with partners.
 - Worked with industry partners to push the long-term technology research in the wireless field forward.
- In research of future data centers, we:
 - Remained focused on continuous innovation in infrastructure, and explored new types of computing and storage by returning to the fundamentals – physics, chemistry, materials, and mathematics.
 - Built models, algorithms, components, and circuits to enable more energy-efficient computing and higher density storage.
- During research into quantum computing, we unveiled HiQ, an industry-leading cloud service platform. HiQ includes a quantum computing simulator and a quantum programming framework on the simulator.
 - Based on Huawei cloud's powerful computing capabilities, HiQ provides cloud services with both full- and single-amplitude simulations.

- Specifically, the HiQ platform can simulate quantum circuits with at least 42 qubits for full-amplitude simulations, and at least 81 qubits for single amplitudes. In addition, for low-depth circuits, the qubit count can reach 169 for single-amplitude simulations.
- HiQ will be fully opened to the public as an enabling platform for quantum research and education.
- In the AI domain, we've made breakthroughs in both algorithms and theoretical research:
 - The innovative Da Vinci architecture effectively extends the AI operation unit from two-dimensional to three-dimensional vector operation, delivering better energy efficiency than any other industry players.
 - We enabled AI computing and applications that differ in computing power by five to six orders of magnitude, ranging from on-cloud training to autonomous driving, smart city, smartphone, smart headset/speaker, and other applications.
 - We applied achievements in research, such as video HDR and video semantic understanding, to the P20 and Mate 20 flagship smartphones.
 - The quantization compression algorithm makes it possible for even thousand-yuan smartphones to embrace AI.
 - Multi-turn dialog and search & recommendation technologies have been used to continuously improve user experience.
 - Decision-making and inference, as well as the analysis optimization algorithms have been embedded in the brains of carrier and enterprise networks, the Global Technical Service Dept (GTS), and supply, generating fantastic results.

- In basic AI research:
 - The shared meta-learning framework that we first proposed has seen breakthroughs in the recommendation function of devices and network control scenarios. With its excellent compression capability, the model can offer higher precision and better privacy protection.
 - Huawei has published dozens of high-quality papers on AI at top conferences. One of these papers was named a Best Paper at NeurIPS 2018.



Huawei invests more than 10% of its sales revenue in R&D every year.



R&D investment over the past decade
CNY480 billion

Improving the Management System

Our global management system enables the company-wide promotion of our corporate culture and the effective management of our business. We aim to:

- Remain customer-centric; continue basing innovation on customer needs and technological leadership; and build an ecosystem for shared success.
- Ensure operational compliance and business continuity, and control risks.
- Pursue corporate social responsibility (CSR) initiatives and promote social sustainability.

Quality and Customer Satisfaction

The company has the quality goal of **making Huawei a synonym for high quality in the ICT industry**. To achieve this, we define “broad quality” as ISO 9000-based total quality management. We are implementing **all-hands, full-process, and full value chain** quality management in alignment with customer needs and driven by strategies. We are also rolling out a broad quality management system across the company and continuously implementing new system requirements. The aim of this is to constantly improve our quality management system along the value creation stream while remaining customer-centric.

- With a focus on value and experience, we drive efforts to extend quality management to **every link along our value chain**:
 - Previously, our broad quality concept was only applied to product lines and engineering. Today, it has been adopted by different business domains of the company and becomes an integral part of every link along the industry chain.
 - With quality as our foundation, we continue to stress operational compliance and place cyber security and privacy protection at the top of the company’s agenda.
 - To deliver Real-time, On-demand, All-online, DIY, and Social (ROADS) user experiences, we strive to build the best digital operation platform. This platform will make transactions more simple, prompt, and accurate, effectively support business development and continuous improvements, and raise the overall quality of customer engagements.

- We also entrust professional, third-party market survey companies to conduct customer satisfaction surveys involving our customers worldwide. Our suppliers are also surveyed in order to obtain their views about Huawei. From these surveys, we identify and consolidate key improvement points and continuously improve customer satisfaction.
- We push our quality management requirements up the industry chain and encourage suppliers to benchmark with and learn from each other. In this way, they can align with industry best practices. We also call on suppliers to build their own Business Continuity Management (BCM) systems and better address customer needs.



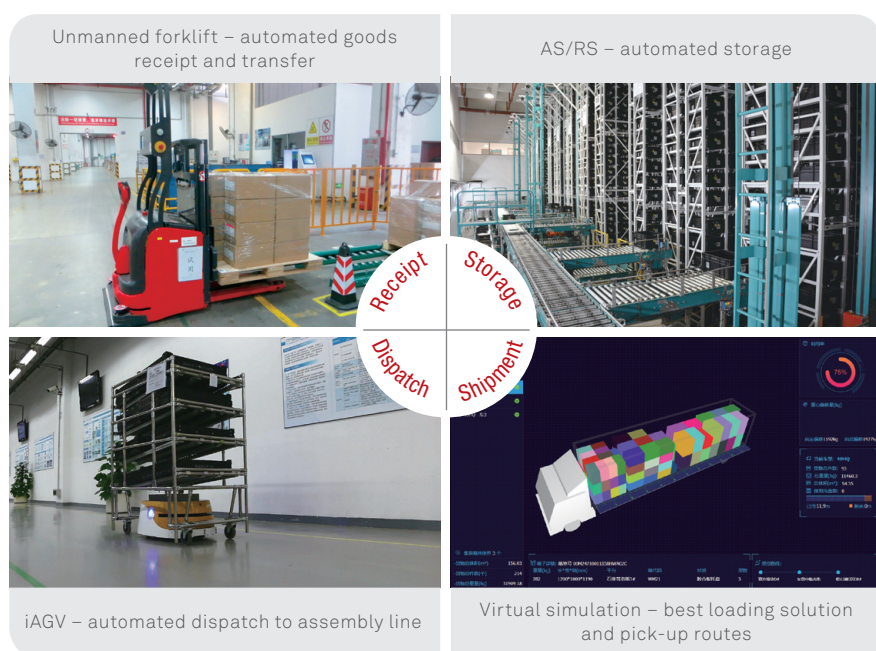
We adhere to the Quality First strategy to support our company in Winning with Quality. Our relentless efforts in promoting lean production have helped us build a one-piece flow for mobile phones. Through the use of robots, digital and IT systems, and artificial intelligence (AI), we have automated 70% of procedures, ensured transparency, visibility, and real-time warnings throughout the manufacturing process, and guaranteed the high quality and premium user experience of our mobile phones.

- We work to raise quality awareness in **all employees** so the company can **win with quality**: We continue to develop quality leadership, create a quality-first culture and atmosphere, and inspire a sense of responsibility and honor regarding quality among all employees. This is achieved through Huawei Quality Awards, internal and external audits and assessments, and Six Sigma and Quality Control Circle (QCC) projects.
- We embed quality requirements into our processes and manage quality throughout **the full process**: Through our complete process system, encompassing operating, enabling, and supporting processes, we have embedded requirements for compliance; quality; internal controls; cyber security and privacy protection; information security; business continuity; Environment, Health, and Safety (EHS); CSR; and sustainability into multiple business domains. These domains include sales, marketing, R&D, delivery and services, supply chain, procurement, manufacturing, etc. We have also streamlined all these processes from end to end, to constantly sharpen our quality edge and mitigate major quality risks.

All aspects of Huawei's broad quality principle and relevant management systems have been certified

by leading industry organizations and won the full recognition of customers.

- The company has been certified by multiple independent third parties, receiving certifications such as: ISO 9001:2015/TL 9000 R6.0 (quality management), ISO 14001 (environment), ISO 45001 (occupational health and safety), ISO 50001 (energy management), ISO/IEC 20000 (IT service management), ISO/IEC 27001 (information security), and ISO 28001 (supply chain security); IATF 16949 (automotive-sector quality) in the device domain; as well as ISO 27018 (protection of personal information in the public cloud), CSA STAR (cloud security assessment), and ISO 22301 (business continuity) in the cloud domain.
- Huawei has passed comprehensive audits, regular assessments, and stringent reviews conducted by 31 of the world's top 50 carriers, as well as by major enterprise and industry customers. Audited domains include financial robustness, quality management, risk management, delivery and services, supply chain management, knowledge management, project management, cyber security and privacy protection, information security, EHS, CSR, sustainability, and BCM. We aspire to become a strategic partner for customers for their future-oriented transformations.



Huawei has applied automation, Internet of Things (IoT), and digital technologies to the entire process of receiving, storing, dispatching, and shipping raw materials. This enables accurate sorting by task or order and ensures the required materials are dispatched to the assigned assembly line, within easy reach of the assigned assembly workers. In addition, such IT-enabled operations also allow quality issue review and foolproofness, improving material management efficiency and refinement from all aspects.

Improving the BCM System

With today's highly globalized division of labor, Huawei must rely on a wide variety of third parties (including outside companies and agencies) for procurement, manufacturing, logistics, and global technical services. Therefore, the discontinuity of third-party business could directly or indirectly compromise Huawei's operations and business performance.

Through years of ongoing investment, Huawei has established a BCM system for procurement, manufacturing, logistics, global technical services, and other domains. This system covers end-to-end processes, from suppliers to Huawei, and on to our customers. As part of this system, we have developed and established effective measures to manage risks that arise from our day-to-day work. Specifically, we have built up management organizations, processes, and IT platforms, prepared business continuity plans and emergency response plans, and organized BCM training and drills for employees.

Key Initiatives for R&D and Procurement

- Diversity: When designing a product, we strive to source raw materials, boards, and products from more than one supplier and prefer suppliers that have multiple manufacturing sites in order to safeguard product and component availability.
 - Scenario-specific storage: During mass production, we have reasonable and safe inventory for raw materials, semi-finished products, and finished products, so that we can better respond to fluctuations in demand and supply.
 - Supply and demand visibility: Huawei works closely with suppliers to ensure that demand forecasts, purchase orders, and supplier inventory are all visible and guarantee the quick transfer of demands and supply responsiveness through advanced IT systems.
 - Strategic partnerships: Huawei establishes strategic partnerships with core suppliers to ensure stable supply. We also sign long-term supply assurance agreements with key suppliers to guarantee supply capacity and availability, and avoid material bottlenecks. Additionally, we encourage suppliers to establish their own BCM systems, arrange for special audits, and follow up on their improvements.
- Shenzhen, Europe, Latin America, and Dubai, which serve as integrated equipment backups for other regions.
- Logistics and transportation backups: Huawei works with many leading global logistics service providers to design a wide and diverse network of transportation routes that cover our global delivery. This network ensures alternative transportation routes are always available in the event of emergencies, enabling us to maintain continuity in logistics and transportation.
 - Spare part reserves to support full-lifecycle operations: Huawei reserves spare parts according to market demand and historical usage before the end of life (EOL) of a product is determined. After the EOL is determined, we reserve sufficient spare parts for the full-lifecycle of the product in one go. This prevents any impact on the operational continuity of live customer networks.

Over the past decade, we have faced many major natural disasters; political, economic, and trade upheavals; conflicts; and other risks. However, Huawei has managed to mitigate these risks, ensure supply continuity, and achieve the timely delivery of products and services. This shows that Huawei's supply continuity management system – as part of the BCM system – is **functioning properly**.

Key Initiatives for Manufacturing, Logistics, and Spare Parts

- Manufacturing resource backups: Huawei establishes strategic partnerships with multiple electronics manufacturing services (EMS) suppliers. Board manufacturing and supply capabilities are shared between Huawei and EMS suppliers, and between different EMS suppliers as backup. We have also established supply centers in

Huawei is a global company that works in the network infrastructure, IT infrastructure, cloud services, and smart device domains. We have worked with over 10,000 of suppliers and established sound, long-term partnerships with them. Looking to the future, we have confidence that our partners can help us build an ecosystem for shared success and development as well as a secure, reliable, competitive, and healthy industry chain.

Operational Compliance

Huawei conducts business with integrity and conforms to applicable international conventions as well as applicable laws and regulations of the countries and regions in which we operate. This is a key principle advocated by our management that lays the foundation for ensuring our operational compliance in all parts of the world. During our business operations, we are committed to strict compliance with laws and regulations of the countries and regions in which we have a presence. We also observe additional applicable laws and regulations. Through more than 10 years of constant investment in our organization and resources, we have built up a compliance system that aligns with industry best practices.

- We have appointed a Chief Compliance Officer (CCO) to centrally manage the company's external compliance. The CCO reports directly to the Board of Directors (BOD). Each business department and subsidiary of our company has also appointed a compliance officer and set up their own compliance organization. In addition, for key domains such as trade compliance, cyber security and protection of user privacy, and anti-commercial bribery, we have established dedicated compliance management organizations for systematic management across regions and business domains.
- We embed compliance control requirements into our business processes from end to end. This ensures compliance management and oversight in each business link. Taking into account changes to external laws and regulations and our own business scenarios, we comprehensively identify and assess risks, develop control strategies, and integrate those strategies into our processes and regulations.
- We attach great importance to and continuously raise the compliance awareness of our employees. Through measures including training, publicity, assessments, and disciplinary actions, we push employees to fully understand both the company's and their own personal responsibilities and obligations to ensure compliance. Through instilling compliance in each employee, we guarantee the sound compliance of the company.
- With an open mind, we proactively partner with government agencies, customers, and partners, and invite external consultants to review our compliance in key domains. We also communicate our compliance principles and practices to stakeholders to constantly enhance mutual understanding and trust.

Ensuring Better Compliance Across Domains

Huawei has long been dedicated to ensuring better compliance across domains, including but not limited to trade compliance, financial compliance, anti-commercial bribery, and protection of intellectual property rights (IPR) and trade secrets. Compliance requirements have been embedded into policies and business processes in these domains.

Trade Compliance

We have expended much effort over more than 10 years to establish a comprehensive internal system for trade compliance in line with industry best practices. We endeavor to comply with all applicable laws and regulations of the countries and regions in which we have a presence, including applicable laws and regulations of the UN, US, and EU in terms of export controls and sanctions.

Huawei is among the first group of companies in China to establish a comprehensive and complete trade compliance system. We benchmark ourselves against industry best practices and have set up an integrated trade compliance management organization. This organization involves different group functions and manages trade compliance across regional offices. We have also established dedicated and part-time specialist teams for our global offices. These teams track changes to local laws, integrate trade compliance into the company's rules and processes, and manage and oversee trade compliance at each stage of our business operations, ranging from procurement, R&D, and sales, to supply and services.

Huawei is also among the first group of companies in China to invite consultants from the US to design, audit, and evaluate our trade compliance system.

Inviting an independent consulting firm to provide instructions and audits from an external perspective is an effective way to ensure the appropriateness and effectiveness of the compliance system. As early as 2007, Huawei invited authoritative US consultants to instruct us on how to ensure better trade compliance. Since then, every two to three years, we invite independent third parties from the US to evaluate our trade compliance system and continually refine and improve the system based on their feedback. Huawei then offers these audit reports to government agencies and partners, to enhance mutual understanding and trust.

Huawei continuously raises the trade compliance awareness of employees. Every year, Huawei provides over 100 training sessions on trade compliance to managers and employees across the company. Format varies from session to session, allowing employees to fully understand the company's and their personal responsibilities and obligations in export control. Our employees must also sign the *Business Conduct Guidelines* (BCGs) each year, which includes commitments to observe applicable export control laws and regulations.

**Financial
Compliance**

Huawei is an ICT company, not a financial institution. To fulfill our social responsibilities and legal obligations, and assist financial partners in fulfilling their own such obligations, we attach great importance to the management of compliance risks, including but not limited to the risks of financial sanctions, money laundering, and terrorist financing. We assess risk by country, customer, transaction type, and other factors, and adopt management initiatives accordingly. We also incorporate key control points for financial compliance into our procurement, sales, and treasury processes, ensuring the effective management of financial compliance risks of different business domains.

**Anti-commercial
Bribery
Compliance**

Huawei has a zero tolerance policy towards corruption and bribery. Through this policy, we have taken multiple compliance measures, such as releasing a statement on anti-corruption, providing compliance training to employees and partners, imposing disciplinary action against violators, and regularly evaluating the operations of our compliance management system. We will continue to crack down on corruption and commercial bribery through a management system that includes a culture of compliance, governance and oversight, prevention-discovery-response techniques, continuous operations, etc.

**IPR and
Trade Secret
Protection**

Respecting and protecting IPR: Huawei complies with and uses common international IPR rules and handles IPR affairs in accordance with international conventions. We adopt a proactive, friendly attitude to address IPR issues through various channels like cross-licensing and business partnerships. In addition, we invest long-term in research and development and continuously enrich our IPR portfolio. Huawei is one of the world's top owners of patents.

Respecting and protecting the trade secrets of others: Huawei also strictly complies with applicable laws and regulations that protect trade secrets, and embeds requirements to protect trade secrets into our policies, instructions, and processes. We have proactively built a global system for tracking related legislation, actively communicated with judicial bodies, associations, law firms, and other such consulting firms through workshops and other formats, and endeavored to learn as much as we can from them. Through these actions, we have built up a complete trade secret protection system, and we are resolutely against any practices that infringe upon the trade secrets of others.

Improving the Regional Compliance Monitoring System

Huawei is selecting, training, and appointing compliance officers within all of our over 130 subsidiaries worldwide. We have also established oversight-oriented subsidiary boards, which manage and oversee the operational compliance of these subsidiaries. Each year, the oversight-oriented subsidiary boards examine over 150 reports on the efforts taken by subsidiaries to ensure compliance and effectively execute compliance management initiatives in these subsidiaries.

- The boards regularly incorporate compliance assessment factors into key performance indicators (KPIs) of the subsidiaries, and have established an annual compliance management award and disciplinary mechanism.
- All subsidiaries have reviewed the laws, regulations, and applicable industry rules of the countries and regions where they operate. Based on their findings, they develop compliance guides used to ensure their compliance management meets local requirements.
- All subsidiaries have also drafted and released compliance white papers that define and elaborate on their own compliance management objectives, organizations, operations, and program management, providing an institutional guarantee for their compliance operations.

In addition to these compliance management initiatives, Huawei will continue to improve our compliance management system and related capabilities, step up external communications and interactions, and establish closer ties with customers and business partners. We will be more open and frank by sharing our efforts and experiences, in regards to improving our compliance management system, with a wider audience.

Management Transformation

The overall goal of our transformation is to “grow the harvest and make the soil more fertile”. Our transformation focuses on simple, efficient, and secure transactions with customers, as well as improvements to internal efficiency and effectiveness.

Looking ahead to future challenges, we have made it clear that the company is committed to delivering a ROADS user experience. Through digital transformation, we are also working to make it easier and more secure for our customers and partners to do business with Huawei, boosting customer satisfaction. When transforming its management approach, the company flexibly invokes open platform capabilities and a consistent and foundational data platform established by HQ to address the unique needs of each customer type or business model.

Our transformation initiatives in 2018 included:

- The continued implementation of IPD+, a major business process transformation that is founded on market innovation. This transformation:
 - Has five areas of focus, namely performing agile innovation, driving new opportunities and growth, achieving digital and collaborative designs, enabling full cloudification of software, and providing capabilities as services.
 - Brought in a model-based digital design and hardware development work chain, as well as digital main line and digital twin technologies to the process.
 - Allows product R&D to migrate from offline to online, so that Huawei can aggregate data throughout entire product lifecycles.
 - Has led to the release of the Product Center, a system that enables cloud-based sales configuration and decouples what to sell from how to sell.

- The continued promotion of CRM+, a customer-facing business process transformation. Through this program:
 - All key data objects are now managed in the data lake, which supports online data generation for the majority of business scenarios and addresses representative office requirements for digital operations.
 - The company emphasizes the importance of experience, efficiency, and effectiveness in driving digital transformation. The digital operating platforms forged by this project team target customers and support efficient operations.
 - The implementation of ISC+ transformation by establishing a digital, proactive supply chain.
 - This supply chain offers complete basic capabilities for going digital.
 - Its digital business platform is in place and has entered the routine operations phase, supporting planning, ordering, logistics, manufacturing, and industry chain management.
 - Progress of the Enterprise BG's Partner Relationship Management (PRM) transformation program. A basic digital platform e+ for three types of users has been built.
 - A platform was launched globally for all ecosystem partners, automating partner registration approval, smart qualification, and business performance/incentive verification, as well as the entire transaction process.
 - An operating and collaboration platform for field offices supports digital operations, motivation, and commands.
 - A digital compliance platform, powered by big data analytics and an AI engine, issues reminders for and visualizes BCG compliance risks, unauthorized distribution of goods, and revenue compliance risks.
 - The continued transformation of the consumer business, centered on customers and driven by experience, with the aspiration of building a safe, secure, and efficient digital operating and command system that ensures full compliance. Through these transformations, the Consumer BG has:
 - Preliminarily connected six major value streams, from product planning, go-to-market (GTM), end-to-end transactions, end-to-end supply, to end-to-end GTM control, end-to-end marketing, and consumer services.
 - Improved experiences for consumers, channel partners, suppliers, ecosystem partners, and employees, and managed partnerships, the ecosystem, and product lifecycles.
 - Built operating platforms, including the Pmall, an online transaction platform for its channel customers; a platform that supports GTM projects; and a one-stop-shop marketing project assistant (PA) platform.
 - Changed the organization and operating model of its IT team, and completed plans for all IT products and the design and integration of their business architectures, information architectures, and application architectures.
- All these efforts have supported the efficient operations of business departments.
- The continued rollout of transformations in representative offices that suit local business scenarios. In addition, HQ delivered scenario-specific services for representative offices. Specifically, the company:
 - Attached importance to purchase order (PO) line streamlining and rolled it out to representative offices, according to specific scenarios.
 - Piloted the restructuring of operating processes and enabled autonomous orchestration, role integration, elimination of unnecessary key control points, and pooling and sharing of resources for handling repetitive activities.
 - Supported the digital operations of representative offices so they could further joint efforts to build an ecosystem and share resources via platforms. Through this model, reports are developed according to business scenarios, with extensive support from HQ.

Companywide Transformation: Enhancing Software Engineering Capabilities

As cloud, digitization, and software-defined everything become more prevalent, so have a broad range of cyber-attacks and threats. Against this backdrop, product integrity and network resilience have become more important than ever. More than new functions and features, the trustworthiness and integrity of our products have become one of our customers' top priorities. **Strong software engineering capabilities are vital to building trustworthy, high-quality products.**

Therefore, we will implement a systematic transformation over the next five years to completely **overhaul our software engineering in all respects, from initial product design to end-to-end build and full lifecycle management.** This transformation will cover all products in our ICT infrastructure business. Our goal is to bring product quality and trustworthiness to new heights.

What will we change?

Awareness: Everyone at Huawei, from board members and executives to managers and employees, must understand that enhancing software engineering at Huawei is essential to developing trustworthy, high-quality products, with lasting implications on Huawei's future growth and development.

Information security policies: Our existing information security policies have laid the foundation for past success by stringently protecting our own IPR, but they have also led to fragmented software and silos between our teams. Moving forward, information security policies must adapt to the "build once, build correctly, used by all" approach of software engineering, allowing product teams to share our proprietary but non-core source code. We will also adopt stringent protocol-based management of code provided by third parties.

Culture: When it comes to the software development culture within the company, we will shift our focus from the logical architecture, functionality, and performance of software, to implementation architecture, build integrity, build consistency, and the maintainability of our code. This will allow us to more effectively address a dramatic increase in the complexity of ICT, while at the same time protecting our customers from old and new threats. We must remain open and transparent in everything we do, and foster a company-wide culture of quality software engineering through ongoing awareness programs, capability development, and regular examination.

Processes: We will integrate software engineering requirements into our processes, tools, and IT systems to evolve our rigid processes into flexible processes that can adapt to increasing challenges.

Resource allocation: We will prioritize investment in software engineering capabilities, giving them precedence over functionality and performance. The targets of these investments include but are not limited to product architecture refactoring, providing enhanced training on software engineering, and acquiring additional high-end software talent.

How will we make these changes?

The company has set up a Transformation Project Team for Improving Software Engineering Capabilities. The BOD has granted full decision-making and management authority to the project team. Full-time working groups will be established and staffed with our most capable managers. The project team will adjust organizations and management systems as needed, and be held responsible for the final results of overall software engineering improvements.

The BOD has **granted US\$2 billion in funding to this transformation program.** It also requires organizations at all levels to ensure the sufficient allocation of budget and resources to meet all software engineering improvement requirements.

Through this transformation, Huawei aspires to **improve software engineering capabilities across all aspects of our business, from culture, awareness, policies, organizations, and processes to appraisal mechanisms, technologies, and specifications.** This will ensure Huawei becomes synonymous with trustworthiness and quality and allow us to earn our place as the most trustworthy supplier and partner in the ICT industry.

Organizational Vitality

In 2018, the company simplified management based on trust and continued to implement differentiated management mechanisms for different talent groups and business departments. In addition, we built an organizational climate that values trust, collaboration, and dedication, and continuously boosted the vitality of the organization as a whole.

Our initiatives to boost organizational vitality in 2018 focused on five areas:

- Organizational restructuring: We restructured and optimized the company's organization. Specifically, we:
 - Established a business and platform management mechanism centered on the ICT Infrastructure Managing Board, Consumer Business Managing Board, and Platform Coordination Committee.
 - Streamlined organizational structures of group functions at HQ and further delegated authority on organizational restructuring and manager deployment to field offices, R&D, and other level-1 departments, to inspire passion in field organizations.
- Leadership management – we:
 - Remained focused on responsibilities and results, adhered to our principle of selecting and developing managers from those with long and successful track records, and implemented a dedicated talent development plan to identify and select more outstanding young managers.
 - Piloted and gradually rolled out a “presentation and Q&A session” mechanism to test managers' capabilities to adapt to change.
 - Continuously improved the manager mobility program to ensure all managers are fully motivated.
- Development of professionals – we:
 - Combined the market mechanism with the planning mechanism, ensured better operations

within the internal talent market, and facilitated the transfer of talent from established business segments to emerging business segments. This supports the development of emerging business and reduces the number of redundant employees in established business segments.

- Optimized individual performance management, “grew the harvest and made the soil more fertile”, concentrated efforts on creating value for customers, and encouraged better teamwork.
- Appointed and promoted “board experts” from different professional domains, highlighted exemplary experts, encouraged the development of great numbers of “board experts”, and boosted the expertise of teams.

- Value creation and distribution – we:

- Refined the Contribute and Share value distribution system based on the responsibilities employees take and the results they deliver, ensuring employees are fairly appraised based on personal contributions.
- Designed differentiated incentive schemes for different business segments, development stages, and talent groups.

These aim to allow all outstanding talent, both internally and externally, to participate in the value creation and distribution process and better encourage organizations and employees to create more value.

- Vision-driven growth – we interpreted and communicated the company's new vision:

- Through this vision, we ignite a stronger sense of mission amongst employees.
- This will drive continuous value creation and inspire a greater sense of honor, serving as a catalyst for a stronger sense of responsibility and generating an enhanced internal drive for employees to continue to work hard.

Cyber Security and Privacy Protection

Security & trustworthiness: Becoming the cornerstone of a fully connected, intelligent world

In an intelligent world where everything is connected, it is essential that ICT infrastructure operations are secure and stable and that data and user privacy are fully protected. This will ensure everyone can trust and easily enjoy the conveniences brought about by technological advances in this new world.

All stakeholders have a role to play in ensuring trustworthiness, security, and stability in cyberspace. Huawei supports and promotes open, secure, stable, and peaceful cyberspace, and respects and protects all basic human rights advocated by the *Universal Declaration of Human Rights* of the UN, including those related to privacy and communications. We ensure cyber security and protect user personal data in accordance with all applicable laws and industry best practices.

As cloud, digitization, and software-defined everything become more and more prevalent, the world will become data-centric and intelligent in the future. This new world will bring both challenges and opportunities. We understand that the ICT industry is undergoing rapid technological transformation, with technologies becoming increasingly complex, and networks increasingly open.

Against this backdrop, we are well aware of the increasing interest and concerns of companies, regulators, and the general public regarding security, and we take all of these very seriously. Users want to get online anytime and anywhere, and efficiently access data. To meet these requirements, product trustworthiness and network resilience have become more important than ever. Compared with new functions and features, customers will pay more attention to the trustworthiness of products and solutions, along with network resilience and cyber security.

Openness & transparency: Building trustworthy, secure, resilient networks

Over the past 30 years, Huawei has worked with carriers to build more than 1,500 networks, providing network services to over three billion people in more than 170 countries and regions. **Our customers can testify that Huawei products have never caused a major security incident. Together with our customers, we will maintain this track record.**

Huawei is a global company, and we have a deep understanding of and comply with laws and regulations around the world. We use the certainty of legal compliance to deal with the uncertainty of international politics. We are also fully aware of recent concerns regarding China's cyber security law. When new laws are introduced in every country, they can cause confusion and even be used to achieve objectives in ways that were never intended. The Chinese government has stated that no law in China requires any company to install backdoors or collect foreign intelligence.

We want to stress that Huawei equipment contains no backdoors, and that we will never plant backdoors on our equipment. We have never provided any improper information to any country or organization, and we will never do so. In the future, we will continue to deal with any requests for providing improper information by strictly adhering to the rights and procedures specified by the law. Everything we do is focused around our customers, meaning we will do everything in our power to protect the legitimate rights and interests of our customers and users.

Huawei's Board of Directors has reinforced the fact that cyber security and privacy protection are and will remain Huawei's top priorities. In accordance with this ongoing position, Huawei has taken many solid and productive steps and measures to continue this journey.

We proactively engage and work with governments, local communities, and our customers in an open, transparent, and constructive way to maximize the benefits of ICT infrastructure while improving its security. We are keenly aware of our responsibilities as a global ICT supplier, and we take the concerns expressed by governments, the general public, and our customers and partners very seriously.

We have established effective cyber security collaboration and communication mechanisms with the governments of many countries, including the UK, Canada, Germany, and France. We opened a Cyber Security Transparency Centre in Brussels in March 2019. This new center will become a platform for our communication and collaboration with governments, customers, and industry partners in Europe. At the center, our customers can better understand the security of Huawei products and solutions by testing and verifying the security of our products based on agreed standards.

Moving forward, technology will continue to evolve and new security risks will emerge, which will require more open and candid communication and closer collaboration. In the future, we will build similar open and transparent security management mechanisms in other parts of the world as required. We will work more closely with governments and our customers and have more dialogues about the value of ICT and what we can do, collectively, to increase protection.

