ON THE RECORD

HUAWEI EXECUTIVES SPEAK TO THE PUBLIC

VOLUME Ⅴ

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Heroes are forged, not born.

During World War II, the famous IL-2 kept flying even after being riddled by anti-aircraft shells and machine-gun fire from other planes. Although badly damaged, it finally made its way back home.

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Ren Zhengfei's Interview with Sky News

August 15, 2019
Shenzhen, China

01 **Tom Cheshire, Asia Correspondent, *Sky News*: Mr. Ren, thank you very much for speaking with us. Right now, Huawei is probably the most controversial company in the world. Did you ever anticipate being in this situation?**

Ren: Maybe I would have anticipated this, maybe not. I could never have expected this controversy to be so intense though. We knew that if there were two teams climbing up the same mountain from opposing sides, we would eventually meet on the peak and we may clash. We just didn't expect this clash to be so intense and lead to this kind of conflict between the state apparatus of a country and a company. We could not have foreseen the intensity of this clash. We haven't yet patched up all holes in our aircraft, in our business. It will take us two or three years to patch all of them up, and we will need three to five years to fully revitalize the company. Of course, during this process, we will still grow gradually.

02 **Tom Cheshire: I read that, 10 years ago, you started preparing. Sounds like you did anticipate conflicts. Why did you anticipate conflicts specifically for Huawei back then?**

Ren: Our company has no desire for anything other than delivering better products and getting our work

done. We have only one goal and always stay focused. We believed that decades of heavy investment in one area would ultimately make us a leader. When we had hundreds of people, we charged at an opening in the city gate. When we had several thousand people, we still charged at the same opening. When we had tens of thousands, and now hundreds of thousands of people, we are still charging at the same opening together. We spend 15 to 20 billion US dollars a year on R&D, so we believe we may lead the world in this area. This will lead to conflicts with other leading international companies as well as some countries. Given all this, we knew we had to prepare, since that conflict was inevitable.

My personality is the kind that tends to compromise and give in. I am not that good at fighting. Over a dozen years ago, we planned to sell Huawei to Motorola for 10 billion US dollars. We had signed all contracts, but their Board of Directors didn't approve the deal. So we discussed whether we would continue with this business or sell the company. Our younger executives then all had electronics backgrounds and wanted to continue in this sector. I said we could easily sell the company and move onto other sectors, but they insisted that we continue working in the electronics sector. We voted and reached a consensus. When this decision was made, I told them, if we continued to work in this sector, we would definitely be in a race against the US in 10

years. We had to prepare. That's the process. That's also why we are not divided when we meet with such huge difficulties. Instead, we are more united than ever before.

03

Tom Cheshire: You talked about the intensity of the assault. I think the most important thing maybe was being placed on the Entity List by the US. What was the effect of being placed on that list? What's been the effect on your company, on your business?

Ren: First of all, please note that adding us to the Entity List was not fair. Huawei has not done anything wrong, but was still placed on this list. This list didn't have that much impact on us. As you saw in our exhibition hall yesterday, most of our more advanced equipment does not contain US components, despite the fact that we used their components in the past. These newest versions of our equipment even function 30% more efficiently than before. In August and September, we will undergo a run-in period before we can mass produce these new versions. So we can only produce around 5,000 base stations each month during that period. Following that, we will be able to produce 600,000 5G base stations this year and at least 1.5 million next year. That means we don't need to rely on US companies for our survival in this area.

Despite this, we will always embrace US companies. As long as they can continue to supply to us, we will continue to buy their components in bulk. Actually, some companies have already restarted their sales to us to the extent permitted by law and the size of our orders to them never shrinks. We believe globalization benefits everyone, so we won't adopt a closed approach even if we can make some components ourselves.

04

Tom Cheshire: On the consumer side of things away from 5G, if there is a British customer using a Huawei phone in a town in Basingstoke, say, they might be worried that the Android software is not going to update. They are not going to get a better experience. Will they get the same experience from their Huawei phone without the Android software, if there is no longer supply?

Ren: Google is a great company. We have a sound relationship with Google. We have signed many agreements with Google over the years. We still want to use Google's system in our devices and develop within its ecosystem. Because of this, we hope that the US government will approve the sale of Google's system to us. There are billions of Android system users and billions of Windows system users around the world. Banning one or two companies from using these systems won't

help ensure the security of the US as a country, so they should keep their doors open.

If the US doesn't want to sell the Android system to us, we will have no choice but to develop our own ecosystem. This isn't something that can be achieved overnight. We estimate that it will take us two or three years to build this ecosystem. In light of all this, we don't believe we will be able to become the No. 1 player in the device sector any time soon.

Tom Cheshire: Is that a way of saying that HarmonyOS, your new operating system, isn't ready yet to compete with Android and Windows?

Ren: We started designing and developing HarmonyOS seven years ago in order to address IoT issues as well as AI's potential contributions to society. Low latency is the biggest feature of our OS. There are numerous edge computing models around the world. The computing models used by different industries, like the electricity, automotive, agriculture, and tractor industries, are all different, so a different OS is needed to support these different models.

It would take us some time to adapt HarmonyOS to mobile phones. We are waiting to see whether the US government will allow Google to continue serving more people. We don't want to see another OS entry to the

market because Apple and Google are still dominating the global market in terms of software systems. But if the US bars Google from keeping Android open, then a third OS will have to appear, and it may threaten the US's global dominance. It's possible that a small newcomer might have a stronger drive than the reigning champion, and if this newcomer comes out on top, the US may be in a tight spot.

Tom Cheshire: Is that why you made it open source, so that it might actually outrun them, and the whole world might adopt HarmonyOS?

Ren: Yes. You may wonder why we have opted to go open source. There are numerous small companies around the world, especially in Europe. Since the Industrial Revolution, Europe, especially the UK, has produced a lot of talent. These people shine as bright as pearls, yet the value of such pearls is only fully realized by being strung together into a necklace. Open source is the string that connects the pearls in our ecosystem. This way, the value of these pearls from the UK can be shared with people in other parts of the world. This open source approach amplifies business value and gives a boost to the UK, Europe, and other parts of the world.

The problem with China, the UK, and Europe is that they don't have their own platforms. Without a platform, they can only innovate sporadically. Our HarmonyOS

is open-source and thus will be helpful for innovation in China, the UK, and across Europe. It could also be helpful for small companies around the world. Low latency is a big feature of our OS, which can deliver superior experiences.

05

Tom Cheshire: So Huawei is the string that runs through all these companies. I want to talk a bit wide about the conflict with the US. Your daughter was arrested in Canada, because of the extradition requested by the US. Can you take us through your reaction when you had that news?

Ren: The Meng Wanzhou case may not be a small case, and it can't be addressed just through small talks. We need to rely on the law and the Canadian legal system to resolve this case. Our lawyers have been working on this case, and we are waiting for their updates.

There is one trait my family members share, which is fussing over little matters but staying calm in times of crisis. We believe that when there is already a huge problem, it's no use trying to rush a solution.

Tom Cheshire: Did you speak to her? How is she now?

Ren: She is doing very well. She often goes out for coffee and eats Chinese hotpot, and she talks with

others in the restaurants. She isn't the kind of person who comes across as indifferent or keeps her distance from other people. When she's at a restaurant, she often chats with other people just like anyone else would.

Tom Cheshire: After she was arrested, two Canadian citizens were arrested in China. They have been held. They are not allowed to have coffee. They don't see anyone. This happened straight after she was arrested. Do you feel in any way implicated or responsible in the arrest of those two Canadians?

Ren: I don't know. Your question is about international relationships, which have nothing to do with us. The US has made groundless allegations to have my daughter detained. This is unfair. Canada isn't at fault. The US is using Huawei as a pawn for the China-US trade talks. Their plan is to detain my daughter, destroy my willpower, and benefit from all of this during the trade talks. Sadly, Canada has suffered because of this. I feel sympathetic to Canada. I have never and will never hate the Canadian government or the Canadian legal system for this. We will have this case settled according to laws. As to other issues, I don't know what the people you mentioned have or have not done, so how could I possibly judge whether there is any link between their arrests and my daughter's case? I'm not a government official.

Tom Cheshire: It does sound like that you think that your daughter's arrest and the extradition request are politically motivated rather than a purely legal process.

Ren: That's true. The US has sued us, which means they believe that we are legally at fault for something. So why are they including us in their trade negotiations with China? Isn't it true that in law, there is no room for political negotiation? Legal issues must be resolved through legal means. If an issue can be resolved through negotiation, then it's not a legal issue. If that was the case, then they shouldn't have sued us. They are contradicting their own claim to be a country governed by the rule of law.

Tom Cheshire: Why do you think the US has been so aggressive in targeting Huawei and your family?

Ren: Over the past few decades, people within Huawei tend to think of me as a person who easily compromises. This is because I'm not that aggressive and easily compromise within the company. In reality, I'm more of a figurehead instead of a demanding leader. The Executive Committee of our Board of Directors is the demanding leader. We established this management system by learning from the UK's constitutional monarchy. In the UK, a monarch's power is limited by the law, and the law lies in the hands of Parliament. In such a system, the monarch serves a primarily ceremonial role and does not

intervene in politics. At Huawei, I have the right to veto certain things, but I don't actually have much power. Because of this, the US may think it's easy to attack me. However, I'm much stronger than I had thought when backed into a corner. Right now, we would have no way out if we compromised. The only thing we need to do is ensure that Huawei can survive and thrive, so that we can better serve people around the world and create more value. This may mean that my family and I will need to make some sacrifices.

06 **Tom Cheshire: I want to talk about some of the US concerns, the perceived relationship between Huawei and the Chinese state. The first thing, I know you have talked about it before, but the National Intelligence Law in 2017, this law states that any organization shall support and cooperate in national intelligence work with the Chinese state. On an equivalent state, Chinese companies, public or private, must work with and be directed by intelligence agencies. That has been caveated, but why should we not just take this law as it stands in black and white?**

Ren: I totally understand the concerns about whether a Chinese company would fully comply with this law.

At the Munich Security Conference, Yang Jiechi, a member of the Political Bureau of the Communist

Party of China (CPC) Central Committee and Director of the Office of the Foreign Affairs Commission of the CPC Central Committee, made it very clear that the Chinese government never requires companies to install backdoors. Premier Li Keqiang then reiterated that position at the press conference held after the second session of the 13th National People's Congress in March 2019. When Premier Li visited our booth at this year's 16+1 Summit in Croatia, he directly told our staff not to install backdoors. They have made this commitment on behalf of the Chinese government. By doing this they have publicly announced how this law will be interpreted by courts in China. So we will follow their requirements not to install backdoors or engage in intelligence gathering activities.

Moreover, if we did something like what the US implies, our customers around the world would stop buying our equipment. This would be a huge financial hit to us. So we will never do something like that.

Tom Cheshire: I know Mr. Yang and Mr. Li have said these things, these politicians saying things. The law is there though in black and white. Why does this law exist, if it's not for the purpose of compelling Chinese companies to assist in national intelligence?

Ren: I don't know. I didn't participate in the legislative process.

Tom Cheshire: You have said that you'd shut the company down and go to jail rather than follow this law. At that point, can the Chinese government, even if you go to jail, still be in control of Huawei, as you say, your constitutional monarch, if the Chinese government wants to take over, sure they can take over?

Ren: It couldn't happen. We wouldn't do this kind of thing. If we did that, it would mean the end of our company, again, because our customers wouldn't buy our equipment and we would go bankrupt and cease to exist.

Europe has established its own cyber security law. Germany and the UK have also proposed laws that would bar all network equipment providers and carriers from installing backdoors. All will be treated equally. I totally agree with this proposal. As long as carriers and network equipment providers around the world promise that they don't install backdoors, then cyber security management will be made much easier. Right now it is only a proposal and hasn't yet become a law that applies globally.

We will continue to work more closely with the UK's National Cyber Security Centre, strictly follow the UK government's cyber security requirements, and make ongoing improvements. We will also follow the EU's cyber security law and the General Data Protection

Regulation (GDPR). We will meet these standards and restructure our networks to make them fully adaptive to the future society.

Information is managed by sovereign states, not by equipment vendors. In 5G networks, information packages are not opened when they are transmitted across base stations and access networks. They are directly transmitted to the core networks and are only opened there. Networks in the UK are managed and operated by UK carriers, not Huawei. Huawei only provides these carriers with a screwdriver, or a pipe. There are so many vendors around the world. Why is Huawei the only company that is being targeted? The UK's management and testing regime for Huawei is the world's most stringent, so they should have confidence in our products and services. Since everyone is looking at us, we will improve faster. We don't have the kind of problems you mentioned.

Tom Cheshire: I slightly disagree, because the UK government recently said, they do want a way to view encrypted messages, for instance, on Facebook. So there is this political move to weaken security, I think. If we think back the Snowden revelations, it was revealed that many Western companies were spying at the request of governments on users around the world. In many cases, they had been forced to spy

without users' knowledge. That has been made secret as a result of the law. Isn't it very naive to assume that China wouldn't ask the same thing as Western governments in terms of spying?

Ren: I can assure you that I won't allow backdoors on our equipment.

07

Tom Cheshire: The Chinese government often has quite opaque relationships with private businesses. How would you describe Huawei's relationships with the Chinese Communist Party?

Ren: First, we are obliged to obey Chinese law. Second, we are obliged to pay taxes. These are the only connections we have to the Chinese government.

Tom Cheshire: President Xi Jinping said at the 2017 National People's Congress that the Party is the leader of everything. Does that not include Huawei?

Ren: I may interpret this in a different way. An enterprise is an economic organization which needs to undertake its due responsibilities. If the Party is capable of managing all economic organizations, then there's no need to develop private enterprises. In that case, party committees will be enough to manage them, and even manager offices won't be needed. However,

China's experience over the past decades showed that this model does not work. That's why Deng Xiaoping proposed reforms and opening-up. This was a new model. Under the new model, party committees in enterprises are there just for educational purposes. They educate employees to work hard and refrain from immoral or illicit behaviour. They do not take responsibility for business management, though different enterprises may take different approaches.

Tom Cheshire: I understand that interpretation, and I'm not saying that when the Party leads everything, they are making business decisions, even if there are committees. I'm saying ultimately when it comes down to national security risks, the Party will intervene at that point. Do you agree with that? Or do you have a different interpretation?

Ren: That would be impossible.

08

Tom Cheshire: Since the conflicts between the US and Huawei began, what conversations have you had with the Chinese leadership?

Ren: None. I don't think it necessary to have such conversations. Otherwise, we would be falling into Trump's trap. Trump wants China to give up some interests in exchange for Huawei's survival. Why would

the Chinese government do that? We can survive on our own. The US cannot crush us, though we may be going through a tougher time than we have expected. China doesn't have to make concessions in China-US trade talks on behalf of Huawei. I don't want to cause Chinese people to get hurt by this. I'm much richer than most of them. How can I ask people with less than me to trade with Trump at their own expense, just for our benefit? I don't want us to be tied with China-US trade talks. We have made up our mind to overcome this difficulty on our own. We won't complain or ask for help, and we believe we will succeed.

You are the first foreign journalist to have visited the exhibition hall in our Ji Jia Center. Our technical departments used to stick to the strategy of keeping our exhibition halls closed to journalists, let alone taking pictures or filming them. They're afraid of our trade secrets being disclosed to our competitors. I don't think there is anything to hide if we stand strong. I think we should be open-minded. So now you are the first journalist in the world to visit our 5G exhibition hall, and you were allowed to not only photograph, but also film while touring around. We just want to show the world that we can still survive without the US's support.

We are confident that we will still be leading the world over the next three to five years. Whether we will

decline after that remains a question. If the US cuts us off from its science and technology, will we gradually decline just as the Qing Dynasty waxed and waned, if we fall behind the times in terms of scientific technology and theoretical innovation? Probably. Given the current situation, I hope Chinese scientists and research institutes can look past the academic bubble, because if the bubble continues to grow, it will stop people from doing serious learning.

To overcome our difficulties, we won't turn to the Chinese government for help. If we did that, it would benefit the US. Why would we do that? We can solve our problems by ourselves. Why would we ask the Chinese government to make any concessions for us?

Tom Cheshire: So they haven't been helping, but there have been a lot of interventions by the Chinese government, you know, a little bit of pressure on states everywhere to accept Huawei. Is that sort of pressure from the Chinese government helpful or unhelpful to Huawei?

Ren: It's not necessary. Seeing that Huawei is strong enough to make the US scared, some countries have concluded that Huawei's products are the most advanced in the world. They immediately bought large quantities of our equipment even without doing tests. This has resulted in a rapid increase in our contracts,

which is beyond my expectations. Now many people say my previous prediction that "we would see a drop of 30 billion US dollars in revenue" was wrong. Our revenue is actually growing very fast. So I don't want the Chinese government to try and help sell our equipment. If some customers don't want to buy from us, we won't try to sell to them for a while. First, Huawei is not worried about sales at all, and second, our component supply has become completely independent of the US. Next, we will work to replace complacent employees with new, hardworking talent.

Tom Cheshire: Just to get it straight, to sum up, the US government is actually being helpful to Huawei, while the Chinese government is being unhelpful to Huawei?

Ren: Without Trump's publicity, many people around the world would not have realized that Huawei's products are so advanced. So it is Trump that has created more market opportunities for us. After Trump said that Huawei's products were very good and posed a threat to their national security, some countries not allied with the US felt they should buy our equipment as soon as possible in case we sold out. Recently, visits by carriers to Huawei facilities have increased by 49%. They wanted to check whether we would be able to continue supplying to them. When they found out that our products don't need to contain US components, they became reassured

and placed large orders. But we need some time to complete this transition. We can only produce 600,000 5G base stations this year, and 1.5 million next year. After that, we will be able to ensure sufficient global supply.

09

Tom Cheshire: A last question related to this topic, am I right to think you are a member of the Communist Party here in China?

Ren: Yes.

Tom Cheshire: So that involves taking an oath. Some of that says you promise to be loyal to the party; work enthusiastically, and fight for communism all your life; you are ready at all times to sacrifice everything for the party and people; and never betray the party. Do you still abide by the oath?

Ren: Of course. But the oath aims to serve not only the Chinese people, but all humanity. In fact, the manifesto of any political party must aim to serve the people; otherwise, the party won't last. It is the same in the UK. Either the Conservative Party or the Labour Party has to claim that it serves the British people, or even all humanity. This is the foundation of any political party.

Huawei's ideal and mission is also to serve all the people of the world. For example, we operate under

harsh and desolate environments in Africa to serve the people there. These efforts are not to turn a profit, but to strive for the well-being of humanity. We are different from people on Wall Street who work for money. We work for ideals and this has yielded positive results. This means we have honoured our oath to the Party.

Tom Cheshire: I don't think the Conservative Party or the Labour Party makes their members take an oath. I think that's a very sunny interpretation. It says "never betray the party". It's about the party. Ultimately the party must come first. You have to choose between, the party, that oath, and Huawei. The oath must come first, surely?

Ren: Yes, the party's mission is to serve the people, and also all of humanity. How could we ever betray such a mission?

Later, I'll show you an article called A Man, A Cook, and A Dog which was written by a Huawei employee. It tells his story on the islands of Comoros which used to be extremely impoverished. Electricity there used to be available only for an hour every day. At first, he was our only permanent employee there, and only had a dog to keep him company. We later sent a cook to help improve his living standards. By reading this article, or talking with our employees in remote areas by video calls, you'll get to understand how Huawei employees

have been striving to work for our ideals and serve people all around the world.

10 **Tom Cheshire: Huawei has been in Shenzhen for 30 years. It's where you started; it's the home of Huawei. Just across the water in Hong Kong, we are seeing a very different situation from what we have ever seen in Hong Kong. What do you make of what's happening in Hong Kong right now?**

Ren: I don't know anything about what is happening in Hong Kong. I focus everything I do on improving product quality and ensuring the continuity of our supply chain in order to overcome the US campaign against Huawei.

The UK is a very friendly country, and the UK government has been very open-minded, whether led by David Cameron, Teresa May, or Boris Johnson. That's why Huawei has made huge investments there, and we have made contributions to the UK in at least two things.

The first was that we decided to support Arm more than 10 years ago when it was still a really small company. It was sold to SoftBank for 33 billion US dollars a few years ago, and thanks to Arm, the UK and Europe have their own CPUs.

The second thing was that we bought hundreds of acres of land in Cambridge to build an optical chip factory. It will be the most cutting-edge factory in the world. We believe the UK has a very favourable investment environment. In addition, it has cut taxes and is also a very open-minded country. The UK should not follow in the footsteps of a few other countries by trying to intimidate investors. If that happened, we would run away and stop investing there. They should welcome investors from around the world, as this will help the country become even more prosperous. I've always had a lot of confidence in the UK.

Tom Cheshire: I do want to talk about the UK; we will get to that very shortly. I know you've been busy, but there has been the news still about Hong Kong. Even not in the business capacity, but as a Shenzhen resident, as a Chinese citizen, just over the water, do you have any view about what's happening in Hong Kong?

Ren: I don't have any opinions on Hong Kong. I just hope that the airport will remain open, as people need to take a plane to go to school. I don't have other views regarding what's happening in Hong Kong.

China is a very stable country. The most important foundation for stability is an improved life for the poor. President Xi Jinping has been working hard to reduce

poverty since he took office. He requires the party secretaries of counties and government officials at all levels to take responsibility for poverty relief.

I have visited some poor places myself in my years. For example, Guizhou used to be the second poorest province in China, and Hezhang County was the poorest county in Guizhou. Things are completely different now. Hezhang runs large-scale production of a kind of thin, bunching onion. The onions are shipped out by air and so on to big cities like Beijing, Shanghai, Guangzhou, and Shenzhen. Farmers rent their land to cooperatives and are also hired by these cooperatives. I saw an interview with a farmer on TV, who said that he rented his land to a cooperative at a price of about 3,000 yuan per acre per year, and he was also hired to plant and process onions, through which he earned a monthly salary of another several thousand yuan. This way, farmers in poor counties have been lifted out of poverty.

I went to school in Zhenning County. Residents there were mostly members of ethnic minorities, and it was a very poor area. The party secretary of Zhenning once came to see me and told me that his county planted over 2,000 acres of ginger and a lot of plums, and had been lifted out of poverty. I once drove there to see it for myself, and I really felt that those poor regions had completely changed.

Tibet used to be the poorest province in China. However, after traveling there, I almost feel like the infrastructure in Tibet is better than Shenzhen's now. I even joked in Shanghai once that even their infrastructure is not as good as Tibet's. The roads in Tibet are also very good now. I recently travelled to Xinjiang, and it seems to be a very tranquil place. I drove along the Duku Highway, which was both quiet and beautiful. Travelling there was very safe.

China has lifted many people out of poverty. As people's lives improve, so do their levels of satisfaction. Why did the Colour Revolution never impact China? I think the reason is that the lives of the poor have improved, and people are more content. Their living standards may still not be high compared with those in some Western countries, but have improved significantly in recent years.

Of course, China is still working to lift more people out of poverty. China's 900 million farmers are increasingly happy about their lives. Urban citizens may face some difficulties because of high inflation and slowing income growth, but overall China is pretty stable.

Tom Cheshire: So when you mentioned the improvement of people's lives, people may be feeling their lives aren't improving. Is that why you think there

is that turmoil in Hong Kong, because people want more and they are not getting it, they are not seeing that improvement, and that's where the political unrest comes from?

Ren: I don't know what has caused the unrest in Hong Kong. What other countries say about China may not be correct. The Shenzhen municipal government has recently taken a lot of measures to cut taxes for small- and medium-sized enterprises. Taxes on low-income taxi drivers have also been cut significantly. That is really amazing, because it will prevent social instability caused by the widening gap between the rich and the poor. I saw the news about tax cuts in Shenzhen on the evening news, but I don't have a full picture of relevant policies.

The growing income gap between the rich and the poor is a fundamental reason for social instability. Capital monopolies, as they develop, may cause instability. In China, we need to guard against the widening income gap between the rich and the poor, and ensure that it doesn't become excessive.

11 **Tom Cheshire: What's your view of Boris Johnson as the UK's new prime minister?**

Ren: He is very capable and good at making decisions.

Tom Cheshire: Have you spoken with Boris Johnson about the coming decision on whether to let Huawei into the UK's critical infrastructure?

Ren: I think he is too busy at the moment. If he has the time and invites me to talk, I'll be willing to go.

Tom Cheshire: How important is that decision for Huawei as a company?

Ren: I thinks it's very important. I noticed that the third day after Mr. Johnson took office, he said that the UK should deploy 5G nationwide as soon as possible. I think this is a wise decision, because speed determines a country's economic development. Of course, Huawei is not the only vendor of 5G equipment, and other companies can also provide good 5G equipment, although Huawei's is better still.

Let me share a story. China used to be an agricultural country, and its army was generally made up of infantry. This meant they were unable to defeat the mounted warriors of their tribal neighbours. Over 2,000 years ago, when Emperor Wu of the Western Han Dynasty went on expeditions to the west, his tactic was to arm his forces with strong horses, because cavalries had a greater advantage in battle. China was conquered twice by the cavalries of its tribal neighbours. In the 18th century, the Industrial Revolution began in the UK, resulting in

the inventions of trains and steamships. This greatly advanced industrial civilization. At that time, however, China was still an agricultural civilization that mainly relied on carriages as its major means of transportation. Therefore, speed determines national strength and economic development. If the UK increases information transmission speed through 5G, they will be able to seize the high ground of AI.

The UK must attach great importance to the development of 5G networks. According to what the new PM said, the UK will strengthen its rollout of optical networks. They should widely deploy optical networks in large cities. However, optical networks are not necessary for small- and medium-sized cities in the UK. That's because 5G can replace optical networks in these cities.

Tom Cheshire: So, from what you said, 5G is a good thing. In regards to the UK's decision about allowing Huawei into critical national infrastructure, are you hopeful that the UK government, under this new Prime Minister, will allow Huawei into critical national infrastructure?

Ren: I am not speaking on behalf of Huawei. I don't think there will be any issues, no matter which vendor the UK chooses for its 5G. The Prime Minister has proposed to speed up the rollout of optical networks and 5G networks. This is an important decision for the

UK, which will help it seize the strategic high ground of this information revolution. The UK must widely deploy optical networks in big cities, because the radio frequencies in big cities are not currently enough. However, in small- and medium-sized cities, 5G can be used to replace optical networks and function as wireless telecom equipment. We can provide the equipment they need, and so can other vendors. Other vendors can also provide very good equipment. The UK government and carriers can make comparisons and choose whichever vendors they believe to be the best. Objectively speaking, I think 5G is critical to the UK.

Currently, South Korea is the most advanced country in terms of 5G deployment. So far, Korean carriers have secured over two million 5G users within just four months.

12 **Tom Cheshire: Okay, so do you think Huawei should be involved and should be allowed in every part of the network?**

Ren: Of course. The UK has conducted the most rigorous reviews on Huawei's products. Our products have been "dissected" by many carriers around the world, and the UK's "dissection" has been the most thorough of all. Therefore, they should have confidence

in Huawei. However, I think the UK can still compare our products with those of other vendors, so that they can identify which ones are the best.

Tom Cheshire: Isn't that telling us that Huawei has, for a long time, had this rigorous testing, had these labs in the UK, as well as all these reports. But there are still doubts, there are still delays with decisions, and senior politicians, senior members, the premium administrations still didn't trust Huawei?

Ren: It is impossible to make everything perfect, without any defects. The more we innovate, the more defects there will be. As long as we comply with the UK's requirements and continue to address any issues or defects that have been identified, we can become a qualified UK supplier. That's why we are willing to work hard and step up our investments.

The Industrial Revolution was first started in the UK, and has become a key part of the UK's DNA. In the future, AI will be in dire need of 5G networks. When AI becomes a reality, even a small workforce will be able to produce a large number of quality products.

The UK doesn't have a large population, but it will be able to shine again. An important reason for this is that tax rates in the UK have become much lower. When it comes to digitization, the UK should remain unaffected

by ideology and politics, and work to advance its digitization agenda. If the UK government does not trust others, they could strengthen their oversight. This is the only way for the UK to stay on the fast-track to economic growth.

Tom Cheshire: If the UK does say no to Huawei in this decision after all this testing, it's pretty damning for Huawei?

Ren: We are confident that they will not say no if they really take the tests seriously. They might say no, but I don't think it would be to us.

Tom Cheshire: If you were talking about the strict testing, then we talk again about the political pressure from the US. Mike Pompeo, the US Secretary of State, met with our new foreign secretary in Washington, and John Bolton, the US national security adviser, came to the UK to speak to Boris Johnson, the most senior US official to do so. Afterwards he said, the UK government is going to look at Huawei from square one – they are going to start from the beginning. Do you think the US is putting pressure on the UK government? Is the US interfering in UK affairs?

Ren: The US is putting a lot of pressure on many countries around the world, but how many countries have they convinced?

We are not particularly concerned with which countries buy our products. Our main concern now is that our supply will be unable to meet demand.

We have spoken with our carrier customers in China and hope they can understand that we need to ship equipment to overseas customers first at this critical time. This is because it takes time for a new product to enter mass production, and we can't produce such large amounts of equipment at the moment.

We told Chinese carriers that we would ship more equipment to them next year, because there are currently many customers buying from us, contrary to what many currently believe. We are not afraid because some important people keep advertising Huawei all over the world.

13 **Tom Cheshire: Part of Boris Johnson's new government signature policy is Brexit. Is Brexit a good idea or is no-deal Brexit a good idea?**

Ren: I am not a politician, so I don't know much about Brexit.

Tom Cheshire: You said in an interview in May with Chinese media, talking about your veto on the board, and talking about democracy within Huawei. You

said, "If we allow voting as the British did, the fate of Huawei might be ruined as a company." You're saying that Brexit would ruin Huawei, so you do have a view on this?

Ren: My right to veto was supposed to expire at the end of 2018 when our transition to new leadership was completed. I had planned to give it up when that date arrived. However, in 2016, the UK had a referendum on its EU membership. They voted to leave the EU. That's it.

Huawei's leadership in governance, including the Representatives' Committee, the Board of Directors, and the Supervisory Board, are elected by shareholding employees in a democratic way from bottom up. We were afraid that if our employees had a sudden vote one day, the company would face great twists and turns. Therefore, I retained my right to veto, which can be conferrable. However, this right will not be passed to my family members, but to the seven elite members who will be selected among our senior management.