Huawei has a robust cyber security assurance system, and we have invited third-party security organizations to independently evaluate Huawei products. It has been proven that Huawei equipment has never caused a large-scale network breakdown, and has never experienced any serious security incidents. There is also absolutely no evidence to show that Huawei equipment contains backdoors. Huawei products have and continue to maintain a strong track record in security. **According to the most recent survey by market research firm CFI Group, Huawei's equipment has far outperformed the industry average in System Stability and Reliability for three consecutive years.**

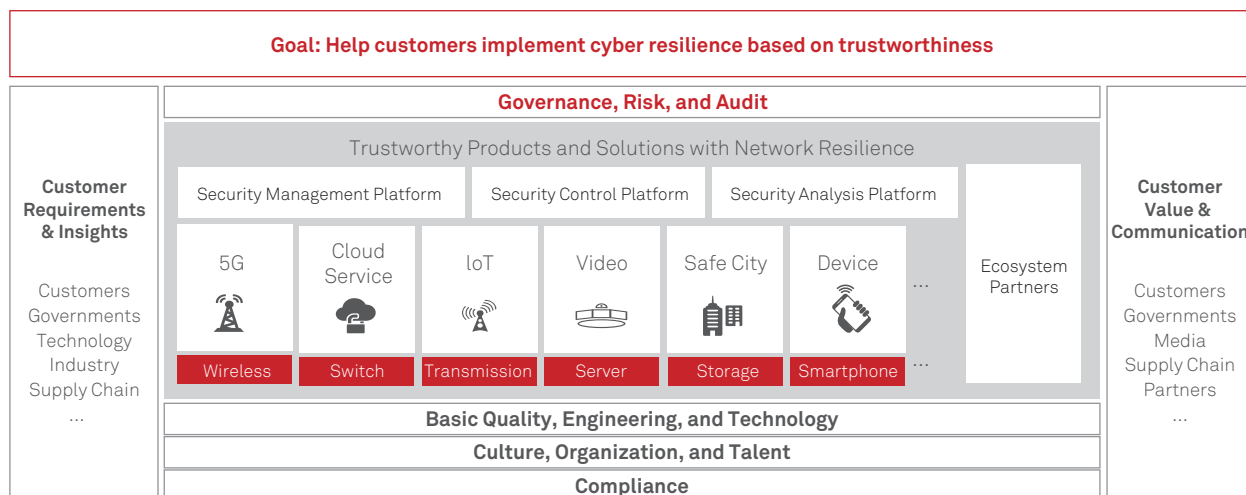
Huawei complies with all applicable privacy protection laws around the world, including the EU's General Data Protection Regulation (GDPR). Privacy protection is not just a legal requirement. Huawei is a provider of ICT infrastructure and smart devices and privacy protection is an integral part of our social responsibility. Huawei adopts industry-recognized privacy protection methodologies and practices. To better identify and mitigate privacy-related risks in our business activities, we have included the Privacy by Design (PbD) approach and Privacy Impact Assessment (PIA) process in our product and service development processes.

Continued investment: Improving industry-wide security capabilities through best practices

New technologies are developing rapidly, and the way ICT is being used is changing. The approaches adopted over the last 10 years may not work well over the next 10 years. Cyber security must be built upon trustworthiness, basic product quality, basic security engineering capabilities, and resilient products and solutions. This is the very foundation of all security activities.

To meet customer requirements in this more complex world, **we will invest an initial budget of US\$2 billion over the next five years to implement a companywide transformation program. With this program, we aim to comprehensively enhance our software engineering capabilities, which are the foundation upon which we will build secure, trustworthy, and high-quality products.** This program will entail reassessing the quality of our code, strengthening our grasp on and capabilities in the core elements of secure and resilient architecture design, and, wherever possible, simplifying every element of our products and solutions.

In 2018, to address the increasingly complex cyber security environment, we used a dynamic response approach to develop an overview of product planning and development. This was based on the assumption that cyberspace is insecure and cyber-attacks are constant. We also released our new Cyber Security Framework.



Huawei's Cyber Security Framework, released by Global Cyber Security & Privacy Officer John Suffolk at HUAWEI CONNECT in October 2018

In 2018, we actively explored and practiced applying our new Cyber Security Framework through people management, security engineering capabilities, security technologies and standards, security certifications, and supply chain. Some highlights of this year are listed below.

In **people management**, we focused on improving employees' security awareness and capabilities:

- We reviewed all key positions across the company relating to cyber security and privacy protection and mandated all employees in such positions must pass and receive certification from a cyber security examination.
- All of our employees received privacy protection awareness training and were tested on their mastery of its content. Currently, 98% of our employees have passed this examination, and the exam will be optimized and re-administered annually.
- A total of 97 Huawei employees received International Association of Privacy Professionals (IAPP) certification.

In **security engineering capabilities**, we embedded cyber security into our R&D processes and continued to improve these capabilities. Over the past several years, we have put an end-to-end security design platform in place, as well as a code security scanning cloud, a security test automation and FUZZ test cloud, and a vulnerability response platform. 2018 in particular saw multiple enhancements in our basic security quality:

- We customized scanning rules and applied AI, enabling the code security scanning cloud to intercept more code security issues faster.
- On our security test cloud, we focused on improving intelligent security testing technology. This technology identified more than 60 vulnerabilities in open-source software, which were then submitted to open source communities.
- We released the DevSecOps platform, incorporating security into the DevOps process. This ensures the security of cloud-based development.
- In the public cloud and consumer domains, we implemented vulnerability reward programs. With these programs, we mobilized industry security experts and worked with the industry to build a responsible, transparent, and collaborative security ecosystem.
- Results from the Building Security in Maturity Model (BSIMM) evaluation that has been conducted for the past five consecutive years showed that Huawei has made significant progress and ranks among the top in the 120 evaluated ICT companies.

In **security technologies and standards**, we continued research on technology and architecture to improve the trustworthiness of our products and network resilience:

- We launched security technologies including security orchestration and virtual machine escape detection at HUAWEI CONNECT 2018.

- We developed a series of key security technologies for mobile phones, including dynamic measurement, enhanced Return Oriented Programming (ROP) attack defense, and a lightweight applet isolation sandbox. We also researched and adopted formal proof technology to perform formal verification on some key designs and code, ensuring that mobile phone security is well protected.
- We developed and applied privacy protection technologies such as randomized identifiers, data masking, generalization, and multi-attribute differential privacy.
- As a director and technical committee member of the Trusted Computing Group (TCG), we submitted *Recommendations for Runtime Integrity Preservation*, which their new standards are based upon. As an ETSI NFV SEC rapporteur, we submitted the *Report on NFV Remote Attestation Architecture*, which also became the basis of their new standards. In addition, as a 3GPP SA3 rapporteur, the 5G security architecture led by Huawei was included in the *Standard on 5G Security Architecture and Functions* as part of the Release 15 standard.

In **certifications**, we actively participated in the industry's mainstream security certifications. Our major products received 11 international mainstream security certifications, including:

- Network Device collaborative Protection Profile (NDcPP) certification from the BSI in Germany for our NE40E product software
- Common Criteria (CC) EAL2 certification from the BSI in Germany for our OSN 1800 V product software
- EMVCo certification in the finance industry for the HUAWEI Mate 20 flagship smartphone's InSE chip

- Authoritative security certifications including ISO 27018, SOC1/2, and Payment Card Industry Data Security Standard (PCI DSS) for Huawei Cloud

In **supply chain management**, we always focused on managing the cyber security and privacy protection of our suppliers around the world. This year, we took significant steps towards that end:

- We evaluated 2,778 of our mainstream suppliers for cyber security risks, and verified the progress of related corrective action plans.
- We signed a Data Protection Agreement (DPA) with 582 suppliers for privacy protection, and performed due diligence on these suppliers.
- We continued to optimize our manufacturing system by developing an independent software test cloud and security assurance system. These were deployed by all of our 62 Electronic Manufacturing Services (EMS) providers, ensuring the security of our manufacturing process.

In this era of globalization, all ICT equipment vendors rely on a global supply chain. The digital infrastructure of the future will inevitably be the result of multi-vendor convergence and collaboration. From a security perspective, we must avoid a closed or narrow-minded approach to cyber security. Instead, we must communicate proactively, enhance transparency, and openly collaborate on a global scale to ensure cyber security and privacy protection can truly safeguard the digital transformation of industries worldwide.

To meet the new challenges that will emerge in the cloud and mobile eras, Huawei must ensure cyber security and protect privacy. These are the top priorities that underpin our future survival. We will continue to work with our customers and users to improve capabilities and share value in terms of cyber security and privacy protection.

Openness. Collaboration. Shared Success.

Building a digital, intelligent world takes joint effort. To this end, Huawei believes in the power of dissolving boundaries and working together to build an ecosystem that thrives on shared success. By advancing the development of the digital world – and by extension, an intelligent world – we can bring the benefits of digital life to everyone.

Ecosystem and Industry Development: Our Principles

We focus on ICT infrastructure and smart devices, cultivating a fertile business environment that runs on information technology, automation, and intelligence. This environment helps enrich our partners' content, applications, and clouds, so they can serve their customers better. When it comes to ecosystem and industry development, we have three guiding principles:

- Growing the industry and enlarging the market. This is more important than increasing our own market share.
- Cooperation is more important than competition. We enable others; we till the soil. We will not compete for profit with our partners, and will stay committed to openness, collaboration, and shared success.
- Through value sharing, we aim to unite as many people and companies as possible as we work towards a fully connected, intelligent world.

Key Progress and Industry Value

Huawei is an active member of more than 400 standards organizations, industry alliances, and open source communities, where we hold more than 400 key positions. We are a member of the board or executive committee in organizations like the 3GPP, IIC, IEEE-SA, BBF, ETSI, TMF, WFA, WWRF, CNCF, OpenStack, LFN, LFDL, Linaro, IFAA, CCSA, AII, CUVA, and VRIF.

On the industry front, Huawei actively contributes to a wide range of industry organizations to advance ICT and expand its market potential.

On the business front, we form and engage in open enablement platforms and business alliances that revolve around our customers' business needs. We work together with ecosystem partners on open innovation projects to speed up the development of customized solutions, helping our customers consolidate their strengths in digital transformation and succeed in their business pursuits.

On the national front, we work across public and private sectors in countries around the globe, using new advances in technology like 5G, AI, IoT, and cloud to help galvanize the economy.

Standards organizations:

Working closely with leading international standards organizations, we help grow the industry by upgrading technology and promoting broader collaboration. We help vertical industries go digital with applied ICT solutions, and work together to create an ecosystem where everything is connected. In 2018, some of our key initiatives included:

- Making core contributions to 5G. We worked together with key stakeholders across the industry to complete the first version of 3GPP 5G standards, paving the way for the commercial use of 5G.
- Enhancing standards coordination. In particular, we actively pushed for greater coordination around Internet Engineering Task Force (IETF) standards to drive Internet Protocol network technology forward, as well as the industry as a whole.

- Advocating industry alignment. In 2018, we worked closely with organizations like the European Telecommunications Standards Institute (ETSI) and the International Telecommunication Union (ITU) to drive consolidation of industry standards and promote a healthy industry ecosystem.
- Contributing market insight. This includes providing the Institute of Electrical and Electronics Engineers (IEEE) with input for their research on Wi-Fi and Ethernet technologies, to drive the ongoing evolution of the industry and promote a standard, universal architecture for the digital transformation of vertical industries.
- Actively participating in standards organizations like the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), expanding industry cooperation in emerging fields, and jointly promoting digital transformation of industries.
- Submitting more than 5,000 standards proposals, bringing the company's total number of proposals to nearly 60,000. We also increased investment in standards for AI, data security and protection, consumer devices, and other domains.

Industry alliances:

At Huawei, we are committed to guiding industry development and promoting growth across the ecosystem. We actively promote and form industry alliances to drive alignment, build an ecosystem for shared success, and promote sustainable industry development. In 2018, some of our key initiatives included:

- Joining forces with industry players to create industry alliances such as the China UHD Video Industry Alliance (CUVA), the Trusted Blockchain Consortium, the Network 5.0 Industry and Technology Innovation Alliance, and the Alliance of Internet + Energy Conservation, to help emerging industries like ultra HD video and blockchain more quickly reach maturity.
- Further deepening partnerships with leading industry alliances such as the GSMA, the Industrial Internet Consortium (IIC), the Alliance of Industrial Internet (AII), the 5G Automotive Association (5GAA), and the Edge Computing Consortium (ECC).



Working with the Global Industry Organizations (GIO) to build an innovative industry platform for cross-sector collaboration and digital transformation

- Leading or participating in more than 20 collaborative testbed projects to advance industry digitization and promote sustainable development.
- Working with major European industry partners to form the Edge Computing Consortium Europe (ECCE).
- Participating in the establishment of the 4K UHD Alliance in Latin America.
- Jointly releasing a *White Paper on Rural Coverage in Africa* with the African Telecommunication Union (ATU) at the Mobile World Congress, helping drive insight and awareness of ICT development in underserved regions.

Open source communities:

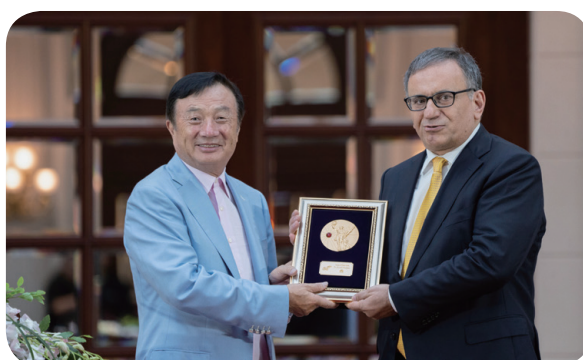
We embrace open source initiatives, actively contributing to mainstream foundations and open source communities, accelerating open innovation, and driving ecosystem development. 2018 activities include:

- Investing in open source communities like CNCF, OpenStack, OCI, ONAP, OPNFV, Akraio, Acmous, Hadoop, and Linaro. We hold more than 10 different seats on the board of directors for major international open source communities, and serve in more than 200 Technical Steering Committee, Project Team Lead, and Core Committer roles.
- Donating open source projects. Examples include ServiceComb, which was the first microservice project to graduate from Apache; Cyborg, which has quickly grown into a de-facto standard for acceleration device management; and CarbonData, which has gradually become one of the standard data formats for big data. Now more than 70% of CarbonData contributors are non-Huawei developers.
- Initiating the edge computing framework KubeEdge to help industries go cloud native and enable digital transformation.
- Introducing new features to the FD.io ecosystem including the DMM open source protocol stack framework. As a creative solution, the DMM makes it possible to use diverse protocol stacks for different applications.
- Boosting the value of open source software and making it easier to use. Of particular note, we launched the OpenLab program to promote better integration across communities and projects, and released the integration and verification baseline V1.0.
- Driving open certification and open source commercialization, including pushing the Compliance & Verification Committee (CVC) to provide certifications in the Linux Foundation Networking (LFN) umbrella project, in order to resolve interconnection issues between multiple vendors in NFVs.
- Building the Cross-domain, Cross-layer VPN (CCVPN) use case in collaboration with China Mobile and Vodafone in the ONAP community, and winning the GNTC Innovation Award.

Technological innovation:

Through open innovation projects and closer collaboration with industry and academia, we integrate innovation and standardization to provide greater value in major European organizations, such as ETSI. We provide guidance for Internet Protocol microwave, edge computing, and AI, and have helped to gradually integrate global standards and industry systems through collaboration and openness. These efforts include:

- Increasing investment in basic research and supporting scientists so their work lights the way forward for the rest of mankind. Professor Arikan is an early example. He published a paper on polar codes in 2008. Huawei invested in his research and built on his original findings to help bring polar codes from the lab to industrial application. Polar codes are now a part of 5G standards.



Turkish professor Dr. Erdal Arikan, the inventor of polar codes for 5G, receiving an award from Huawei at its Shenzhen headquarters in July 2018. The award was to recognize his outstanding contributions to communications technology.

- Collaborating closely with European research institutes such as Fraunhofer, and participating in ICT industry development projects like AI and connected cars through initiatives related to research, standards, open source, testbeds, and industry alliances.
- Forging close ties with European scientists, and working together on leading technology to drive industry development.
- Working together with 15 other companies to establish the Network 5.0 Industry and Technology Innovation Alliance that covers eight primary areas with Network 5.0 projects.
- Setting the stage for standardizing the security architecture for deterministic IP networks in ETSI and Internet Research Task Force (IRTF), and taking the lead in the standardization of this field.
- Pushing for a common architecture for an optical ecosystem through Optical Networks 2020 (ON2020) based on Optical Networking 2.0 industry projects. Our aim is to promote the development of standards for WDM Transport Network (WTN) and guide future development.

Developer ecosystem:

We leverage full-stack open capabilities and intelligence to provide digital services across all scenarios. Progress made in 2018 includes:

In our consumer business:

- Expanding the Huawei Developer Alliance that centers on Huawei Mobile Services. To date, more than 560,000 developers have registered for Huawei Mobile Services. We have made 47 additional capabilities and services available for developers, with 883 APIs. Our goal is to enable developers from development, promotion, to monetization.
- Providing comprehensive training sessions and incentives to connect with developers at different levels, including through various activities like the Shining Star program, DigiX geek innovation contests, Huawei Developer Day, and open courses.

In our ICT infrastructure business:

- Investing in the Developer Enablement Program for carrier and enterprise markets to help developers more rapidly develop capabilities related to Huawei Cloud. In 2018, the number of registered developers worldwide reached nearly 300,000, with a growth rate of over 150%. We also added around 600 new certified joint solutions, and over 1,700 new developers in 2018.
- Improving development efficiency and accelerating application innovation through DevCloud, the enterprise application development platform, and other tools.
- Launching the Huawei Cloud Academy, deploying OpenLabs globally, and implementing the Huawei Cloud Developer Program to offer a range of services like training, certification, development, and support.
- Accelerating talent development and product launches, and giving developers access to Huawei opportunities in the global market, by providing commercial support such as physical goods, funds, cloud service resources, and enterprise connections.

In full-stack, open AI:

- Releasing open, full-stack, all-scenario AI capabilities based on the self-developed Ascend series of chips, Atlas intelligent hardware, Compute Architecture for Neural Networks (an operator development tool), MindSpore (a training and inference framework), and ModelArts. ModelArts is a one-stop AI development platform that manages the entire AI development lifecycle, from data management, algorithm development, model training, model deployment, model market, to O&M. This platform was ranked as the fastest to train an image recognition model (only 9 minutes and 22 seconds) according to the DAWNBench by Stanford University.

Business alliances:

We develop customer-facing business solutions together with our partners. 2018 landmarks include:

- Establishing strategic relationships with leading consulting, application, and industry solution providers in areas where we can work with alliances to drive the industry forward.
- Serving customers through joint technical innovation, joint solution development, and joint marketing and sales, and creating new market value together with our customers.
- Establishing strategic partnerships with new partners, such as Bosch, and further expanding strategic partnerships with existing partners like SAP, Microsoft, Intel, Accenture, and Infosys.
- Developing and customizing solutions for smart city, transportation, energy, manufacturing, and other segments with local small and medium partners around the globe. We use IoT, video, AI, 5G, and other platform technologies, as well as our Huawei Solution Partner program and a global spread of OpenLabs to help our customers go digital.
- Adding over 2,000 new Huawei solution ecosystem partners, bringing the total to more than 5,000.

Government advisory:

We encourage using technology to better and more rapidly serve local communities. 2018 activities include:

- Joining the technical work group of Germany's Federal Ministry of Transport and Digital Infrastructure (BWVI), participating in the development of the DigiNet 5G infrastructure technical specifications, and proposing sharing infrastructure to reduce national broadband deployment costs.
- Developing the *SME Digitization Whitepaper* in collaboration with SME Corp Malaysia to speed up the digital transformation of SMEs in Malaysia.
- Actively contributing ideas to Thailand's National Digital Economy and Society Commission regarding new technologies such as 5G, cloud, and big data, and engaging in government flagship projects related to industry policies.
- Innovating together with the Indonesian government in areas such as universal coverage, mid- and long-term 5G spectrum planning, 3G and 4G spectrum refarming, IoT standards for vertical industries, and smart cities.
- Actively participating in the formulation and implementation of broadband policies and standards in Saudi Arabia and countries in the League of Arab States and African Union.
 - Sharing the best practices of national broadband network construction to speed up the development of national broadband in Saudi Arabia.

- Winning recognition of the Council of the Arab ICT Organization (AICTO) for our proposal *ICT as Basic National Policy: Build Solid Foundation for Arab Digital Society*.
- Completing a white paper with the African Union, setting goals for funding, resources, and regulation, and releasing it to 54 African Union members at the African Union's broadband conference.
- Joining forces with third-party organizations to encourage governments, industry organizations, and carriers in Africa and Southeast Asia to prioritize and invest in rural networks.
- Launching RuralStar, an innovative scenario-based site solution, to reduce network construction costs and increase network coverage in more rural areas.
- Participating in dedicated workshops run by spectrum organizations in Asia Pacific and Africa, and contributing ideas to ICT management of each country.
- Creating formal plans to connect the unconnected more rapidly, and help achieve the UN Broadband Commission's target of connecting the other half of the world's population by 2025.
- Publishing the position paper *Telco: Investment, Innovation and Competition in ICT Infrastructure*, calling on governments to support investment in ICT infrastructure, encourage ICT innovation, and guide and regulate ICT competition, in order to guide the dynamic and healthy development of the ICT industry.
- Releasing the position paper *Digital Nation: Stronger Economy, Better Society, Adept Governance* at the Huawei European Innovation Day event, calling on governments to develop policies for organization, talent, and financing that are conducive to the development of digital economy.
- Huawei has been operating in Brazil for 20 years, serving local enterprises and citizens with innovative solutions. In June 2018, Huawei, together with Deloitte, released *Insights about Digital Transformation and ICT Opportunities for Brazil* and submitted it to the President of Brazil, further contributing to the Brazil ICT industry in terms of safe city, broadband, wireless, cloud, and talent.



Brazilian customers and Huawei employees celebrating Huawei's 20th anniversary in Brazil

Results of Operations

Financial Performance

(CNY Million)	2018	2017	YoY
Revenue	721,202	603,621	19.5%
Gross profit	278,171	238,142	16.8%
– Gross profit margin	38.6%	39.5%	(0.9)%
Total operating expenses	(204,884)	(181,758)	12.7%
– as % of revenue	28.4%	30.1%	(1.7)%
Operating profit	73,287	56,384	30.0%
– as % of revenue	10.2%	9.3%	0.9%
Net finance expenses	253	(573)	(144.2)%
Income tax expenses	(14,301)	(8,673)	64.9%
Net profit	59,345	47,455	25.1%

Revenue in 2018 totaled CNY721,202 million, representing an increase of 19.5% year-on-year. Net profit grew by 25.1% year-on-year to CNY59,345 million. This was mainly attributable to increasing revenue, higher operating efficiency, and improvements in the quality of our operations.

- As the consumer business grew rapidly and contributed a larger share to total revenue, the company's gross profit margin dropped by 0.9 percentage points from 2017.
- Although the company increased investment in future-oriented research and innovation and in building its brand and sales channels, total operating expenses as a percentage of revenue dropped by 1.7 percentage points compared with 2017. This was attributable to efficiency gains enabled by ongoing management transformation.
- As interest income grew, other net finance losses declined sharply over 2017. As a result, the company's net finance expenses decreased significantly compared with 2017.

Total Operating Expenses

(CNY Million)	2018	2017	YoY
Research and development expenses	101,509	89,690	13.2%
– as % of revenue	14.1%	14.9%	(0.8)%
Selling and administrative expenses	105,199	92,681	13.5%
– as % of revenue	14.6%	15.4%	(0.8)%
Other (income)/expenses, net	(1,824)	(613)	197.7%
– as % of revenue	(0.3)%	(0.1)%	(0.2)%
Total operating expenses	204,884	181,758	12.7%
– as % of revenue	28.4%	30.1%	(1.7)%

In 2018, Huawei continued to increase its investment in research and development for the future, such as in 5G, cloud, artificial intelligence, and smart devices. Despite this, the company's R&D expenses as a percentage of revenue decreased by 0.8 percentage points year-on-year due to the rapid growth of revenue. The company also increased investment in building its brand and sales channels for the consumer and enterprise businesses; however, the higher operating efficiency made possible by ongoing management transformation resulted in a decline of 0.8 percentage points in selling and administrative expenses as a percentage of revenue. Total operating expenses as a percentage of revenue dropped by 1.7 percentage points.

Net Finance Expenses

(CNY Million)	2018	2017	YoY
Net foreign exchange loss	2,031	1,080	88.0%
Other net finance gains	(2,284)	(507)	350.5%
Total net finance expenses	(253)	573	(144.2)%

Net finance expenses in 2018 amounted to –CNY253 million, a decrease of CNY826 million compared with 2017. Due to the depreciation of currencies in emerging markets, net foreign exchange losses grew by CNY951 million over 2017. As interest income increased, other net finance losses declined by CNY1,777 million.

Financial Position

(CNY Million)	December 31, 2018	December 31, 2017	YoY
Non-current assets	135,678	99,964	35.7%
Current assets	530,114	405,261	30.8%
Total assets	665,792	505,225	31.8%
Among which: Cash and short-term investments	265,857	199,943	33.0%
Trade receivables	91,052	106,324	(14.4)%
Contract assets	48,276	–	–
Inventories and other contract costs	96,545	72,352	33.4%
Non-current liabilities	73,477	42,851	71.5%
Among which: Long-term borrowings	66,170	38,338	72.6%
Current liabilities	359,250	286,758	25.3%
Among which: Short-term borrowings	3,771	1,587	137.7%
Trade payables	94,320	72,846	29.5%
Contract liabilities	58,278	–	–
Equity	233,065	175,616	32.7%
Total liabilities and equity	665,792	505,225	31.8%

As of December 31, 2018, the balance of cash and short-term investments reached CNY265,857 million, up 33.0% year-on-year.

In 2018, Huawei's DSO was 70 days, 7 days longer than that in 2017. Its ITO increased by 6 days to 77 days. The company's DPO was 77 days, 5 days longer than that in 2017.

As of December 31, 2018, total short-term and long-term borrowings amounted to CNY69,941 million, an increase of 75.2% year-on-year from CNY39,925 million at the end of 2017. The primary purpose of these borrowings was to ensure the company's sustained and increased investment in future-oriented research and innovation in areas such as 5G, cloud, artificial intelligence, and smart devices, as well as in building our brand and sales channels.

Cash Flow from Operating Activities

(CNY Million)	2018	2017	YoY
Net profit	59,345	47,455	25.1%
Adjustment for depreciation, amortization, net foreign exchange losses and non-operating expenses, net	14,090	14,255	(1.2)%
Cash flow before change in operating assets and liabilities	73,435	61,710	19.0%
Change in operating assets and liabilities	1,224	34,626	(96.5)%
Cash flow from operating activities	74,659	96,336	(22.5)%

In 2018, we continued to invest more in R&D and increased our inventory. As a result, our cash flow from operating activities in 2018 declined by 22.5% year-on-year to CNY74,659 million.

Financial Risk Management

In 2018, we amended and improved our financial risk management policies and processes to further enhance our ability to withstand financial risks and better support our business development.

Liquidity Risk

We have continuously worked to improve our capital structure and short-term liquidity planning, budgeting, and forecasting systems to better assess mid-to long-term liquidity needs and short-term funding shortfalls. We have implemented prudent financial measures to meet our liquidity needs and guarantee our company's business development, including maintaining a robust capital structure and financial flexibility, keeping a proper level of funds, gaining access to adequate and committed credit facilities, creating effective cash plans, and centralizing cash management. As of December 31, 2018, our cash and short-term investments had increased by 33.0% year-on-year to CNY265,857 million, enabling us to further mitigate our liquidity risks.

(CNY Million)	2018	2017	YoY
Cash flow from operating activities	74,659	96,336	(22.5)%
Cash and short-term investments	265,857	199,943	33.0%
Short-term and long-term borrowings	69,941	39,925	75.2%

Foreign Exchange Risk

Our presentation currency is CNY, but we have foreign currency exposure related to buying, selling, and financing in currencies other than CNY, mainly USD and EUR. According to our established foreign exchange risk management policy, material foreign exchange exposures are hedged based on a comprehensive analysis of market liquidity and hedging costs. We have developed a complete set of foreign exchange management policies, processes, and instructions. These include:

- Natural hedging: We structure our operations to match currencies between procurement and sales transactions, to the greatest extent possible.
- Financial hedging: For certain currencies where natural hedging does not fully offset the foreign currency position, we hedge through forward foreign exchange transactions.

In countries where local currencies depreciate sharply or in those with strict foreign exchange controls, we manage foreign exchange exposures using different measures, including pricing in USD. We also accelerate customer payment and promptly transfers cash out of these countries to mitigate risks.

With other conditions remaining unchanged, exchange rate fluctuations will impact our net profit as follows:

(CNY Million)	2018	2017
USD depreciates by 5%	(1,776)	(1,077)
EUR depreciates by 5%	177	158

Interest Rate Risk

Interest rate risks mainly arise from Huawei's long-term borrowings and long-term receivables. By analyzing its interest rate exposures, the company uses a combination of fixed-rate and floating-rate bank loans to mitigate interest rate risks.

1. Major interest-bearing long-term financial instruments held by the company as at December 31, 2018

	2018		2017	
	Effective		Effective	
	Interest Rate (%)	(CNY million)	Interest Rate (%)	(CNY million)
Fixed-rate long-term financial instruments				
Long-term borrowings	4.07	30,762	4.07	29,251
Trade and other receivables	5.87	(2,316)	7.21	(2,465)
Floating-rate long-term financial instruments				
Long-term borrowings	3.82	35,408	4.21	9,087
Trade and other receivables	0.83	(1,737)	0.32	(1,968)
Total		62,117		33,905

2. Sensitivity analysis

Assuming that the interest rate increased by 50 basis points on December 31, 2018 and other variables remained unchanged, the company's net profit and equity would decrease by CNY132 million (in 2017, the amount decreased by CNY27 million).

Credit Risk

The company has established and implemented globally consistent credit management policies, processes, IT systems, and quantitative credit risk assessment tools. It has established dedicated credit management teams across all regions and business units, and set up centers of expertise specializing in credit management in Europe and Asia Pacific. The company uses quantitative risk assessment models to determine customer credit ratings and credit limits and quantify transaction risks. It has also set risk control points for key activities across the end-to-end sales process to manage credit risks in a closed loop. Huawei's Credit Management Department regularly assesses global credit risk exposures and develops IT tools to help field offices monitor risk status, estimate potential losses, and determine bad debt provisions as appropriate. To minimize risk, a special process is followed if a customer defaults on a payment or poses an unacceptably high credit risk.

Sales Financing

With its global coverage, Huawei's sales financing team maintains close contact with customers to understand their financing needs and taps into a wide range of financing resources around the world. As a bridge for communication and cooperation between financial institutions and customers, the sales financing team provides customers with specialized financing solutions that contribute to ongoing customer success. To transfer risks, Huawei arranges for third-party financial institutions to provide sales financing, such as export credit facilities, leasing, and factoring. These institutions bear the associated risks and profit from these operations. Huawei has established systematic financing policies and project approval processes to strictly control financing risk exposures. Huawei only shares risks with financial institutions on certain projects, and measures and recognizes the risk exposures to ensure that business risks are under control.