They will be partially retired by then, so they will be fair while exercising the right to veto. A tenure system will then be adopted for these members. Their terms of office, which may be iterated, can be four or eight years.

These members, as a group, will be conferred with the right to veto on major matters. They are the most

senior leadership who have left the Board of Directors and the Supervisory Board, and they will exercise the right to veto as major shareholders. This will prevent the company from making wrong decisions on major matters by simply acting on the wishes of employees. We should not allow major changes to the company to be based purely on what employees desire.

Tom Cheshire: As an example, you saw the referendum we had about leaving the European Union. And you decided not to enable full democracy to stop big mistakes on major matters. Does this sound like you think that the Brexit was a big mistake on a major matter?

Ren: No, that's not what I meant. What I said just now is that we should extract lessons from the UK's decision-making process when establishing our own systems. I didn't comment on whether the UK should leave the EU or not.

14

Tom Cheshire: Beyond the UK, there are other issues alongside the relationship with Chinese state. One of the things that keeps coming up is about the theft of the intellectual property. Has Huawei ever engaged in an IP theft?

Ren: No. The company has strict rules, and we've never stolen any intellectual property. We have a large

amount of cutting-edge intellectual property, and we are an industry leader in this regard. We have respected IP protection since we started the company. Even when this interview is finished and you release the video in the UK, we will pay all copyright fees required for any rebroadcasting we want to do. We obviously can't rebroadcast your video without paying for the copyright. So in addition to IP related to technologies, we also pay a lot of attention to IP protection in other aspects. We proactively observe all related laws and regulations.

Tom Cheshire: You are very welcome to use our video. But with things like the Motorola case in 2007, Cisco in 2003, and Tappy, the T-Mobile robot, these are all pure inventions. A lot of these cases have been settled. But I believe Huawei admitted to copying some source code for routers. These things do keep happening, so it does seem like there's a small problem here?

Ren: First, these kinds of judgments are made by the courts. Recently Cisco has also used our code. A lot of code is publically available and can be accessed online. When programmers downloaded a bit of code online, it does not create problems.

15 **Tom Cheshire: You mentioned Xinjiang earlier. You mentioned that it had become stabilized. A lot of people are worried about what's happening in**

Xinjiang. The first question is that is Huawei supplying equipment, software, or expertise to authorities in Xinjiang?

Ren: As a communications equipment provider, we sell equipment to carriers and relevant companies. However, it's the carriers who decide how to use the equipment. Similarly, carmakers sell cars to anyone, and so the cars they've sold may be used for different purposes. I suggest that you also visit Guizhou, Yunnan, Tibet, and other regions in China inhabited by ethnic minorities, and take a look at the situations for yourself. You should visit these places in person. I may not be able to explain everything clearly to you.

Tom Cheshire: We've been to Xinjiang. We've seen it with our eyes and felt it. Do you approve of the government's policies in that region?

Ren: I am not familiar with government policies in Xinjiang. I only know the overall living standards there are improving. The only way to guarantee social stability is to eliminate poverty. In regards to specific policies, I am not very familiar with them. I am not a politician, and I don't study policies. My knowledge about Xinjiang is based on what I experienced on vacation there. I visited farm houses and listened to the farmers' stories.

16 **Tom Cheshire: You talked about cars, like supplying cars to people, and this is a more general question. Do you worry that when you supply technology, it might be misused by governments, especially by authoritarian governments, wherever they are around the world, especially when it comes to things like big data and AI? Are you concerned about how governments will use your technologies, all the types of technologies you have?**

Ren: We don't sell equipment based on what countries the carriers come from. Governments hold sovereignty over their country. There are lots of different types of governments around the world: monarchies, democracies, republics, and so on. We won't interfere with other countries' internal affairs. If we decide to sell equipment to some countries and reject some others, that essentially means we are taking a political stance. Sovereign states have the right to decide how to use the equipment.

17 **Tom Cheshire: Your experience as an entrepreneur growing up in China, during an era that experienced the great leap forward, the Cultural Revolution, reform and opening up, how did those shape you as an entrepreneur? And how did they shape Huawei as well?**

Ren: I matured and such experiences made me less naïve.

Tom Cheshire: And in terms of Huawei's culture, how does that reflect, that maturity and lack of naivety?

Ren: Huawei is now full of vigour everywhere. Employees are free to criticize me and the company in our Xinsheng Community, and we do not consider those who criticize us to be bad people. Our Human Resource Mgmt Dept will check whether these employees' criticisms of us are valid. If they are valid, the department will further check whether these employees have been high performers during the latest three years. If they have, these employees will be transferred to work at HQ for six months and then be assigned back to operating teams. This has made our corporate culture flexible. People outside Huawei might think that there is chaos at Huawei when we are attacked. However, as you can see here on our campus, there's no chaos. Instead, you only see our employees working diligently. Such a relaxed environment enables employees to speak out when they see things unpleasant and then become relieved.

Tom Cheshire: It feels like one word to describe Huawei, one noun, would be toughness. That analogy of the plane, you talk about this conflict, getting to the top of the mountain, being tough seems to be, maybe the most prized attribute of Huawei.

Ren: You're right. Before Trump's attacks against us, Huawei was like a plate of loose sand. That was because many employees were very rich and didn't want to go to work in hardship regions. They just wanted to stay where they were. The company was too big to manage as well, so it was in a shaky and unsteady state. However, the US's attacks against us activated this organization. If employees work hard, they are likely to grow in the company. Otherwise, they might have to leave. I would like to thank Trump for activating our company.

18 **Tom Cheshire: Is there anything else you'd like to add? Anything you'd like to say to the people that are watching at UK, including Boris Johnson, but also around the world?**

Ren: First, I have high respect for the UK. The country has made outstanding contributions to the world over the past several hundred years, especially during the Industrial Revolution. The British are known for global expansion, through which they brought their advanced culture and industry to different parts of the world. Today, two-thirds of the world's population are using English in one form or another. This shows the tremendous contributions that the UK has made to the world. Without a unified language, it would be impossible to modernize the world. Today, English is the

world's most universal language. The UK has spread the elements of its modern civilization like industry and culture across the world, so I think the contributions the UK has made to the world are really great.

Second, the key characteristics of the UK lie in its institutional development, which has made significant contributions to the world history. The Glorious Revolution in the UK was a peaceful revolution, which was also known as "The Bloodless Revolution". In the 350 years that followed, there were no major internal conflicts within the country. The UK has adopted a constitutional monarchy. Under this system, the monarch serves a primarily ceremonial role and doesn't intervene in politics, thus allowing Parliament to leverage its collective wisdom. The development of the UK provides a new model for the world. Revolutions often cause much damage to society. It is not just about casualties. The damage can be so severe that it cannot be repaired, even over several hundred years. I think the path that the UK chose has been very successful. The UK pays a lot of attention to standardisation, but it lacks one thing, innovation. The US has inherited the attribute of standardisation from the UK, because a great many Protestants migrated to the US. The US had been expanding too rapidly, so it couldn't control its end points; however, this left room for innovation. As a result, the rise of the US has been even faster than the rise of the UK.

Third, the UK should become a role model in the information era, as it has some of the greatest educational and cultural systems in the world, despite a small population. Looking ahead, the UK should focus on developing AI. Super-fast computing and super-large storage, which you can buy, are important for AI's development. But super-fast connections are more important. Fibre and 5G can provide super-fast connections. The US doesn't have super-fast connections, because it is still using cables for most of its networks, which provide low-speed connections. If the US wants advanced fibre networks, it would have to invest another 500 billion US dollars. The US also needs to invest heavily in 5G. The US is rejecting advanced 5G, so it has encountered big obstacles for AI development.

The UK must seize the opportunity to develop AI. At Huawei, we have a lab called the Turing Lab. Turing was a British mathematician, and the father of AI, over 80 years ago. The UK is also a world leader in genetic engineering. If electronics technology is combined with genetic engineering, will that create an even bigger industry for humanity? What if genetic, electronic, photon, quantum, and AI technologies are all combined? Then we will see a world that we can hardly imagine.

The UK must seize this historical opportunity and leverage AI to amplify the effects of its small population.

This will allow it to once again become a major industrial power. The British people are polite and well-educated, and they have everything that is necessary to make this happen. In the traditional industrial era, large-scale industrial manufacturing couldn't be achieved through automation and informationization. As a result, industries had to be moved east to countries with larger populations. You have visited our production lines, where we use a little bit of AI, but our reliance on manual labour has significantly reduced.

The UK should develop vigorously and become a role model for the world, encouraging people to focus on increasing productivity. The best goal for a country is to make its people rich and prosperous. I would like to convey my best wishes to the UK and I have complete confidence in our investments there.

Ren Zhengfei's Interview with The Associated Press

August 20, 2019
Shenzhen, China

Joe McDonald, China Correspondent, *The Associated Press*: Thank you, Mr. Ren, for seeing us. We understand you're very busy, so thank you for giving us this time.

Ren: I'm also very glad to see you, because you are giving us an opportunity to share our situation with a wider audience.

01

Joe McDonald: Last night in Washington, the US government announced it's going to postpone this Entity List by 90 days. May we ask your reaction to this? What difference will this 90-day extension mean to Huawei? You know, how much does the company still need the American products and components that will be affected by this Entity List?

Ren: This is a good thing. Both sides need to think it over cool-headedly though.

First of all, the US should weigh in on which party stands to lose more: Huawei or the US companies. They really need to do their research and then consider whether to keep us on the Entity List.

I am always an advocate of globalization. This is because globalization enables optimal allocation of resources and stands a better chance of delivering high quality services to customers around the world.

The globalization we have achieved today was hard won through decades of collaborative efforts. A further divided market is not in the best interests of the US, because the US is currently the world's most powerful country and has the biggest vested interest in the global tech sector.

Second, whether the temporary license is extended will not have too significant an impact on Huawei. From 5G products to core networks, we can do well without relying on the US. Yesterday, you must have seen our whole series of products that no longer contain US components. We need a short period of time to switch over and ensure run-in of these newly designed circuit boards. Following that run-in period, our production capacity will soar.

The biggest impact of the Entity List would be on our consumer business. There are billions of Android system users around the world. Banning Huawei from using this system will not ensure the US's national security. If the US still wants to ban us from Android, we may need to work on our own backup plan. Google is a great company and we have signed many agreements with them in good faith over the years. We want to continue using their products. If we are allowed to do so, we are more than willing to help extend the use of this US technology around the world. But if Google or Microsoft

cannot continue to provide their systems to Huawei, then it is possible that there will have to be a third system to replace theirs. No one can be certain that this third system will fail. If this system does succeed, it will pose a big threat to the US.

What's happened over the last few months has proven that the Entity List won't crush us. Huawei can definitely survive and thrive. Is this what they wanted when they added us to this Entity List? They might not get what they wanted. China and other countries will produce alternatives. In the future, US products may not be able to enter markets using these alternatives. If this happens, their market size will shrink, which will weaken their financial performance. We don't want to provoke confrontation. We still want to buy US components, despite the fact that we can mass produce alternatives ourselves. We want to reduce our own production and buy from the US, because we want to contribute to the prosperity of humanity together with the US companies.

02 **Joe McDonald: You've been talking to foreign reporters a lot this year. For a long time you did not talk to reporters. I assume that your goal in talking to reporters this year is to repair Huawei's reputation abroad and to improve operating conditions in the face of this pressure from the United States. Do you think**

it's working? Do you think conditions are improving for Huawei? Do you think you're repairing your reputation?

Ren: Your analysis is pretty much correct. I came forward to show who we really are during this time of crisis. When the US added Huawei to the Entity List in May, most people, including those from the media and other companies, thought Huawei was doomed. Some believed that Huawei would survive for more than two or three months, and that when our current inventory was used up, Huawei would collapse. As I met with more and more media outlets, many believed I was just trying to conceal how poorly prepared we were. Over the past six months, roughly 2,000 journalists have visited our campuses. When they saw how Huawei was actually doing, they came to realize that Huawei is still alive and its productivity is increasing. In the beginning, media coverage of Huawei was very negative, but then it started to improve slowly, and now it is almost good. This shows that what we have been doing has worked. If I were to only speak with the media, and not allow you guys to see firsthand how we are doing, I don't think our credibility would be very high.

03 **Ken Moritsugu, Greater China News Director, *The Associated Press*: I want to ask going back to your**

daughter's detention in Canada in December and then coming through the six or seven months of this year and the tensions with the US on trade and the Entity List. In your time running Huawei, is this the biggest crisis you've felt as a company? Or have there been other crises in the past that you would say similar?

Ren: Actually, there have often been crises over the last 30 years. If it's not this crisis, then it's that crisis. Sometimes a particular crisis would be big enough to endanger our very survival. The crisis created by the US was a big blow to us, but its impact has not been too significant. In the past, we had no talent, technology, capital, or market share, and we had no clue whether we could survive the next day. Those crises might have been more severe than the one we are facing today. Regarding this current crisis, we are likely to overcome it, because our business has grown to a certain scale and we have developed our capabilities. Therefore, I don't think this is too scary.

04 **Joe McDonald: President Trump has suggested that he might go easy on Huawei or drop the Entity List and also that he might improve conditions for your daughter Meng Wanzhou, if the Chinese government agrees to make some trade agreement with the United States. What's your reaction to this? Do you**

think Huawei is just a pawn or bargaining chip in this? How do you feel about the American President talking about your company this way?

Ren: It sounds like a good idea if this pawn can help solve the problem between the two countries. However, I will not push the Chinese government to make concessions for the benefit of Huawei, because trade is something governments should handle, not businesses. Despite the current US campaign against Huawei, we still have sufficient funds to help us get through the difficulty. Many people in China are still very poor. So as a matter of conscience, I could not accept it if the government had to sacrifice the interests of those poor people for the benefit of Huawei. I would rather withstand attacks for a couple more years and my daughter to suffer more, than let China concede something to the US for Huawei's benefit. In fact, the US should realize the standard of living for many people in China is still very low.

So I will never ask the Chinese government to make concessions so that the US would go easier on us. If the US does not ease up, Huawei might grow slower and Meng Wanzhou might have to stay longer in Canada and suffer more. But I would rather accept this because it is in the interests of China and the Chinese people. If the Chinese government makes many sacrifices for

Huawei's survival, I would feel indebted to the country.

If some people in the US say, "Ren Zhengfei can spend some money to improve the situation for Huawei", they are right. That is something I might consider. If some people in the US say our 5G technology poses a threat to the US's national security, then I'm open to discussing the possibility of transferring our 5G technologies and production techniques to US companies. Then they can develop their 6G based on our 5G and speed up the process of their technological development. I'm open to all of these possibilities because we will sacrifice our own interests instead of the interests of the Chinese people. Otherwise, people will curse at me on the street.

05 **Joe McDonald: You mentioned people who say that Huawei or 5G might be a security threat. What additional things can Huawei do? Or what additional things is Huawei planning to do to reassure the United States and Australia and other governments that its technology is safe, is not a threat in order to gain access to their 5G markets?**

Ren: I think if the US and Australia haven't been convinced that 5G is nothing more than an advanced tool and if they still have security concerns, maybe it's

best for them not to buy Huawei's 5G technologies or products. They can decide whether to buy from us after all the other countries have proven our products pose no threats. By doing this, they will not feel as worried. I personally see 5G as just a tool to support the future adoption of artificial intelligence. So the tool itself is not a security concern.

If you look into this tool further, data in 5G networks will be aggregated in core networks. These networks are owned by the telecom carriers of sovereign states. These carriers are subject to the laws of those states in which they operate, and their data is governed by local laws. There are no security issues there with 5G.

Although we currently think that we don't have any security issues, we are still working hard in that area. Huawei has grown from a small company to what we are today. Our software may not be perfect, but we will continue to improve it. This of course involves ensuring cyber security and privacy protection across entire networks. With privacy protection, for example, we are fully compliant with the EU's General Data Protection Regulation.

06 **Joe McDonald: We've seen over the last three months protests in Hong Kong. We're wondering how these**

protests affect Huawei. I mean it's the next city over, adjacent to your HQ city, and Hong Kong is an important business center for you. What effects are these protests having on Huawei and what effects are they having on US-China relations and tensions in a way that might affect Huawei?

Ren: China operates based on a "one country, two systems" principle in Hong Kong. The problem as we see it is not as simple as a next-door-neighbor problem. Unlike two adjacent cities in the mainland, there's still a border and customs between Hong Kong and Shenzhen.

In terms of the "one country, two systems" policy, Hong Kong works under a free capitalist system while China's mainland works under a socialist system. These are two completely incompatible systems. For Hong Kong, the legal system gives people the freedom to demonstrate. That's understandable. There has been some violence recently, which is in nobody's best interest.

The protests in Hong Kong haven't had any impact on our business. We are still focusing on our production and are patching up the holes in our bullet-riddled plane so that it can return home safely. Right now, we are primarily concerned about whether we will continue to survive under the current US sanctions against Huawei. We are not concerned about what is happening in Hong Kong, nor will we analyze it. We are working to find out

more about how the US's Entity List affects us and how to improve our production.

07 **Joe McDonald: We're also wondering about Huawei's technological future. What do you see as the most important emerging technologies that have not been developed yet? What do you see as the priority areas for Huawei to develop?**

Ren: I think the future of emerging technologies is about intelligent computing and evolution from intelligent computing to artificial intelligence. 5G is just a supporting platform that lets artificial intelligence deliver low latency and high bandwidth. It is a tool rather than a result.

08 **Joe McDonald: How is Huawei changing its research and development in response to US pressure? Are you acting as if the Entity List and restrictions will become permanent and you will have to produce your own components? In what areas does Huawei think that it has to become self-reliant or ensure it is no longer dependent on American suppliers? And how is it trying to accomplish that?**

Ren: It's unlikely that the US will ever remove Huawei from the Entity List, because no one in the US will

take a stand to get us removed from it. It seems that attacking Huawei in the US is politically correct and that the US has every reason to give Huawei a hard time. Any American who voices their support of Huawei, even once, would probably find themselves under attack by many. So we are mentally prepared for staying on the Entity List for a long time to come.

In the short term, we will work to fix the areas that need to be fixed. In the long term, we should be far-sighted, strengthen international cooperation, and firmly support division of labor and cooperation under the globalization framework. We must achieve success in emerging technologies like artificial intelligence and cloud. If we aren't successful in these areas, we might become sidelined or just die out. If the US cuts its tech sector off from China, it may be difficult for us to access some advanced US elements. In that situation, will Huawei start to fall from the top? Probably. This is where Chinese scientists and research institutes will come into play.

09 **Ken Moritsugu: I'm wondering how much this Entity List and the pressure on Huawei from the US have changed Huawei's strategy. Last year, before this happened, I think most people were talking about 5G rollout. That was the big Huawei story and here's what's coming next. Now, we're talking about**

the Entity List, the need for Huawei to reduce its dependence on US suppliers. How much have you or Huawei had to change the strategy of the company? And how is that affecting the company and its future?

Ren: The Entity List has not impacted our strategy; rather it has helped it. It has led us to give up on some marginal, unimportant products so that we can focus our resources on core products. In the past, we couldn't control budget allocation among entry-level teams, and as a result, we worked on peripheral products, but now we've made up our mind to axe them. To do this, we implemented a transformation across our R&D functions, during which 46% of R&D departments were removed. The outstanding employees from these departments were relocated to our core product lines. This way, we will only become more competitive in our core products. You visited our exhibition hall yesterday and saw our products with your own eyes. If you have an opportunity to visit other companies and make a comparison, you will come to understand why we are so confident in our global leadership.

The Entity List will not crush us as the US hopes. By adding Huawei to the Entity List, the US wanted to kill off Huawei. But we are not dead; in fact, we are doing even better than before. This is not what they were hoping for, and the Entity List has not affected us as

much as it has affected our US partners. They used to supply us with several hundred million or even several billion dollars' worth of components and were suddenly not allowed to do so. Their short-term financial results will surely be significantly impacted and their losses will be felt. After all, stock prices matter a lot to Wall Street.

I think the Entity List hurts the US a lot more than it hurts us. While it should be revoked, I don't think it is likely. So we are prepared for a situation where we will be on the Entity List for a long time.

10 **Joe McDonald: You mentioned 5G earlier. How much does Huawei depend on American components or technology for 5G and how will the Entity List affect that and Huawei's ability to sell 5G products? Just products, any 5G technology?**

Ren: Huawei's 5G products and core networks don't depend on US components or technology.

Joe McDonald: So either Huawei makes everything itself, or it has non-American suppliers?

Ren: We basically make everything ourselves. However, this is not our purpose. It is only a solution for the current period. Our ultimate purpose is still to provide advanced services for humanity through reasonable

division of labor across the globe.

11 **Joe McDonald: I would like to ask about the foreign workforce at Huawei. Huawei is unusual among Chinese companies in that it has a large number of very advanced technicians and specialists who are not Chinese. What advantage does Huawei get by having foreign employees instead of an entire Chinese workforce? And what difficulty or what burden does that place on the company?**

Ren: When different countries, nationalities, and cultures come together, collisions happen, but these collisions can be mutually beneficial and generate a lot of vitality. Our foreign employees have helped create a diversified culture within our company, giving our products a leading edge around the world. Today, the US is the world's most advanced and most developed country as well as the most powerful country in terms of technology. A critical reason behind this is that the US is an immigrant society, which has attracted countless brilliant minds from around the world. Of course, Huawei is far less diversified than the US, but our foreign employees can serve as "gamma globulins" to inspire changes to the mindset of our current employees. So there are many advantages to hiring foreign workforce.

We are also working to increase the percentage of local hires in our overseas offices. Since it may not be easy for Chinese employees to adapt to overseas work environments, we now prefer hiring local employees to sending more Chinese staff overseas. This is more cost-effective, and more importantly, this creates jobs and cultivates talent for local communities.

Joe McDonald: Some people abroad are uneasy about Huawei and they say there are some questions about who controls the company or who makes decisions. For now, in the very top layer of people who make decisions, the board and the CEO level, all are Chinese citizens. Would Huawei consider adding non-Chinese members to the board of directors or appointing a non-Chinese chief executive as a way of increasing the trust of foreign countries? And if you don't think that's possible, why do you think it's not possible?

Ren: I think our foreign employees must first have the right skillset before being placed in a top management position. Besides, such foreign employees must have worked at Huawei for at least 25 years. This is because I believe a senior executive should start from the very bottom of the company and climb their way up the career ladder step-by-step to gain a comprehensive understanding of how the company works. Some Western companies change their CEOs frequently,

but after several rounds of changes, these companies may be totally ruined. This is because new CEOs from other companies may not really understand how these companies run, especially not on the ground floor. Some might even think they can just drink a little wine, talk a little philosophy, and then they're good to run a company.

Non-Chinese employees have taken up positions at Huawei as country-level CEOs and directors of product lines, as well as senior experts like Huawei Fellows, which is the highest technical position at Huawei. Of course, please feel free to recommend qualified candidates for CEO, chairman, or other senior management positions. We will first assign these candidates to work in hardship regions, like in Africa and even way out on the Comoros Islands where we only have one permanent employee with only a cook and a dog to keep him company. We will then send them to other places to get more hands-on experience and technological expertise. After they have developed a comprehensive understanding of Huawei's business, they may have opportunities to be promoted to top management positions.

Why are some Western companies not doing very well? Because their board of directors is focused on finding an excellent chief executive officer. After new executives come on board, they often leverage just

about anything to expand capacity, but then have to drop prices when there is an oversupply of products. This might eventually lead to the collapse of these companies.

Therefore, at Huawei, we emphasize that our business leaders must come from within, and this includes our pool of 30,000-plus foreign employees.

Joe McDonald: If you appointed a non-Chinese board member or a non-Chinese chief executive-level person, could you see that causing any trouble with the Communist Party? Would it change the personality of the company from a political point of view? Do you think that's an obstacle?

Ren: No, absolutely not. We have established boards of directors in some countries outside of China, and in those cases, the majority of the members are renowned figures in the local communities.

12 **Ken Moritsugu: We learned yesterday that you like to talk to your employees and you like to have tea or coffee, or you encourage them to have tea or coffee. Even as the company has gotten very big, you continue this. I'm wondering, when you speak to your employees now, is anybody worried about the future of Huawei because of the pressure from the US? Or**

are they comfortable? And why? How are you able to give the employees such confidence despite everything that is happening, if that's the case?

Ren: First, it's not me giving our employees the confidence they need to face our current situation. They get their confidence from the clear path to future success they can see on their own. We wouldn't be able to constantly preach to our employees and force them to believe in the stories we tell. Rather, they can see how their own hard work is contributing to the company. This fills our employees with hope. The Entity List incident has inspired our employees, and they have improved their abilities to solve problems. That further adds to their confidence in our company.

13 **Joe McDonald: We want to ask about your life and how your life experiences influence the development of Huawei. Could I ask your background? You came from Guizhou, one of the poorest places in China and you grew up in a poor town. How did someone from your background, a poor kid from Guizhou, become one of the most successful business people in China?**

Ren: I personally don't know how I managed to get to where I am today. I once said, even if I had not gone to university and instead worked on raising pigs, I could

have become a leading expert in pig farming. I focus relentlessly on whatever I choose to do, so I believe I could be good at anything.

Recently, I traveled to a place called Beidahuang in Northeast China. During that trip, I said if I had worked there when I was young, I would have transformed a village in Beidahuang into a noodle processing factory. This plant would have been able to process all the wheat in Beidahuang into various types of noodles and other wheat products. All the farmers would have become members of the business and shared in our success. That is not a hi-tech industry, and we just would have been turning wheat into noodles, so I don't think that business would have easily failed.

There is a village like this called Nanjie in Henan Province that focuses on making noodles. That village continues to adopt a model of collective dedication, and is very successful. There's yet another village in China called Huaxi that focuses on steel. That's a faster-paced tech industry, so it has been impossible for simple farmers to keep pace with the times. That's why Huaxi village has declined slowly over time.

Even if I had not gone to university and instead raised pigs or worked on noodle processing or something else, I believe I would have still become the best in whichever area I chose, because I have this relentless focus. I

established Huawei by accident.

When I was young, I did not have very big dreams. I always just wanted to have some fresh steamed buns because that was something that I was rarely able to have. The second dream I had when I was young was to go to university, so I could get some distance from my parents. I had never left the province where I grew up, so I really wanted to go to another province to broaden my horizons.

I didn't have big dreams when I was young. I just had this relentless focus on whatever I chose to do. With this kind of almost obsessive focus, the likelihood of success becomes much higher. I don't see any connection between my poor background and the success I have today.

Ken Moritsugu: Can I ask about the relentless focus that started when you were very young, when you were still a child? What gave you this relentless focus on whatever you are doing?

Ren: The place where I grew up was very poor. There was pretty much nothing that we could do to entertain ourselves. I played with mud and stones, and shot things at birds. These were the simple things that I could do. Maybe this was how my personality started to take shape. I don't have a background in psychology, so I'm not sure how my personality was formed. I think it may

be attributable to my curiosity.

Joe McDonald: We met your author Tian Tao the other day, who wrote a book about Huawei. He said that he asked 50 people what the most important factor in your development was and he said that all 50 people said it was your mother. Is that true? Do you think that your mother influenced your life? And if so, can you tell us how? In what ways?

Ren: Back then, my behavior towards my parents was similar to the way today's young people act towards their parents. The youth of today tend to be cold towards their parents. For example, when they return home from abroad, they may not even bother to call their dad or mom. Instead of talking to their own parents, they will talk with others here and there. This was also true to me. I only came to understand the greatness of my parents' personality and integrity after they passed away. When they were alive, I couldn't understand them, and I often became fed up with what they said to me. So it's hard to say what kind of influence my parents had on my personality.

My father was the principal of a middle school. My mother was responsible for a class of third-year high school students and also taught mathematics. At the same time, she had to take care of seven kids. We had no housekeeper, so my mother had to cook for all of

us on her own. She generally spent the 10 minutes between her classes rushing back home to cook rice. Then after a class, she would rush back again to cook, possibly, two simple dishes. Actually, the dishes could hardly be called dishes. That was the life she had.

My father was denounced as a "capitalist roader". He was detained in a so-called cow shed, which was used to hold intellectuals at that time. Because of that, his salary was slashed. My mother was not a college graduate. Therefore, despite her hard work, she only earned 40 yuan per month, around 7 to 8 US dollars, to feed the entire family. We had grown up then, but we boys still had to wear patched and rugged clothes. It was too embarrassing for my sisters, especially those at college, though. So my mother gave the unpatched old clothes to my sisters, and she herself wore the clothes that had been patched up again and again. I was told by my younger brother that her colleagues didn't want to sit close to her during a meeting, because of what she was wearing and the fact that she was the wife of a "capitalist roader". So it's hard to say what influence she had on our personalities. What I do remember was the pitiful experience she went through. By the time I came to understand my parents and I wanted to take good care of them, they had passed away. That was the biggest regret in my life: I missed the opportunity to take good care of my parents.

As I mentioned, my mother only graduated from a junior high school. But she continued studying on her own to better teach her students. Out of her students, more than 90% went to college. So you can imagine the great efforts she had to make. When she was 15 or 16, she joined a choir that sang songs opposing the Japanese invasion during the Second Sino-Japanese War. Because of the absence of the Communist Party there, the choir was probably organized by unofficial teams from the Nationalist Party. After the Chinese Civil War, this experience caused political pressure for her, and she mentally suffered for decades afterwards. On top of this, she had to feed and take care of seven kids. Although my father was a principal, the school was far away from where we lived. So he had no time for us, and it was my mother alone who took care of us. In such a difficult situation, how could my mother have time to talk with us? As far as I can recall, she only talked with us once or twice after cooking in the kitchen.

After my parents passed away, I came to reflect and regret how little I understood them. That's why I don't criticize my own kids for not being close to us. After all, I was just like that when I was a kid. So again, it's really hard to say what kind of influence my parents had on me. I believe that what society has taught us and what we learn by ourselves have a greater influence on us. We cannot attribute our personality entirely to our parents.

Otherwise, we would be misled to the theory that your parents' genes define everything about you.