Independent Auditors' Report



Independent auditors' report on the consolidated financial statements summary to the Board of Directors of Huawei Investment & Holding Co., Ltd.

Opinion

The consolidated financial statements summary of the Huawei Investment & Holding Co., Ltd. and its subsidiaries (the Group) set out on pages 70 to 126, which comprises the summary consolidated statement of financial position as at December 31, 2018, the summary consolidated statements of profit or loss and other comprehensive income and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information, is derived from the audited consolidated financial statements of the Group for the year ended December 31, 2018.

In our opinion, the accompanying consolidated financial statements summary is consistent, in all material respects, with the audited consolidated financial statements, in accordance with the basis described in note 2 to the consolidated financial statements summary.

Consolidated financial statements summary

The consolidated financial statements summary does not contain all the disclosures required by International Financial Reporting Standards applied in the preparation of the audited consolidated financial statements of the Group. Reading the consolidated financial statements summary and the auditors' report thereon, therefore, is not a substitute for reading the audited consolidated financial statements of the Group and the auditors' report thereon.

The audited consolidated financial statements and our report thereon

We expressed an unmodified audit opinion on the audited consolidated financial statements in our report dated March 27, 2019.

Management's responsibilities for the consolidated financial statements summary

Management is responsible for the preparation of the consolidated financial statements summary in accordance with the basis described in note 2 to the consolidated financial statements summary.

Auditors' responsibilities

Our responsibility is to express an opinion on whether the consolidated financial statements summary is consistent, in all material respects, with the audited consolidated financial statements based on our procedures, which were conducted in accordance with International Standard on Auditing 810 (Revised), *Engagements to Report on Summary Financial Statements*.

KPMG Huazhen LLP
Certified Public Accountants
15th Floor, China Resources Tower
2666 Keyuan South Road
Shenzhen 518052, China
March 27, 2019

Consolidated Financial Statements Summary

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Summary Consolidated Statement of Profit or Loss and Other Comprehensive Income

(CNY million)	Note	2018	2017
Revenue	8	721,202	603,621
Cost of sales		(443,031)	(365,479)
Gross Profit		278,171	238,142
Research and development expenses		(101,509)	(89,690)
Selling and administrative expenses		(105,199)	(92,681)
Other income, net	9	1,824	613
Operating profit		73,287	56,384
Finance income and expenses	11	253	(573)
Share of associates' and joint ventures' results (post tax)		106	317
Profit before taxation		73,646	56,128
Income tax	12	(14,301)	(8,673)
Profit after tax		59,345	47,455
Other comprehensive income (after tax and reclassification adjustments)	13		
Items that will not be reclassified to profit or loss:			
Re-measurement of defined benefit obligations		(766)	715
Equity investments at fair value through other comprehensive income (FVOCI) – net change in fair value		(66)	–
		(832)	715
Items that are or may be reclassified subsequently to profit or loss:			
Available-for-sale investments – net change in fair value		–	92
Non-equity financial assets at FVOCI – net change in fair value and impairment loss		27	–
Translation differences on foreign operations		1,235	(1,662)
		1,262	(1,570)
Total other comprehensive income		430	(855)
Total comprehensive income		59,775	46,600
Profit for the year attributable to:			
Equity holders of the Company		59,227	47,451
Non-controlling interests		118	4
Total comprehensive income attributable to:			
Equity holders of the Company		59,656	46,601
Non-controlling interests		119	(1)

Note: The Group has initially applied IFRS 15 and IFRS 9 at January 1, 2018. Under the transition methods chosen, comparative information has not been restated. See Note 4.

The notes on pages 74 to 126 form part of this consolidated financial statements summary.

Summary Consolidated Statement of Financial Position

(CNY million)	Note	December 31, 2018	December 31, 2017
Assets			
Goodwill and intangible assets	14	7,964	5,327
Property, plant and equipment	15	74,662	56,089
Long-term leasehold prepayments	16	6,896	5,152
Interests in associates and joint ventures	17	562	750
Other investments, including derivatives	18	18,725	5,965
Deferred tax assets	19	17,257	18,565
Contract assets	21	601	–
Trade and bills receivable	22	3,588	2,451
Other assets	23	5,423	5,665
Non-current assets		135,678	99,964
Inventories and other contract costs	20	96,545	72,352
Contract assets	21	47,675	–
Trade and bills receivable	22	91,995	107,595
Other assets	23	28,042	25,371
Other investments, including derivatives	18	81,751	24,596
Cash and cash equivalents	24	184,106	175,347
Current assets		530,114	405,261
Total assets		665,792	505,225
Equity			
Equity attributable to equity holders of the Company		232,658	175,585
Non-controlling interests		407	31
Total equity		233,065	175,616
Liabilities			
Loans and borrowings	25	66,170	38,338
Deferred government grants		1,209	1,340
Deferred tax liabilities	19	1,937	1,471
Other liabilities	28	4,161	1,702
Non-current liabilities		73,477	42,851
Loans and borrowings	25	3,771	1,587
Employee benefits		98,164	91,857
Income tax payable		4,191	4,390
Trade and bills payable	26	96,919	72,866
Contract liabilities	27	58,278	–
Other liabilities	28	87,683	95,825
Provisions	29	10,244	20,233
Current liabilities		359,250	286,758
Total liabilities		432,727	329,609
Total equity and liabilities		665,792	505,225

Note: The Group has initially applied IFRS 15 and IFRS 9 at January 1, 2018. Under the transition methods chosen, comparative information has not been restated. See Note 4.

The notes on pages 74 to 126 form part of this consolidated financial statements summary.

Summary Consolidated Statement of Cash Flows

(CNY million)	Note	2018	2017
Cash flows from operating activities			
Cash receipts from goods and services		795,520	669,545
Cash paid to suppliers and employees		(768,796)	(618,305)
Other operating cash flows		47,935	45,096
Net cash generated from operating activities		74,659	96,336
Net cash used in investing activities		(93,880)	(24,657)
Net cash generated from/(used in) financing activities		26,926	(16,936)
Cash and cash equivalents			
Net increase		7,705	54,743
At January 1	24	175,347	123,047
Effect of foreign exchange rate changes		1,054	(2,443)
At December 31	24	184,106	175,347

Note: The Group has initially applied IFRS 15 and IFRS 9 at January 1, 2018. Under the transition methods chosen, comparative information has not been restated. See Note 4.

The notes on pages 74 to 126 form part of this consolidated financial statements summary.

Notes

1 Reporting entity

Huawei Investment & Holding Co., Ltd. (the Company) is a limited liability company established in Shenzhen in the People's Republic of China (the PRC). The Company's registered office is at Building 1, Zone B, Huawei Base, Bantian Longgang District, Shenzhen City, PRC.

The Company and its subsidiaries (the Group) principally provide end to end Information and Communication Technology solutions. This includes the research, design, manufacture and marketing of telecom network equipment, IT products and solutions, cloud technology and services and smart devices for telecom carriers, enterprises and consumers. The principal activities and other particulars of the Company's major subsidiaries are set out in note 33(b) to the consolidated financial statements summary.

2 Preparation basis of the consolidated financial statements summary

The Group has prepared a full set of consolidated financial statements (consolidated financial statements) for the year ended December 31, 2018 in accordance with International Financial Reporting Standards (IFRSs).

This is the first set of the Group's annual financial statements in which IFRS 15 and IFRS 9 have been applied. Changes to significant accounting policies are described in Note 4.

The consolidated financial statements summary has been prepared and presented based on the audited consolidated financial statements for the year ended December 31, 2018 in order to disclose material financial and operational information.

3 Significant accounting policies

(a) Basis of preparation of the consolidated financial statements

The consolidated financial statements have been prepared under the historical cost basis modified for the fair valuation of certain financial instrument classifications (see note 3(e)).

The preparation of consolidated financial statements in accordance with IFRSs requires management to make judgements, estimates and assumptions that affect the application of policies and reported amounts of assets, liabilities, income and expenses. Estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed regularly and revised when required. Revisions to accounting estimates are recognised in the period in which the estimate is revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

Judgements made by management in the application of IFRSs that have significant effect on the consolidated financial statements and major sources of estimation uncertainty are discussed in note 5.

Changes in accounting policies

As explained in more details below, the Group has adopted IFRS 15 and IFRS 9 from January 1, 2018. As permitted by these standards, the Group has not restated comparatives. The policies set out below include both the new policies adopted in the current year and the Group's previous policies which were applied in preparing the comparative amounts.

(b) Functional and presentation currency

All financial information in the consolidated financial statements summary is presented in millions of Renminbi (CNY), which is the Company's functional currency.

(c) Consolidation

The financial statements consolidate the results, assets, liabilities and cash flows of all subsidiaries which the Group controls.

Subsidiaries are consolidated from the date that control commences until the date that control passes. Intra-group balances, transactions and cash flows and any unrealised profits arising from intra-group transactions are eliminated in full in preparing the consolidated financial statements. Unrealised losses resulting from intra-group transactions are eliminated in the same way as unrealised gains but only to the extent that there is no evidence of impairment.

The Group controls an entity when it is exposed, or has rights, to variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. When assessing whether the Group has power, only substantive rights are considered.

The Group uses the acquisition method to account for business acquisitions. The difference between the fair value of the consideration paid and the fair value of assets, liabilities and contingent liabilities acquired is recorded as goodwill. Transaction costs incurred in an acquisition are included in operating costs.

Non-controlling interests represent the carrying value of the net assets of subsidiaries attributable to non-controlling shareholders. The Group measures non-controlling interests at the non-controlling interests' proportionate share of the subsidiary's net identifiable assets. Changes in the Group's interests in a subsidiary that do not result in a loss of control are accounted for as equity transactions, whereby adjustments are made to the amounts of controlling and non-controlling interests within consolidated equity to reflect the change in relative interests, but no adjustments are made to goodwill and no gain or loss is recognised.

When the Group loses control of a subsidiary, it is accounted for as a disposal of the entire interest in that subsidiary, with a resulting gain or loss being recognised in profit or loss. Any interest retained in that former subsidiary at the date when control is lost is recognised

at fair value or, when appropriate, the cost on initial recognition of an investment in an associate or a joint venture (see note 3(d)).

(d) Associates and joint ventures

An associate is an entity in which the Group has significant influence, but not control or joint control, over its management, including participation in the financial and operating policy decisions.

A joint venture is an arrangement whereby the Group and other parties contractually agree to share control of the arrangement, and have rights to the net assets of the arrangement.

An investment in an associate or a joint venture is accounted for in the consolidated financial statements using the equity method. They are initially recognised at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and other comprehensive income (OCI) of equity-accounted investees, until the date on which significant influence or joint control ceases.

Unrealised profits and losses resulting from transactions between the Group and its associates and joint ventures are eliminated to the extent of the Group's interest in the investee, except where unrealised losses provide evidence of an impairment of the asset transferred, in which case they are recognised immediately in profit or loss.

(e) Financial instruments

The Group has adopted IFRS 9, with effect from January 1, 2018. As permitted by the standard, comparative figures have not been restated and these are presented in accordance with the Group's previous policies. Both the new and the old accounting policies are described below where appropriate.

(i) Recognition and derecognition

Financial instruments, comprising financial assets and financial liabilities, are recognised in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the instrument.

The Group derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred or where it neither transfers nor retains substantially all of the risks and rewards of ownership and loses control. When control is retained, the Group continues to recognise the financial asset to the extent of its continuing involvement. Financial assets are also de-recognised when they are written off. Financial assets are written off when there is no reasonable expectation of further recoveries even though there may be enforcement actions ongoing.

The Group derecognises a financial liability when its contractual obligations are discharged, cancelled, or expire.

Financial assets and financial liabilities are offset and the net amount presented in the consolidated statement of financial position when, and only when, the Group currently has a legally enforceable right to set off the recognised amounts and intends either to settle them on a net basis or to realise the asset and settle the liability simultaneously.

(ii) Classification and measurement

Policy applicable from January 1, 2018

All financial assets and liabilities are initially recognised at fair value, which is usually the transaction price including, where appropriate, transaction costs, with the exception of trade receivables without a significant financing component, which are measured at their transaction price, determined in accordance with the Group's accounting policies for revenue. Subsequently, measurement depends on the financial assets/liabilities classification as follows:

- Financial assets measured at fair value through profit or loss (FVPL)

Non-equity financial assets are classified as FVPL if they arise from contracts which do not give rise to cash flows which are solely principal and interest, or otherwise where they are held in a business model which mainly realises them through sale.

Such assets are re-measured to fair value at the end of each reporting period. Gains and losses arising from re-measurement are taken to profit or loss, as are transaction costs.

Equity investments are classified as FVPL unless they are designated as at FVOCI on initial recognition (see below). Dividends from equity investments, irrespective of whether classified as FVPL or FVOCI, are recognised in profit or loss as finance income.

- Financial assets measured at FVOCI

Non-equity financial assets are classified as FVOCI where they arise from contracts which give rise to contractual cash flows which are solely principal and interest and which are held in a business model which realises some through sale and some by holding them to maturity. They are recognised initially at fair value plus any directly attributable transaction costs, or in the case of trade receivables, at the transaction price.

At the end of each reporting period they are re-measured to fair value, with the cumulative gain or loss compared to their amortised cost being recognised in other comprehensive income and in the fair value reserve, except for the recognition in profit and loss of expected credit losses, interest income (calculated using the effective interest method) and foreign exchange gains and losses.

When these assets are derecognised, the cumulative gain or loss is reclassified from equity to profit or loss.

Equity investments not held for trading purposes are designated as at FVOCI where they are considered strategic to the Group. Such designation is made on an instrument-by-instrument basis, but may only be made if the investment meets the definition of equity from the issuer's perspective. Amounts accumulated in the fair value reserve in respect of these investments are transferred directly to retained earnings on the disposal of the investment. These investments are not subject to impairment.

- Financial assets measured at amortised cost (AC)

Financial assets are held at amortised cost when they arise from contracts which give rise to contractual cash flows which are solely principal and interest and are held in a business model which mainly holds the assets to collect contractual cash flows.

Financial assets measured at AC that are not purchased or originated credit-impaired are measured at amortised cost using the effective interest method. For those purchased or originated credit-impaired, the Group applies the credit-adjusted effective interest rate since initial recognition. These assets are also subject to impairment losses (see note 3(k)). Interest income is calculated based on the gross carrying amount of the financial asset unless the financial asset is credit impaired, in which case interest income is calculated on the amortised cost (i.e. gross carrying amount less loss allowance). Interest income is included in finance income.

Policy applicable before January 1, 2018

All financial assets and liabilities are initially recognised at fair value, which is usually the transaction price including, where appropriate, transaction costs. Subsequently, measurement depends on their classification as follows:

- Financial assets at fair value through profit or loss

Financial assets are classified as at fair value through profit or loss if they are classified as held-for-trading or are designated as such on initial recognition, and are re-measured to fair value at the end of each reporting period. Gains and losses arising from re-measurement are taken to profit or loss, as are transaction costs.

- Loans and receivables

Loans and receivables including trade receivables are measured at amortised cost using the effective interest method including a reduction for any impairment losses (see note 3(k)). Interest income is included in finance income.

- Available-for-sale financial assets

Available-for-sale financial assets are non-derivative financial assets that are not classified in any of the above categories of financial assets and are recognised initially at fair value plus any directly attributable transaction costs. At the end of each reporting period the fair value is remeasured, with any resultant gain or loss being recognised in other comprehensive income and accumulated separately in equity in the available-for-sale reserve except for the foreign exchange gain or loss on debt instruments which is recognised in finance income or expenses. When these assets are derecognised or impaired (see note 3(k)), the cumulative gain or loss is reclassified from equity to profit or loss.

Available-for-sale financial assets that do not have a quoted price in an active market and whose fair value cannot be reliably measured are measured at cost less any impairment losses (see note 3(k)) at the end of each reporting period.

Interest income on available-for-sale financial assets is recognised in finance income using the effective interest method. Dividends on available-for-sale equity securities are recognised in finance income when the right to receive dividends has been established.

Policy applicable before and after January 1, 2018

- Financial liabilities at amortised cost

Financial liabilities, except those designated as at FVPL, are stated at amortised cost using the effective interest method. Interest is included in finance expenses unless capitalised into property, plant and equipment (see note 3(t)).

- Financial liabilities designated as at FVPL

The Group has irrevocably designated certain financial liabilities as at FVPL on initial recognition because they are managed and their performance is evaluated on a fair value basis and information is provided internally on that basis to the Group's key management personnel.

(f) Investment property

Investment properties are land and buildings which are owned or held under a leasehold interest (see note 3(j)) to earn rental income and/or for capital appreciation.

Investment properties are stated at cost less accumulated depreciation (see note 3(g)(ii)) and impairment losses (see note 3(k)).

Rental income from investment properties is accounted for as described in note 3(q)(ii).

Where components of an item of property, plant and equipment and investment property have different useful lives, the cost or valuation of the item is allocated on a reasonable basis between the parts and each part is depreciated separately. Both the useful life of an item of property, plant and equipment and investment property and its residual value, if any, are reviewed annually.

Freehold land and construction in progress are not depreciated.

(g) Other property, plant and equipment

(i) Cost

Items of property, plant and equipment are stated at cost less accumulated depreciation and impairment losses (see note 3(k)).

Cost includes expenditure that is directly attributable to the acquisition of the assets including for self-constructed assets, the cost of materials, direct labour, the initial estimate, where appropriate, of the costs of dismantling and removing the items and restoring the site on which they are located, and an appropriate proportion of production overheads and borrowing costs (see note 3(t)).

Construction in progress is transferred to other property, plant and equipment when it is ready for its intended use.

Gains or losses arising from the retirement or disposal of an item of property, plant and equipment are determined as the difference between the net disposal proceeds and the carrying amount of the item and are recognised in profit or loss on the date of retirement or disposal.

(ii) Depreciation

Depreciation is calculated to write off the cost of items of property, plant and equipment and investment property, less their estimated residual value, if any, using the straight line method over their estimated useful lives as follows:

■ Buildings	30 years
■ Machinery, electronic equipment and other equipment	2 to 10 years
■ Motor vehicles	5 years
■ Decoration and leasehold improvements	2 to 5 years

(h) Long-term leasehold prepayments

Long-term leasehold prepayments represent land premium paid, resettlement fees and related expenses incurred in obtaining the relevant land use rights, less accumulated amortisation and impairment losses (see note 3(k)).

Amortisation is charged to profit or loss on a straight-line basis over the period of the rights which is generally no more than 50 years.

(i) Goodwill and intangible assets

(i) Goodwill

Goodwill represents the excess of the fair value of consideration paid to acquire a subsidiary over the acquisition date fair value of the acquiree's identifiable assets acquired less liabilities, including contingent liabilities, assumed as at the acquisition date, less impairment losses (see note 3(k)).

Where the fair value of the assets acquired less liabilities assumed exceeds the consideration paid, the excess is recognised immediately in profit or loss as a gain.

Goodwill is not amortised but subject to impairment testing (see note 3(k)) annually.

(ii) Other intangible assets

Other intangible assets that are acquired by the Group are stated at cost less accumulated amortisation and impairment losses (see note 3(k)).

(iii) Amortisation

Amortisation of other intangible assets with finite useful lives is charged to profit or loss on

a straight-line basis over the assets' estimated useful lives. The following intangible assets with finite useful lives are amortised from the date they are available for use and their estimated useful lives are as follows:

■ Software	2 to 20 years
■ Royalties	2 to 15 years
■ Patents	3 to 22 years
■ Trademark and others	2 to 20 years

Both the period and method of amortisation are reviewed annually and revised when necessary.

(iv) Research and development

Research and development costs comprise all costs that are directly attributable to research and development activities or that can be allocated on a reasonable basis to such activities. The nature of the Group's research and development activities is such that the criteria for the recognition of such costs as assets are generally not met until late in the development stage of the project when the remaining development costs are immaterial. Therefore most expenditure on research and development activities is recognised as an expense in the period in which it is incurred.

(j) Leased assets

Most of the Group's leases are operating leases which do not transfer substantially all the risks and rewards of ownership to the Group.

Payments made under the leases are charged to profit or loss in equal instalments over the accounting periods covering the lease term, except where an alternative basis is more representative of the pattern of benefits to be derived from the leased asset. Lease incentives received are recognised in profit or loss as an integral part of the aggregate net lease payments made. Contingent rentals are charged to profit or loss in the accounting period in which they are incurred.

(k) Impairment of assets

(i) Impairment of financial assets, contract assets and lease receivables

Policy applicable from January 1, 2018

The Group recognises an allowance for impairment on non-equity financial assets held at FVOCI and AC and also on contract assets and lease receivables on an expected credit loss basis. Increases and decreases in the impairment allowance are recognised in profit or loss. The expected credit losses are the difference (on a present value basis) between the contractual cash flows (or transaction price) and the present value of cash flows expected to be received based on the Group's past loss experience and reasonable and supportable expectations, at the end of the reporting period, about future credit conditions.

For trade receivables, contract assets, and lease receivables, the Group recognises impairment both individually and using provision matrices based on the probability that the customer will default during the lifetime of the asset, and the loss that will be incurred given the default (the lifetime expected loss). The Group defines default as the customer being more than 90 days past due.

For all other financial assets that are not purchased or originated credit-impaired, the Group recognises impairment initially based on the probability that the customer or counterparty will default in the next 12 months unless there has been a significant deterioration in credit quality, or the financial asset becomes credit impaired in which case the impairment allowance is increased to the lifetime expected loss.

An asset is credit impaired when it has one or more of the loss events described below:

- significant financial difficulty of the borrower or issuer;

- a breach of contract such as a default or past due event;
- the restructuring of a loan or advance by the Group on terms that the Group would not consider otherwise;
- it is probable that the borrower will enter bankruptcy or other financial reorganisation; or
- the disappearance of an active market for a security because of financial difficulties.

In the case of purchased or originated credit-impaired financial assets, the Group only recognises the cumulative changes in lifetime expected credit losses since initial recognition as a loss allowance.

Policy applicable before January 1, 2018

Loans and receivables, available-for-sale securities and cash and cash equivalents are reviewed at the end of each reporting period to determine whether there is objective evidence of impairment. Objective evidence of impairment includes observable data that comes to the attention of the Group about one or more of the following loss events:

- significant financial difficulty of the debtor or issuer;
- a breach of contract, such as a default or delinquency in contractual payments;
- it is probable that the debtor or issuer will enter bankruptcy or other financial reorganisation;
- significant changes in the technological, market, economic or legal environment that have an adverse effect on the debtor or issuer;
- a general decline in the ability of a group of financial assets to make payments when due; or
- a significant or prolonged decline in the fair value of an investment in an equity instrument below its cost.

Assets are tested for impairment individually and collectively. Where there is objective evidence that a financial asset or a group

of financial assets is impaired, the Group recognises an impairment loss using an allowance account representing the difference between the carrying amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate. When assets are assessed collectively, they are grouped on the basis of similar credit characteristics.

Impairment losses are subsequently reversed if in a subsequent period the amount of an impairment loss decreases and the decrease can be linked objectively to an event occurring after the impairment loss was recognised.

Where an available-for-sale debt security is deemed to be impaired, cumulative fair value losses recognised in the available-for-sale reserve are reclassified to profit or loss. Losses are reversed if a subsequent increase in fair value can be objectively related to an event occurring after the impairment loss was recognised.

Available-for-sale equity securities are impaired where there has been a significant or prolonged decline in their fair value below cost and then the cumulative loss is reclassified to profit or loss. Impairment losses for these assets are not reversed.

(ii) Impairment of other non-financial assets

Internal and external sources of information are reviewed at the end of each reporting period to identify indications that non-financial assets, including property, plant and equipment, long-term leasehold prepayments, intangible assets and other long-term assets may be impaired.

Goodwill is tested for impairment at least annually. For the purposes of impairment testing, goodwill is allocated to each cash generating unit, or groups of cash generating units, that is expected to benefit from the synergies of the acquisition. Where impairment testing is of a cash generating unit (or group of units), an impairment loss is recognised in profit or loss where the recoverable value is less than the carrying value of the unit (or group of units)

and the impairment loss recognised is allocated first to reduce the carrying amount of any goodwill allocated to the unit (or group of units).

Other assets are impaired and an impairment loss is recognised in profit or loss where the recoverable value of the asset is less than its carrying amount, and reversed where there has been a favourable change in the recoverable amount. Impairment of goodwill is not reversed.

The recoverable amount of an asset or group of assets is the greater of its fair value less costs of disposal and value in use. Value in use is the total estimated future cash flows from the asset or, where the asset does not generate cash flows independent of other assets, a group of assets, discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset, or group of assets.

(l) Inventories

Inventories are carried at the lower of cost and net realisable value.

Cost is calculated based on the standard cost method with periodic adjustments of cost variance to arrive at the actual cost, which approximates to weighted average cost. Cost includes expenditures incurred in acquiring the inventories and bringing them to their present location and condition. The cost of manufactured inventories and work in progress includes an appropriate share of overheads based on normal operating capacity.

The Group estimates losses for obsolescence and adjustment to net realisable value of the inventories periodically. Net realisable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and the estimated costs necessary to make the sale.

When inventories are sold, the carrying amount of those inventories is recognised as an expense in the period in which the related revenue is recognised. Any write-down of inventories to net realisable value and all losses of inventories

are recognised as an expense in the period the write-down or loss occurs.

(m) Cash and cash equivalents

Cash and cash equivalents comprise cash at bank and on hand, demand deposits with banks and other financial institutions, demand deposits with third party merchants, and short-term, highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value. Bank overdrafts that are repayable on demand and form an integral part of the Group's cash management are also included as a component of cash and cash equivalents for the purpose of the consolidated statement of cash flows.

(n) Employee benefits

(i) Short-term employee benefits, contributions to defined contribution retirement plans and other long-term employee benefits

Salaries, profit-sharing and bonus payments, paid annual leave and contributions to defined contribution retirement plans and the cost of non-monetary benefits are accrued in the year in which the associated services are rendered by employees. Where payment or settlement is deferred and the effect would be material, these amounts are stated at their present values.

(ii) Defined benefit obligations

The Group's obligation in respect of defined benefit plans is calculated separately for each plan by estimating the total amount of future benefit that employees have earned in return for their service in the current and prior periods which is then discounted to present value. The calculation is performed by management using the projected unit credit method.

Service cost and interest cost on the defined benefit obligations and any curtailment gains and losses are recognised in profit or loss.

Remeasurements arising from changes in assumptions regarding the amounts of future benefits are recognised immediately in other comprehensive income and shall not be reclassified to profit or loss in a subsequent period.

(o) Income tax

Income tax for the year comprises current tax and movements in deferred tax assets and liabilities. Current tax and movements in deferred tax assets and liabilities are recognised in profit or loss except to the extent that they relate to items recognised in other comprehensive income or directly in equity, in which case the relevant amounts of tax are recognised in other comprehensive income or directly in equity, respectively.

Current tax is the expected tax payable on the taxable income for the year, using tax rates enacted or substantively enacted at the end of the reporting period, and any adjustment to tax payable in respect of previous years.

Deferred tax is provided on temporary differences, representing the difference between the carrying amounts of assets and liabilities for financial reporting purposes and their tax bases. Deferred tax assets also arise from unused tax losses and unused tax credits.

Deferred tax assets are recognised to the extent that it is probable that future taxable profits will be available against which the asset can be utilised. Future taxable profits that may support the recognition of deferred tax assets arising from deductible temporary differences include those that will arise from the reversal of existing taxable temporary differences, provided those differences relate to the same taxation authority and the same taxable entity, and are expected to reverse either in the same period as the expected reversal of the deductible temporary difference or in periods into which a tax loss arising from the deferred tax asset can be carried back or forward. The same criteria are adopted when determining whether existing taxable temporary differences support the

recognition of deferred tax assets arising from unused tax losses and credits, that is, those differences are taken into account if they relate to the same taxation authority and the same taxable entity, and are expected to reverse in a period, or periods, in which the tax loss or credit can be utilised.

No deferred tax is recognised on:

- the initial recognition of goodwill;
- the initial recognition of assets or liabilities that affect neither accounting nor taxable profit (provided they are not part of a business combination); and
- temporary differences relating to investments in subsidiaries to the extent that, in the case of taxable differences, the Group controls the timing of the reversal and it is probable that the differences will not reverse in the foreseeable future, or in the case of deductible differences, unless it is probable that they will reverse in the future.

The amount of deferred tax recognised is measured based on the expected manner of realisation or settlement of the carrying amount of the assets and liabilities, using tax rates enacted or substantively enacted at the end of the reporting period. Deferred tax assets and liabilities are not discounted.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and is reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow the related tax benefit to be utilised. Any such reduction is reversed to the extent that it becomes probable that sufficient taxable profits will be available.

Current tax balances and deferred tax balances, and movements therein, are presented separately from each other and are not offset. Current tax assets are offset against current tax liabilities, and deferred tax assets against deferred tax liabilities, if the Group has legally enforceable rights to set off current tax assets against current tax liabilities and the following additional conditions are met:

- in the case of current tax assets and liabilities, the Group intends either to settle on a net basis, or to realise the asset and settle the liability simultaneously; or
- in the case of deferred tax assets and liabilities, if they relate to income taxes levied by the same taxation authority on either:
 - the same taxable entity; or
 - different taxable entities, which, in each future period in which significant amounts of deferred tax liabilities or assets are expected to be settled or recovered, intend to realise the current tax assets and settle the current tax liabilities on a net basis or realise and settle simultaneously.

(p) Provisions and contingent liabilities

Provisions are recognised for liabilities of uncertain timing or amount when the Group has a legal or constructive obligation arising as a result of a past event, it is probable that an outflow of economic benefits will be required to settle the obligation and a reliable estimate can be made. Where the time value of money is material, provisions are stated at the present value of the expenditure expected to settle the obligation.

Where it is not probable that an outflow of economic benefits will be required, or the amount cannot be reliably estimated, disclosure is made of the contingent liability, unless the probability of outflow of economic benefits is remote. Possible obligations, whose existence will only be confirmed by the occurrence or non-occurrence of one or more future events are also disclosed as contingent liabilities unless the probability of outflow of economic benefits is remote.

The main types of provisions are as follows:

(i) Provision for warranties

The Group provides assurance warranty on its standard consumer and enterprise products for a period typically covering 12 to 24 months.

With effect from January 1, 2018, the Group estimates the costs that may be incurred under its assurance warranty obligations and records a liability in the amount of such costs when revenue is recognised. Warranty costs generally include spare parts, labour costs and service centre support. Factors that affect the Group's warranty liability include the number of installed units, historical and anticipated rates of warranty claims. The Group periodically reassesses its warranty liabilities and adjusts the amounts as necessary.