14 **Joe McDonald: We were wondering whether there's an example of a problem you encountered and you solved in a way that you think illustrates the Huawei strategy. Someone suggested to us the story of Xiaolingtong and Huawei's decision on whether to develop Xiaolingtong or not. That's one possibility of the Huawei strategy, and how you think about the business.**

Ren: I would say Xiaolingtong or the Personal Handyphone System (PHS) in China was a strange occurrence. It was not born out of market demand; instead, it was a byproduct from the systems at the time. Back then, 55 MHz spectrum was still available at the 1,800 MHz frequency band in China, which could have been allocated to China Telecom to support GSM services. If that had been the case, there would have been no reason for China Telecom to launch the PHS. However, that 55 MHz spectrum was not allocated to China Telecom and as a result, China Telecom had to find an alternative that could work on spectrums that were not strictly regulated. It happened that the PHS acted as cordless home telephones, and didn't require strong signals.

Therefore, China Telecom enhanced its mobility, and introduced it to the market. The PHS was just a temporary product. China Telecom did not have wireless products at the time, so they used the PHS in wireless scenarios.

I think our strategy is to take a long-term view and think about what the actual needs are. That's very important.

The PHS did not have a bright future, and consumed huge amounts of effort and energy. If we expanded into this market, how would we have focused our strategic forces on our promising core business?

Joe McDonald: We have read that that situation was very contentious within Huawei and that the company almost split apart because of it. Can you tell us about that?

Ren: We were not particularly concerned with the external pressure, and we insisted that we not go with the PHS. But there was still pressure from within the company. What if Huawei had tumbled and even died because of my misjudgment?

At the time, Huawei was under great pressure to survive. We were focused on developing products that were in line with 3GPP standards. The whole process to achieve this lasted about eight years. During that

period, there were many employees within Huawei who wrote reports asking the company to work on the PHS, because they wanted to make more money. They thought the PHS was very simple, and that Huawei was well positioned to work on it.

Every time I read a report, it was a struggle and an extremely painful experience for me. That's probably also when my depression got worse. Our concerns were not put to rest until China decided to issue 3G licenses eight years later.

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Joe McDonald: You mentioned depression. We have heard that you have told employees that in about 2000 you felt great pressure and you would wake up in the night and worry about how you would pay employees, and that you even considered suicide. Is that true? And if it is true, can you tell us about that situation? What happened?

Ren: I don't want to talk about this painful experience any further. All I can tell you is that what they have said is true.

Ken Moritsugu: Can you talk about what you learned from that experience, maybe? And did it change you? And how did you overcome this kind of challenge?

Ren: I would say I learned nothing from it. It's like a

journey that contains only pain, with no gain. All I can say is that if we spread things too thin and don't stay focused, we are doomed to fail. But if we choose the correct direction and stay the course, success is very likely. We have summarized this goal as the generally correct direction. It's impossible to choose a direction that is 100% correct. So all we need is a generally correct direction.

We also need to inspire passion across our organization, and ensure we all work towards the same goal. Looking back, I would say that's the bet we made on science and technology. It could have been wrong, but luckily, it turned out right. This relieved my pressure, and I never thought about suicide again.

Joe McDonald: How do you think of the situation now, the crisis facing Huawei with the United States, compared with the difficulties with Xiaolingtong in 2000 and so on? If you compare the two, what does this situation feel like?

Ren: The pressure we are facing now is probably only 10% of what we faced back then, because now we are confident that we will weather this crisis. Back then, we knew nothing for sure and we feared the unknown. Now though, I don't have that fear. At that time, I was so tormented by my fear that I fell into depression. Now we are patching our holes step by step. The holes in our 5G

and core networks have been fixed, and we only have a couple of holes remaining in our consumer business. We believe we can fix them over the next two to three years. Therefore, we have confidence that we didn't have back then. In addition, unlike those days, we now have more financial resources, and the company stands united as a whole.

Moreover, back then we had yet to define our own identity. We are a private company and in those days, private companies in China had very little social or political status. However, we were earning a profit, and people just couldn't understand why. The pain points that we feel today are the attacks from the US. They attack our business and our market, but this won't crush us. Only in China could my social standing be impacted; nothing the US does could hurt me because I wouldn't go there. I am more relaxed now.

I could have retired earlier, so why am I still working? Because I see I am still helpful in this current crisis. I will continue working for a few more years, so it is likely we will meet again in the future. You can ask whatever questions you want; I will give you the honest answers.

The last 30 years has been a painful experience for me, with little joy. Every step of the way had its own difficulties and pains. You are the first journalist to ask me to compare the current crisis with the painful

situation we experienced in 2000. This has given me an opportunity to refresh my memory. Thank you.

16 **Joe McDonald: You're in your 70s now. Most Chinese business leaders at your age have already retired, and most people at your age would be enjoying being praised for having been very successful. Instead, you're now in the middle of this trade and technology war between Washington and Beijing. How does that feel? You had so much success and now you are in this conflict. How will you get through this?**

Ren: Probably I'm too healthy to want to retire at this point in time. I would be bored if I retired, so I would rather do something for our PR department. This is also a way to entertain myself.

I'll share a few funny stories with you. AIG's former chairman, Allen Greenberg, once invited me to the US for a routine physical with his private doctor. Later on, I did two other physicals at the 301 Hospital and the Peking Union Medical College Hospital back in China. The results of all of these showed that my heart and stomach are both very young and there are no areas of any concern regarding my heart or blood vessels.

I am still very healthy all around. It's probably because I don't have any really bad habits. I never smoke

or drink, and I eat healthy and follow my doctor's advice. What's more, I don't have any hobbies like singing or dancing, and I don't take care of children. If I retired, I would have nothing to do at all. I would rather stay at Huawei and do something helpful.

In the last couple of years, I followed my wife on trips to Bolivia. I did not feel uncomfortable at an altitude of more than 4,000 meters in Bolivia. One Huawei employee there told me that the oxygen level at that height was only 0.5 points lower than that in Shenzhen. I was unsure whether he was telling the truth. Recently I also went to Nepal for site visits. A helicopter took me to some level ground near our sites, and then I walked the rest of the way up to see our base stations at an altitude of 5,200 meters. I didn't feel that it was a burden for my heart. Of course, it was unlike walking fast at sea level, but I was able to handle it well. In these last two years, I have not been walking so much. During the years before that, I walked a lot, and young people walking with me might have got blisters on their feet and been unable to carry on.

Why haven't I retired? The reason is that if I don't retire, I can often come to the company to have some coffee. It's inconvenient for me to drink coffee outside, because I am an Internet celebrity.

I told these funny stories to relax the atmosphere.

Now let's return to our conversation.

17 **Joe McDonald: One question from the news about current events. We saw a news report from the Wall Street Journal that said Huawei employees in two African countries had helped authorities there find or harass their political opponents. What is Huawei's position on this? What is your personal policy on helping other governments do political things? Do you agree to help governments do this sort of thing? Did Huawei agree to help these governments in Africa to do this?**

Ren: No such thing happened at all. And this information was totally unsupported. We have issued a legal letter to the Wall Street Journal.

Joe McDonald: What sort of letter is that? A legal demand for retraction or something else?

Ren: It's about asking the media outlet to investigate and clarify. They shouldn't circulate rumors. Instead, they must investigate thoroughly and correct their mistakes.

18 **Ken Moritsugu: One more follow-up question. I want to ask about technology because technology is very powerful; it can be used for good or bad in many**

ways. And I believe Google and Facebook had some of these debates going on about whether they had responsibility for how their technology is used. Do you have any thoughts on technology? Or do you just provide it and people use it? Or do you feel you have a responsibility for how technology is used?

Ren: Huawei provides technology and ensures that our technology complies with cyber security and privacy protection laws, like GDPR. At the end of the day, networks are controlled and managed by sovereign states through carriers, so this is not something that Huawei can or cannot do. After our equipment is installed, carriers observe and track you at all times. Otherwise, how can you dial and make phone calls? The whole process must comply with international laws as well as laws of different countries. This is not something Huawei employees can control. Therefore, the international community has to come up with a unified set of rules on this.

David Wang's Interview with Sky News

August 14, 2019
Shenzhen, China

01 **Tom Cheshire, Asia Correspondent, *Sky News*: 5G is now at the center of geopolitical controversy. But I do not want to talk about controversy, just about 5G itself. Why is 5G so important?**

David Wang: 5G is the next-generation mobile communications technology. It will drastically change the way we work and live. We often say that 4G changed our lives, but 5G will change society. However, 5G is now at the center of geopolitical controversy. That means the role that 5G plays has been overhyped. 5G is nothing more than a technology; it has no major impact on a country's security. There have been overestimations and overreactions about 5G from the general public.

02 **Tom Cheshire: That's exactly the question I was going to ask. With 3G, with 4G, there didn't seem to be this debate over security in the same way we're having with 5G. Is there something different about the nature of 5G, how it works? We've heard a lot about how it's more decentralizing and how the network maybe isn't as separate from the critical and non-critical bits. Is there something different about 5G that makes people more concerned about those security issues?**

David Wang: I've been working at Huawei for over two decades. I was part of 2G and 3G development, and led

the company's wireless team in 4G and 5G development. This gives me a deep understanding about these four generations of mobile communications technology.

I would like to compare 3G, 4G, and 5G. 3G enabled mobile calls and mobile data, and 4G improved user experiences with higher network speeds and lower latency, making mobile data more accessible and available. Built on 4G, 5G will be used for mobile video and applications that require higher bandwidth, such as VR and AR, in order to deliver better user experiences.

5G is simply an evolution of 4G and is not much different in terms of technology. 5G adopts virtually the same technologies as 4G, from the most important air interface technology to the network architecture. As a technology provider, we use many shared technologies to deploy 4G and 5G networks, and there are no fundamental differences between 4G and 5G.

I was surprised to some extent when I learned that so many countries and government officials were so concerned about 5G. On the other hand, I'm very happy about this because it also means the mobile communications industry has received a lot of attention and support from governments. But the fact that 5G is now at the center of geopolitical controversy suggests that the role of 5G has been overstated to some extent.

As 5G technology begins to be deployed and applied, people will become more rational and objective regarding how 5G will change societies and lives. Once again, 5G is evolutionary, not revolutionary.

03 **Tom Cheshire: It sounds like it is quite similar, in terms of components, to 4G, but are people concerned perhaps about the effects of 5G? So the idea of the Internet of Things, that driverless cars will be used in every factory. Whereas 3G and 4G are more about, as you say, mobile data, consumer stuff. This is actually going to be about the future of society, and so the components might be the same but people are worried that the application is revolutionary, it's not just evolutionary.**

David Wang: Over the past 30 years, mobile communications technology has evolved from 2G to WCDMA, LTE, and now 5G. In fact, we were already able to connect everything to the Internet back in the 2G era.

Currently, the majority of connected things use GSM and GPS technologies. Whether in China or Europe, most connections are enabled by 2G. We apply NB IoT in IoT to connect everything to the Internet in typical scenarios that feature low power and wide area. IoT technology has the ability to connect things in many

scenarios, and 5G will further this ability to bring more significant changes.

People are hugely concerned about autonomous driving and the intelligent vehicles of the future. To address these concerns, we have developed IoV technology based on IoT to connect vehicles. What is worth noting is that intelligent vehicles or autonomous driving vehicles are mainly powered by the intelligence of the vehicles themselves in order to enable a certain degree of automation, and the network plays only a minor role in this process. In other words, autonomous driving is actually possible without networks. However, with networks, vehicles can more successfully prevent accidents. So in this sense, networks are not a must for autonomous driving.

5G is just an advantage, not a decisive factor for protecting people's lives or production in many cases. People tend to misunderstand 5G and believe that if 5G were insecure, it might affect the safety of lives and production. In fact, the security of any system depends on the overall ability of the system itself, not on a single component or part. Therefore, we need to address security by looking at the whole system, instead of just one of its components.

04 **Tom Cheshire: People talk about the race to 5G and how we have to do it right now. It sounds like, from what you are saying, it is an evolution rather than revolution. Actually maybe there isn't a race and we can wait for a bit, say six months. It doesn't have to happen immediately. The UK, for instance, isn't going to fall behind the rest of the world if it just takes its time.**

David Wang: Mobile communications capabilities are improving from 4G to 5G, helping build the information infrastructure for the modern information society. Just as highways are essential to improving traffic and economies, 5G is essential to driving society forward. If 5G deployment is delayed, there would be some ripple effects down the road.

Why do countries attach great importance to 5G and all-optical networks? Because they represent information infrastructure to some extent. If one country falls behind others in terms of 5G or all-optical networks by six months, it would suffer multiplier effects for years to come.

The UK is one of the most developed countries in the world, and is at the forefront of Europe, or even the world at large, in terms of information infrastructure. Different countries have different visions. Some countries and regions might accept falling behind by six months

or even two to three years. However, for leading countries like the UK, I don't think a six-month delay in 5G deployment is the right choice.

05 **Tom Cheshire: To not talk about 5G, for once. I mean, 5G is the present for Huawei. But what are the technologies that Huawei is looking at in the future, for 5 years' time, for 10 years' time, for 20 years' time?**

David Wang: As an ICT solutions provider, Huawei has developed strong capabilities in CT, IT, and consumer electronics through years of efforts. Huawei released its new vision and mission last year: Bring digital to every person, home and organization for a fully connected, intelligent world. We will work to achieve this goal over the next five to ten years, or beyond.

5G is only part of telecommunications. We will continue to help every carrier and country build telecom infrastructure and push the limits of technology even further. We will also strive to set the trend in technology, from 5G to 6G and even 7G, with the aim of building an intelligent world.

In terms of IT, we have made tremendous efforts over the past 10 years to grow the IT ecosystem. This will help lay a stronger foundation for every person, home, and organization in a fully connected, intelligent world.

As you can see, we have also made a lot of progress in consumer electronics and smart devices over the past few years. The Consumer BG aims to deliver a seamless and intelligent user experience across all scenarios by offering "1+8+N" device products and solutions.

We will increase our research investment in IT, 5G, and consumer domains to contribute more to society.

Eric Xu's Media Roundtable at the Ascend 910 and MindSpore Launch

August 23, 2019
Shenzhen, China

01 ***Financial Times*: I know that the *Global Times* published an article a few days ago preempting this announcement and mentioning that the release of the chip had been delayed a little due to the US ban. Is this report correct? If not, can you provide more clarity on that?**

Eric Xu: I have heard nothing about this. As far as I know, the release has not been delayed.

02 ***People's Daily*: What are your future priorities in AI? Your AI solutions, like smart city and medical imaging, look very similar to those of other companies. You are doing pretty much the same thing as other AI companies. What are your unique competitive strengths in AI?**

Eric Xu: We have built our Ascend AI processors from the ground up, from their instruction sets to the architecture. Four days ago at Hot Chips 2019 in Silicon Valley, one of our Fellows introduced the Da Vinci architecture and Ascend AI processors during a remote video presentation. I was told that after his presentation, more than 1,200 people at the event stood up and applauded him. This shows their recognition for our explorative spirit behind our innovative Da Vinci architecture.

The Da Vinci architecture is very scalable, adaptive to all deployment scenarios, from wearables to clouds, and supports the full range of Ascend processors, from Ascend-Nano to Ascend-Max. MindSpore also works with the Da Vinci architecture to adapt to all scenarios. MindSpore supports model training and inference across all scenarios – devices, edge, and cloud – both in standalone and cooperative modes. No other computing framework can achieve this.