Prior to January 1, 2018, the Group applied the above policy to all warranties provided, including the warranties classified as service warranties under IFRS 15.

(ii) Provision for onerous contracts

A provision for onerous contracts is recognised when the expected benefits to be derived by the Group from a contract are lower than the estimated cost of meeting its obligations under the contract. The provision is measured at the present value of the lower of the expected cost of terminating the contract and the expected net cost of continuing with the contract. Before a provision is established, the Group recognises any impairment loss on the assets associated with that contract.

Policy applicable before January 1, 2018

(iii) Provision for product sales

The Group may provide rebates to customers and other sales based incentives based on contractual agreements or specific incentive programmes. The provisions for such incentives are estimated, and regularly reviewed, based on various factors including, but not limited to, contractual terms, customary business practices, expected take up rates, expected sales volumes, experience of similar contracts, and historical experience.

(q) Revenue

Revenue is income arising from sales of products, provision of services or use by others of the Group's properties under leases in the ordinary course of the Group's business.

(i) Revenue from customer contracts

The Group divides its business into three operating segments, Carrier Business, Enterprise Business and Consumer Business. The principal activities of each segment are disclosed in Note 7.

The Group applies its revenue accounting policies based on the features of the contracts and business practices of its business groups.

The Group has applied IFRS 15 from January 1, 2018 using the cumulative effect method and therefore the comparative information has not been restated and continues to be reported in accordance with IAS 18 *Revenue* (IAS 18) and IAS 11 *Construction Contracts* (IAS 11). The details of accounting policies under IAS 18 and IAS 11 are disclosed separately to the extent that they are different from those under IFRS 15 and the impact of changes is disclosed in note 4.

Policy applicable from January 1, 2018

Revenue is measured based on the consideration the Group expects to be entitled to from the contract with the customer and excludes those amounts collected on behalf of third parties. The Group recognises revenue when it transfers control over a product or service (or bundle) to a customer.

i. Contract combinations and modifications

The Group combines separate customer contracts with the same customer or related parties of the same customers entered into at or near the same time when those contracts are negotiated as a package to form a single commercial objective, are significantly interdependent in nature or contain significant pricing dependencies.

Contract modifications are generally treated either as a new separate contract, or as a prospective change to an existing contract. In the cases when the additional or the remaining goods and services are not distinct from those transferred before the date of modification, typically in the Carrier Business and Enterprise Business, the modifications are accounted for through a cumulative catch-up adjustment.

ii. Performance Obligations (POB)

In the Consumer Business, POBs are typically terminal devices, accessories and services. In the Carrier Business, there are generally more POBs due to the nature of the contracts which typically involve sales of networking hardware, software and a wide range of services. In the Enterprise Business where the Group delivers bespoke end-to-end solutions, there may in some cases only be a few POBs.

iii. Warranties

In the Carrier Business and Enterprise Business, customer service warranties, except for those related to certain Enterprise products, are generally recognised as a distinct service for which revenue is allocated and recognised over the service period. In the Consumer Business, warranties provided on terminal devices and accessories are generally standard and assurance in nature and are accounted for as a warranty provision at the time of the sale (see note 3(p)).

iv. Timing of revenue recognition

The Group determines at contract inception whether it transfers the control of a good or service underlying a POB to the customer over time or at a point in time. A POB is satisfied and related revenue is recognised over time, if one of the following criteria is met:

- The customer simultaneously receives and consumes the benefits provided by the Group's performance as the Group performs;

- The Group's performance creates or enhances an asset that the customer controls as the asset is created or enhanced; or
- The Group's performance does not create an asset with an alternative use to the Group and the Group has an enforceable right to payment for performance completed to date.

If a POB is not satisfied and the control over the related good or service is not transferred over time in accordance with the above criteria, it is satisfied and revenue is recognised at a point in time.

Most Carrier Business contracts include multiple POBs for which revenue is recognised when the Group transfers control of each obligation, either at a point in time such as delivery or acceptance, or over time as the obligation is being fulfilled or the customer obtains control of the goods and/or services. Some Carrier Business construction contracts represent a single or a few POBs for which revenue is recognised over the delivery period.

Within the Enterprise Business certain solution build contracts constitute a single or a small number of POBs for which revenue is recognised over the delivery period. For the remaining contracts with multiple POBs, revenue is recognised as and when control related to each obligation is transferred, either at a point in time, such as delivery or acceptance, or over time, as the obligation is being fulfilled and the customer obtains control of the goods and/or services.

Sales of terminal devices and accessories by the Consumer Business to distribution channels are recognised when control of the goods has transferred. In most cases, this is when the sell-in occurs; however, in a limited number of cases, this is when the goods are sold to the second tier distribution channels or end-users.

v. Variable consideration

Revenue is measured at the fair value of the consideration received or receivable, adjusted at contract inception for penalties, price concessions, returns, trade discounts, volume rebates and other sales incentives, such as coupons, provided that the level of expected return of goods, volume rebates and other incentives given can be estimated reliably and that revenue is only recognised to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognised will not occur. When making an estimate for variable consideration, the Group considers several factors, including but not limited to, contract commitments, business practices, historical experience, customer take-up rates, and expected purchase volumes.

vi. Significant financing component

In the Carrier Business and Enterprise Business, payments are generally received according to the payment milestones set out in the contracts before or after the obligations are fulfilled, usually including advance payments, delivery payments and completion payments. In the Consumer Business and certain business units under the Enterprise Business, advance payments are commonly received. Advance payments are usually received less than one year ahead of satisfaction of a performance obligation.

The amount of consideration in a sales contract is adjusted for the existence of significant financing in determining the transaction price only when the payment terms exceed one year in duration between performance and payment.

The Group recognises interest income where payment is received more than one year in arrears of satisfaction of a performance obligation, reflecting a deemed lending of cash to a customer. Such interest income is presented in finance income. The consideration attributable to other goods and services in the contract is reduced by a corresponding amount and is included within revenue.

The Group adopts the practical expedient under IFRS 15 and does not account for the significant financing components where the Group anticipates at contract inception that the timing difference between transfer of control of a good or service to a customer, and the customer paying for that good or service will be one year or less.

vii. Stand-alone selling prices (SSP)

The transaction price of a contract with a customer is allocated to each POB in proportion to its SSP. The Carrier Business and Enterprise Business primarily use estimated SSP and the Consumer Business uses directly observable SSP.

Within the Carrier Business and the Enterprise Business, the Group establishes the SSP for products mainly using an average price approach by product category. Average price of a product is calculated with reference to the historical stand-alone product sale transactions for the product and the product category is determined with reference to the product family and geographical region.

For services that are regularly sold on a stand-alone basis, most of such services are customised and priced on a project basis, therefore the transaction prices generally reflect the SSP. For the services where an observable transaction price is unavailable such as the services sold in a bundle with products, the Group determines the SSP using a cost-plus approach, taking into

account several factors, including but not limited to, labour cost, competition, and company business strategy.

When a significant discount is granted and is specifically attributable to one or more POBs that discount is allocated to the identified POB(s) if the allocation reflects the Group's regular sales pattern. In all other cases the discount is allocated to the contract overall.

viii. Contract costs

Certain acquisition costs (those paid to acquire a contract such as commission) and fulfilment costs (those incurred to deliver services to customers) are capitalised and recognised, to the extent that the costs are recoverable, over the period of expected benefit, which is generally the associated revenue contract duration.

Costs of obtaining a contract are expensed as incurred where the amortisation period of the asset that would have been recognised is one year or less.

The Group recognises a contract cost impairment when the carrying amount of unamortised contract costs exceeds the difference between the remaining consideration expected and the associated costs relating to providing those goods and services under the contract.

ix. Contract assets and liabilities

When revenue is recognised under a contract with a customer before the Group becomes unconditionally entitled to the consideration under the relevant payment terms of the contract, a contract asset is recognised. Contract assets are reclassified to trade receivables when the right to consideration becomes unconditional.

When consideration is received (or the right to consideration is unconditional) before the related revenue is recognised, a contract liability is recognised.

For a single contract with the customer, either a net contract asset or a net contract liability is presented. For multiple contracts, contract assets and contract liabilities of unrelated contracts are not presented on a net basis.

Trade receivables are recognised when the right to consideration under a revenue contract becomes unconditional, regardless of the billing date.

x. Refund liabilities

A refund liability, such as the accrued rebates to customers and other sales-based incentives granted, is recognised when the Group receives consideration from the customer and expects to refund some or all of that consideration to the customer. Refund liabilities are presented in “other liabilities” in the consolidated statement of financial position.

Policy applicable before January 1, 2018

Revenue from sale of goods is recognised when the significant risks and rewards of ownership of goods have been transferred to the buyer. Revenue from the provision of services is recognised at the time when the services are provided. No revenue is recognised if there are significant uncertainties regarding the recovery of the consideration due, associated costs or the return of goods. Revenue excludes value added tax or other sales taxes and is after deduction of any trade discounts, sales rebates and incentives.

(ii) Rental income from operating leases

Rental income receivable under operating leases is recognised in profit or loss in equal instalments over the periods covered by the lease term, except where an alternative basis is more representative of the pattern of benefits to be derived from the use of the leased asset. Lease incentives granted are recognised in profit or loss as an integral part of the aggregate net lease payments receivable. Contingent rentals are recognised as income in the accounting period in which they are earned.

(r) Government grants

Grants that are unconditional and compensate the Group for expenses incurred are recognised directly in profit or loss as other income when the grants become receivable. Grants that compensate the Group for expenses incurred which are conditional are initially recognised as deferred income in the statement of financial position at fair value, and are then recognised in profit or loss as other income when government acceptance documents are obtained, indicating that the conditions associated with the grants are fully satisfied.

Grants that compensate the Group for the cost of an asset are recognised as deferred income and consequently are effectively recognised in profit or loss on a systematic basis over the useful life of the asset.

(s) Translation of foreign currencies

(i) Foreign currency transactions

Foreign currency transactions during the year are translated to the respective functional currencies of group entities at the foreign exchange rates ruling at the transaction dates. Monetary assets and liabilities denominated in foreign currencies are translated to the functional currency at the foreign exchange rates ruling at the end of the reporting period. Exchange gains and losses are recognised in profit or loss.

Non-monetary assets and liabilities that are measured in terms of historical cost in a foreign currency are translated using the foreign exchange rates ruling at the transaction dates. Non-monetary assets and liabilities denominated in foreign currencies that are stated at fair value are translated using the foreign exchange rates ruling at the dates the fair value was measured.

(ii) Foreign operations

The results of foreign operations, except for foreign operations in hyperinflationary economies, are translated into the presentation currency of the Group (CNY) at the exchange rates approximating the foreign exchange rates ruling at the dates of the transactions. Statement of financial position items are translated into CNY at the closing foreign exchange rates at the end of the reporting period. The resulting exchange differences are recognised in other comprehensive income and accumulated separately in equity in the translation reserve. If the operation is a non-wholly-owned subsidiary, then the relevant proportionate share of the translation difference is allocated to the non-controlling interests.

The results and financial position of foreign operations in hyperinflationary economies are translated to CNY at the exchange rates ruling at the end of the reporting period. Prior to translating the financial statements of foreign operations in hyperinflationary economies, their financial statements for the current year are restated to account for changes in the general purchasing power of the local currencies. The restatement is based on relevant price indices at the end of the reporting period.

When a foreign operation is disposed of in its entirety or partially such that control, significant influence or joint control is lost, the cumulative amount in the translation reserve related to that foreign operation is reclassified to profit or loss as part of the gain or loss on disposal.

(t) Borrowing costs

Borrowing costs that are directly attributable to the acquisition, construction or production of an asset which necessarily takes a substantial period of time to get ready for its intended use or sale are capitalised as part of the cost of that asset. Other borrowing costs are expensed in the period in which they are incurred.

4 Changes in significant accounting policies

The following new standards which are effective from January 1, 2018 led to changes in the Group's significant accounting policies.

- IFRS 15 *Revenue from Contracts with Customers*
- IFRS 9 *Financial Instruments*
- IFRIC 22 *Foreign Currency Transactions and Advance Consideration* (IFRIC 22)

IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognised. It replaced IAS 18, IAS 11 and related interpretations.

IFRS 9 introduces new requirements on the classification and measurement (including the impairment) of financial assets. It replaced IAS 39 *Financial Instruments: Recognition and Measurement* (IAS 39).

The main impacts of IFRS 15 and IFRS 9 on the Group's summary consolidated financial statements are disclosed in the tables below.

IFRIC 22 establishes that the transaction date for advance consideration received or paid is the date of initial recognition, and the amounts are not subsequently re-measured. The adoption of this interpretation has not had a material impact on the Group's financial statements.

Effects of the adoption of IFRS 15 and IFRS 9

The following table gives a summary of the opening balance adjustments recognised for each line item in the summary consolidated statement of financial position that has been impacted by IFRS 15 and 9:

(CNY million)	At December 31, 2017	Impact on initial application of IFRS 15 – pre tax (Note 4(A))	Impact on initial application of IFRS 9 – pre tax (Note 4(B))	Related tax	At January 1, 2018
Goodwill and intangible assets	5,327	–	–	–	5,327
Property, plant and equipment	56,089	–	–	–	56,089
Long-term leasehold prepayments	5,152	–	–	–	5,152
Interests in associates and joint ventures	750	–	–	–	750
Other investments, including derivatives	5,965	–	316	–	6,281
Deferred tax assets	18,565	–	–	649	19,214
Trade and bills receivable	2,451	–	(2)	–	2,449
Other assets	5,665	–	–	–	5,665
Non-current assets	99,964	–	314	649	100,927
Inventories and other contract costs	72,352	(5,420)	–	–	66,932
Contract assets	–	19,728	(370)	–	19,358
Trade and bills receivable	107,595	484	1,207	–	109,286
Other assets	25,371	1	38	(6)	25,404
Other investments, including derivatives	24,596	–	–	–	24,596
Cash and cash equivalents	175,347	–	–	–	175,347
Current assets	405,261	14,793	875	(6)	420,923
Total assets	505,225	14,793	1,189	643	521,850
Equity attributable to equity holders of the Company	175,585	(3,904)	1,186	636	173,503
Non-controlling interests	31	(37)	3	(1)	(4)
Total equity	175,616	(3,941)	1,189	635	173,499
Loans and borrowings	38,338	–	–	–	38,338
Deferred government grants	1,340	–	–	–	1,340
Deferred tax liabilities	1,471	–	–	(43)	1,428
Other liabilities	1,702	–	–	–	1,702
Non-current liabilities	42,851	–	–	(43)	42,808
Loans and borrowings	1,587	–	–	–	1,587
Employee benefits	91,857	–	–	–	91,857
Income tax payable	4,390	–	–	34	4,424
Trade and bills payable	72,866	–	–	–	72,866
Contract liabilities	–	52,184	–	–	52,184
Other liabilities	95,825	(23,243)	–	17	72,599
Provisions	20,233	(10,207)	–	–	10,026
Current liabilities	286,758	18,734	–	51	305,543
Total liabilities	329,609	18,734	–	8	348,351
Total equity and liabilities	505,225	14,793	1,189	643	521,850

A. IFRS 15

As a result of the changes in accounting policies set out in note 3(p) and (q):

- (i) for the Carrier Business and Enterprise Business, the transfer of control of goods and services is in many cases earlier than the passing of significant risks and rewards. Accordingly, the recognition of revenue and contract assets of CNY12,176 million has been accelerated to accounting periods prior to January 1, 2018 together with associated costs of CNY5,543 million to reflect the earlier de-recognition of inventories. The net impact before tax on equity attributable to equity holders of the Company and NCI at January 1, 2018 is an increase of CNY6,631 million and CNY2 million, respectively.
- (ii) warranty provisions of CNY4,477 million previously recorded as at December 31, 2017 have been derecognised and contract liabilities of CNY15,100 million have been recognised at January 1, 2018 to reflect the deferral of revenue related to the unexpired portion of service warranties. The net

impact before tax on equity attributable to equity holders of the Company and NCI at January 1, 2018 is a reduction of CNY10,584 million and CNY39 million, respectively.

- (iii) the following changes in presentation of current assets and liabilities were made at January 1, 2018:
 - Certain trade receivables for which the Group's entitlement to the consideration is conditional on achieving certain milestones, have been reclassified from "trade and bills receivable" to "contract assets";
 - Advances received from customers and liabilities accrued for unperformed obligations, which were previously included in "other liabilities", are now included in "contract liabilities";
 - Accrued rebates to customers and other sales-based incentives, which were previously included in "provisions" as provision for product sales, are now included in refund liabilities under "other liabilities".

The following tables summarise the impact of adopting IFRS 15 on the Group's summary consolidated statement of profit or loss and OCI for the year ended December 31, 2018 and its summary consolidated statement of financial position as at December 31, 2018 for each of the line items affected. There was no impact on the Group's statement of cash flows for the year ended December 31, 2018.

Impact on the summary consolidated statement of profit or loss and OCI

(CNY million)	As reported, after adoption of IFRS 15	Adjustments	Amounts without adoption of IFRS 15
<i>For the year ended December 31, 2018</i>			
Revenue	721,202	(7,411)	713,791
Cost of sales	(443,031)	2,794	(440,237)
Selling and administrative expenses	(105,199)	(359)	(105,558)
Others	(99,326)	—	(99,326)
Income tax	(14,301)	764	(13,537)
Profit for the year	59,345	(4,212)	55,133
Other comprehensive income	430	(34)	396
Total comprehensive income	59,775	4,246	55,529

Impact on the summary consolidated statement of financial position

(CNY million)	As reported, after adoption of IFRS 15	Adjustments	Amounts without adoption of IFRS 15
<i>December 31, 2018</i>			
Assets			
Deferred tax assets	17,257	(1,368)	15,889
Contract assets	48,276	(48,276)	–
Trade and bills receivable	95,583	26,397	121,980
Inventories and other contract costs	96,545	7,807	104,352
Others	408,131	–	408,131
Total assets	665,792	(15,440)	650,352
Equity			
Equity attributable to equity holders of the Company	232,658	(924)	231,734
Non-controlling interests	407	(41)	366
Total equity	233,065	(965)	232,100
Liabilities			
Deferred tax liabilities	1,937	(432)	1,505
Income tax payable	4,191	(754)	3,437
Contract liabilities	58,278	(58,278)	–
Other liabilities	91,844	40,763	132,607
Provisions	10,244	4,226	14,470
Others	266,233	–	266,233
Total liabilities	432,727	(14,475)	418,252
Total equity and liabilities	665,792	(15,440)	650,352

B. IFRS 9

As a result of the changes in accounting policies set out in note 3(e) and (k), the adoption of IFRS 9 resulted in the following significant reclassification, re-measurement and impairment adjustments as at January 1, 2018:

(CNY million)	December 31, 2017	Reclassification	Re-measurement	Impairment	January 1, 2018
Trade and bills receivable (i):					
– Loans and receivables/at AC	110,046	(7,754)	–	1,270	103,562
– At FVOCI	–	7,754	(65)	–	7,689
Total	110,046	–	(65)	1,270	111,251
Cash and cash equivalents (ii):					
– Loans and receivables/at AC	155,349	–	–	–	155,349
– Available-for-sale	19,998	(19,998)	–	–	–
– At FVPL	–	19,998	–	–	19,998
Total	175,347	–	–	–	175,347
Other investments, including derivatives (iii):					
Investment funds					
– Loans and receivables/at AC	3,000	–	–	–	3,000
– Available-for-sale	18,530	(18,530)	–	–	–
– Held-for-trading	27	(27)	–	–	–
– At FVPL	–	18,557	–	–	18,557
Sub total	21,557	–	–	–	21,557
Debt securities					
– Available-for-sale	6,313	(6,313)	–	–	–
– At FVOCI	–	6,313	–	–	6,313
Sub total	6,313	–	–	–	6,313
Fixed deposits					
– Loans and receivables/at AC	2,039	–	–	–	2,039
Equity securities					
– Available for sale	652	(652)	–	–	–
– At FVPL	–	151	297	–	448
– At FVOCI	–	501	19	–	520
Sub total	652	–	316	–	968
Total	30,561	–	316	–	30,877
Other financial assets included in other assets (i):					
– Loans and receivables/at AC	11,480	–	–	38	11,518

(i) Trade and bills receivable

Trade receivables of CNY7,754 million which were subject to reverse factoring arrangements at December 31, 2017 and were previously held at amortised cost (loans and receivables) have been reclassified to FVOCI as they were held within a business model whose objective is to realise cash through the collection of contractual cash flows and through sale. A reduction in carrying value of CNY65 million arose on re-measurement to fair value.

(ii) Cash and cash equivalents

Cash equivalents (money market funds) totalling CNY19,998 million were assessed as not giving rise to cash flows that were solely payments of principal and interest and were transferred from the available-for-sale category to FVPL. All are either on demand or have short dated maturities with immaterial risk of changes in value.

(iii) Other investments, including derivatives

Most of the investment funds are money market funds and wealth management products which do not give rise to cash flows which are solely principal and interest and were therefore reclassified from the available-for-sale category to FVPL. Debt securities held to collect but also for sale that give rise to cash flows which are solely principal and interest were reclassified from the available-for-sale category to FVOCI.

The Group has reclassified its equity investments from the available-for-sale category to FVPL and, where the investments are considered strategic to its business, to FVOCI. Some of these equity investments, which were previously measured at cost as permitted by IAS 39, have been re-measured to the Group's best estimate of their fair values.

(iv) Impairment

The Group has re-measured the impairment losses on trade receivables and other financial assets measured at amortised cost to reflect its estimate of expected losses, which has led to reductions in the impairment loss on trade receivables of CNY1,270 million and on other financial assets of CNY38 million, respectively. The reduction in the loss allowances reflects refinements in the Group's estimates.

As IFRS 9 requires impairment on FVOCI assets to be recognised in profit or loss, the relevant equity items have been adjusted by CNY38 million at January 1, 2018.

Contract assets arising from the application of IFRS 15 (see note 4A above) as at January 1, 2018 were assessed for impairment under the Group's ECL model resulting in additional allowances totaling CNY370 million.

(v) Equity

The total impact of the re-measurement of assets and impairment under IFRS 9 was CNY1,189 million which has been included as an adjustment to equity on January 1, 2018. The impact on NCI was not material.

5 Accounting judgements and estimates

(a) Accounting judgements

(i) Revenue recognition

Revenue is recognised when control of a good or service is transferred to a customer as disclosed in note 3(q). To determine the satisfaction of performance obligations the Group applies the following judgements:

- Where revenue is recognised over time, the Group primarily uses the output method to measure progress; in limited business units, the input method is adopted when the Group is unable to reasonably measure the outcome of a performance obligation. Judgements applied when using the output method include assessing progress and milestones achieved and determining if that represents the value of goods and/or services delivered to the customer to date. Judgements applied when using the input method include determining if consumption of the resources relative to the total expected amount faithfully depicts the transfer of control of goods and/or services promised to the customer.
- Where revenue is recognised at a point in time, the Group assesses the transfer of control by reference to the contractual terms and the circumstance of the

arrangements including a consideration of past business practice. These include having a legal right to payment, title has passed, the customer has the risks and rewards of ownership, or the customer is using the asset to generate value for themselves.

- For sales to distribution channels, judgement is also applied in determining when the control of the goods is transferred to distributors. These judgements consider several external and internal factors including, but not limited to, market conditions, product life cycles, distributor sales, competitive conditions and the extent to which the Group has continuing managerial involvement over the goods after their delivery.

(ii) Contract modification

The Group applies judgements in determining whether a contract modification should be treated as a new contract or a prospective change to an existing contract, or accounted for through a cumulative catch-up adjustment to revenue, by considering the nature of the goods and services, and sales price data.

The Group judges a contract modification as a separate contract when the increase in contract scope is due to additional distinct promised goods or services and the price increases reflect the SSP of such goods or services plus any appropriate adjustments. Otherwise, a contract modification is judged as a prospective change to an existing contract when the remaining goods or services are distinct from those transferred before the date of the modification, or accounted for as cumulative catch-up adjustment to the revenue when the new or remaining goods or services are not distinct from those transferred.

(iii) Capitalisation of contract costs

Contract cost assets are recognised for both contract acquisition and contract fulfilment costs when certain criteria are met (see Note 3(q)(viii)). Judgement is applied to determine if certain contract costs should

be recognised as an asset based on factors such as the nature of the costs and how the costs are expected to be recovered.

For contract acquisition costs, the Group judges if those costs are incremental to obtaining a single or group of contracts.

For contract fulfilment costs, the Group judges if those costs relate directly to a contract that can be specifically identified, if those costs generate or enhance resources that will be used in satisfying future performance obligations, and if those costs are expected to be recovered.

(b) Sources of estimation uncertainty

Key sources of estimation uncertainty are as follows:

(i) Revenue recognition

To determine the transaction price and the amounts allocated to performance obligations the Group applies the following estimation:

- Variable consideration is estimated using the most likely amount or expected value based on the nature of the specific consideration and the analysis of relevant contract terms, taking into consideration historical, current and expected information.
- SSP is determined using observable evidence of sales prices, where available. In a number of cases statistical analysis is used to identify the historical price a product/service has been sold for as its SSP. Where observable evidence is not available, SSP is estimated using multiple inputs (see note 3(q)(vii)). SSP is monitored regularly to ensure they remain appropriate.
- Obligations for returns and refunds are judged based on estimates made from historical information associated with similar products and anticipated rates of claims for the products.
- The collectability of a consideration is estimated at contract inception, based on the Group's assessment on the customer's ability and intention to pay when due.

The above estimation is inherent in revenue recognition and revenue may materially change if management's estimation were to change or to be found inaccurate.

(ii) Impairment of trade receivables and contract assets

The credit risk of customers is regularly assessed with a focus on the customer's ability and willingness to pay, reflected by the Group's estimation of the expected credit loss allowance on trade receivables and contract assets. The Group estimates expected credit loss by assessing the loss that will be incurred given customer default based on past payment experience and adjusted by the cash flow expected from collateral or credit risk mitigation received where these are considered to be integral to the asset, and by assessing the probability of default taking into account information specific to the customer as well as pertaining to the country and economic environment in which the customer operates. From January 1, 2018 the estimate also incorporates forward looking data.

Impairment is assessed on an individual basis for trade receivables and contract assets meeting pre-determined criteria, including customers in financial difficulties, and contracts with risk mitigation arrangements or significant financing arrangements etc. Apart from receivables and contract assets that have been assessed and provided for individually, allowances are estimated using provision matrices by management with reference to the customers' credit risk ratings and aging analysis of the remaining trade receivable and contract asset balances. Different provision matrices have been developed by the Group based on different customer groups which indicate different risk characteristics.

If the financial condition of customers were to deteriorate or improve, or actual future economic performance is different to the Group's estimates, additional allowances or reversals may be required in future periods.

(iii) Net realisable value of inventories

The net realisable value of inventories is the estimated selling price in the ordinary course of business, less the estimated costs of completion and the estimated costs necessary to make the sale. These estimates are based on the current market condition and the historical experience of distributing and selling products of similar nature. They could change significantly as a result of competitor actions in response to severe industry cycles or other changes in market condition. Management will reassess the estimations at the end of each reporting period.

(iv) Depreciation and amortisation

Property, plant and equipment are depreciated on a straight-line basis over the estimated useful lives, after taking into account the estimated residual value. Intangible assets with finite useful life are amortised on a straight-line basis over the estimated useful lives. Both the period and method of depreciation and amortisation are reviewed annually. The depreciation and amortisation expense for future periods is adjusted if there are significant changes, such as operational efficiency or changes in technologies, from previous estimates.

(v) Impairment losses of long-lived assets

The carrying amounts of long-lived assets (including goodwill) are reviewed periodically in order to assess whether the recoverable amounts have declined below the carrying amounts. In order to determine the recoverable amount, the Group uses assumptions and develops expectations, which requires significant judgement. The Group uses all readily available information in determining an amount that is a reasonable approximation of recoverable amount, including estimates based on reasonable and supportable assumptions and projections of production volume, sales price, amount of operating costs, discount rate and growth rate.

(vi) **Income tax**

The Group is subject to income taxes in various jurisdictions. Significant judgement is required in determining the Group's provision for income taxes. There are many transactions and computations for which the ultimate tax determination is uncertain during the ordinary course of business. The Group recognises liabilities based on estimates of whether additional taxes will eventually be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will impact current and deferred tax liabilities and the taxation charge for the year.

(vii) **Provision for warranties**

As explained in note 29(b), the Group makes provision for assurance warranties in respect of its Consumer Business and certain Enterprise Business products (prior to January 1, 2018, for the warranties in respect of all its products), taking into account the Group's recent claim experience and anticipated claim rates for respective products. As the Group is continually upgrading its product designs and launching new models, it is possible that the recent claim experience is not indicative of future claims that it will receive in respect of past sales. Any increase or decrease in the provision would affect profit or loss in future years.

(viii) **Other provisions**

The Group makes provisions for onerous contracts, outstanding litigations and claims based on project budgets, contract terms, available knowledge, legal advice and past experience. The Group recognises provisions to the extent that it has a present legal or constructive obligation as a result of a past event; that it is probable that an outflow of resources will be required to settle the obligation; and that the amount can be reliably estimated. Judgement is required in making such estimates and the ultimate outcome may be different.

(ix) **Deferred tax asset**

The Group considers the key source of estimation uncertainty lies in recognition of deferred tax assets from unused tax losses and deductible temporary differences. As explained in note 3(o), all deferred tax assets to the extent that it is probable that future taxable profits will be available against which they can be utilised, are recognised. It is possible that adverse changes to the operating environment or the Group's organisation structure could result in a future write-down of the deferred tax assets recognised.

6 Possible impact of amendments, new standards and interpretations issued but not yet effective for the year ended December 31, 2018

The International Accounting Standards Board (IASB) has issued a number of new standards and amendments which will affect the financial statements in subsequent accounting periods.

The most relevant to the Group is IFRS 16, *Leases* (IFRS 16), effective for annual periods beginning on or after January 1, 2019. IFRS 16 will affect how the Group accounts for leasing transactions as lessee. The main change is that the Group will recognise assets in respect of its rights to use assets held under leases currently classified as operating leases, and liabilities for its obligations to make payments under such leases. The assets will be subject to depreciation and impairment where appropriate, and an interest expense will be reflected on the recognised liabilities. As allowed by IFRS 16, the Group will adopt the practical expedient for not applying the new accounting model to leases with a lease term ending within 12 months as at January 1, 2019.

Based on the current assessment, the Group expects to recognise right-of-use assets of approximately CNY7.0 billion and lease liabilities of approximately CNY6.8 billion respectively as at January 1, 2019. The effect on profit or loss is expected to be immaterial.

The Group plans to use the modified retrospective approach, with the cumulative effect of adoption of IFRS 16 recognised as an adjustment to the opening balance of equity and no restatement of comparative information.

7 Segment information

Operating segments are determined based on the types of customers, products and services provided, as well as the Group's organisation structure, management requirement and reporting system. The Group divides its business into three operating segments:

Carrier Business

The Carrier Business provides a series of products, services and business solutions encompassing wireless network, fixed network, cloud core network, carrier software, IT infrastructure, network energy, professional services, and network rollout services, for global telecom carriers.

Enterprise Business

The Enterprise Business builds a digital infrastructure platform by using new ICT technologies such as cloud computing, software-defined networking, big data and Internet of Things to provide products and services that help industries (such as government, public utilities, finance, energy, transport, and manufacturing) go digital.

Consumer Business

The Consumer Business provides smartphones, tablets, wearable devices, converged home devices, as well as the applications on these devices for consumers and businesses.

There are no inter-segment transactions. The financial information of the different segments is regularly reviewed by the Group's most senior executive management for the purpose of resource allocation and performance assessment. During the year, the classification for certain products among operating businesses was changed. Comparative figures have been adjusted to reflect the current year presentation.

Revenue information in respect of business segments

(CNY million)	2018	2017
Carrier	294,012	297,838
Enterprise	74,409	60,091
Consumer	348,852	240,372
Unallocated items	3,929	5,320
Total	721,202	603,621

Revenue information in respect of geographical segments

(CNY million)	2018	2017
China	372,162	312,532
Europe, the Middle East and Africa (EMEA)	204,536	164,603
Asia Pacific	81,918	71,199
Americas	47,885	39,470
Others	14,701	15,817
Total	721,202	603,621

8 Revenue

(CNY million)	2018	2017
Revenue from contracts with customers	720,940	603,391
Rental income (note 30(b))	262	230
Total	721,202	603,621

Revenue from contracts with customers is disaggregated by timing of revenue recognition as follows:

(CNY million)	2018	2017
Revenue from contracts with customers		
– Recognised at a point in time	608,092	516,651
– Recognised over time	112,848	86,740
Total	720,940	603,391

The Group has initially applied IFRS 15 using the cumulative effect method. Under this method, the comparative information is not restated in accordance with the revised policies and was prepared in accordance with IAS 18 and IAS 11.

Further disaggregation of revenue by business and geography is set out in Note 7.

The amount of revenue recognised for the year ended December 31, 2018 from POBs satisfied (or partially satisfied) in previous years amounted to CNY1,084 million. The revenue was constrained in prior years as the relevant customers are high credit risk rated and the collectability of sales consideration was estimated to be low.

Transaction price allocated to remaining performance obligations

As at December 31, 2018, the aggregated amount of transaction price allocated to the remaining performance obligations under the Group's existing customer contracts is CNY94,449 million. This amount mainly represents the remaining performance obligations under the Group's Carrier Business contracts. The Group will recognise the revenue in future when control of the corresponding service or product is transferred to the customer as stipulated in note 3(q). 65% of the amount is expected to occur over the next year, while 35% is expected to occur in the years that follow. The amounts disclosed above do not include any estimated amounts of variable consideration that are constrained.

The Group has applied the practical expedient in paragraph 121 of IFRS 15 and does not disclose information about remaining performance obligations that have original expected durations of one year or less.

Revenue is recognised when a performance obligation is satisfied in accordance with the accounting policies in note 3(q). The timing of payment from customers relative to revenue recognition generates either contract assets or trade receivables for payments received in arrears or contract liabilities for payments received in advance.

Contract assets and contract liabilities are presented in notes 21 and 27 respectively.

9 Other income, net

(CNY million)	Note	2018	2017
Factoring expenses		(1,269)	(436)
Loss on continuing involvement arrangements		–	(316)
Government grants	(i)	1,545	1,178
Impairment loss on intangible assets and goodwill		(85)	–
Net gain/(loss) on disposal of property, plant and equipment and intangible assets	(ii)	750	(118)
Gain on deemed disposal of a joint venture	33(c)	269	–
Others		614	305
		1,824	613

- (i) During the year ended December 31, 2018, the Group received unconditional government grants of CNY969 million (2017: CNY671 million) which were directly recognised as other income. The majority of the grants are in respect of the Group's contributions to the development of research and innovation.

During the year ended December 31, 2018, the Group received government grants of CNY444 million (2017: CNY326 million) which were conditional upon completion of certain research and development projects. These grants were initially recognised in the consolidated statement of financial position as deferred income and were recognised in profit or loss as other income when government acceptance documents were obtained. During the year ended December 31, 2018, conditional government grants of CNY576 million (2017: CNY507 million) were recognised in profit or loss.

- (ii) The amount for the year ended December 31, 2018 mainly comprises the gain on sales of patents to a third party.

10 Personnel expenses

(CNY million)	2018	2017
Salaries, wages and other benefits	112,403	106,851
Time-based unit plan (TUP)	16,906	17,155
Post-employment plans and others		
– Defined benefit plan	3,771	3,665
– Defined contribution plans and others	13,504	12,614
	17,275	16,279
	146,584	140,285

TUP

TUP is a profit-sharing and bonus plan based on employee performance for all eligible employees (recipients) in the Group. Under TUP, time-based units (TBUs) are granted to recipients for a period of five years which entitle them to receive an annual cash incentive based on an annual profit-sharing amount and a cumulative end-of-term appreciation amount. Both the annual profit-sharing and the end-of-term appreciation amount are determined at the discretion of the Group. Recipients will receive the pay-out of the annual profit-sharing amount in each of the next fiscal year during the five-year period. TBUs expire either at the end of the five-year period or on the date recipients leave the Group's employment, when the end-of-term appreciation amount will be paid.

Defined contribution plans

The Group contributes to defined contribution retirement plans for eligible employees. The plans are managed either by the government in the countries where the employees are employed, or by independent trustees. Contribution levels are determined by the relevant laws and regulations concerned.

11 Finance income and expenses

(CNY million)	Note	2018	2017
Interest income on financial assets measured at amortised cost			
– deposits and cash equivalents		4,768	3,393
– other financial assets		324	692
Interest income on financial assets measured at FVOCI		407	–
Net gains on disposal of financial assets measured at FVOCI	13(b)	1	–
Net gains on non-derivative financial assets mandatorily measured at FVPL		312	–
Dividend income on other investments		713	209
Gain on disposal of available-for-sale financial assets measured at fair value	13(b)	–	7
Finance income		6,525	4,301
Interest expenses on loans and borrowings		(2,857)	(2,169)
Interest cost on employee benefit obligations		(1,118)	(708)
Other interest expenses		(230)	(773)
Net foreign exchange loss		(2,031)	(1,080)
Impairment loss on debt securities measured at FVOCI and other financial assets measured at amortised cost		(8)	–
Bank charges		(28)	(124)
Loss on other financial instruments		–	(20)
Finance expenses		(6,272)	(4,874)
Net finance income/(expenses)		253	(573)

No borrowing costs were capitalised during the year ended December 31, 2018 (2017: Nil).

12 Income tax in the consolidated statement of profit or loss and other comprehensive income

Charge for the year

(CNY million)	2018	2017
Current tax		
Provision for the year	10,909	8,873
Under provision in respect of prior years	1,153	1,289
	12,062	10,162
Deferred tax	2,239	(1,489)
	14,301	8,673

13 Other comprehensive income

(a) Tax effects relating to each component of other comprehensive income

(CNY million)	2018			2017		
	Before-tax amount	Tax benefit/(expense)	Net-of-tax amount	Before-tax amount	Tax benefit/(expense)	Net-of-tax amount
Remeasurement of defined benefit obligations						
– The Group	(816)	50	(766)	773	(58)	715
Net change in the fair value of equity investments at FVOCI	(78)	12	(66)	–	–	–
Net change in the fair value and impairment loss of non-equity financial assets at FVOCI						
– The Group	35	1	36	–	–	–
– Share of associates and joint ventures	(9)	–	(9)	–	–	–
	26	1	27	–	–	–
Net change in the fair value of available-for-sale investments						
– The Group	–	–	–	98	(13)	85
– Share of associates and joint ventures	–	–	–	7	–	7
	–	–	–	105	(13)	92
Translation differences on foreign operations						
– The Group	1,247	–	1,247	(1,674)	–	(1,674)
– Share of associates and joint ventures	(12)	–	(12)	12	–	12
	1,235	–	1,235	(1,662)	–	(1,662)
	367	63	430	(784)	(71)	(855)

(b) Components of other comprehensive income, including reclassification adjustments

(CNY million)	2018	2017
Net change in the fair value and impairment loss of financial assets measured at FVOCI:		
Changes in fair value recognised during the year	(52)	–
Reclassification adjustments for amounts transferred to profit or loss:		
– Gain on derecognition (note 11)	(1)	–
Loss allowances recognised during the year	1	–
Net deferred tax credited to other comprehensive income	13	–
Net change in the fair value of available-for-sale investments:		
Changes in fair value recognised during the year	–	112
Reclassification adjustments for amounts transferred to profit or loss:		
– Gain on derecognition (note 11)	–	(7)
Net deferred tax charged to other comprehensive income	–	(13)
Net movement in the fair value reserve during the year	(39)	92

(CNY million)	2018	2017
Translation differences on foreign operations:		
Recognised during the year	1,253	(1,662)
Reclassification adjustments for amounts transferred to profit or loss:		
– Disposal of subsidiaries	(27)	–
– Disposal of an associate	(1)	–
– Deemed disposal of a joint venture	10	–
Net movement in the translation reserve during the year	1,235	(1,662)

14 Goodwill and intangible assets

(CNY million)	Goodwill	Software	Patents	Royalties	Trademark and others	Total
Cost:						
At January 1, 2017	4,334	2,447	3,092	2,105	482	12,460
Exchange adjustments	(245)	(12)	(28)	–	(13)	(298)
Additions	–	254	722	879	33	1,888
Disposals	–	(38)	(32)	(37)	(1)	(108)
At December 31, 2017	4,089	2,651	3,754	2,947	501	13,942
At January 1, 2018	4,089	2,651	3,754	2,947	501	13,942
Exchange adjustments	174	6	20	2	11	213
Additions	–	422	495	3,450	301	4,668
Acquisition of subsidiaries (note 33(c))	119	–	108	–	151	378
Disposals	–	(389)	(109)	(18)	(1)	(517)
At December 31, 2018	4,382	2,690	4,268	6,381	963	18,684
Amortisation and impairment:						
At January 1, 2017	4,011	1,801	989	527	337	7,665
Exchange adjustments	(260)	(11)	(26)	–	(10)	(307)
Amortisation for the year	–	251	231	828	39	1,349
Disposals	–	(38)	(16)	(37)	(1)	(92)
At December 31, 2017	3,751	2,003	1,178	1,318	365	8,615
At January 1, 2018	3,751	2,003	1,178	1,318	365	8,615
Exchange adjustments	175	5	18	1	10	209
Amortisation for the year	–	328	232	1,578	130	2,268
Impairment loss	79	1	–	–	6	86
Disposals	–	(387)	(52)	(18)	(1)	(458)
At December 31, 2018	4,005	1,950	1,376	2,879	510	10,720
Carrying amount:						
At December 31, 2018	377	740	2,892	3,502	453	7,964
At December 31, 2017	338	648	2,576	1,629	136	5,327

(a) The amortisation charge for the year is allocated to “cost of sales”, “research and development expenses”, “selling and administrative expenses” in the summary consolidated statement of profit or loss and other comprehensive income based on the use of the related assets. Impairment losses are included in “other income, net” and “cost of sales”.

(b) Goodwill impairment testing

Goodwill is allocated to the Group’s cash-generating units (CGU) or group of CGUs, which is not larger than an operating segment and is expected to benefit from the synergies of the acquisition.

For impairment test purposes, the recoverable amounts of the CGUs are based on value-in-use calculations by using a discounted cash flow model. The calculations use cash flow projections based on financial budgets approved by management covering a five-year period, based on industry knowledge. Cash flows beyond the five-year periods are extrapolated using an estimated growth rate which does not exceed the long-term average growth rate for the business in which the CGU or group of CGUs operates. Cash flows are discounted using pre-tax discount rates that reflect specific risks relating to respective CGU or group of CGUs.

As at December 31, 2018 and 2017, all of the carrying amount of goodwill is allocated across multiple CGUs and the amount so allocated to each unit is not significant.

During the year ended December 31, 2018, due to intensifying competition and market change, the estimated growth and profitability of the acquired business related to Narrow Band Internet of Things declined below previous expectation. An impairment loss of CNY79 million was therefore recorded against the goodwill previously allocated to this CGU.

The Group performed the impairment test for the year ended December 31, 2018 and did not consider further impairment to the remaining goodwill is required.

(c) As at December 31, 2018 and 2017, the Group did not hold any intangible assets whose title is restricted or pledged as security for liabilities.

15 Property, plant and equipment

(CNY million)	Freehold land	Buildings	Machinery, electronic equipment and other equipment	Motor vehicles	Construction in progress	Investment property	Decoration and leasehold improvements	Total
Cost:								
At January 1, 2017	124	14,703	41,851	565	11,962	100	10,108	79,413
Exchange adjustments	(13)	(74)	(578)	(3)	(142)	2	(94)	(902)
Additions	185	–	5,802	104	11,176	70	35	17,372
Transfer from construction in progress	–	2,053	3,126	–	(8,112)	–	2,933	–
Disposals	–	(143)	(1,797)	(87)	(65)	–	(79)	(2,171)
Others	–	163	37	–	–	–	–	200
At December 31, 2017	296	16,702	48,441	579	14,819	172	12,903	93,912
At January 1, 2018	296	16,702	48,441	579	14,819	172	12,903	93,912
Exchange adjustments	(3)	(18)	(142)	(9)	(30)	(2)	(38)	(242)
Additions	141	798	14,173	38	14,730	213	433	30,526
Acquisition of subsidiaries (note 33(c))	–	–	34	–	–	–	4	38
Transfer from construction in progress	–	4,569	4,735	–	(14,458)	–	5,154	–
Transferred from investment property	–	60	–	–	–	(60)	–	–
Disposals	–	–	(1,822)	(43)	(63)	–	(140)	(2,068)
Hyperinflation adjustments	–	–	109	1	–	–	21	131
At December 31, 2018	434	22,111	65,528	566	14,998	323	18,337	122,297

	Freehold land	Buildings	Machinery, electronic equipment and other equipment	Motor vehicles	Construction in progress	Investment property	Decoration and leasehold improvements	Total
(CNY million)								
Accumulated depreciation and impairment:								
At January 1, 2017	–	3,195	19,747	313	9	86	6,757	30,107
Exchange adjustments	–	(19)	(547)	1	4	–	(28)	(589)
Depreciation charge for the year	–	466	7,778	77	–	3	1,501	9,825
Impairment loss	–	–	78	–	4	–	–	82
Disposals	–	(29)	(1,616)	(75)	(4)	–	(78)	(1,802)
Others	–	163	37	–	–	–	–	200
At December 31, 2017	–	3,776	25,477	316	13	89	8,152	37,823
At January 1, 2018	–	3,776	25,477	316	13	89	8,152	37,823
Exchange adjustments	–	(9)	(41)	(5)	–	(3)	(12)	(70)
Depreciation charge for the year	–	494	9,239	78	–	3	1,838	11,652
Impairment loss	–	–	34	–	–	–	–	34
Transferred from investment property	–	1	–	–	–	(1)	–	–
Disposals	–	–	(1,688)	(34)	(6)	–	(139)	(1,867)
Hyperinflation adjustments	–	–	54	1	–	–	8	63
At December 31, 2018	–	4,262	33,075	356	7	88	9,847	47,635
Carrying amount:								
At December 31, 2018	434	17,849	32,453	210	14,991	235	8,490	74,662
At December 31, 2017	296	12,926	22,964	263	14,806	83	4,751	56,089

As at December 31, 2018 and 2017, the Group did not hold any property, plant and equipment as collateral for liabilities or contingent liabilities.

Investment property

The fair value of investment property as at December 31, 2018 is estimated by management to be CNY360 million (2017: CNY194 million).

The fair value of investment property is determined by the Group internally with reference to market conditions and discounted cash flow forecasts, taking into account current lease agreements on an arm's-length basis.

16 Long-term leasehold prepayments

(CNY million)	2018	2017
At January 1	5,152	4,112
Additions	1,876	1,145
Amortisation for the year	(132)	(105)
At December 31	6,896	5,152

17 Interests in associates and joint ventures

	Associates		Joint ventures		Total	
(CNY million)	2018	2017	2018	2017	2018	2017
Share of net assets	492	413	42	322	534	735
Goodwill	30	16	16	16	46	32
Subtotal	522	429	58	338	580	767
Less: impairment loss	(18)	(17)	–	–	(18)	(17)
Total	504	412	58	338	562	750

All associates and joint ventures are accounted for using the equity method in the consolidated financial statements.

Particulars of material associate and joint venture, all of which are unlisted corporate entities whose quoted market price is not available, are set out below:

Name of associate or joint venture	Form of business structure	Place of incorporation and business	Proportion of ownership interest		Principal activities
			2018	2017	
<u>Associate</u>					
TD Tech Holding Limited (TD Tech)	Incorporated	Hong Kong, PRC	49%	49%	Note (a)

<u>Joint venture</u>					
Huawei Marine Systems Co., Ltd. (Huawei Marine)	Incorporated	Hong Kong, PRC	N/A	51%	Note (b)

Note (a): TD Tech's principal activity is research and development, production and sale of TD-SCDMA telecommunication products.

Note (b): Huawei Marine's principal activities are research and development, trading and installation of submarine network equipment and software, and the provision of integration, upgrading or maintenance services. On August 1, 2018, the Group obtained control over Huawei Marine and ceased to equity account for the interests in Huawei Marine on the same day. Details of the acquisition are set out in note 33(c). Accordingly, Huawei Marine is now consolidated as a subsidiary and is not included in the above joint venture balances as at December 31, 2018.

Summarised financial information of the material associate, reconciled to the carrying amounts in the consolidated financial statements, is as follows:

(CNY million)	TD Tech	
	2018	2017
<i>Gross amounts of the associate's</i>		
Non-current assets	317	54
Current assets	1,908	1,857
Current liabilities	1,161	930
Equity	1,064	981
Revenue	3,796	5,785
Profit (note)	101	223
Other comprehensive income	(18)	14
Total comprehensive income (note)	83	237
<i>Reconciled to the Group's interest in the associate</i>		
Gross amounts of net assets of the associate	1,064	981
Group's effective interest	49%	49%
Group's share of net assets of the associate	521	481
Elimination of unrealised profit	(35)	(69)
Carrying amount in the consolidated financial statements	486	412

Note: As the issuance date of the Group's consolidated financial statements is ahead of TD Tech's audit report date, the Group applies the equity method to account for its investment in TD Tech based on unaudited financial information contained in TD Tech's management accounts, which may differ from TD Tech's audited results. Any differences are to be accounted for in the Group's next financial period.

Summarised financial information of the material joint venture, reconciled to the carrying amount in the consolidated financial statements, is as follows:

(CNY million)	Huawei Marine (Note)	
	2018	2017
<i>Gross amounts of the joint venture's</i>		
Non-current assets	—	65
Current assets	—	1,440
Non-current liabilities	—	46
Current liabilities	—	822
Equity	—	637
 Included in the above assets and liabilities:		
Cash and cash equivalents	—	200
 Revenue	559	1,658
Profit	24	244
Other comprehensive income	(22)	31
Total comprehensive income	2	275
 Included in the above profit:		
Depreciation and amortisation	(6)	(7)
Interest income/(expense)	1	(17)
Income tax expense	(9)	(33)
 <i>Reconciled to the Group's interest in the joint venture</i>		
Gross amounts of net assets of the joint venture	—	637
Group's effective interest	—	51%
Group's share of net assets of the joint venture	—	325
Elimination of unrealised profit	—	(47)
Carrying amount in the consolidated financial statements	—	278

Note: The Group ceased to equity account for its interests in Huawei Marine on August 1, 2018. The statement of profit or loss and other comprehensive income items disclosed above represent the amounts recorded in Huawei Marine's financial statements for the period from January 1, 2018 to July 31, 2018.

Aggregate carrying amounts and summarised financial information of individually immaterial associates and joint ventures are as follows:

(CNY million)	Associates		Joint ventures	
	2018	2017	2018	2017
Aggregate carrying amount	18	–	58	60
Aggregate amount of the Group's share of those associates' and joint ventures'				
Loss for the year	–	(5)	–	(2)
Other comprehensive income	–	–	(1)	(3)
Total comprehensive income	–	(5)	(1)	(5)

For the years ended December 31, 2018 and 2017, no dividend was declared or paid by the associates or joint ventures.

18 Other investments, including derivatives

(CNY million)	Note	2018	2017
Financial assets measured at amortised cost			
Investment funds	(i)	18,700	3,000
Fixed deposits		24,882	2,039
		43,582	5,039
Financial assets measured at FVPL			
Investment funds	(i)	33,059	27
Debt securities	(ii)	2	–
Equity securities		501	–
Foreign exchange derivatives		83	–
		33,645	27
Financial assets measured at FVOCI			
Debt securities	(ii)	22,636	–
Equity securities	(iii)	617	–
		23,253	–
Available-for-sale financial assets			
Investment funds	(i)	–	18,530
Debt securities	(ii)	–	6,313
Unlisted equity securities		–	283
Listed equity securities		–	373
		–	25,499
		100,480	30,565
Less: Loss allowances		(4)	(4)
		100,476	30,561
Non-current portion		18,725	5,965
Current portion		81,751	24,596
		100,476	30,561

- (i) Investment funds comprise short-term investments in wealth management products and money market funds. Wealth management products with guaranteed principal and interest are measured at amortised cost where the Group intends to hold them to maturity; other investment funds are measured at FVPL where the Group intends to sell them or where the investments do not give rise to cash flows which are solely principal and interest.
- (ii) Debt securities comprise investments in fixed rate bonds, floating rate notes, certificates of deposit and commercial papers. The Group has classified most of its debt securities as FVOCI since they are held to collect and sale, and also give rise to cash flows which are solely principal and interest. In limited cases, certain bonds are measured at FVPL where the Group intends to hold them for trading. The loss allowance on the debt securities at FVOCI amounted to CNY7 million as at December 31, 2018.
- (iii) The Group designated certain equity investments at FVOCI according to the policy set in note 3(e)(ii). No dividend income was received on these investments for the year ended December 31, 2018 (2017: Nil).
- These equity investments designated at FVOCI are composed of several investments, all of which are individually insignificant.
- No FVOCI equity investments were sold during the year ended December 31, 2018.
- (iv) Available-for-sale financial assets were reclassified on the Group's adoption of IFRS 9 upon January 1, 2018. See Note 4.
- (v) As at December 31, 2018 and 2017, the Group did not hold any other investments pledged as collateral for liabilities or contingent liabilities.

19 Deferred tax assets and liabilities

(a) Components of recognised deferred tax assets/(liabilities)

(CNY million)	2018	2017
Accruals, provisions and unperformed obligations	12,466	11,672
Depreciation of property, plant and equipment	(830)	(109)
Provision for impairment losses	836	1,369
Unrealised profit	2,935	3,979
Tax losses	1,187	1,065
Undistributed profits of subsidiaries	(1,784)	(1,409)
Fair value adjustments on acquisition of subsidiaries	(41)	(35)
Others	551	562
Total	15,320	17,094

Reconciliation to the consolidated statement of financial position:

(CNY million)	2018	2017
Net deferred tax assets recognised in the consolidated statement of financial position	17,257	18,565
Net deferred tax liabilities recognised in the consolidated statement of financial position	(1,937)	(1,471)
	15,320	17,094

(b) Deferred tax assets not recognised

In accordance with the accounting policy set out in note 3(o), deferred tax assets were not recognised in relation to certain unused tax losses and deductible temporary differences.

Unutilised tax losses and their expiry dates are as follows:

(CNY million)	2018	2017
Expiring in:		
2018	–	1
2019	–	352
2020	668	720
2021	294	1,074
2022	399	1,425
2023 and afterwards or no expiring period	23,802	3,219
	25,163	6,791

In addition, deductible temporary differences amounting to CNY71,559 million have not been recognised as deferred tax assets as at December 31, 2018 (2017: CNY27,588 million).

Unused tax credits of CNY1,402 million relating to overseas withholding income tax and research and development tax credits were not recognised as at December 31, 2018 (2017: CNY1,910 million).

Under the relevant tax regulations of the PRC, certain research and development expenses incurred in the three-year period from 2018 to 2020 qualify for an additional 75% deduction for income tax purposes (2017: 50%); eligible expenses incurred in the research and development projects outsourced to overseas entities also qualify for the additional deduction from January 1, 2018. These changes resulted in a significant increase in the Group's additional tax deduction for qualified research and development expenses, which in turn has reduced the amounts of the Group's estimated future taxable profits against which deductible temporary differences, unused tax losses and tax credits may be utilised.

20 Inventories and other contract costs

(CNY million)	2018	2017
Inventories		
Raw materials	35,448	19,005
Manufacturing work in progress	17,065	10,776
Finished goods	26,308	16,967
Contract work in progress	11,397	21,690
Other inventories	4,283	3,914
	94,501	72,352
Other contract costs	2,044	–
	96,545	72,352

As at December 31, 2018 and 2017, the Group did not hold any inventories pledged as collateral for liabilities or contingent liabilities.

(a) Amount of inventories recognised as an expense and included in profit or loss:

(CNY million)	2018	2017
Carrying amount of inventories sold	375,606	292,621
Write down of inventories	5	1,166
	375,611	293,787

(b) Contract costs

As at December 31, 2018, the contract costs capitalised relate to contract fulfilment costs, which will be charged to “cost of sales” when the corresponding contract revenue is recognised.

No impairment loss was recognised on contract costs as at December 31, 2018.

21 Contract assets

(CNY million)	2018
Gross carrying amount	48,693
Less: Loss allowances (note 22(b))	(417)
	48,276
Non-current portion	601
Current portion	47,675
	48,276

The contract assets relate to the Group’s rights to consideration for performance obligations performed but not billed, primarily from Carrier Business and Enterprise Business contracts. The contract assets are transferred to receivables when the rights become unconditional. This usually occurs when the Group issues an invoice to the customer in accordance with the billing milestones agreed in the contract, which are generally upon passing of the product acceptance tests.

The non-current portion of the contract assets represents the amount that is expected to be settled by customers after more than one year after being billed according to the contract terms.

Significant changes in the gross balances of contract assets during the year are as follows:

(CNY million)	2018
At January 1 (note 4)	19,728
Acquisition of subsidiaries (note 33(c))	118
Addition for obligations performed but not billed during the year	46,262
Transfers from contract assets recognised at the beginning of the period to receivables	(17,394)
Exchange adjustments	(21)
At December 31	48,693

22 Trade and bills receivable

(CNY million)	Note	2018	2017
Trade receivables			
Trade receivables from third parties	(i)	90,988	105,991
Trade receivables from related parties	32	64	333
		91,052	106,324
Bills receivable			
Bank acceptance bills		733	2,042
Commercial acceptance bills		2,776	994
Letters of credit		1,022	686
		4,531	3,722
		95,583	110,046
Non-current portion		3,588	2,451
Current portion		91,995	107,595
		95,583	110,046

Note:

- (i) As at December 31, 2018, the Group's trade receivables that may be sold through reverse factoring arrangement amounted to CNY6,228 million. These trade receivables are managed in a business model whose objective is achieved by both collection and sale, and are therefore measured at FVOCI.

(a) Ageing analysis

At the end of the reporting period, the ageing analysis of trade receivables is as follows:

(CNY million)	2018	2017
Not past due	74,276	89,420
Less than 90 days past due	13,559	15,090
90 days to 1 year past due	5,229	5,061
1 year and above past due	1,803	2,452
	94,867	112,023
Less: Loss allowances	(3,815)	(5,699)
	91,052	106,324

Trade receivables are generally due within 30 days from the date of billing.

(b) Loss allowances of trade receivables from third parties and related parties

Loss allowances in respect of trade receivables are recorded using an allowance account unless the Group is satisfied there is no reasonable expectation of further recoveries in which case the receivables are written off (see note 3(e)(i)).

The movement in the loss allowances in respect of trade receivables and contract assets during the year is as follows. Comparative amounts for 2017 represent the allowance account for impairment losses under IAS 39.

(CNY million)	Note	2018	2017
At January 1		5,699	7,399
Effects of the adoption of IFRS 9		(900)	–
At January 1 – as adjusted		4,799	7,399
Loss allowances recognised/(reversed)		74	(115)
Uncollectible amounts written-off		(718)	(1,629)
Collection of previously written-off debtors		143	291
Exchange adjustments		(66)	(247)
At December 31		4,232	5,699
Representing loss allowance on			
– Trade receivables		3,815	5,699
– Contract assets	21	417	–
Total		4,232	5,699

Loss allowance is included in “selling and administrative expenses”.

During the year ended December 31, 2018, the loss allowance of trade receivables and contract assets decreased mainly due to the write off of uncollectible amounts. CNY420 million of the write-off was due from customers in EMEA markets.

As at December 31, 2018, loss allowances on trade receivables measured at FVOCI amounted to CNY33 million, which is included in equity.

Comparative information under IAS 39

As at December 31, 2017, the impairment allowance includes allowance of CNY3,113 million on individually assessed receivables from third parties of CNY6,393 million relating to customers who are in financial difficulties and the likelihood of recovery is expected to be in doubt. Apart from receivables that have been provided for specifically, general allowances were estimated by management based on the risk portfolio and aging analysis of the remaining receivable balances.

Trade receivables due from third parties that were neither past due nor collectively considered to be impaired as at December 31, 2017 amounted to CNY86,072 million, which related to a wide range of customers for whom there was no objective evidence of impairment, such as default. Receivables that were past due but not impaired as at December 31, 2017 were immaterial.

(c) Transferred trade receivables that are not derecognised in their entirety

As at December 31, 2018, the Group's trade receivables with the face value of CNY30 million (2017: CNY29 million) have been transferred to banks and the Group received the corresponding remittance of CNY30 million (2017: CNY29 million). As these transactions are with recourse, the Group therefore has retained substantially all the risks and rewards and continues to recognise these trade receivables and the relevant financing as loans and borrowings (note 25).