Our Ascend processors will continue progressing, just like our Kirin processors. Every time I meet with the Kirin team, I feel a little sorry for them because they have to turn out one chipset every year, and each must be better than the last and offer new value propositions. Our Mate smartphone team has to wait patiently until the Kirin team develops a new chipset; otherwise, they are unable to launch new flagship phones.

The same is true for Ascend. After Ascend 310, there will be Ascend 320 and then Ascend 330. After Ascend 910, we will deliver Ascend 920 and then Ascend 930. It's a process of constant iteration and development. We must keep forging ahead. Whether we launch a new Ascend processor every 12, 18, or 24 months depends on market competition.

To meet the needs for auto-grade autonomous driving, we are working on the Ascend 6 series. Next

year, we are going to launch Ascend 610 to help carmakers meet the requirements for auto-grade autonomous driving.

The AI solutions on display in our showroom are the result of our collaboration with partners from different industries. You may wonder what our role is in these partnerships. We position ourselves as the digital foundation or the "fertile soil", providing a complete portfolio of IT infrastructure and services, which includes computing and storage. Intelligence can't be achieved by Huawei alone. Without partners, we can't deliver these AI solutions. We have never and will never compete with our partners. Many of our AI solutions are the result of our partnerships.

03 ***Communications World*: Chips are used in different scenarios and are related to communications. I also saw that Huawei launched other chip series for 5G baseband, for example. It always seems that Huawei could be ahead of others in the industry by launching a new generation of chipsets. What is the reason behind this? Is it because Huawei started earlier, Huawei invested more, or Huawei is more aggressive in terms of going in that direction? What are the strategic considerations behind it? Foreign companies have great strengths and technologies, but why is it Huawei**

that has come up with the world's most powerful AI processor? How have you developed your capabilities in AI and chipsets?

Eric Xu: I think the answer is very simple: We are not short of money, and we have a simple decision-making chain.

Chip development requires huge investment. In companies where there are complex decision-making chains, deciding whether to make a new chip usually takes six to twelve months. They have to decide how much they will invest into the chip. Finance will then ask why the chip needs so much money. As a result, the whole process takes six to twelve months.

Huawei is not a listed company. Even though we have set a profit target for each year, whether or not the target is actually met is not a big matter. Whenever we see a big opportunity that we should invest in, we make the decision quickly. It's not that important whether we end up with less profits than expected.

I can tell you that after we published our 2018 annual report, some outsiders said that Huawei was not as profitable as Internet companies. The fact is that many executives, including me, were criticized by our CEO Mr. Ren last year. He said we had made too much profit, which meant we had failed to make sufficient strategic investment.

04 ***South China Morning Post*: At the launch event earlier, you said that Huawei isn't using chip technologies from the US. I just want to confirm with you: Are you not using them, or are you still using them while trying to find alternative sources of supply, for example, from Chinese companies like Huada Empyrean? My second question is about the architecture. You're still using the Arm architecture for many chipsets. Arm is a British company, but there have been reports that it may be subject to influence from the US ban. Even though you have a permanent license from Arm, what if Arm keeps iterating in the future, will this affect your future generations of chipsets?**

Eric Xu: Arm isn't the only option we have. RISC-V is another alternative and is fully open. So there will always be a way for us no matter what happens. Having said that, we still want to continue working with Arm.

05 ***C114*: Will your AI chipsets be used only for Huawei equipment, the same as for Kirin chipsets? How will you provide customers with the capabilities of the AI chipset and computing framework launched today? Would it be through Huawei Cloud?**

Eric Xu: Our AI chipsets are not sold in the open market. They are embedded into our AI accelerator cards,

servers, and cloud services, which are provided to our customers and partners.

Many Chinese and foreign companies have been using the Ascend 310-based accelerator cards and servers for model development and verification. We will launch cloud services for AI training based on Ascend 910 in China in September, and in global markets in the first quarter of 2020.

Our accelerator cards, servers, and cloud services powered by Ascend 310 and 910 can help universities and research organizations complete their jobs more quickly. As you might know, a lack of computing power is the biggest challenge in AI research. The more computing power one has, the faster they can get their research papers published.

Currently, Google is making the fastest progress when it comes to publishing AI papers. It is said 30 percent of all new AI research papers are published by Google. Why Google? Because they have the world's greatest AI computing power right now. They can finish AI computing that might normally take one month in just a couple of minutes. Major breakthroughs in AI research are also primarily made by Google. At this point in time, brute-force computing is important for AI. If you don't have enough computing power, how can you expect significant results in AI? Huawei Cloud will provide

affordable and abundant computing power across the globe.

06 ***Light Reading*: Can you talk a little bit about how AI is impacting your business and how your business is resourcing it in terms of personnel and investment? In the medium and longer term, if AI, as you said, is this general-purpose technology, will that make you an AI company that delivers various types of IT solutions, rather than a telecom-focused company like you are today?**

Eric Xu: Inside Huawei, AI is first used for base station installation. Previously, after a base station was installed, our people had to go onsite to perform acceptance. Now with the help of AI, we don't have to visit the site, which has increased efficiency by several thousand or even tens of thousands of times.

In an internal memo, our CEO Mr. Ren discussed how to use AI to improve our internal efficiency. Our Board of Directors has released a resolution announcing that we would invest 200 million US dollars every year into using AI for internal efficiency improvement.

Huawei will not change from a telecom equipment provider to an AI company. But Huawei today is not just a telecom equipment provider. We position ourselves

as a provider of ICT infrastructure solutions and smart devices.

The value of AI to Huawei is clear. It will increase our internal efficiency and strengthen our existing products and solutions. We will develop AI products and services, and engage with ecosystem partners in this field.

If you are interested, I can give you an example of how Huawei has been using AI to improve efficiency. Our finance team has been using AI to check financial documents. Every year, more than five million financial documents are processed by AI, which is followed by automated payment. Both the accuracy and efficiency of this process are higher than manual operations.

We are making ongoing exploration concerning what problems AI can solve. And we can leverage the experience we have gained along the way to better serve our customers.

07 ***Global Times*: Two questions. First, you just mentioned that the 90-day extension has not impacted Huawei. But still, have there been some adjustments for Huawei on the business side as a result of the 90-day extension? Second, we have seen the annual reports of many companies along the same value chain as Huawei. Most of them have seen pretty good growth**

in the first half of the year. So how and where has Huawei helped in those regards?

Eric Xu: I would suggest you look at the preconditions laid out for the 90-day extension. US suppliers can continue to provide services and components for the products that they have sold to us without adding any new functionality. With that requirement, what's the point of buying from them? If we made business adjustments due to this extension, there would be no way for us to do business.

So we will not make adjustments due to this extension because we finished adjusting our business long ago.

You mentioned the growth of our partners along the value chain in the first half of the year. Huawei's revenue grew in the same period, so it's normal that our partners also grew.

08 ***The Paper*: Last month Baidu announced that their deep-learning framework, PaddlePaddle, can run on Huawei's Kirin processors. You also mentioned in your speech that MindSpore, your own computing framework, can cover smart device scenarios. So what is the relationship between these two computing frameworks?**

Eric Xu: It's up to the users to decide which one to use. Huawei will of course use its own computing framework, MindSpore, while Baidu will use their own framework, PaddlePaddle. Other users can choose whichever framework they find easier to use. This is also true for Kirin chipsets and 5G products. We don't exclude any company from using our products. Every layer of our architecture is open, and we ensure better cross-layer synergy.

Dang Wenshuan: In addition to PaddlePaddle, our Ascend processors also support models that are trained using frameworks other than MindSpore.

Eric Xu: The framework, chipsets, and ModelArts can all be standalone, but we ensure greater synergy between these three.

09 ***Financial Times*: What are comparable chipsets from other companies that Ascend 910 will replace, and are you using those chipsets right now? You said Huawei has a permanent license from Arm to develop Ascend 910, so the development of Ascend chips won't be impacted. Can you speak more broadly about how Arm's suspension of business with Huawei is affecting Huawei's chip pipeline in general?**

Eric Xu: There are only two companies in the industry

that offer chips for AI training comparable to Ascend 910. One is Google and you all know the other one. Google only provides cloud services; they don't provide AI accelerator cards. Currently, there are mainly three providers, including Huawei, that make processors for large-scale training.

Many companies make AI chips, and I would say most of them work on inference, similar to the Ascend 310 we launched last year. We launched this inference chip before today's training chip.

Regarding your question about Arm, I don't think it's an issue for us because we have obtained a permanent license for ARMv8. We can also define some of the instructions sets. In addition, we work on embedded solutions, which allow us to provide products and services to our customers.

The Ascend 910 contains Arm cores but it primarily runs on our Da Vinci cores. We can choose to either include Arm cores or exclude them. If we don't use Arm cores in the Ascend 910, then it's fully an AI processor. If we include Arm cores, then it's an SoC, which users find easier and less costly to use.

10 ***Qbitai*: How much, in terms of human and financial resources, has Huawei put into the development of**

Ascend 910? What has the R&D cost of that been? Huawei and Baidu have been working together on AI since 2017. What progress has there been? Ascend 910 and MindSpore work together to provide a full stack of functions across all scenarios, so we cannot help but think that there are some similarities or links to the HarmonyOS. At the launch ceremony of the HarmonyOS, Richard Yu said that the OS was also for AI. So how could the HarmonyOS and the Ascend processors work together? You have launched your full-stack AI portfolio in the hopes of driving your own business development. Has the US incident this year affected your business? How big has the impact been?

Eric Xu: Cost data is confidential, so unfortunately I cannot give you an answer about it.

Regarding the amount of R&D investment, our chip development covers so many areas that it's difficult to come up with an accurate figure. Our accounting books do not tell us the total amount of chip investment.

Regarding whether there is any relationship between HarmonyOS and AI processors, you can either say yes or no. This is because HarmonyOS primarily runs on the CPU core instead of on the Da Vinci core. If HarmonyOS runs on the host CPU, then it has nothing to do with the Da Vinci cores. However, if HarmonyOS runs on Ascend processors, then there's some connection between

HarmonyOS and Ascend processors.

To answer your question on Huawei's collaboration with Baidu. Baidu leverages the AI capabilities of Huawei's smart devices for better tuning, which allows their applications that run on Huawei's smart devices to create more value and deliver better experiences.

As for your last question, our AI strategy execution has not and will not be affected by the external environment. It will only make us more determined to invest in AI.

11 ***CGTN*: At the launch event, you mentioned that the new framework will go open source. So based on our experience of engaging with other companies, whenever something is made open source it means something better is at hand. So is the same true with Huawei in this specific case? What is Huawei's major consideration when deciding whether or not to make particular software open source?**

Eric Xu: The decision on whether or not to make something open source depends on your objective. We make the framework open source with the objective of building an ecosystem, so that other players can develop and train models on this framework. We also hope to gather together as many developers as possible in order

to improve this computing framework so that it can support more scenarios and lead to more possibilities.

Our business value is built on the AI accelerator cards, servers, and cloud services. Going open source will only bring us business benefits, because more people will be using Huawei's accelerator cards, servers, and cloud services.

12 ***Nikkei Asian Review*: How many people or engineers are involved in Huawei's AI strategy?**

Eric Xu: I don't have an accurate number because these people are scattered across many different teams.

13 ***The Paper*: You have such a wide portfolio of processors, such as Kirin processors for set-top boxes and Ascend, and you also have HarmonyOS. They are all only developed by one R&D team. How have you achieved that? What is your operation mechanism? Another question relates to the naming of your products. It seems you have taken many well-known words from ancient Chinese literature, like Ascend and Harmony. What is the methodology behind the naming?**

Eric Xu: Regarding the naming, whenever our team

was trying to decide on a particular name, they would ask me for advice. They didn't even mention to me that the names were from *The Classic of Mountains and Seas*. They would ask me whether a name was OK, and I would say yes. This is how we came up with these names. In fact, we didn't have a system in place for the naming, and there are not really any connotations behind the names. We simply want the names to sound good.

Huawei has a relatively simple organization for AI product development, with one team for one project. This structure is even simpler than that of 5G development because 5G covers more areas. Typically, whenever we decide to work on one particular product, we set up a team and find the right team leader. The team leader then takes care of everything.

We are working with Tsinghua University Press to publish a book called Ascend AI Processor Architecture and Programming. I wrote the preface for the book, in which I talk about how decisions were made within Huawei when we were developing Ascend processors.

Things are not as great as many people have imagined. We don't really need to think about too much when it comes to product development.

14 ***Yicai*: Seven or eight years ago, Huawei did not have an extensive business portfolio, and just worked in the carrier and smartphone businesses. But in recent years, you seemed to have expanded your business portfolio to cover chipsets, servers, cloud, and TVs. What kind of company does Huawei want to become? Are all of these developments simply because your business scope has evolved with your strategy?**

Eric Xu: I think our business rationale is quite simple. All of our businesses share the same two underlying technologies: connectivity and computing. All of our R&D work is centered on these two technologies. In all of our businesses, we just work on different products for different types of customers.

At different phases, we might add or remove one line of business or another. That's something that happens naturally based on customer needs or our judgments about future development.

For example, we work on incremental components for intelligent connected vehicles, which is new to people in the automotive industry. But for Huawei, this is nothing new. We still work on what we used to; it's just that now we are applying existing technologies to the automotive industry.

Our vision is to bring digital to every person, home,

and organization. The underlying technologies are the same, and we just use these technologies to develop different products for different scenarios and to meet different customer needs. They ultimately are based on the same technologies. Chipsets are not a standalone business for Huawei, and we just delve a little bit deeper in this technology.

***Yicai*: You said that chipsets are not a standalone business, and that you just went a little bit deeper compared to others. But you always benchmark yourself against leading companies like Google. What is your plan for increasing the market share of your products that are built on Ascend processors? Which customers have already used your processors?**

Eric Xu: Jack Jia is responsible for Huawei Cloud EI. His team provides all AI-related services for customers, and they want to have a higher gross margin. If they buy accelerator cards from other companies and use them for our cloud services, how could they earn a higher gross margin? In this case, it is enough if they just don't suffer losses. That's where our Ascend 910 comes in.

The same is true for Amazon. Amazon is a cloud service provider and an e-commerce sales platform. But it also develops its own chipsets, and this business rationale is easy to understand.

15 ***Financial Times*: I just want to ensure I understand correctly. So Ascend 910 is a chipset for AI training. And you have given some examples today like its ability to crunch data in cloud. You can use AI in base stations to increase the efficiency of acceptance, and also use AI in connected cars. Can you give two or three very specific examples for our readers and explain how this chipset is going to be used? Huawei's core businesses are handsets, 5G, and enterprise. Will Ascend 910 be used across all of your core businesses or only for 5G and enterprise?**

Eric Xu: Ascend is a series of AI IP and chipsets. Ascend-Nano, Ascend-Tiny, and Ascend-Lite are all IP that can be embedded into the chipsets of smart devices or any other products that need AI capabilities.

That means all offerings that will need AI capabilities may use Ascend AI IP and chipsets. Take smartphones for example. If you want to check what time it is in the morning, you usually have to tap the phone screen first. The same is true for smart watches. You have to turn your wrist a little bit to light up the screen and find out what the time is.