As at December 31, 2018, the Group's trade receivables with the carrying amount of CNY3,190 million (2017: CNY3,035 million) have been transferred to banks. These trade receivables are covered by insurance policies issued by a third party export credit agency with the transferees as the loss payees. In these transactions, the Group retains risk not covered by the insurance, therefore the Group has neither transferred nor retained substantially all the risks and rewards in relation to the trade receivables and the Group is considered to have retained control of these trade receivables as the transferees have no practical ability to sell these trade receivables without the Group's consent. As such, the Group continued to recognise the transferred trade receivables of CNY840 million (2017: CNY805 million) and the associated liabilities of CNY845 million (2017: CNY810 million) to the extent of its continuing involvement. The associated liabilities are included in other liabilities. As at December 31, 2018, loss allowances of CNY577 million (2017: CNY384 million) were made on these transferred receivables.

(d) Collateral

Except as disclosed in Note 22(c), as at December 31, 2018 and 2017, the Group did not hold any other trade and bills receivable pledged as collateral for liabilities or contingent liabilities.

23 Other assets

(CNY million)	Note	2018	2017
Advance payments to suppliers		2,860	3,228
Tax receivables on unbilled deliveries	(i)	6,077	1,570
Income tax related assets		3,810	4,607
Other tax related assets		9,789	9,943
Pledged deposits with a bank		2,078	1,693
Restricted deposits of government grants	(ii)	1,737	1,968
Other receivables from third parties		6,188	6,799
Other receivables from related parties	32	332	246
Other long-term deferred assets		546	664
Prepayment for acquisition of long-term leasehold land		46	286
Assets classified as held for sale		2	32
		33,465	31,036
Non-current portion		5,423	5,665
Current portion		28,042	25,371
		33,465	31,036

- (i) According to the PRC tax regulations, value added tax ("VAT") and relevant surcharges are payable at the earlier of delivery of goods and services or issuance of VAT invoices. The balances represent the VAT and surcharge receivable from customers on unbilled deliveries and will be reclassified to trade receivables upon billing.
- (ii) As required by the relevant authorities, the conditional government grants received by the Group are first placed into restricted bank accounts until the Group obtains the government acceptance documents pertaining to the relevant research and development projects.

24 Cash and cash equivalents

(CNY million)	2018	2017
Cash on hand	7	11
Deposits with banks and other financial institutions	95,900	88,312
Highly liquid short-term investments	88,126	86,902
Deposits with third party merchants	73	122
	184,106	175,347

Short-term investments included in cash and cash equivalents are highly liquid, readily convertible into known amounts of cash and subject to an insignificant risk of changes in value. As at December 31, 2018, the short-term investments comprised money market funds of CNY24,526 million and wealth management products of CNY63,600 million respectively. Money market funds comprise investments in short-term debt securities which have constant net asset values and are measured at FVPL. The wealth management products are purchased from commercial banks with maturities of less than three months or with maturities of less than one year which can be redeemed at any time without any interest penalty and are measured at amortised cost.

As at December 31, 2018, cash and cash equivalents of CNY659 million (2017: CNY703 million) were held in countries where exchange controls or other legal restrictions are applicable.

At December 31, 2018, the Group held CNY4,969 million (2017: CNY7,033 million) of cash in two multicurrency pooling arrangements used to meet its day to day cash requirements and also to economically hedge foreign exchange rate movements arising from foreign currency cash flows. The facilities allow participating subsidiaries to place deposits and borrow funds from the counterparty banks, in substance to hold long and short positions, in any freely convertible currency subject to the overall balance on the pools being positive.

As at December 31, 2018 and 2017, the Group did not hold any cash and cash equivalents pledged as collateral for liabilities or contingent liabilities.

25 Loans and borrowings

Contractual terms of the Group's loans and borrowings are summarised below.

(CNY million)	2018	2017
Short-term loans and borrowings:		
– Intra-group guaranteed	40	95
– Unsecured	2,738	1,304
	2,778	1,399
Long-term loans and borrowings:		
– Intra-group guaranteed	1,890	2,026
– Trade receivables financing (note 22(c))	30	29
– Unsecured	34,576	7,326
– Corporate bonds	30,667	29,145
	67,163	38,526
	69,941	39,925
Non-current portion	66,170	38,338
Current portion	3,771	1,587
	69,941	39,925

Intra-group guaranteed loans are borrowings which have been raised by one group entity but contractual payments of principal and interest are guaranteed by another group entity.

Terms and repayment schedule

A summary of the main terms and conditions of outstanding loans and borrowings are as follows:

Balance for the year ended December 31, 2018

(CNY million)		Interest rate	Total	1 year or less	1 to 5 years	over 5 years
Intra-group guaranteed bank loans:						
Euro	variable	0.73% p.a.	779	779	–	–
South African Rand	variable	8.88% p.a.	293	–	293	–
Nepalese Rupee	fixed	10.39% p.a.	40	40	–	–
CNY	variable	4.41% ~ 4.90% p.a.	818	114	682	22
			1,930	933	975	22
Trade receivables financing:						
USD	variable	6.00% p.a.	30	5	17	8
Unsecured bank loans:						
CNY	variable	4.13% ~ 4.41% p.a.	16,624	2,595	13,981	48
Russian Ruble	variable	10.44% p.a.	191	191	–	–
Hungarian Forint	fixed	4.36% p.a.	95	–	–	95
USD	variable	3.57% ~ 4.50% p.a.	20,404	47	20,357	–
			37,314	2,833	34,338	143
Corporate bonds:						
USD	fixed	3.25% ~ 4.13% p.a.	30,667	–	6,836	23,831
			69,941	3,771	42,166	24,004

Balance for the year ended December 31, 2017

(CNY million)		Interest rate	Total	1 year or less	1 to 5 years	over 5 years
Intra-group guaranteed bank loans:						
Euro	variable	0.73% p.a.	775	–	775	–
South African Rand	variable	8.89% p.a.	341	–	341	–
Nepalese Rupee	fixed	9.00% p.a.	95	95	–	–
CNY	variable	4.41% ~ 4.90% p.a.	910	91	614	205
			2,121	186	1,730	205
Trade receivables financing:						
USD	variable	4.70% p.a.	29	1	20	8
Unsecured bank loans:						
CNY	variable	4.28% ~ 4.41% p.a.	7,220	96	6,981	143
Hungarian Forint	fixed	4.36% p.a.	106	–	–	106
USD	variable	2.75% p.a.	1,304	1,304	–	–
			8,630	1,400	6,981	249
Corporate bond:						
USD	fixed	3.25% ~ 4.13% p.a.	29,145	–	6,497	22,648
			39,925	1,587	15,228	23,110

Certain of the Group's banking facilities are subject to compliance with covenants relating to financial ratios. In the event of breach, the drawn down facilities would become payable on demand. The Group regularly monitors its compliance with these covenants. As at December 31, 2018 and 2017, none of the covenants relating to drawn down facilities had been breached.

Corporate bond

The corporate bonds were issued by two wholly owned subsidiaries of the Company, Proven Glory Capital Limited (Proven Glory) and Proven Honour Capital Limited (Proven Honour). Main terms of the outstanding corporate bonds are as follows:

Corporate bond/(USD million)	Issue date	Principal amount	Interest rate per annum	Term
USD bond	May 19, 2015	1,000	4.13%	10 years
USD bond	May 6, 2016	2,000	4.13%	10 years
USD bond	February 21, 2017	1,000	3.25%	5 years
USD bond	February 21, 2017	500	4.00%	10 years

All the corporate bonds are fully guaranteed by the Company.

Reconciliation of movements of major liabilities to cash flows arising from financing activities for the year ended December 31, 2018

Related liabilities/(CNY million)	Loans and other borrowings	Corporate bonds	Royalty instalments	Interest payable related to financing activities
Balance at January 1, 2018	10,780	29,145	1,359	276
Proceeds from borrowings	51,216	—	—	—
Repayment of borrowings	(20,351)	—	—	—
Royalties acquired	—	—	3,291	—
Instalment payments	—	—	(729)	—
Interest incurred during the year	—	—	—	2,333
Interest paid	—	—	—	(2,067)
Amortisation of capitalised interest and transaction costs	20	29	89	—
Non-cash transaction (note)	(3,148)	—	—	—
Exchange adjustments	757	1,493	45	(150)
Balance at December 31, 2018	39,274	30,667	4,055	392

Note: Under certain financing arrangements, the Group's contractual obligations are transferred to customers without recourse when the Group obtains unconditional entitlements to the considerations of relevant customer contracts. During the year ended December 31, 2018, the Group derecognised loans and borrowings equivalent to CNY3,148 million under these arrangements when the Group became unconditionally entitled to the relevant contract consideration.

Reconciliation of movements of major liabilities to cash flows arising from financing activities for the year ended December 31, 2017

Related liabilities/(CNY million)	Loans and other borrowings	Corporate bonds	Interest payable related to financing activities
Balance at January 1, 2017	22,535	22,264	233
Issuance of corporate bonds	—	10,234	—
Repayment of corporate bonds	—	(1,600)	—
Proceeds from borrowings	28,055	—	—
Repayment of borrowings	(39,726)	—	—
Interest accrued during the year	—	—	2,169
Interest paid	—	—	(1,998)
Amortisation of capitalised transaction costs	126	30	—
Exchange adjustments	(210)	(1,783)	(128)
Balance at December 31, 2017	10,780	29,145	276

26 Trade and bills payable

(CNY million)	Note	2018	2017
Trade payables			
Trade payables to related parties	32	500	1,047
Trade payables to third parties		93,820	71,799
		94,320	72,846
Bills payable			
Bank acceptance bills		1,565	20
Letters of credit payable		1,034	–
		2,599	20
		96,919	72,866

27 Contract liabilities

(CNY million)	2018
Consideration received from customers in advance of performance	11,878
Billing in advance of performance and unperformed obligations	46,400
	58,278

Significant changes in the balances of contract liabilities during the year are as follows:

(CNY million)	2018
At January 1 (note 4)	52,184
Acquisition of subsidiaries (note 33(c))	343
Revenue recognised that was included in the contract liability balance at the beginning of the year	(38,812)
Increases due to cash received or billed but obligation not performed	44,894
Exchange adjustments	(331)
At December 31	58,278

28 Other liabilities

(CNY million)	Note	2018	2017
Interest payable		1,471	1,518
Advances received	(a)	–	34,135
Accrued expenses		37,749	32,463
Refund liabilities	(b)	18,118	–
Other taxes payable		8,296	8,805
Due in relation to property, plant and equipment		4,507	3,817
Due in relation to intangible assets		4,432	1,540
Foreign exchange contracts		51	465
Others	(b)	17,220	14,784
		91,844	97,527
Non-current portion		4,161	1,702
Current portion		87,683	95,825
		91,844	97,527

Notes:

- (a) From January 1, 2018, advances received and the liabilities accrued for unperformed obligations are included in “contract liabilities”.
- (b) From January 1, 2018, the accrued rebates and other sales-based incentives to customers, which were previously included in others and “provisions” (Note 29) are included in refund liabilities.

29 Provisions

(CNY million)	Note	2018	2017
Provision for warranties	(b)	5,517	9,030
Onerous contracts		1,129	1,999
Provision for product sales	28	–	5,582
Other provisions	(c)	3,598	3,622
		10,244	20,233

(a) Movement in provisions during the year is shown as below:

(CNY million)	Provision for warranties (Note (i))	Onerous contracts (Note (ii))	Provision for product sales (Note (iii))	Other provisions	Total
At January 1, 2018	9,030	1,999	5,582	3,622	20,233
Adjustment on initial application of IFRS 15	(4,477)	(148)	(5,582)	–	(10,207)
Adjusted balance at January 1, 2018	4,553	1,851	–	3,622	10,026
Exchange adjustments	(1)	–	–	(337)	(338)
Acquisition of subsidiaries (note 33(c))	–	7	–	–	7
Provisions made	4,911	808	–	604	6,323
Provisions utilised	(3,946)	(1,537)	–	(291)	(5,774)
At December 31, 2018	5,517	1,129	–	3,598	10,244

Notes:

- (i) Upon the adoption of IFRS 15, the provision for warranties, which have been determined to be a service in nature, has been reversed and the transaction price allocated to the unexpired portion of these service warranties has been deferred and recorded in “contract liabilities” (see Note 4A(ii)).
- (ii) Upon the adoption of IFRS 15, the revenue and costs relating to certain onerous contracts have been recognised in the retained earnings as at January 1, 2018. The provision previously recognised for these contracts has been reversed at January 1, 2018 (see Note 4A(i)).
- (iii) Upon the adoption of IFRS 15, the provision for product sales is included in refund liabilities under “other liabilities” (see Note 4A(iii)).

(b) Provision for warranties

The provision for warranties relates mainly to products sold during the year and is determined based on estimates made from historical warranty data associated with similar products and the amount of products covered by warranty at the end of the reporting period and their corresponding remaining warranty periods. Most claims are expected to be settled within one year.

(c) Other provisions

Other provisions are mainly for outstanding cases and disputes.

30 Operating leases

(a) As lessee

As at December 31, 2018 and 2017, the total future minimum lease payments under non-cancellable operating leases are payable as follows:

(CNY million)	2018	2017
Within 1 year	2,404	2,593
After 1 year but within 5 years	4,554	4,386
After 5 years	986	375
	7,944	7,354

The Group leases a number of warehouses, factory facilities, office premises and staff apartments under operating leases. These leases typically run for an initial period of one to five years. None of the leases includes contingent rental payments.

During the year ended December 31, 2018, CNY4,014 million (2017: CNY4,287 million) was recognised as an expense in the consolidated statement of profit or loss and other comprehensive income in respect of operating leases.

(b) As lessor

The Group leases out certain of its properties under operating leases (see note 8 and note 15). As at December 31, 2018 and 2017, the Group's total future minimum lease payments under non-cancellable operating leases are receivable as follows:

(CNY million)	2018	2017
Within 1 year	42	18
After 1 year but within 5 years	64	13
After 5 years	69	–
	175	31

During the year ended December 31, 2018, CNY262 million (2017: CNY230 million) was recognised as rental income in the consolidated statement of profit or loss and other comprehensive income.

31 Capital commitments

Capital commitments of the Group in respect of acquisition and construction of property, plant and equipment and intangible assets outstanding at December 31 not provided for in the consolidated financial statements were as follows:

(CNY million)	2018	2017
Acquisition and construction of long-term assets		
– Contracted for	8,764	10,387
– Authorised but not contracted for	18,165	9,562
Total	26,929	19,949

Other contracted capital commitments outstanding at December 31 not provided for in the consolidated financial statements were as follows:

(CNY million)	2018	2017
Investment commitment	108	–

32 Related parties

A related party is a person or an entity that has control or joint control or significant influence over the Group, or is a member of its key management personnel, or is member of the Group, including joint ventures and associates.

Details of the Group's significant transactions with related parties are set out below.

Transactions with associates and joint ventures

(CNY million)	2018				
	Sales	Purchases and processing expenses	Service income	Rental income	Service expenses
TD Tech	1,569	629	6	–	51
Huawei Marine (note)	70	553	5	3	–
	1,639	1,182	11	3	51

(CNY million)	2017				
	Sales	Purchases and processing expenses	Service income	Rental income	Service expenses
TD Tech	1,040	763	4	–	40
Huawei Marine	20	1,466	17	3	1
	1,060	2,229	21	3	41

Note: On August 1, 2018, the Group obtained control over Huawei Marine. The transaction amounts disclosed above related to the period from January 1, 2018 to July 31, 2018.

Balances with associates and joint ventures

(CNY million)	December 31, 2018					
	Trade receivables	Contract assets	Other receivables	Trade payables	Contract liabilities	Other payables
TD Tech	64	6	332	500	8	289

(CNY million)	December 31, 2017					
	Trade receivables	Contract assets	Other receivables	Trade payables	Contract liabilities	Other payables
TD Tech	290	-	2	369	-	183
Huawei Marine	43	-	244	678	-	9
	333	-	246	1,047	-	192

33 Group enterprises

(a) Parent and ultimate controlling party

The Group's ultimate controlling party is the Union of Huawei Investment & Holding Co., Ltd.

(b) Major subsidiaries

Name of subsidiaries	Place of incorporation and business	Proportion of ownership interest		Principal activities
		2018	2017	
Huawei Technologies Co., Ltd. (Huawei Technologies)	PRC	100%	100%	Development, manufacture and sale of telecommunication and related products and provision of support and maintenance services.
Huawei Device Co., Ltd. (i)	PRC	100%	100%	Development, manufacture and sale of mobile communication products and ancillaries.
Huawei Machine Co., Ltd.	PRC	100%	100%	Manufacture of telecommunication products.
Shanghai Huawei Technologies Co., Ltd.	PRC	100%	100%	Development of telecommunication products.
Beijing Huawei Digital Technologies Co., Ltd.	PRC	100%	100%	Development of telecommunication products.
Huawei Tech. Investment Co., Limited (Huawei Investment)	Hong Kong	100%	100%	Distribution of telecommunication products.
Huawei International Co., Limited	Hong Kong	100%	100%	Distribution of telecommunication products.
Huawei International Pte. Ltd.	Singapore	100%	100%	Distribution of telecommunication products.
Huawei Technologies Japan K.K.	Japan	100%	100%	Development and sale of telecommunication products and ancillary services.
Huawei Technologies Deutschland GmbH	Germany	100%	100%	Development and sale of telecommunication products and ancillary services.
Huawei Device (Shenzhen) Co., Ltd. (ii)	PRC	100%	100%	Development, manufacture and sale of mobile communication products and ancillaries.
Huawei Device (Hong Kong) Co., Limited	Hong Kong	100%	100%	Sale and related services of mobile communication products and ancillaries.
HUAWEI TECHNICAL SERVICE CO., LTD.	PRC	100%	100%	Installation and maintenance of telecommunication products and ancillaries, including consultancy.

Name of subsidiaries	Place of incorporation and business	Proportion of ownership interest		Principal activities
		2018	2017	
Huawei Software Technologies Co., Ltd.	PRC	100%	100%	Development, manufacture and sale of telecommunication software and related products and services. Sale of cloud business.
HiSilicon Technologies Co., Ltd.	PRC	100%	100%	Development and sale of semiconductors.
HiSilicon Optoelectronics Co., Ltd.	PRC	100%	100%	Development, manufacture and sale of optoelectronic products related to information technology.
Huawei Digital Technologies (Suzhou) Co., Ltd.	PRC	100%	100%	Development and sale of inverter.
Huawei Technologies Coöperatief U.A.	Netherlands	100%	100%	Intermediate parent company for certain overseas subsidiaries.
Huawei Global Finance (UK) Limited	United Kingdom	100%	100%	Treasury and risk management.
Proven Honour	British Virgin Islands	100%	100%	Financing.
Proven Glory	British Virgin Islands	100%	100%	Financing.

(i) On November 16, 2018, Huawei Device (Dongguan) Co., Ltd was renamed as Huawei Device Co., Ltd.

(ii) On May 18, 2018, Huawei Device Co., Ltd was renamed as Huawei Device (Shenzhen) Co., Ltd.

(c) Acquisition of subsidiaries

On August 1, 2018, Huawei Investment, a wholly-owned subsidiary of the Company, and Global Marine Systems Limited ("Global Marine", 49% equity interest holder of Huawei Marine) signed an amended joint venture agreement in respect of Huawei Marine. Previously, significant matters relating to Huawei Marine's principal operating activities were to be approved in Huawei Marine's Shareholders' meeting and both shareholders' unanimous consent was required. After the amendment, the Board of Huawei Marine is irrevocably authorised to approve such significant matters. The shareholding in Huawei Marine remained unchanged. As Huawei Investment holds the majority of voting rights in the Board, Huawei Investment obtained control over Huawei Marine upon the amendment. Huawei Marine and its wholly owned subsidiary, Huawei Marine Networks Co., Ltd., therefore became consolidated subsidiaries of Huawei Investment from August 1, 2018 onwards with Global Marine holding 49% non-controlling interests. The acquisition integrated Huawei Marine's resources and capability in the submarine business into the Group's global market channel.

During the year ended December 31, 2018, Huawei Marine contributed revenue of CNY394 million and net profit of CNY115 million to the Group's consolidated result. If the acquisition had occurred on January 1, 2018, management estimates that consolidated revenue would have been CNY721,224 million, and consolidated profit for the year would have been CNY59,329 million. In determining these amounts, management have assumed that the fair value adjustments that arose on the acquisition date would have been the same if the acquisition had occurred on January 1, 2018.

Identifiable assets acquired and liabilities assumed at the date of acquisition.

(CNY million)	Note	Recognised values on acquisition date Huawei Marine
Property, plant and equipment	15	38
Goodwill and intangible assets	14	259
Inventories and other contract costs		231
Contract assets	21	118
Trade and bills receivable		582
Other assets		322
Other investments, including derivatives		211
Cash and cash equivalents		196
Deferred tax liabilities		(17)
Employee benefits		(79)
Trade and bills payable		(534)
Contract liabilities	27	(343)
Other liabilities		(81)
Provisions	29	(7)
Total net identifiable assets		896
Cash and cash equivalents acquired		196

Comprising amounts attributable to:

(CNY million)	
The Group	457
Non-controlling interests holder	439
Net identifiable assets	896

Goodwill was recognised as a result of the acquisition as follows:

(CNY million)	Note	Recognised values on acquisition date
Fair value of the equity interests attributable to the Group		576
The Group's share of net identifiable assets		(457)
Goodwill	14	119

The fair value of the equity interests of Huawei Marine was estimated by an independent third party valuer using the income approach on the acquisition date.

Goodwill arising from this acquisition is attributable to Huawei Marine's skills and experience in the submarine industry, and the synergies expected to be derived from integrating Huawei Marine's business into the Group's global sales network. The goodwill recognised is not expected to be deductible for income tax purpose.

Gain on deemed disposal of equity interest in Huawei Marine:

(CNY million)	
Fair value of the equity interests attributable to the Group	576
Carrying value of the equity interest on acquisition date	(302)
Amounts transferred out from reserves	(5)
Gain on deemed disposal of a joint venture (note 9)	269

34 Contingent liabilities

During January 2019 the United States Department of Justice issued two indictments in respect of certain alleged activities during prior years as follows:

(a) On September 2, 2014, T-Mobile USA, Inc. ("T-Mobile") filed a civil action against the Group's subsidiary, Huawei Device USA Inc., in relation to the alleged misappropriation of trade secrets relating to certain of T-Mobile's mobile phone test equipment. The two parties reached a settlement on November 8, 2017.

On January 16, 2019, the United States Department of Justice issued an indictment against Huawei Device USA Inc. and Huawei Device Co., Ltd, containing 10 charges in relation to the alleged theft of trade secrets relating to the above equipment and alleged wire fraud and obstruction of justice. The charges relate to the years from 2012 to 2014.

(b) On January 24, 2019, the United States Department of Justice issued an indictment against Huawei Technologies, Huawei Device USA Inc. and other parties. The indictment contains 13 charges in relation to alleged bank and wire fraud, violation of the International Emergency Economic Powers Act of the United States with respect to certain transactions involving Iran, and associated matters in prior years.

The Group has engaged external legal advisers to assist it in respect of these matters. However, given the early stage of these proceedings, as at the date of approval of these financial statements, management considers that both the timing and the outcome of these matters are inherently uncertain, and that the amount of any possible obligation of the Group, if any, cannot be reliably estimated. Accordingly, these indictments give rise to contingent liabilities for the Group and no provision has been made in this regard in these financial statements. It is also not practicable at this early stage for the Group to disclose an estimate of the possible future financial effect on the Group's financial statements of these matters.

35 Subsequent event

Subsequent to December 31, 2018 and up to the date of approval of these financial statements, the Group has drawn down accumulatively CNY14,000 million from a syndicated loan facility entered into by Huawei Technologies, a wholly-owned subsidiary of the Group on December 28, 2018.

36 Comparative figures

The presentation of certain prior year comparative figures has been adjusted to reflect current year presentation requirements. None of these changes were considered material.

Risk Factors

All risk factors listed in this Annual Report, particularly those covered in this section, refer to key, future uncertainties that could influence the company's business objectives. These are risk factors that have been identified to exist in Huawei's strategic plans, business models, external environment, and financial

system. Major risk factors refer to events that could significantly impact the company's competitiveness, reputation, financial position, operating results, and long-term prospects over the coming 18 months. The major risk factors faced by Huawei are outlined below.

Huawei's Risk Management System

Based on the COSO framework, and referencing ISO 31000 risk management standards, Huawei has an Enterprise Risk Management (ERM) system that takes into account our unique organizational structure and operating model. In addition, we have a robust set of ERM policies and processes, and we continuously refine our ERM organizations and operating mechanisms to optimize risk management. Huawei's ERM system ensures the following:

- The Board of Directors approves solutions related to managing the company's major risks, crises, and unforeseen events.
- Business managers, as primary risk management owners in their respective business domains, proactively identify and manage risks to ensure they remain at an acceptable level.

At Huawei, risk management factors are incorporated into both strategic planning and business planning processes: Each business department and regional office systematically identifies and assesses risks during strategic planning, lists appropriate countermeasures in annual business plans, and monitors and reports on high-agenda risks during routine operations. Huawei ensures uninterrupted business operations by identifying major risk factors during strategic decision making and planning, coupled with taking necessary measures to control risks during business planning and execution.

Strategic Risks

In terms of technology, we will enter an intelligent world within two or three decades. The world around us will go through a seismic shift, the depth and breadth of which we can hardly imagine. However, one thing is clear: The transformation of the ICT industry will introduce greater uncertainty to technology, business, transaction models, and industry policies.

Looking to the future, we will remain dedicated to ICT infrastructure and smart devices, and to building a technical architecture that achieves synergy between devices, networks, and the cloud in the intelligent world. We will invest more heavily into the research of technology and business models in areas where

development is uncertain, remain focused on our goals, and make concerted investments along multiple paths in multiple waves.

In addition to these endeavors, we will strive to stay ahead of industry trends, and identify, understand, and satisfy the diverse requirements of our customers. To maintain and enhance our competitive strengths and constantly improve our performance, we will continually launch better products and services while reducing the total cost of ownership for our customers. Going forward, we will continue to invest in the future, develop our advantages in technologies and the industry ecosystem, and strive to become a strategic partner that is trusted by our customers.

External Risks

Macro environment: The global economy is facing downside risk. This can be attributed to geopolitical tension, escalating global trade friction, uncertainties in macro policies, and increasingly ingrained financial risks. Huawei is also increasingly likely to face additional internal and external risks. Each business department and regional office will step up its efforts to identify and control risks and promptly adjust strategies accordingly.

Legal risks: Observance of laws and global compliance provide a solid foundation on which Huawei can survive and can serve and contribute to the world. Huawei has always been dedicated to strictly complying with all applicable laws and regulations of the countries and regions in which we operate. These include all the applicable laws and regulations of the UN, US, and EU.

Through years of efforts, we have established a compliance management system that covers all offices, all businesses, and all employees around the world, including but not limited to trade compliance and financial compliance. This program enables the systematic management of compliance risks through established policies, organizations, regulations, processes, etc.

We strive to fully comply with all applicable local laws and regulations and make every effort to avoid violations. However, there might still be negative impacts due to complex legal environments in some of countries and regions in which we operate, such as a lack of openness regarding laws and regulations, inconsistency or ambiguity in regards to law enforcement, or complex ideologies. Huawei will continue, as always, to proactively assess risks, learn from industry best practices, and take preventative measures to address risks. The certainty of legal compliance is our best bulwark against the uncertainty of international politics.

Trade risks: Deglobalization and protectionism have become prominent risks within global trade. Trade restrictions have increased and global trade tensions have intensified. On one hand, trade barriers have

always existed for both exporters and importers. On the other hand, new technologies are changing economic development, trade models, and our lives in general.

Against this backdrop, international trade rules should be reshaped and the multilateral trading system could be weakened. In response, members of the World Trade Organization (WTO) are negotiating international reforms. In addition, mega free trade agreements are being negotiated or settled across the globe, leading to major trade partnerships being adjusted and bringing more uncertainty to trade policies. As a global company, Huawei supports global trade rules and pledges to place trade compliance above its own commercial interests.

Natural disasters: Earthquakes, floods, epidemics, and other natural disasters can impact certain aspects of Huawei's business operations. Our mission and primary social responsibility are to support stable network operations. We have a robust set of mechanisms for responding to natural disasters and continue to improve our capabilities in this regard. This has helped us ensure business continuity, and has also helped us effectively support our customers' network stability and business operations.

Country-specific risks: Huawei currently operates in more than 170 countries and regions worldwide. The complex international, economic, and political landscape could expose Huawei to particular risks in certain countries and regions. These risks include civil unrest, economic and political instability, exchange rate fluctuations, foreign exchange controls, sovereign debt crises, regulations for local business operations, and labor issues. Specifically, regional tension, civil war, sanctions, and local unrest could greatly hinder Huawei's business operations and development. To address these issues, Huawei must possess exceptional risk management and response capabilities. We will closely monitor any possible risks and changes in the environment, and employ prompt countermeasures to minimize any potential impacts on our business.

Operational Risks

Business continuity: With today's highly globalized division of labor, Huawei must rely on a wide variety of third parties (including outside companies and agencies) for procurement, manufacturing, logistics, and global technical services. Therefore, the discontinuity of third-party business could directly or indirectly compromise Huawei's operations and business performance.

Through years of ongoing investment, Huawei has established a Business Continuity Management (BCM) system for procurement, manufacturing, logistics, global technical services, and other domains. This system covers end-to-end processes, from suppliers to Huawei, and on to our customers. As part of this system, we have developed and established effective

measures to manage risks that arise from our day-to-day work. Specifically, we have built up management organizations, processes, and IT platforms, prepared business continuity plans and emergency response plans, and organized BCM training and drills for employees. (For further information on the BCM system, see page 47 of this Annual Report.)

Information security and IPR: While Huawei has adopted stringent information security measures to protect its IPR, it is impossible to completely prevent other companies from improperly using our information and patents. Even when we are able to resort to litigation to protect our IPR, we may still suffer losses from improper usage.

Financial Risks

For further information on financial risks, see pages 67 to 68 of this Annual Report.

Corporate Governance Report

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By staying customer-centric and inspiring dedication, we have sustained long-term growth through continuous improvement of our corporate governance structure, organizations, processes, and appraisal systems.

Shareholders

Huawei Investment & Holding Co., Ltd. is a private company wholly owned by its employees. Huawei's shareholders are the Union of Huawei Investment & Holding Co., Ltd. (the "Union") and Mr. Ren Zhengfei.

Through the Union, the company implements an Employee Shareholding Scheme (the "Scheme"), which involved 96,768 employees as of December 31, 2018.

The Scheme effectively aligns employee contribution and development with the company's long-term development, fostering Huawei's continued success.

Mr. Ren Zhengfei is the Company's natural person shareholder and also participates in the Scheme. As of December 31, 2018, Mr. Ren's investment accounts for nearly 1.14% of the Company's total share capital.

The Shareholders' Meeting and the Representatives' Commission

The Shareholders' Meeting, the company's authoritative body, comprises two shareholders: the Union and Mr. Ren Zhengfei.

The Representatives' Commission (the "Commission") is the organization through which the Union fulfills shareholder responsibilities and exercises shareholder rights. The Commission consists of 115 representatives of shareholding employees ("Representatives") and exercises rights on behalf of all shareholding employees. In 2018, the Commission held two meetings, at which it reviewed and approved proposals on annual profit distribution, capital increases, and corporate governance rules and regulations.

The Representatives and Alternate Representatives are elected by the active shareholding employees with a term of five years. In the event that there is a vacancy in the body of Representatives, the Alternate Representatives shall take up the vacancy in a predetermined sequence.

In January 2019, an election for the Commission was held, producing 115 Representatives and 18 Alternate Representatives. Current members of the Commission are:

Mr. Ren Zhengfei, Ms. Sun Yafang, Mr. Liang Hua, Mr. Guo Ping, Mr. Xu Zhijun, Mr. Hu Houkun, Ms. Meng Wanzhou, Mr. Ding Yun, Mr. Yu Chengdong, Mr. Wang Tao, Mr. Xu Wenwei, Ms. Chen Lifang, Mr. Peng Zhongyang, Ms. He Tingbo, Mr. Li Yingtao, Mr. Yao

Fuhai, Mr. Tao Jingwen, Mr. Yan Lida, Mr. Li Jie, Mr. Zhou Daiqi, Mr. Ren Shulu, Mr. Yin Xuquan, Mr. Li Jin'ge, Mr. Li Dafeng, Mr. Song Liuping, Mr. Tian Feng, Mr. Yi Xiang, Mr. Li Jian, Mr. Li Jianguo, Mr. Peng Bo, Mr. Zhao Ming, Ms. Zhao Minglu, Ms. Shi Yanli, Mr. Peng Qiu'en, Ms. Zhang Xiaoqing, Mr. Gao Aozhan, Mr. Yang Shubin, Ms. Ji Hui, Mr. Zou Zhilei, Mr. Lu Yong, Mr. Peng Song, Mr. Liu Hongyun, Mr. Dong Ming, Mr. Yang Yougui, Mr. Li Peng, Mr. Cao Jibin, Mr. Wu Weitao, Mr. Chen Hao, Mr. Wang Shengniu, Mr. Wang Jianfeng, Mr. Chen Lei, Mr. Wu Hui, Mr. Cai Yinghua, Mr. Meng Ping, Mr. Lv Ke, Mr. Jiang Xisheng, Mr. Pan Shaoqin, Mr. Jiang Yafei, Mr. Zhang Wenlin, Mr. Wang Weijian, Mr. Su Liqing, Mr. Luo Wencheng, Mr. Zhang Hongxi, Mr. Wan Biao, Mr. Xiong Lening, Mr. Ying Weimin, Mr. Wu Kunhong, Mr. Wei Chengmin, Mr. Wu Qinming, Mr. Xie Guohui, Mr. Wang Kexiang, Mr. Tang Qibing, Mr. Wang Shengqing, Mr. Sun Fuyou, Mr. Ma Yue, Mr. Zhou Jianjun, Mr. Xun Su, Mr. Lu Qi, Mr. Lin Baifeng, Mr. Shen Huifeng, Mr. Zheng Liangcai, Mr. Ma Qingqing, Mr. Zhao Yong, Mr. Li Shanlin, Mr. Wang Hua'nian, Mr. Bai Limin, Mr. Hou Jinlong, Mr. Deng Taihua, Mr. Zheng Yelai, Mr. Hu Kewen, Mr. Zhang Shunmao, Mr. Zha Jun, Mr. Zhou Hong, Mr. Ma Haixu, Mr. Liu Shaowei, Mr. Tang Xinhong, Mr. Yang Chaobin, Mr. Gong Ti, Mr. Cai Changtian, Mr. Gao Ji, Mr. Xiong Yan, Mr. Zhou Taoyuan, Mr. Wang Yixiang, Mr. Li Zhoujian, Mr. Yu Quan, Mr. He Gang, Mr. Zhang Ping'an, Mr. Bian Honglin, Mr. Wang Chenglu, Mr. Xu Qinsong, Mr. Li Xiaolong, Mr. Zhu Ping, Mr. Shao Yang, Mr. Su Jie, and Mr. Zhu Yonggang.

Board of Directors

The Board of Directors (BOD) is the highest body responsible for corporate strategy, operations management, and customer satisfaction. The BOD's mission is to lead the company forward. It exercises decision-making authority for corporate strategy and operations management, and ensures the protection of customer and shareholder interests.

The main responsibilities of the BOD are to:

- Develop proposals for corporate governance.
- Review proposals to increase or decrease the company's registered capital, as well as proposals related to profit distribution and loss recovery.
- Review the company's stock options plan and other long-term incentive plans.
- Review or approve plans for entering and exiting different industry sectors, and approve the company's strategic plan.
- Approve major organizational restructuring, management system development, and business transformation.
- Approve major financial policies, financial plans, and business transactions.
- Approve the company's annual budget proposal, annual operations report, and annual audit report.
- Approve the appointment/removal, compensation, and long-term incentives of senior management.
- Approve major HR policies and plans at the corporate level.
- Approve proposals for managing major risks and crises, and manage major emergencies.
- Approve the development of internal controls and operational compliance systems.

In 2018, the BOD held ten meetings. At the meetings, the BOD reviewed and approved matters such as

the company's medium-to-long-term development plan, annual budget, annual audit report, corporate governance rules and regulations, annual profit distribution, capital increases, compliance oversight system, and cyber security.

Currently, the BOD is comprised of 17 members, who were elected by the Commission and voted in by the Shareholders' Meeting. In March 2018, the Commission and Shareholders' Meeting elected a new Board of Directors that includes the Chairman, regular members, and alternate members. The BOD elected deputy chairs of the board and the members of its Executive Committee. In the event that there is a vacancy in the BOD, alternate members will take up the vacancy in a predetermined sequence.

Current board members include:

- Chairman: Mr. Liang Hua
- Deputy Chairs: Mr. Guo Ping, Mr. Xu Zhijun, Mr. Hu Houkun, and Ms. Meng Wanzhou
- Executive Directors: Mr. Ding Yun, Mr. Yu Chengdong, and Mr. Wang Tao
- Directors: Mr. Xu Wenwei, Ms. Chen Lifang, Mr. Peng Zhongyang, Ms. He Tingbo, Mr. Li Yingtao, Mr. Ren Zhengfei, Mr. Yao Fuhai, Mr. Tao Jingwen, and Mr. Yan Lida

Alternate Directors include: Mr. Li Jianguo, Mr. Peng Bo, and Mr. Zhao Ming

Executive Committee

The BOD has established the Executive Committee, which acts as the standing executive body of the BOD. Entrusted by the BOD, the Executive Committee examines and reflects on major issues within the company, decides on issues authorized by the BOD, and oversees their execution. In 2018, the Executive Committee held 12 meetings.

Members of the BOD Executive Committee include Mr. Guo Ping, Mr. Xu Zhijun, Mr. Hu Houkun, Ms. Meng Wanzhou, Mr. Ding Yun, Mr. Yu Chengdong, and Mr. Wang Tao.

Rotating chairs

The BOD and its Executive Committee are led by rotating chairs. During their terms, the rotating chairs will serve as the foremost leader of the company. Rotating chairs' terms last six months at a time. The rotation schedule is as follows:

- Mr. Xu Zhijun: April 1, 2018 to September 30, 2018
October 1, 2019 to March 31, 2020
April 1, 2021 to September 30, 2021
October 1, 2022 to March 31, 2023
- Mr. Guo Ping: October 1, 2018 to March 31, 2019
April 1, 2020 to September 30, 2020
October 1, 2021 to March 31, 2022
- Mr. Hu Houkun: April 1, 2019 to September 30, 2019
October 1, 2020 to March 31, 2021
April 1, 2022 to September 30, 2022

Audit Committee

The Audit Committee (AC) operates under the BOD to oversee internal controls, including the internal control system, internal and external audits, corporate processes, legal compliance, and adherence to the BCGs.

The main responsibilities of the AC are to:

- Approve the annual internal audit plan, and review its scope, required resources, and audit outputs.
- Approve corporate policies for internal controls; approve the corporate development plan for internal controls and the plan's key milestones; and regularly assess the company's internal control status.
- Evaluate the effectiveness of the ethics and compliance function, legal compliance, and adherence to corporate policies.

- Approve the selection of the external auditor, notify the BOD of any proposed change to the external auditor for approval, approve related budgets, and evaluate the work of the external auditor.
- Supervise the completeness, accuracy, and legal compliance of the company's financial statements; and review compliance with and application of accounting policies and all financial disclosures.
- Approve internal control Key Performance Indicators (KPIs), and instruct Global Process Owners (GPOs) and business executives to report internal control results.

The AC holds quarterly meetings and convenes special sessions as necessary. Business executives and various experts are invited to attend as non-voting participants.

The committee held five meetings in 2018. Focusing on topics such as risk management, the development of the internal control system, restructuring of the inspection department, internal auditing development, accounting monitoring, and financial reporting management, the AC has taken the following key initiatives:

- Reviewing and approving the company's annual plans for internal audit and global internal controls.
- Receiving reports on Internal Control Maturity trends, SACAs (including internal controls over financial reporting), internal control improvements of the Consumer and Enterprise BGs, and the internal audit transformation.
- Improving employee compliance with the BCGs through anti-corruption education, publicity of cases of managers who violated the *Employee Conduct – Eight Principles for Improving Work Ethic*, and publicity of major audit findings and non-compliance cases.
- Arranging discussions between the committee Chairman and the external auditor on management improvement proposals.

Supervisory Board

Pursuant to the requirements of *the Company Law of the People's Republic of China*, Huawei has established the Supervisory Board. The key responsibilities of the Supervisory Board include overseeing the responsibility fulfillment of BOD members and senior management, monitoring the company's operational and financial status, and supervising internal control and legal compliance. Members of the Supervisory Board attend BOD and EMT meetings as non-voting participants.

The Supervisory Board held ten meetings in 2018. At the meetings, it assessed the responsibility fulfillment of BOD members in 2017, reviewed the company's annual financial statements, received reports on the company's compliance oversight system and oversight of overseas subsidiaries, and reviewed compliance oversight in subsidiaries worldwide. Throughout the year, members of the Supervisory Board attended all meetings of the BOD as non-voting participants, overseeing the legitimacy of BOD decisions and operations.

The Supervisory Board is comprised of 10 members, who were elected by the Representatives' Commission and voted in by the Shareholders' Meeting.

Current Supervisory Board members include:

- Chairman: Mr. Li Jie.
- Executive members: Mr. Zhou Daiqi, Mr. Ren Shulu, Mr. Yin Xuquan, Mr. Li Jin'ge, and Mr. Li Dafeng.
- Members: Mr. Song Liuping, Mr. Tian Feng, Mr. Yi Xiang, and Mr. Li Jian.

The Supervisory Board has established the Executive Committee, which acts as authorized by the Supervisory Board. Members of the Executive Committee are Mr. Li Jie, Mr. Zhou Daiqi, Mr. Ren Shulu, Mr. Yin Xuquan, Mr. Li Jin'ge, and Mr. Li Dafeng.

Members of the Board of Directors and the Supervisory Board

Members of the Board of Directors



From the left in the first row: Ms. Meng Wanzhou, Mr. Hu Houkun, Mr. Guo Ping, Mr. Xu Zhijun, Mr. Liang Hua
From the left in the second row: Ms. He Tingbo, Mr. Xu Wenwei, Mr. Yan Lida, Mr. Ding Yun, Mr. Ren Zhengfei, Mr. Tao Jingwen, Mr. Li Yingtao, Mr. Wang Tao, Mr. Peng Zhongyang, Mr. Yu Chengdong, Ms. Chen Lifang, and Mr. Yao Fuhai

Mr. Liang Hua (Howard Liang)

Born in 1964, Mr. Liang holds a doctorate degree from Wuhan University of Technology. Mr. Liang joined Huawei in 1995 and has served as President of Supply Chain, CFO of Huawei, President of the Business Process & IT Mgmt Dept, President of the Global Technical Service Dept, Chief Supply Chain Officer, Chairman of the Audit Committee, and Chairman of the Supervisory Board. Mr. Liang is now Chairman of Huawei's Board of Directors.

Mr. Guo Ping

Born in 1966, Mr. Guo holds a master's degree from Huazhong University of Science and Technology. Mr. Guo joined Huawei in 1988 and has served as R&D Project Manager, General Manager of Supply Chain, Director of Huawei Executive Office, Chief Legal Officer, President of the Business Process & IT Mgmt Dept, President of the Corporate Development Dept, Chairman and President of Huawei Device, Rotating CEO of Huawei, and Chairman of the FC. Currently, Mr. Guo serves as Deputy Chairman of the Board and Rotating Chairman of Huawei.

Mr. Xu Zhijun (Eric Xu)

Born in 1967, Mr. Xu holds a doctorate degree from Nanjing University of Science & Technology. Mr. Xu joined Huawei in 1993 and has served as President of the Wireless Network Product Line, Chief Strategy & Marketing Officer, Chief Products & Solutions Officer, Chairman of the Investment Review Board, Rotating CEO of Huawei, and Chairman of the SDC. Currently, Mr. Xu serves as Deputy Chairman of the Board and Rotating Chairman of Huawei.

Mr. Hu Houkun (Ken Hu)

Born in 1968, Mr. Hu holds a bachelor's degree from Huazhong University of Science and Technology. Mr. Hu joined Huawei in 1990 and has served as President of the Marketing & Sales Dept in China, President of the Latin America Region, President of the Global Sales Dept, Chief Sales & Service Officer, Chief Strategy & Marketing Officer, Chairman of the Global Cyber Security and User Privacy Protection Committee (GSPC), Chairman of the BOD of Huawei USA, Deputy Chairman of the Board, Rotating CEO, and Chairman of the HRC. Currently, Mr. Hu serves as Deputy Chairman of the Board and Rotating Chairman of Huawei.

Ms. Meng Wanzhou (Sabrina Meng)

Ms. Meng holds a master's degree from Huazhong University of Science and Technology. Ms. Meng joined Huawei in 1993 and has held the positions of Director of the International Accounting Dept, CFO of Huawei Hong Kong, and President of the Accounting Mgmt Dept. Ms. Meng now serves as CFO of Huawei and Deputy Chairwoman of the Board.

In 2003, Ms. Meng established Huawei's globally unified finance organization, and developed the standardized and unified organizational structure, financial processes, financial systems, and IT platforms.

Since 2005, Ms. Meng has led the founding of five shared service centers around the world, and she also promoted the completion of the Global Payment Center in Shenzhen, China. These centers have boosted Huawei's accounting efficiency and monitoring quality, providing accounting services to sustain the company's rapid overseas expansion.

Since 2007, Ms. Meng has been in charge of the Integrated Financial Services (IFS) Transformation Program, an eight-year partnership between Huawei and IBM. This transformation program helped Huawei develop its data systems and rules for resource allocation, operating efficiency improvement, process optimization, and internal controls. IFS also took Huawei's financial management to a new level, creating new DNA for the company's sustainable growth.

In recent years, Ms. Meng has focused on advancing fine-grained and comprehensive financial management at Huawei, working to align these efforts with the company's long-term development plan. Ms. Meng has continually worked to improve treasury risk and tax compliance management systems, and has helped to make financial operations within the company more efficient, agile, and intelligent.

Mr. Ding Yun (Ryan Ding)

Born in 1969, Mr. Ding holds a master's degree from Southeast University. Mr. Ding joined Huawei in 1996 and has served as Product Line President, President of the Global Solution Sales Dept, President of the Global Marketing Dept, President of Products & Solutions, and CEO of the Carrier BG.

Mr. Yu Chengdong (Richard Yu)

Born in 1969, Mr. Yu holds a master's degree from Tsinghua University. Mr. Yu joined Huawei in 1993 and has served as 3G Product Director, Vice President of the Wireless Technical Sales Dept, President of the Wireless Network Product Line, President of the European Area, Chief Strategy & Marketing Officer, Chairman of Huawei Device, and CEO of the Consumer BG.

Mr. Wang Tao (David Wang)

Born in 1972, Mr. Wang holds a master's degree from Xi'an Jiaotong University. Mr. Wang joined Huawei in 1997 and has served as R&D Manager in Wireless, Vice President of the UMTS Technical Sales Dept, Vice President of Technical Sales of the European Area, Managing Director of Huawei Italy and Switzerland, President of the Wireless Network Product Line, President of the Network Product Line, President of Products & Solutions, and Chairman of the Investment Review Board.

Mr. Xu Wenwei (William Xu)

Born in 1963, Mr. Xu holds a master's degree from Southeast University. In 1991, Mr. Xu joined Huawei's Research & Development, leading the development of the first generation of Huawei's public program controlled switches. Mr. Xu also took charge of work related to chips, general technology, strategy planning, and research. He has served as President of the International Technical Sales & Marketing Dept, President of the European Area, Chief Strategy & Marketing Officer, Chief Sales & Service Officer, President of the Joint Committee of Regions, CEO of the Enterprise BG, and Chairman of the Investment Review Board. Mr. Xu is currently Huawei's Chief Strategy Marketing Officer.

Ms. Chen Lifang (Catherine Chen)

Born in 1971, Ms. Catherine Chen graduated from Northwest University in China. She joined Huawei in 1995 and has served as Chief Representative of the Beijing Representative Office, Vice President of the International Marketing Dept, Deputy Director of the Domestic Marketing Management Office, a member of the Board, President of the Public Affairs and Communications Dept, and Corporate Senior Vice President.

Mr. Peng Zhongyang

Born in 1968, Mr. Peng holds a bachelor's degree from Huazhong University of Science and Technology. Mr. Peng joined Huawei in 1997 and has served as Technical Service Engineer of the South China Area, Transmission Project Manager and Development Engineer of the Russia Representative Office, General Manager of the Yemen Representative Office, Assistant to President of the Middle East and Northern Africa Region, President of the Northern Africa Region, President of the China Region, and Vice President of the Corporate Leadership Mgmt Dept. Currently, Mr. Peng serves as President of the Corporate Leadership Mgmt Dept.

Ms. He Tingbo (Teresa He)

Born in 1969, Ms. He holds a master's degree from Beijing University of Posts and Telecommunications. She joined Huawei in 1996 and has since served as Chief ASIC Engineer, R&D Director of HiSilicon, and Vice President of the 2012 Laboratories. Currently, she serves as President of HiSilicon and President of the 2012 Laboratories.

Mr. Li Yingtao

Born in 1969, Mr. Li holds a doctorate degree from Harbin Institute of Technology. Mr. Li joined Huawei in 1997 and has served as Chief of the Sweden Research Center, Director of the Product Mgmt Dept of Wireless Marketing, Director of the Research Dept of Products & Solutions, Director of the General Technology Office of Products & Solutions, President of the Central Research & Development Unit, President of the 2012 Laboratories, and President of Products & Solutions. Currently, Mr. Li serves as President of Network Products & Solutions.

Mr. Ren Zhengfei

Born on October 25, 1944 into a rural family where both parents were school teachers, Mr. Ren Zhengfei spent his primary and middle school years in a remote mountainous town in Guizhou Province. In 1963, he studied at the Chongqing Institute of Civil Engineering and Architecture. After graduation, he was employed in the civil engineering industry until 1974 when he joined the military's Engineering Corps as a soldier tasked to establish the Liao Yang Chemical Fiber Factory. Subsequently, Mr. Ren had taken positions as a Technician, an Engineer, and was lastly promoted as a Deputy Director, which was a professional role equivalent to a Deputy Regimental Chief,

but without military rank. Because of his outstanding performance, Mr. Ren was invited to attend the National Science Conference in 1978 and the 12th National Congress of the Communist Party of China in 1982. Mr. Ren retired from the army in 1983 when the Chinese government disbanded the entire Engineering Corps. He then worked in the logistics service base of the Shenzhen South Sea Oil Corporation. As he was dissatisfied with his job, he decided to establish Huawei with a capital of CNY21,000 in 1987. He became the CEO of Huawei in 1988 and has held the title ever since.

Mr. Yao Fuhai

Born in 1968, Mr. Yao holds a bachelor's degree from the University of Electronic Science and Technology of China. Mr. Yao joined Huawei in 1997 and has served as Director of the Pricing Center, Vice President of the Business Process & IT Mgmt Dept, Vice President of the Strategy Cooperation Dept, Vice President of the Global Technical Sales Dept, and President of the Global Technical Service Dept. Currently, Mr. Yao serves as a member of the Board, Chief Supply Chain Officer, Director of the Group Procurement Management Committee, and President of the Global Procurement Qualification Mgmt Dept.

Mr. Tao Jingwen

Born in 1971, Mr. Tao graduated from Beijing University of Posts and Telecommunications. Mr. Tao joined Huawei in 1996 and has served as a product development engineer, Deputy General Manager of the Market Technology Section, Executive Deputy Director of the International Technical Sales Dept, Executive Vice President and President of the Sub-Saharan Region, President of the Global Technical Sales & Marketing Dept, President of Huawei Device, President of the West European Region, and President of the Quality, Business Process & IT Mgmt Dept.

Mr. Yan Lida

Born in 1970, Mr. Yan holds a bachelor's degree from Tsinghua University. Mr. Yan joined Huawei in 1997 and has served as Vice President of the European Region, General Manager of the Japan Representative Office, and President of the East Asia Region. Currently, Mr. Yan serves as a member of the Board, President of the Enterprise BG, and a member of the ICT Infrastructure Managing Board.

Members of the Supervisory Board



From the left in the first row: Mr. Zhou Daiqi, Mr. Li Jie, and Mr. Ren Shulu

From the left in the second row: Mr. Li Jin'ge, Mr. Song Liuping, Mr. Li Jian, Mr. Yi Xiang, Mr. Tian Feng, Mr. Li Dafeng, and Mr. Yin Xuquan

Mr. Li Jie (Jason Li)

Born in 1967, Mr. Li holds a bachelor's degree in wireless communications and a master's degree in computer image processing from Xi'an Jiaotong University. Mr. Li joined Huawei in 1992 and has served as an R&D engineer, General Manager of a representative office in China, General Manager of the Moscow Representative Office, President of the Commonwealth of Independent States Region, President of the Global Technical Sales Dept, President of the Global Technical Service Dept, President of the Human Resource Mgmt Dept, President of the Joint Committee of Regions, and President of the Corporate Leadership Mgmt Dept. Currently, Mr. Li serves as Chairman of the Supervisory Board and Chairman of the Audit Committee.

Mr. Zhou Daiqi

Born in 1947, Mr. Zhou graduated from Xidian University. Mr. Zhou joined Huawei in 1994 and has served as ATM Product Manager, Chief Engineer and General Manager of the Multimedia Dept, Director of the Hardware Dept, Chief of the Xi'an Research

Center, and Director of the HR Branch of Products & Solutions. Currently, Mr. Zhou serves as Chief Ethics & Compliance Officer and Director of the Corporate Committee of Ethics and Compliance.

Mr. Ren Shulu (Steven Ren)

Born in 1956, Mr. Ren holds a bachelor's degree from Yunnan University. Mr. Ren joined Huawei in 1992 and has served as President of Shenzhen Smartcom Business Co., Limited, Chairman of the Capital Construction Investment Management Committee, and Chairman of the Internal Service Management Committee. Currently, Mr. Ren serves as Huawei's Chief Logistics Officer.

Mr. Yin Xuquan

Born in 1964, Mr. Yin holds a master's degree from Xi'an Jiaotong University. Mr. Yin joined Huawei in 1995 and has served as President of the Southern Africa Region, Vice President of the Turnkey Business Dept, President of the Optical Network Product Line, HR Director of Sales & Services, and Vice President of the Global Procurement Qualification Mgmt Dept.

Mr. Li Jin'ge

Born in 1968, Mr. Li holds a bachelor's degree from Beijing University of Posts and Telecommunications. Mr. Li joined Huawei in 1992 and has served as Regional Vice President, Regional President, President of the Global Technical Sales Dept, President of the Sub-Saharan Area, a member of the Joint Committee of Regions, a member of the HRC, President of the Asia Pacific Area, a member of the Audit Committee, and President of the Internal Audit Dept.

Mr. Li Dafeng

Born in 1966, Mr. Li holds a bachelor's degree from the Department of Radio Engineering, Changchun Institute of Posts and Telecommunications, and a master's degree in signal and information processing, Harbin Institute of Technology. Mr. Li joined Huawei in 1996 and has served as Deputy Sales Director of the Beijing Office, General Manager of the Tianjin Office, General Manager of the Shijiazhuang Office, Deputy Director of the China Telecom Account Dept, Deputy Sales President of the Southern Africa Region, Director of the MTN Account Dept, President of the Eastern and Southern Africa Region, President of the Sales & Delivery Finance Mgmt Dept, President of the Middle East and Africa Area, and Director of the ICT Infrastructure Managing Board Office.

Mr. Song Liuping

Born in 1966, Mr. Song completed his postdoctoral research at Beijing Institute of Technology. Mr. Song joined Huawei in 1996 and has served successively as Manager of the Product Strategy Planning Dept, Director of the IPR Dept, Director of the External Cooperation Dept, PSST member, President of the Legal Affairs Dept, President of the Patent Review Board, Director of the Trade and Customs Compliance Committee, a member of the Disciplinary and Supervisory Sub-committee of the HRC, and a member of the AC and FC, Chief Legal Officer, and Chief Compliance Officer.

Mr. Tian Feng

Born in 1969, Mr. Tian holds a bachelor's degree from Xidian University. Mr. Tian joined Huawei in 1995 and has served as General Manager of the Shijiazhuang Office, HR Director of the Domestic Marketing Dept,

Director of the Market Finance Dept, EVP of the Middle East and Northern Africa Area, President of the Middle East Region, President of the China Region, CEO of Huawei Agissson, Vice President (acting) of the Human Resource Mgmt Dept, EVP of Huawei University, Director of the Institute of Education of Huawei University, Director of the Disciplinary and Supervisory Sub-committee of the HRC, an executive member of the Management Team of the Joint Committee of Regions, Director of the Subsidiary Board Directors Resources Bureau, President of the Central Asia and Russia Area, a member of the Management Team of the Corporate Leadership Mgmt Dept, a member of the AC, a member of the ICT Infrastructure Managing Board, Director of the Disciplinary and Supervisory Committee, President of the Asia Pacific Area, and a member of the Supervisory Board.

Mr. Yi Xiang (Steven Yi)

Born in 1975, Mr. Yi holds a bachelor's degree from Wuhan University. Mr. Yi joined Huawei in 1998 and has served as General Manager of the Pakistan Representative Office, President of the Middle East Region, President of the Sales & Delivery Finance Mgmt Dept, Deputy CFO of Huawei, President of the Regions Mgmt Dept, and President of the America Area. Currently, Mr. Yi serves as President of the Middle East and Africa Area and a member of the ICT Infrastructure Managing Board.

Mr. Li Jian

Born in 1973, Mr. Li holds a master's degree from Xidian University. Mr. Li joined Huawei in 2001 and has served as General Manager of the Nigeria Representative Office, General Manager of the Ghana Representative Office, President of the Western Africa Region, Special Assistant to President of Sales & Services, President of the Accounts & Regions Business Support Dept, President of the CEE & Nordic European Region, a member of the HRC, an executive member of the Management Team of the Joint Committee of Regions, Vice President of the Joint Committee of Regions, Global Process Owner of LTC, and President of the America Area. Currently, Mr. Li serves as President of the Europe Area, a member of the Management Team of the Corporate Leadership Mgmt Dept, and a member of the ICT Infrastructure Managing Board.

Independent Auditor

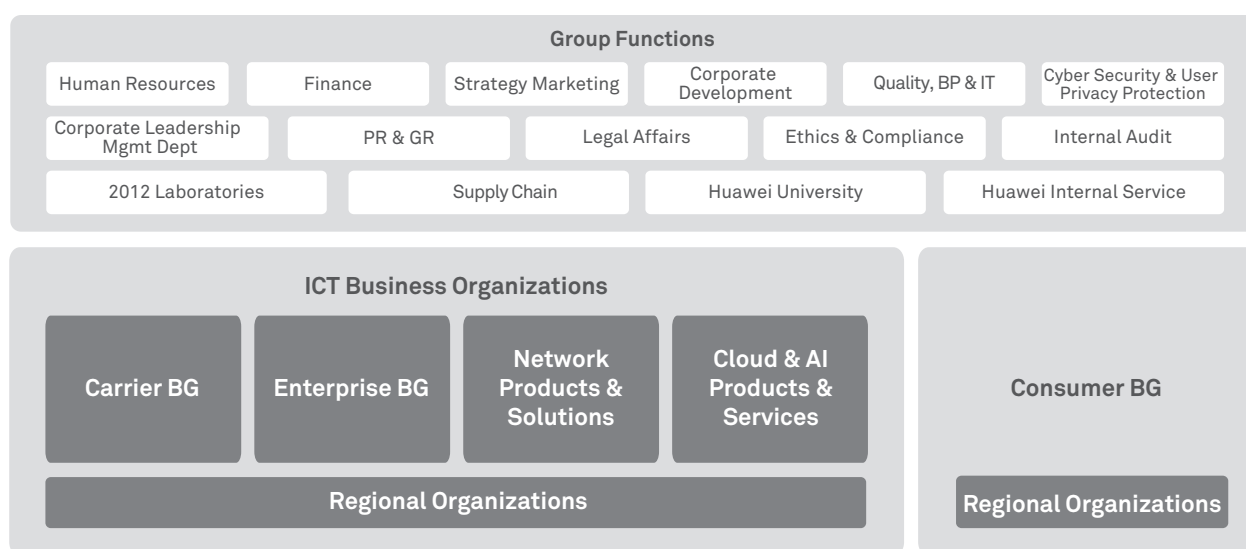
An independent auditor is responsible for auditing a company's annual financial statements. In accordance with applicable accounting standards and audit procedures, the independent auditor expresses an opinion as to whether the financial statements are true and fair.

The scope of the financial audit and the annual audit results are subject to review by the Audit Committee. Any relationship or service that may potentially affect

the objectivity and independence of the independent auditor can be discussed with the Audit Committee. The independent auditor may discuss any issues identified or any difficulties encountered during the course of the financial audits with the Audit Committee.

KPMG has been Huawei's independent auditor since 2000.

Business Structure



To strengthen end-to-end operations management of our ICT infrastructure business, the company set up the ICT Infrastructure Managing Board, which is the primary owner of our business strategy, operations management, and customer satisfaction for ICT infrastructure business.