To address this, we're going to embed our Ascend-Tiny into chipsets of smart devices, allowing the devices to recognize voices. So if you want to know the time, all you need is ask "what time is it right now?" To do this,

the chipsets must be always-on.

We are going to embed AI capabilities, either through Ascend-Nano or Ascend-Tiny, into all of our smart devices, including TVs, speakers, watches, and smartphones. We want these devices to be always-on.

For current AI assistants, such as Siri, you have to call their name before they can respond. Why? Because they're not smart enough. In the future, all smart devices should be always-on, prepared to be woken up at any time. That requires chipsets with very low power consumption, and this is where Ascend-Nano comes into play. To put it simply, we want to build Ascend AI IP or chipsets into all of our smart devices and products. We want to make pervasive intelligence a reality.

The microphone I am currently using is not intelligent. I have to press a button before or after I speak. You won't need to do this in the future. Whenever you speak, the microphone will automatically wake up, and when you aren't speaking, it will go to sleep. The future will be fantastic.

That's actually what we mean when we talk about ubiquitous networks and pervasive intelligence. We don't have to wake certain devices up. Instead, they are always-on and can respond to our needs at any time. They should be always there for us whenever we need

them. That is our goal.

Dang Wenshuan: Our Ascend 910 processor is not designed for smartphones. It will be used for training in data centers.

Eric Xu: It's too big for smartphones. It can only be used for cloud or servers. Our Ascend 310 processor launched last year is designed for edge computing and in-vehicle computing. Different chipsets are used for different scenarios. What you see now is only part of the processor. There is still a module for heat dissipation.

16 ***Light Reading*: How is the 5G business going? Is the industry still in the early phase of development? Are carriers taking new strategic initiatives?**

Eric Xu: To me, there are three different types of markets for 5G.

Some Gulf countries, China, and South Korea are among the first type. These countries are seeing large-scale deployment of 5G networks.

The second type includes some European countries. They are deploying 100 to 200 5G base stations for branding purposes, but they don't have a clear plan about how many more base stations to build next. The US, Australia, and New Zealand are also included in this type.

The third type refers to countries where 4G has not yet been fully developed. So we don't know how many years they will have to wait until they see 5G networks there.

Today, more than half of the world's 4G base stations are in China, so the 4G business largely depends on how China is doing. The same is true for 5G. It's estimated that nearly half of the world's 5G base stations will be in China, so China will also play a key role in the 5G business.

I think this is mainly because Chinese people love phones so much. Wherever they are, whether they are taking the high-speed rail or metro, walking, or in airplanes, they are always checking their phones.

Dang Wenshuan: To build on what Eric just mentioned, China had 50% of the world's 4G base stations at the end of 2018.

If we look at 5G in Europe and China, there is a wide consensus that 5G is important, but China and Europe are taking very different approaches.

China is actually rolling out 5G networks, and local government units are providing telecom carriers with huge support. For example, 5G spectrum licenses in China are far cheaper than in other countries. China has positioned 5G as an underlying infrastructure that can

drive the digital economy forward.

But in countries outside of China, especially those in Europe, people are simply talking about 5G, rather than walking the walk. Europe is very interested in the digital economy, but they haven't provided sufficient support for 5G network infrastructure, which is the foundation of the digital economy.

Guo Ping's Irish Media Roundtable

August 27, 2019
Shenzhen, China

01 ***The Sunday Business Post*: Thank you again for your time. Recently, Mr. Ren described the situation with the US and the sanctions as a matter of life or death. He's spoken about the survival and development of Huawei. In June, you mentioned that the sanctions could cost 30 billion US dollars in lost handset sales. So is this situation so serious that it could threaten the viability and future of Huawei?**

Guo Ping: Thank you for your question. As the only superpower in the world, the US has mobilized resources across the country to crack down on our company. We are certainly feeling the pressure and pain from that. However, Huawei is doing everything it can to survive and thrive.

In July, we announced our business results for the first half of 2019. We have witnessed a 23.2% growth in our revenue, and I am optimistic about our overall business results for 2019. I do not believe the decrease in revenue will be as high as Mr. Ren suggested.

We are also very happy to announce that among our three business groups (BGs), the Carrier and Enterprise BGs have essentially achieved sustainable business development without relying on US elements. So, in these two businesses, Huawei is able to continuously provide products and services for our global customers, including our carrier and enterprise customers in Ireland.

Our handset business outside China is being impacted, as we currently depend on the Google Mobile Services (GMS) ecosystem. We are still discussing this problem with certain stakeholders. But until today, there has been no impact on the products we have already launched. In addition, our smartphone sales have recently rebounded, including in European countries.

Huawei is still an advocate of the Android ecosystem, but we are also aware that the operating systems of today focus more on individuals and scenarios than on apps. As mobile devices, phones can be seamlessly connected to smart home appliances, such as TVs. In our workplaces, phones can connect to our personal computers and servers. In our cars, they can be connected to our audio and display systems or even serve as car keys, delivering a seamless experience. Huawei is building a smart life ecosystem. We believe the US's continuous cooperation with us is conducive to their own further development.

On August 10, we launched a smart TV, which is the first device to use our HamonyOS. If any of you have time, we encourage you to try and connect the TV to your phone here and enjoy the seamless experience.

We have full confidence in the future development of these three BGs.

02 ***The Sunday Business Post*: Do you believe that Huawei is being used as a pawn in a wider trade war between the US and China? Ultimately, do you expect the sanctions will be imposed in 90 days' time? Or do you anticipate that a solution might be found in the next three months?**

Guo Ping: We are a business. Over the past three decades, we have made solid investments in R&D and customer service. We have made breakthroughs in ICT innovation, from 0 to 1, and accomplished much in terms of ICT promotion, from 1 to N.

We firmly believe that we are doing the right thing and are contributing to the development of humanity. Regarding your question about whether we are being used as a pawn by some politicians, if the answer is yes, then there is not much we can do. Pawns are not in a position to make decisions.

Whether or not the Temporary General License issue will be solved is not something we can decide, and Huawei is not in the position to answer this question. The attack from the US, a global superpower, is unethical and groundless. We are working hard to ensure we can continue providing customers with our products and services without relying on US parts. We will simply focus on getting our own business done. That is our choice.

03 ***The Irish Times*: Since the European Union has not gone and followed in the footsteps of other countries and ordered the Trump ban, do you expect this continues to be the case and what kind of conversations have you been having with member states around the issue?**

Guo Ping: We have maintained strong channels of communication with all customers and stakeholders. We will discuss and work out solutions with them to address their concerns. We have every confidence that individual EU countries will make the decisions that are most appropriate for themselves as sovereign countries and based on their own interests.

04 ***The Irish Times*: I have a specific question here. Huawei has spent an awful lot of money, especially a lot in Ireland over the last few years. How important is Ireland to the company strategy?**

Guo Ping: Ireland is a very open country and has a lot of outstanding talent. I have visited Ireland many times, and people have said that my English name, Patrick, is quite Irish.

In Dublin, we are working closely with local partners on software development. In Cork, we have entered into many hardware agreements. In Athlone, we have also established a research centre to better collaborate with

local research institutes and companies.

In the next three years, we plan to invest 70 million euros in R&D in Ireland.

05 ***Silicon Republic*: China already has a policy of technical independence like 2025. I'm just wondering the US sanctions and the so-called trade war have sort of sped up the way that Huawei is trying to be more self-sufficient. I think at the moment one-third of the components come from US companies, but you launched your own chip this year. Maybe you could tell us a little bit more about what you're doing with your own operating system, your own chipset, to become more self-sufficient.**

Guo Ping: First of all, Huawei does not seek self-sufficiency. We still pursue global partnerships to contribute to the technological progress of humanity.

Huawei has a very limited business scope. That is, we focus on the ICT sector. If we need other technologies in our products, we will choose to work with our partners to make our products more competitive. We will not expand the scope of our business.

For those countries that restrict or block collaborations with Huawei, we will withdraw our investments there and invest this money in countries that are friendly to us.

Why is the top dog so nervous now? Personally, I think one reason is that technology is now progressing more slowly. For example, in the ICT sector, there are two famous theories: Moore's law and the Shannon theorem. Both of them have almost reached their limits. This is a lot like what happened during the 1900s in Europe. Although Newtonian physics was quite excellent, Albert Einstein worked to create a new type of physics. This is also the case in the current ICT industry, and we are calling upon someone to make the next technological breakthrough.

We expect to see such significant breakthroughs from some of the partners that Huawei is working with. Maybe it will be from Ireland.

06 ***Silicon Republic*: I believe that Huawei has already launched research into 6G, and you're working with some of the universities in Canada, which will eventually supersede 5G. I'm wondering, are there any concerns about the relationship with Canada because of the hostility from the US? Or are you confident with retaining a good relationship with Canada?**

Guo Ping: Huawei's Canada Research Centre is one of our important 5G research facilities. This research centre has made impressive achievements. We will begin our

6G research in Canada first.

Our cooperation with Canadian universities, research institutes, and businesses is still going on as usual and has not been affected by a few politicians.

I have noticed that after the US started to exclude some non-US researchers in their projects, Canada has increased its efforts to attract such talent. I have also noticed that many multinationals have increased their R&D investments in Canada. This shows that Canada provides a favorable environment for R&D partnerships.

Of course, Ireland also offers a favorable environment. I hope that Ireland will come out on top in the next wave of competition for talent.

07 ***TheJournal.ie*: You spoke about the relationships you've maintained with some EU member states and you said that you're confident that countries in the EU will make the right decisions based on their sovereign judgments. You also mentioned that you are investing 70 million euros in R&D in Ireland. Does that suggest you're confident that Ireland will make a decision in favour of Huawei going forward? Given the international pressure coming from the US, are you confident that Ireland will not raise the same issues we've heard from other countries?**

Guo Ping: When it comes to political decisions, what I say may not count for much. I know that many people are concerned about cyber security and that the US is using it as leverage against Huawei, so let me explain a little. I'd like to reaffirm Huawei's position regarding cyber security. Huawei shares the concerns of all stakeholders regarding cyber security and is willing to work with them to address these concerns.

Cyber security does not depend on which equipment vendor you use. Huawei barely has any presence in the US. But does that mean there are no cyber security issues in the US? I don't think so.

When we talk about cyber security with stakeholders, including those from Ireland, we usually look at it from three aspects.

First, safety relating to people. Huawei does not own the telecom networks, and we do not own the data that runs through those networks. In Ireland, the telecom networks are owned by the carriers, such as Eir, Vodafone, and Hutchison. Huawei has no access to the data carried by these networks.

As an equipment vendor, Huawei can hold discussions with stakeholders about who the right people are to operate the data on these networks. For example, carriers in Ireland may choose to use only certified Irish

citizens to operate the networks and access the data. When it comes to cyber security, we need to first address the issues relating to people. If we can do this, Irish people and companies will be assured.

Second, network equipment security. Huawei is an equipment vendor, and provides equipment to Irish telecom carriers just like all of our competitors. We take our responsibilities as an equipment provider very seriously, and fully comply with all applicable international standards. Our equipment does not contain backdoors.

In the telecom industry, there are two leading international standards organizations, both of which are based in Europe. One is the International Telecommunication Union, an inter-governmental organization based in Geneva. The other is the GSM Association, based in Barcelona, which develops technical standards for mobile networks. In this sense, Europe is a leading player in the global telecom sector and has made many outstanding achievements in this field.

Just like other equipment providers, Huawei fully complies with all applicable standards. Otherwise, our equipment would be incompatible with everyone else's. This is the first rule of thumb when it comes to security.

Another aspect of cyber security is that we must

ensure there are no backdoors, and that security is verifiable. We noticed that German Chancellor Angela Merkel said that all vendors should be treated equally. This applies to all vendors worldwide, not just Chinese vendors. In this way, all vendors will be prohibited from implanting backdoors in their equipment.

Huawei opened a transparency centre in Brussels to serve the EU market. At that centre, we can verify our software and ensure there are no backdoors in our equipment. We call on Irish carriers to apply the same requirements to all equipment vendors to ensure that all products from all vendors are verifiable.

Third, resilience. Only when a network is resilient can we ensure it is secure. Over the past three decades, Huawei's network equipment has displayed the best performance. Last year, there were network outages in over a dozen countries, including the UK. That happened because the networks were not resilient enough, but Huawei's equipment was not a part of any of these outages.

Huawei has a proven track record in cyber security. We talk with stakeholders about what their concerns are and how to work out solutions to address these concerns. Shouting out political slogans or using cyber security as a political tool against others is not a solution.

08 ***TheJournal.ie*: Thank you. It sounds like, from what you're saying, that you are aware of the concerns raised by a number of different countries in relation to security. So my question would be, have the Irish government or politicians in Ireland raised any concerns to Huawei, have you moved to reassure them in any way, and, if so, at what level are those talks?**

Jijie Shen: The Irish government has not raised any particular concerns over cyber security. Huawei has established constant communication mechanisms with the Department of Communications, Climate Action, and Environment, and with regulators and experts of ComReg, Ireland's Commission for Communications Regulation. We welcome and support the NCSC, National Cyber Security Centre, in carrying out industry-wide and evidence-based cyber security assessments of all vendors, rather than just assessments that target Huawei.

09 ***The Sunday Business Post*: Can Huawei oppose cooperating with the Chinese government under Chinese legislation, regardless of whether it would choose or want to?**

Guo Ping: Huawei is a private company that is legally registered. We operate and pay taxes in compliance with

applicable laws and regulations. We have been creating many job opportunities in China. I think this is what the Chinese government expects of us.

I've noticed that Chinese Premier Li Keqiang and Yang Jiechi, Director of the Office of the Foreign Affairs Commission of the CPC Central Committee, have both stated on many occasions, including when in Europe, that the Chinese government has not asked and will not ask Chinese companies to install backdoors. There are also differences between China's legislation and that of a few other countries. Unlike some countries, China does not practice long-arm jurisdiction or enforce its domestic laws worldwide.

10 ***The Irish Times*: The US market has been closed, or seems to be closed to Huawei at the moment. If Huawei has to pull back a little bit, or if Huawei isn't able to progress in the US, can it still continue to thrive in the local markets in which it operates, like in China? Also, what are the opportunities for the company in markets such as India and Russia?**

Guo Ping: Huawei has a business presence in over 170 countries and regions. If some countries choose to be closed off to us, this will not impact Huawei's development.

We believe that fair competition between Huawei and other industry players will help drive technological progress and greatly benefit consumers. China is the world's largest telecom equipment market, and Huawei is fortunate to develop in its home market. But I would also like to share a fact that the number of wireless base stations built by European telecom vendors in China exceeds the number of those built by Huawei in Europe.

I believe that mutually open markets and fair competition will benefit all European countries and their consumers, and help European telecom vendors make greater technological progress.

11 ***Silicon Republic*: So I'd love to hear a little bit more about the kind of research and development that is going on in Ireland in your three centres there, and perhaps also just to hear a little bit about why you chose Ireland, since it's such a small country with five million people, and your relationship with Ireland and the IDA, how did you find it and do you think we might see more Chinese companies looking at Ireland to base themselves or their operations?**

Guo Ping: I think after Brexit, Ireland will become a very important option for Chinese companies looking to build their European presence. Huawei makes sure its

R&D centres are in strict compliance with GDPR when it comes to protecting individual privacy in Europe. As such, we selected Dublin to host the device cloud services we provide for Europe. This centre serves not just Ireland, but also the entire EU.