- The Carrier BG and the Enterprise BG manage and support solution marketing, sales, and services that target carrier customers and enterprise/industry customers respectively. The two BGs provide innovative, differentiated, and advanced solutions based on the business characteristics and operational patterns of different customers while continuously improving the company's industry competitiveness and customer satisfaction.
- Network Products & Solutions and Cloud & AI Products & Services are organizations that provide integrated ICT solutions to carriers and enterprise/

industry customers. They are responsible for product planning, development, and delivery as well as for building product competitiveness to deliver better user experience and support business success. The goal of Network Products & Solutions is to build the world's best, most intelligent, and most cost-effective connections. The goal of Cloud & AI Products & Services is to create Huawei's "fertile soil" for computing and cloud services to help build a fully connected, intelligent world.

- ICT regional organizations are the company's regional ICT business operations centers. They are responsible for developing and effectively leveraging regional resources and capabilities, and also for implementing the company's ICT business strategy in their regions. The company has continuously optimized regional organizations and accelerated the delegation of more authority

to field offices. Command and on-site decision making authority has gradually been delegated to representative offices. To further improve efficiency and responsiveness to customer needs, the company is now piloting contract approval at the representative office level in some countries. While establishing closer partnerships with customers and helping them achieve business success, ICT regional organizations will develop ICT management systems, cyber security and privacy protection management systems, internal control systems, and compliance systems in their regions, and will continue to support the company in achieving profitable and sustainable growth.

To strengthen strategy and risk management and increase decision-making efficiency for the consumer business, the company set up the Consumer Business Managing Board, which is the primary owner of the business strategy, operations management, and customer satisfaction for the consumer business.

- The Consumer BG focuses on serving device consumers and deals with all aspects of the consumer domain. This BG is responsible for business performance, risk controls, market competitiveness, and customer satisfaction in the consumer business.
- The Consumer BG's regional organizations are responsible for their overall business results, consumer satisfaction, and the brand image

enhancement of regional consumer business. They need to gain insight into environmental changes and competition dynamics for the consumer electronics industry, and develop and implement regional consumer business plans and resource investment strategies. These organizations are also responsible for launching products, managing product lifecycles, planning and implementing marketing events, and developing and managing channels, retail outlets, and services in their regions. They also need to develop and maintain partnerships, create a favorable business environment, and ensure operational compliance and sustainable development of regional consumer business.

To gradually build a shared service platform to support the development of our multiple businesses and create an anchor for corporate policy execution, the company set up the Platform Coordination Committee. This committee is designed to push group functions to optimize their execution and operations, simplify cross-function operations, and strengthen collaboration, so that group functions will become the best service organizations available to support and promote business operations. Group functions provide business support, services, and oversight. They are positioned to offer accurate, timely, and effective services to field offices and strengthen oversight while delegating sufficient authority to them.

Improving the Internal Control System

Huawei continued to design and implement an internal control system based on its organizational structure and operating model. The internal control framework and its management system apply to all business and financial processes of the company and its subsidiaries and business units. The internal control system is based on the five components of the COSO framework: Control Environment, Risk Assessment, Control Activities, Information & Communication, and Monitoring. It also covers internal controls of financial statements to ensure their truthfulness, integrity, and accuracy.

Control Environment

A control environment is the foundation of an internal control system. Huawei is committed to a corporate culture of integrity, business ethics, and

compliance with laws and regulations. Huawei has issued the *Business Conduct Guidelines* (BCGs) to identify acceptable business conduct. The BCGs must be observed by all employees, including senior executives. Regular training programs are offered, and all employees are requested to sign the BCGs to ensure that the BCGs have been read, understood, and observed.

Huawei has implemented a mature governance structure, with clearly defined authorization and accountability mechanisms. The governance structure comprises the Board of Directors (BOD), its committees, group functions, and multi-level management teams. Huawei clearly defines the roles and responsibilities of its organizations to ensure the effective separation of authority and responsibilities as well as checks and balances through mutual

oversight. The CFO of Huawei is in charge of internal controls. The business control department reports to the CFO for any possible defects and improvements already made in terms of internal controls, and assists the CFO in building the internal control environment. The internal audit department independently monitors and assesses the status of internal controls for all business operations.

Risk Assessment

Huawei has a department dedicated to internal controls and risk management to regularly assess risks to the company's global business processes. This department identifies, manages, and monitors significant risks, forecasts potential risks caused by changes to the internal and external environments, and submits risk management strategies along with risk mitigation measures for decision making. All process owners are responsible for identifying, assessing, and managing business risks and taking necessary internal control measures. Huawei has instituted a mechanism for improving internal controls and risk controls to efficiently manage critical risks.

Control Activities

Huawei has established the Global Process Management System and the Business Transformation Management System, released the global Business Process Architecture (BPA), and appointed Global Process Owners (GPOs) in line with the BPA.

Responsible for building processes and internal controls, GPOs:

- Identify key control points and the Separation of Duties Matrix for each process, and apply these to all regional offices, subsidiaries, and BUs.
- Conduct monthly compliance tests on key control points and issue test reports to ensure continuous monitoring of the effectiveness of internal controls.
- Optimize processes and internal controls based on business pain points and key requirements for financial statements. The aim is to improve operating efficiency and financial results, ensure operational compliance and the accuracy and reliability of financial statements, and help achieve business objectives.
- Perform Semi-Annual Control Assessments (SACAs) to assess the overall process design and the effectiveness of process execution by each

business unit, and then report the results to the Audit Committee (AC).

Information & Communication

Huawei has developed multi-dimensional information and communication channels to ensure the timely acquisition of external information from customers, suppliers, and other parties. It has also created formal channels for transferring internal information, and offered an online space, the *Xinsheng Community*, for employees to freely communicate their thoughts and ideas. Corporate management holds regular meetings with departments at all levels to effectively communicate management orientation to employees and ensure effective implementation of management decisions. All business policies and processes are available on the company's Intranet.

Managers and process owners regularly organize training programs on business processes and internal controls to ensure that up-to-date information is made available to all employees. The company has established a mechanism for process owners at all levels to regularly communicate with each other, review the execution of internal controls, follow up on internal control issues, and implement improvement plans.

Monitoring

Huawei has established an internal complaint channel, an investigation mechanism, an anti-corruption mechanism, and an accountability system. The *Agreement on Honesty and Integrity* that Huawei has signed with its suppliers clearly stipulates that suppliers may report improper conduct by Huawei employees through the channels stipulated in the *Agreement* to assist the company in monitoring the integrity of its employees. The internal audit department independently assesses the overall status of the company's internal controls, investigates any suspected violations of the BCGs, and reports the audit and investigation results to the AC and senior management. Huawei has also implemented a mechanism for internal control appraisals of GPOs and regional managers, holding them accountable and pursuing impeachment when and where necessary. The AC and the CFO regularly review the company's internal control status, and receive reports on action plans for improving internal controls and plan execution progress. Both have the authority to request the relevant GPOs or business executives to explain their internal control issues and take corrective actions.

Sustainable Development

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Introduction

Our approach to sustainability management is customer-centric as always. By focusing on our sustainability strategy, we remain committed to contributing to society and helping to build a fully connected, intelligent world. Together with our partners, we bring ICT to every person, home, and organization, and develop innovative solutions to allow more people to benefit from digital inclusion. We also improve our capabilities in identifying, detecting, and preventing cyber risks to ensure robust and stable network operations. We make cyber security and user privacy protection the top priorities of our company and we continually intensify our efforts to improve in these areas. Our end-to-end product eco-design management helps reduce the environmental impact of our products throughout their lifecycles. We care for our employees, operate in compliance with all applicable laws and regulations, give back to local communities, and work with our partners to build a robust and healthy ecosystem.

Overview of Huawei's Sustainability Initiatives in 2018



Bridging the Digital Divide and Promoting Digital Inclusion

- Huawei's Three-Star solutions connect 100 million people in rural areas
- Huawei's Mobile Money solution serves more than 150 million users
- Huawei's ICT academy covers 557 colleges across more than 60 countries and regions
- More than 4,700 students from 108 countries and regions have studied at Huawei as part of the Seeds for the Future program, which has just celebrated its 10th anniversary



Supporting Network Stability and Enhancing Cyber Security and User Privacy Protection

- Guaranteed smooth communications for over one-third of the world's population
- Provided 24/7 technical services for over 1,500 networks across more than 170 countries and regions
- Signed cyber security agreements with over 3,400 suppliers
- Obtained 11 international security certifications for major products



Promoting Environmental Protection

- Energy efficiency of major network products increased by between 15% and 26%
- Six of our mobile phones received the distinguished UL 110 for environmental friendliness
- 82.3% of returned products were reused
- Used about 932 million kWh of clean energy, representing an emissions reduction of about 450,000 tons



Building a Healthy Ecosystem

- Invested more than CNY13.5 billion in employee benefits
- Appointed and trained compliance officers for over 130 subsidiaries
- Over 140,000 people have passed Huawei's Safety Passport certification
- Launched 177 community support programs around the world

Responsible Partner

Supporting Network Stability

Supporting network stability is our paramount social responsibility. We strive to ensure that everyone is able to communicate, access data, and share information anytime, anywhere. Specifically, we have established a comprehensive customer network support system that covers a range of areas, including organizational structures, designated personnel, processes, and IT tools. To protect lives and property, we have established a mature business continuity management system, which provides contingency plans for emergencies (e.g., earthquakes and wars) and allows us to quickly restore customer networks and resume stable operations.

In 2018, we ensured smooth communications for over one-third of the world's population, and supported the stable operations of over 1,500 networks in more than 170 countries and regions. We guaranteed network availability throughout more than 300 key events and natural disasters, including the Indonesian tsunami, the Hokkaido earthquake in Japan, Typhoon Mangkhut in China, the 2018 World Cup in Russia, and the Asian Games in Jakarta.

Cyber Security and Privacy Protection

In today's highly digital, intelligent world, guaranteeing cyber security and protecting privacy is critical for people to benefit from technological advances. We are fully aware of the importance of cyber security and privacy protection and hold these as our company's top priorities. As such, we have actively invested in the research and development of new cyber security technologies and solutions.

In the future fully connected, intelligent world, cyber security will be essential for massive amounts of data to be transmitted across networks. The advent of 5G will accelerate this process, and the ICT industry will see a rapid technological transformation. As technologies become increasingly complicated and networks more open, Huawei will work with all of our partners to build a secure, intelligent world for customers and users. This will allow them to easily and securely enjoy the conveniences brought about by technological advances.

(For further details, see pages 54 to 57 of this Annual Report.)

Trustworthy, High-quality Products

Huawei's products and solutions are used, securely and stably, in more than 170 countries and regions around the world, earning the trust of tens of thousands of customers. Today we find ourselves at the cusp of yet another great change. As cloud, intelligence, and software-defined everything become increasingly prevalent, demands are growing for trustworthy ICT infrastructure products. Trustworthiness is not just about producing quality results. It is about quality process – designing and creating products in an inherently quality way. Trustworthiness stems from verifiable quality – both in process and results.

Huawei will continue with broad quality management (i.e., ISO 9000-based total quality management). We are committed to ensuring that every ICT infrastructure product and solution we develop is completely trustworthy and of high quality. Some key areas we will work on include security, resilience, privacy, reliability, and availability. Our goal is to comprehensively enhance software engineering capabilities and practices and build trustworthy, high-quality products.

Business Continuity Management

As division of labor is common worldwide, more businesses and organizations, including those of our customers, have realized the importance of business continuity management. Over the past decade, Huawei has maintained its performance during major incidents like the tsunami in Japan, the flood in Thailand, the earthquake in Nepal, and ransomware attacks. This is one of the key reasons why more customers continue to choose Huawei as their partner.

Looking forward, Huawei will continue to improve our end-to-end business continuity management system for domains like procurement, manufacturing, logistics, and global technical services. This system covers the processes from suppliers to Huawei, and on to customers. This system can help ensure that all possible risks in our routine business operations are managed effectively.

(For further details, see page 47 of this Annual Report.)

Operational Compliance

It is essential to create a level playing field and maintain well-regulated business practices around the world. Therefore, trade compliance, cyber security, data and privacy protection, environmental protection, anti-corruption, and anti-bribery are drawing wider attention. These are also important issues that companies need to address in order to survive and thrive in the marketplace.

Operational compliance is the basic requirement for our company. We use the certainty of legal compliance to deal with the uncertainty of international politics. Legal compliance is the foundation upon which we survive, serve our customers, and contribute to the world. Huawei complies with all applicable laws and regulations of the countries and regions in which it operates, as well as any related international conventions. We have clearly defined compliance responsibilities, and selected, trained, and appointed compliance officers in all of our subsidiaries. We have also established oversight-oriented subsidiary boards to manage and oversee subsidiaries' operational compliance.

(For further details, see pages 48 to 50 of this Annual Report.)

Sustainability Footprint

Promoting Digital Inclusion

Digital technologies are valuable because they create new opportunities to connect and communicate, and improve the quality of our lives. They also offer unprecedented opportunities to revolutionize social and economic development and change the world.

Promoting digital inclusion is an extension of bridging the digital divide in the digital era. It is about empowering every person, home, and organization to access ICT without any barriers and using digital technologies to drive inclusive social and economic development.

Huawei has been investing in technological breakthroughs that make connectivity easier, simpler, and more cost-effective. We work with our customers to deploy our localized solutions around the world in order to transform the way people live and work.

According to the *2018 Huawei ICT Sustainable Development Goals Benchmark* report, ICT technologies will help address global inequality and realize sustainable development goals (SDGs) set by the UN. As a contributor to the ICT industry, we believe that ICT will play a critical role in driving the rapid attainment of SDGs. With ICT infrastructure widely available, individuals and businesses will be able to access more information and enjoy more convenience and higher efficiency.

Promoting Digital Inclusion with Innovative Solutions

Huawei develops innovative solutions to help countries meet UN SDGs. Huawei's RuralStar, PoleStar, and TubeStar solutions, collectively known as Three-Star, provide network coverage for 100 million people in rural areas. They also offer base stations that can make full use of the limited space in urban areas, saving about 800,000 square meters of floor space.

With the RuralStar solution, base stations are extremely simplified. Powered purely by solar energy, they can be installed on trees or wooden poles, and use 4G self-backhaul technology instead of expensive satellite or microwave technology. With the same amount of investment, this solution can provide twice the network coverage of traditional solutions.

The PoleStar solution helps build lightweight base stations. They can be installed on existing lamp poles, utility poles, and billboards. They do not require any additional space to be created for installation.

The TubeStar solution integrates an entire base station into a tube. It has the same capacity as a tower, but at a footprint of just two square meters, reducing the space required by 90%.



Innovative Three-Star solutions and applications

Huawei ICT Competition

Huawei is committed to driving education digitization. With our ICT-enabled information sharing platforms, we provide quality education resources that are both public and free to help more students learn ICT technologies and products. This will help bridge the education divide and promote education equality.

In 2018, the Huawei ICT Competition attracted more than 40,000 students from over 800 universities across 32 countries and regions, including China, the UK, Spain, Italy, Russia, Australia, Mexico, South Africa, Egypt, Saudi Arabia, the United Arab Emirates, Pakistan, and India. This event has driven collaboration between Huawei and universities on talent cultivation and helped build a global talent ecosystem.



Award winners of the Huawei ICT Competition

Making Products More Energy-efficient

Huawei builds sustainability into the product development lifecycle. During product design, we explore how to use innovative solutions to design more energy-efficient products. To adapt to future network technologies and evolving architecture, we have also created innovative power-saving solutions that reduce power consumption and carbon emissions.

Huawei's Hybrid Power Solution Helps Carriers Cut Power Consumption

Huawei's hybrid power solution integrates enhanced digital and AI technologies. In Africa, for example, the solution helped dramatically cut the total cost of ownership (TCO), making it possible to build wireless base stations in a more economical manner. In addition, this helped customers halve both their fuel costs and carbon emissions. After deploying the Huawei PowerCube 1000, a carrier in Ethiopia saw annual fuel savings of 12 million liters and annual carbon emissions reduced by 10,000 tons.



Huawei's hybrid power solution that helps build out networks in remote regions

By the end of 2018, the Huawei PowerCube 1000 solution had been widely applied across 93 countries and regions and provides telecom energy services for more than 130 carriers, helping Huawei earn customer trust and support. In the future, Huawei will continue to ramp up innovation and provide reliable and efficient hybrid power solutions that help carriers quickly deploy base stations and achieve greater business success.

At the awards ceremony of the 21st AfricaCom, held in November 2018, Huawei's hybrid power solution PowerCube 1000 received the Best Sustainable Power Solution award. The solution helps to provide stable power supply in a green, intelligent, and cost-effective manner and connect remote regions to the digital world.

Green Operations

Huawei is committed to ensuring our business is environmentally friendly. This is reflected by our low-carbon campus management. We have adopted initiatives to reduce our energy consumption and CO₂ emissions, such as implementing an energy management system, making managerial and technological improvements, and using clean energy. These efforts help us minimize the environmental impact.

In 2018, we referred to industry best practices and encouraged our campus management suppliers to manage energy more efficiently. This includes setting procedures and control parameters for any common facilities that have a major impact on energy consumption; identifying other variables that affect energy efficiency, like temperature changes and staff capacity; and setting and analyzing the parameters of the energy management system to ensure controls are effective. In 2018, we implemented more than 150 energy-saving programs on our campuses, saving over 50 million kWh of electricity and reducing carbon emissions by about 47,000 tons.

Using Clean Energy to Reduce Emissions

In 2018, Huawei continued with its clean energy plan. We actively worked with electricity suppliers and engaged with gas power plants that have clean energy capacity, which provided us with gas power to run our campuses. In 2018, we used about 932 million kWh of electricity from clean energy sources, representing an emissions reduction of about 450,000 tons.

We also estimated campus demand for electricity in 2019 and urged our electricity suppliers to negotiate with multiple gas power plants. We managed to purchase 1.19 billion kWh of gas power, which is expected to reduce carbon emissions by more than 560,000 tons.

In 2018, Huawei introduced over 800 shuttle buses to its campuses in China. These buses use renewable energy, replacing buses with diesel engines. This is expected to cut annual CO₂ emissions by about 32,000 tons.



| Statement regarding 2019 greenhouse gas emissions reduction

Circular Economy

During product design, Huawei fully considers how to fully utilize resources and maximize resource recovery, from manufacturing and recycling to reuse. We have worked with industry leaders and researched the dismantling and reuse of scrapped products. We have also categorized the materials that can be reused before reprocessing. This has increased the reuse rate of recycled products and components and reduced the amount of raw materials Huawei needs to acquire.

During product use, we fully consider customer needs. We have extended product lifecycles with cost-effective maintenance solutions and software updates. This has ensured that necessary support and maintenance are provided for legacy products and increased the use rate of Huawei products. It has also cut the use of raw materials and reduced the environmental impact of our products.

Building a Recycling System for Consumer Products

Huawei proactively fulfills our extended producer responsibility. We have developed a global recycling system for consumer products and offer consumers channels for recycling their used electronics products. This helps reduce the environmental impact, such as pollution, caused by scrapping electronic products. We have also organized recycling initiatives to give consumers a better understanding of Huawei's recycling channels, and invite them to participate in the recycling process. These efforts have contributed to a circular economy. By the end of 2018, we had more than 1,300 recycling stations in 48 countries and regions around the world.

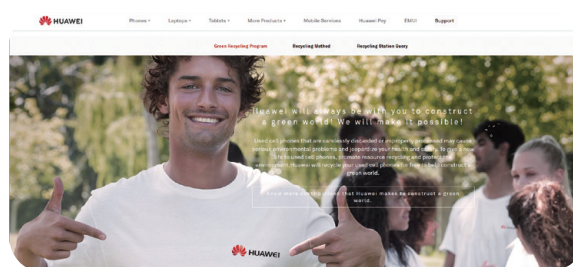
Recycling website in China: <https://consumer.huawei.com/cn/support/recycling/>

Recycling website outside China: <https://consumer.huawei.com/en/support/recycling/>

In 2018, we further scaled up our product trade-in program to lower the purchase cost of new products while increasing the reuse rate of old products. In China, we also introduced a new online program: credit-based recycling, where we give users coupons in return for recycling. We also established 193 new trade-in stations. Outside China, our trade-in program is available in nine countries, including Russia, Italy, Germany, and the United Arab Emirates. We recycled more than 140,000 phones worldwide through the trade-in program.

Online trade-in platform in China: <https://www.vmall.com/recycle>

Online trade-in platform in the UK: <https://www.hihonor.com/uk/tradein/index.html>



| Huawei's global green recycling platform

Caring for Employees

Dedicated, outstanding employees are Huawei's treasure and the source of our company's value creation. Huawei fully respects employees' interests. We create fair opportunities to enable employees to grow together with our company. We also create an efficient, comfortable, and caring workplace, in which our employees can receive reasonable awards while living a happy, rich life.

To prepare for the uncertainties around the world, Huawei has increased its investment in employee benefits and established a robust health and safety assurance system. In 2018, Huawei focused more on preventive healthcare and developed an integrated platform by pooling internal and external healthcare resources. This platform served as an umbrella of protection for Huawei employees around the world, providing them with access to different channels and healthcare services and more effectively protecting them from health risks.

Raising Employees' Health Awareness

To explore preventive healthcare programs, Huawei worked closely with its healthcare and insurance partners. We piloted a "health bonus points" program to encourage employees to do more exercise such as walking, jogging, yoga, and swimming. Participants could claim rewards with the points they collected. The awards are typically fitness products or services such as healthy meals, healthy drinks, and health insurance. The program was warmly welcomed by our employees, reinforcing Huawei's philosophy that everyone should care for their own health.



| Health promotion activities

Safe Operations

In accordance with ISO 14001 and ISO 45001 standards, customer requirements, and applicable laws and regulations, Huawei implements an EHS management system in all countries and regions where it operates. The system covers leadership, planning, organization and capability support, process operations, performance evaluation, and continuous improvement. Huawei's EHS guidelines are Safety First, Green Environment, and Caring for Employees. Based on these guidelines, we have established layered EHS management teams and systems, regularly detected EHS risks, established corresponding controls, and made ongoing improvements. We have also passed our EHS requirements on to the executives of our suppliers, with reward and accountability measures in place. This way, we were able to help our suppliers improve their EHS capabilities.

EHS Management in Project Delivery

We have enhanced EHS management in project delivery. Specifically, we actively embraced digital technologies to manage EHS risks. By monitoring key risks in real time, deploying pre-warning functions based on pre-set parameters, and taking measures in advance, we were able to prevent numerous risks. To drive suppliers to improve their EHS capabilities, we ran a supplier EHS capability development program, covering EHS leadership improvements, process management, capability assessments, reward and accountability systems, etc. To improve the EHS awareness and skills of operating staff, we developed an EHS video tutorial covering multiple scenarios. In addition, we used AI technology to identify EHS violations. We continued to nurture our EHS culture in order to improve the awareness of all employees.

In the meantime, we stepped up efforts to pass our EHS requirements for project delivery on to our suppliers. We held EHS Golden Seeds training for regional staff to teach them how to reduce EHS risks, prevent major EHS incidents, and prompt suppliers to improve their EHS capabilities. As a result, we developed best practices in supplier EHS self-management, which improved suppliers' leadership and self-management capabilities regarding EHS. In 2018, more than 140,000 Safety Passport holders were registered in Huawei's online system.



Indonesia's Manpower Ministry presents an award to Huawei

Developing a Healthy Supply Chain

Huawei has been working closely with suppliers to develop a healthy ecosystem and promote sustainability within the industry. In 2018, we continued with our Quality First strategy and integrated sustainability into this strategy. Sustainability was given more weight throughout supplier certifications, performance evaluation, and procurement decisions. We worked more closely with customers, suppliers, and industry organizations to improve the sustainability of suppliers through procurement activities. In addition, we rolled out more supplier training programs to encourage them to share and learn from each other, and drive suppliers to improve their sustainability capabilities, reduce risks, and make the supply chain more competitive.

Encouraging Suppliers to Quickly Adopt Best Practices through Peer Learning

We encourage suppliers to learn from each other through benchmarking. We seek to create a strong and competitive learning atmosphere where suppliers can learn from each other during competition. Each supplier has unique experiences and capabilities. We identified some topics that we and our suppliers were both concerned about and organized face-to-face workshops to discuss them. Experts were also invited to the discussions and online and offline learning groups were established. Through peer learning and benchmarking activities, suppliers gained excellent experiences and learned the best practices quickly and at a low cost. In recognition of this practice, Huawei won the Best Practices Award from the United Nations Global Compact Network China.



Peer learning and benchmarking session

Social Contributions

Huawei is committed to creating value for the communities where we operate. We collaborate and innovate together with our partners to continuously create positive impacts and solve economic, environmental, and social problems. We believe that the development of communications networks can connect the unconnected and make it possible to access information across borders. This will be conducive to local social and economic development. We also work with governments, customers, companies, and non-profit organizations to roll out projects aimed at giving back to local communities and protecting the environment. We expend a lot of effort into providing education opportunities and developing skilled ICT workforces. In addition, we make different types of donations to the countries and regions in which we operate. All these efforts contribute to the development of local communities.

Seeds for the Future Program

2018 was the 10th anniversary of Huawei's flagship program – Seeds for the Future. This program seeks to cultivate young people and acts as a bridge of communication between different countries and cultures. Through this program, Huawei shares ICT knowledge and experience we have gained during our global business operations and allows young people from different countries to learn about cutting-edge ICT technologies and related knowledge. They will, in turn, drive the development of local ICT industries and contribute to the progress of the global ICT industry.

By the end of 2018, more than 4,700 students from 108 countries and regions visited and studied at Huawei headquarters as part of the Seeds for the Future program.

For more information, please visit:

<https://www.huawei.com/en/about-huawei/sustainability/win-win-development/social-contribution/seeds-for-the-future>



| Seeds for the Future participants gain hands-on experience

For further details, please see the complete Huawei 2018 Corporate Sustainability Report.

Abbreviations, Financial Terminology, and Exchange Rates

Abbreviations

Abbreviation	Full Name
3GPP	3rd Generation Partnership Project
5GAA	5G Automotive Association
AAU	Active Antenna Unit
AI	Artificial Intelligence
AI	Alliance of Industrial Internet
API	Application Programming Interface
AR	Augmented Reality
ARM	Advanced RISC Machine
B2B	Business to Business
B2C	Business to Consumer
B2H	Business to Home
BBF	Broadband Forum
BCGs	Business Conduct Guidelines
BCM	Business Continuity Management
BG	Business Group
BOD	Board of Directors
BPA	Business Process Architecture
CAGR	Compound Annual Growth Rate
CCSA	China Communications Standards Association
CFO	Chief Financial Officer
CGU	Cash-Generating Unit
CNCF	Cloud Native Computing Foundation
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CPE	Customer Premise Equipment
CPU	Central Processing Unit
CSR	Corporate Social Responsibility
CUVA	China UHD Video Industry Alliance
DC	Data Center
DPO	Days of Payables Outstanding
DSO	Days of Sales Outstanding
DSP	Digital Signal Processor
EHS	Environment, Health, and Safety
EI	Enterprise Intelligence
EMEA	Europe, the Middle East, and Africa
EMS	Electronics Manufacturing Services
EMT	Executive Management Team
eMTC	enhanced Machine Type Communications
ERM	Enterprise Risk Management
ETSI	European Telecommunications Standards Institute
FC	Finance Committee

Abbreviation	Full Name
FVOCI	Fair Value Through Other Comprehensive Income
FVPL	Fair Value Through Profit or Loss
GDPR	General Data Protection Regulation
GIO	Global Industry Organizations
GIS	Geographic Information System
GIV	Global Industry Vision
GNTC	Global Network Technology Conference
GPO	Global Process Owner
GPU	Graphics Processing Unit
GSMA	Global System for Mobile Communications Association
GSPC	Global Cyber Security and User Privacy Protection Committee
HD	High Definition
HPC	High-Performance Computing
HRC	Human Resources Committee
IAS	International Accounting Standards
ICT	Information and Communications Technology
IDN	Intent-Driven Network
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IEEE-SA	IEEE Standards Association
IETF	Internet Engineering Task Force
IFAA	Internet Finance Authentication Alliance
IFRS	International Financial Reporting Standards
IFS	Integrated Financial Services
IIC	Industrial Internet Consortium
IoT	Internet of Things
IP	Internet Protocol
IPR	Intellectual Property Right
ISO	International Organization for Standardization
ISP	Internet Service Provider
IT	Information Technology
ITO	Inventory Turnover
ITU	International Telecommunication Union
KPI	Key Performance Indicator
LTC	Lead to Cash

Abbreviation	Full Name
LFDL	Linux Foundation Deep Learning
LFN	Linux Foundation Networking
LTE	Long Term Evolution
MIMO	Multiple-Input Multiple-Output
NB-IoT	Narrowband Internet of Things
NFC	Near Field Communication
NFV	Network Functions Virtualization
NPU	Neural Network Processing Unit
NSA	Non-Standalone
O&M	Operations and Maintenance
OCI	Open Container Initiative
ONAP	Open Network Automation Platform
OPNFV	Open Platform for NFV
OWS	Operation Web Services
OXC	Optical Cross Connection
PC	Personal Computer
POB	Performance Obligation
PUE	Power Usage Effectiveness
PV	Photovoltaic

Abbreviation	Full Name
R&D	Research and Development
ROADS	Real-time, On-demand, All-online, DIY, and Social
ROI	Return on Investment
SA	Standalone
SACA	Semi-Annual Control Assessment
SDC	Strategy & Development Committee
SDG	Sustainable Development Goal
SDN	Software-defined Networking
SLA	Service Level Agreement
SoC	System on a Chip
TCO	Total Cost of Ownership
TUP	Time-based Unit Plan
VoLTE	Voice over Long Term Evolution
VR	Virtual Reality
VRIF	Virtual Reality Industry Forum
WFA	Wi-Fi Alliance
WTTx	Wireless to the X
WWRF	Wireless World Research Forum

Financial Terminology

Operating profit

Gross profit less research and development expenses, selling and administrative expenses, plus other (expenses)/income, net

Cash and short-term investments

Cash and cash equivalents plus other current investments

Working capital

Current assets less current liabilities

Liability ratio

Total liabilities expressed as a percentage of total assets

Days of sales outstanding (DSO)

Trade receivables plus contract assets at the end of the year divided by revenue, and multiplied by 360 days

Inventory turnover days (ITO)

Inventories at the end of the year divided by cost of sales, and multiplied by 360 days

Days of payables outstanding (DPO)

Trade payables at the end of the year divided by cost of sales, and multiplied by 360 days

Cash flow before change in operating assets and liabilities

Net profit plus depreciation, amortization, exchange loss, interest expense, loss on disposal of property, plant and equipment and intangible assets, and other non-operating expense, less exchange gain, investment income, gain on disposal of property, plant and equipment and intangible assets, and other non-operating income

Exchange rates

CNY/USD	2018	2017
Average rate	6.6362	6.7453
Closing rate	6.8561	6.5222

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