Ireland has the same investment environment and policies as the rest of the EU, so we have based our digital services for Europe in Dublin. Huawei has also built several R&D centres in order to work with outstanding local talent.

For example, when I visited the Taoiseach several years ago, I told him we had established an R&D centre in Cork. He asked me why we had chosen that city. I said plainly there was a brilliant technical expert in Cork who only wanted to work there, so we established the R&D centre there for him. This expert, Martin, is still in charge of our Cork R&D Centre to this day.

Every time I go to Cork, Martin invites me out for a pint of beer, since he says the black beer in Cork is even better than Guinness. He is very proud of Cork, and only wants to work in his hometown. We respect that, so we established the R&D centre for him.

12 ***TheJournal.ie*: Just to, I suppose, return to some of the non-Irish topics on the agenda. You have spoken and**

Huawei have spoken about a lack of evidence in terms of the accusations coming from the United States. I understand that Huawei has moved to pacify some of the concerns that are raised at the government level. But I suppose in terms of tech companies in general, there are some fears among international citizens, ordinary people, about how safe their data is online. Companies like Facebook and Google have been asked to reassure people that their data is being used for legitimate purposes. So how can Huawei reassure ordinary citizens, not just governments, that everything they're doing is legitimate?

Guo Ping: First of all, there is a fundamental difference between Huawei and companies like Facebook and Google – Huawei does not own massive amounts of user data. We don't own any customer networks or data in either our carrier network or enterprise business. Huawei has only one business model: We monetize technologies and products, not user data.

For our consumer business, the real owner of the majority of user data is Google, because our devices worldwide use Google's Android system. Huawei's business model is fundamentally different from those of these Internet companies. We earn our profits by selling equipment.

The reason Huawei has based its cloud service centre

for Europe in Ireland is because we have sold hundreds of millions of smartphones in Europe, and we need to offer after-sales services and platform upgrade services to our consumers. When we provide these services, we strictly comply with GDPR. We also have a very close and transparent relationship with Irish regulators regarding all of our operations.

The fundamental difference between Huawei and OTT companies is that we monetize technologies instead of user data.

13 ***The Sunday Business Post*: Does Huawei perhaps regret not engaging with the media, especially the international media, sooner, in order to tell its side of story and counter the claims being made by the US administration?**

Guo Ping: You're the experts in this industry, so you can make your own judgments. Huawei's doors are always open, and we invite people to come and see what we're doing and what we're going to do next. We offer advanced products and services, in order to create value for our customers and contribute our fair share to the progress of humanity. Frankly speaking, we didn't expect to experience so many difficulties. We thought that we would achieve business success if we made solid

investments in technology and worked hard to serve our customers to the best of our ability. Therefore, we didn't really make any big efforts to engage with the media to make sure people understood who we are.

According to the EU Industrial R&D Investment Scoreboard in 2018, Huawei ranked No. 5 among all the companies in the world. We invested 15 billion US dollars in R&D last year.

Such heavy investment has enabled Huawei to make significant achievements in technology. Huawei holds over 87,000 patents, and we are one of the world's top patent contributors.

Talking about the hot topic, 5G, Huawei is a major contributor of 5G standards. I hope you will be able to learn more about Huawei. We welcome you to come and visit our campuses, our production lines, and our labs, so that you can see Huawei's continuous investments.

In this era, we believe we will need to call upon many more "Albert Einsteins".

14 ***The Irish Times*: I wonder if you would comment on the selling of equipment to countries such as Uganda. There have recently been reports that your technology**

has been used for surveillance purposes. Following these reports, feedback has been quite negative in the press. Does Huawei consider potential use cases for how the equipment will be used following sales of this kind? Or is the company simply an equipment provider that has no say on how the equipment will be used?

Guo Ping: In the words of Donald Trump, this is just fake news. This has significantly damaged Huawei's reputation, and we have already sent a lawyer's letter to *The Wall Street Journal.*

15 ***Silicon Republic*: We visited your P30 production line yesterday, which was fascinating. You know, there's a concern in our part of the world about the displacement of manufacturing jobs by AI and robotics. So I just wonder if this is a big concern here. For example, in China, where there is such a huge population, are there fears that the people's jobs will disappear with automation?**

Guo Ping: There are different opinions regarding the implications of AI and its impact on the job market, and I understand these concerns. However, as a technology developer, we think that there is a trend of using advanced technologies to improve people's lives. You can see that Huawei was among the first to apply cutting-

edge technologies in some scenarios, for example, applying 5G and AI technologies to deep coal mining and mine excavation.

This trend is already taking place, and you couldn't change it by blocking certain technologies.

One of my friends shared a picture with me. It was from 1910, and showed some of the 100,000 workers that would go out at 7:00 p.m. every night to light gas lamps on the streets of New York. Later, electrical appliances replaced these gas lamps, leading to these 100,000 workers losing their jobs. However, electricity then went on to create more opportunities.

When automobiles were first introduced to the UK market, people were concerned that they might disturb the horses. So the Red Flag Act was enacted, requiring that automobiles be led by someone on foot waving a red flag to warn the drivers of horse-drawn carriages that an automobile was approaching. The horse-drawn carriages would then pull over while the automobile passed by. However, this did not stop the trend of horse-drawn carriages being completely replaced by cars.

When one door closes, another opens. I think the most important is that governments and relevant stakeholders provide training to upskill their talent.

What if AI is a great tool to improve education?

My feeling is that no matter how AI evolves, it will never replace jobs that require creativity. AI will never generate works of art like Vincent van Gogh or beautiful poems like William Butler Yeats.

16 ***TheJournal.ie*: We have seen the opportunities that will be possible on the back of 5G advancements and the idea of smart cities. I'm curious to hear what your opinion is on how Ireland will fare in terms of cooperation between these new technologies and day-to-day life as a country, when compared to other countries around the world?**

Guo Ping: My personal view is that Ireland is a technology-intensive country. I am truly impressed by Dublin's strength in software development, and Cork's strength in hardware and technology applications. I think 5G and AI technologies are just tools, and they can create value only when they are applied in different scenarios.

In 1910, Thomas Edison invented the light bulb and ushered in the era of electricity. Electricity itself was not that valuable, but it was applied to home appliances and used to automate and electrify different industries, leading to the prosperity of humanity in the 20th century. I think this is also true for 5G and AI. These

technologies can only help to reshape an intelligent world and enable intelligent lives when they are applied to homes, organizations, and individuals.

I think Ireland is well positioned to apply AI and 5G locally. This will also help Ireland, the EU, and even the world as a whole seize the opportunities brought about by these new technologies, just like those brought by home appliances, electric automation, and industry electrification.

I would also more directly recommend that Ireland utilize Huawei's 5G technologies, like how they use electricity, to develop more 5G applications for Ireland, the EU, and even the world at large. This will make Irish companies and Ireland even stronger in R&D and further drive the country's economic development.

17 ***The Sunday Business Post*: Does Huawei have business operations in Syria, Sudan, or Iran, and will it be in any stage if it doesn't have currently? And did it help to build a wireless network in North Korea?**

Guo Ping: Huawei is committed to complying with all applicable laws and regulations in the countries and regions where we operate, including the export control and sanction laws of the UN, US, and EU.

18 ***The Irish Times*: Huawei obviously has grown at a phenomenal rate over the last few years. If you had a crystal ball, where would you think Huawei will be in the next 10 years? What will the company look like then?**

Guo Ping: It's hard to predict the future, and I really can't tell what Huawei will look like. One thing we know for sure is that 5G and AI will be key to helping humanity open the door to an intelligent world.

As I have said, the application of electricity in industries and homes created huge opportunities in the 20th century. I believe we will also have numerous opportunities over the next 10 years. I hope Huawei can survive the attacks we are seeing today and contribute to this future intelligent world as much as we can.

I hope our Irish partners will also grow with us over the next 10 years, creating more business and social value.

19 ***Silicon Republic*: Just at the moment with the fires in the Amazon rainforest, a lot of us are looking very closely at climate change and how AI and the technologies the companies like Huawei are building will help. I would like to get your thoughts on how they can help us when it comes to climate change. And**

to what extent is Huawei looking at the environment and sustainability when it looks at AI?

Guo Ping: Huawei equipment consumes energy, so we are inevitably linked with climate change. Because of this, Huawei has dedicated labs researching energy saving and efficiency improving technologies.

Huawei is an absolute leader in 5G, and energy saving features are part of our competitive edge. Huawei's equipment uses 15% less of energy than that of competitors. This helps our carrier customers reduce the amount they spend on energy. This also helps society as a whole save energy and promote sustainable development. Technology contributes to resolving the issues of climate change.

We need to rely on technological advancements to address climate change and promote sustainable development.

20 ***TheJournal.ie*: I think a lot of the questions from me and my colleagues have been answered. I know you have been asked to comment on where Huawei might be in 10 years' time given how fast it has changed. I think globally we are in a period of transition on many different levels. I wonder if you might comment on this: Where do you foresee Ireland might be**

in 10 years, from a technology, economy, or other perspective? I think your experience would be a good platform to comment on that.

Guo Ping: Well, this is not my area of expertise, but I will try my best to guess what will happen.

Ever since 2008 when European countries started to deal with the financial crisis, Ireland has done very well. Despite being among the four worst-hit countries, Ireland was the first to come out of the European debt crisis. This shows the Irish economy has great resilience. Brexit might be an opportunity for Ireland to become a new trade hub of the EU.

Close ties with other countries like the US, China, the UK, and Japan in terms of technology, economy, and trade will help Ireland reinforce its role in the EU and its position as a global hub for trade and technology.

Ireland itself has strong technological capabilities. Over the next 10 years, humanity will enter an intelligent world. With technology as a pivot point, Ireland is very likely to develop in certain areas, and become a global leader in certain intelligent solutions.

Despite the huge uncertainties in politics and the future development of the global economy, I believe Ireland has what it takes to become a new economic hub of Europe, thanks to its geographic location and

economic ties.

Huawei will step up its investments in Ireland. Together with the Irish government, customers, partners, and other relevant enterprises, we will explore more opportunities to grow together.

21 ***Silicon Republic*: You mentioned where your R&D centres are in Ireland. They are close to universities and talent. Cork is great for hardware and hardware application, and Dublin is great for software. What do you specialize in Athlone, or what's the talent you are looking for in that area of the country?**

Jijie Shen: As Mr. Guo just mentioned, we have established R&D centres in Dublin, Cork, and Athlone, because they all have abundant talent. These R&D centres focus on AI, video, cloud computing, and SRE.

22 ***The Irish Times*: I saw a piece in the South China Morning Post this morning that suggested the future success of Shenzhen is interlinked with that of Hong Kong, the two are linked to grow together to be successful. Given obviously how important Shenzhen has been to Huawei, I wonder, do you agree with that idea? That a strong Hong Kong is also essential for a strong Shenzhen as well?**

Guo Ping: Regardless of whether we are talking about Shenzhen, Hong Kong, or any other Chinese city, development always depends on the strengths and competitiveness of the city itself.

Huawei has established a business presence in all major cities in China. This includes our production facilities you visited in Dongguan. I think the success of a city depends on whether it has fully utilized its strengths, not on the help of others.

23 ***The Sunday Business Post*: Have the difficulties of what Huawei faced over the last year made it a better company by forcing it to accelerate the development of its own technology areas like chip manufacturing and also by making it a more open company as well?**

Guo Ping: Huawei remains focused on its key business areas. That means, we only focus on ICT solutions, and will stay committed to specific business domains going forward.

We don't produce integrated circuits. In terms of product manufacturing, we only perform 30% of the overall process. That means we are only involved in pilot production so that products can mature faster, and leave mass production to our outsourced partners around the world.

I believe over the course of our development, we have brought many opportunities to different companies around the world. We focus on the areas that we are good at, and are open to cooperation with companies who specialize in other areas. Therefore, I think Huawei's development would mean opportunities for most countries, and our procurement increases every year as we continue to develop.

Huawei has not and will not aim to be self-sufficient. That said, the management will need to seriously consider how to ensure business continuity in such a complex business environment.

Eric Xu's Interview with Handelsblatt

August 28, 2019
Dusseldorf, Germany

01 **Sven Afhueppe, *Editor in Chief*, Handelsblatt: Have you been afraid when it comes to the first attack by the US President Donald Trump?**

Eric Xu: No, because we were fully aware that the day of the attack would come sooner or later.

02 **Sven Afhueppe: How long do you have to wait to come to a solution? If it takes more and more time to find a way out of the conflict, the economic and business effects on Huawei might be bigger and bigger.**

Eric Xu: We don't think this thing will be resolved anytime soon, and we are already accustomed to working with the Entity List restrictions. So for Huawei as a company, and for our employees, we are fully prepared to work in such an environment for as long as required. There is no reason to believe that things will change for the better in the next one or two months. If we did, we would go under. Now that we are prepared to live and work within such an environment for the long term, any sudden changes to it would be a gift from heaven. We have to get used to these restrictions and look to survive and thrive.

03 **Sven Afhueppe: The US has reprieved the Entity List by 90 days, but it has put more Huawei research facilities**

onto the blacklist. What happened when the blacklist started?

Eric Xu: The Entity List has no impact on us, regardless if the number of facilities on the blacklist goes up or down. The 90-day reprieve means nothing to us, because it won't create any value for us.

04 **Sven Afhueppe: What is your focus? How long does it take for Huawei to be completely self-reliant?**

Eric Xu: We have achieved self-reliance, haven't we? If we were not self-reliant, I would not have been able to sit in front of you today, and Huawei would have gone bankrupt. Other people thought we would go bust or our production or other activities would stop. The reality is, we have become self-reliant, and we are still alive.

05 **Sven Afhueppe: Huawei spends a lot of money on R&D. Are you going to increase your R&D investment in the next months or next year? And how much is it exactly?**

Eric Xu: It's hard to say if we just look at the next few months. But in the long run, we will step up R&D investments every year. This is because we have to do more things and resolve more problems than ever

before. Only by increasing R&D investments can we survive and thrive.

Huawei is owned entirely by its employees. We don't look for huge profits, but instead, we put a lot of money into R&D. This is the only way for us to survive and thrive. A reduction of several billion US dollars in profits doesn't matter much to us. Survival is our most critical goal. If we can survive and grow better, we can make up for what we have lost. Through our employee stock ownership plan, our employees have clearly understood the fact: The money they have invested in the company will be safe only if the company survives. If the company goes, their money goes too. The four people who are with me here today have reinvested most of what they've earned back into the company. If Huawei is gone, then all the money they have invested in the company will be gone. Our employees don't care much about how much profit is earned each year, so the company is free to boldly invest in R&D well into the future.

06 Sven Afhueppe: Is Huawei having the most R&D expenditure in China?

Eric Xu: Yes. And we are the fifth largest R&D investor worldwide.

07 **Sven Afhueppe: You said you are completely self-reliant at the moment, otherwise you would not have survived. So does it mean you are not using imported parts any more, for example, for your smartphones or devices? And how far is the development of HarmonyOS, your own operating system?**

Eric Xu: Though we can live without US components, we still need to rely on components from many other countries. We haven't made a decision yet on whether we will use HarmonyOS in our smartphones, but it's very likely.

08 **Sven Afhueppe: Deutsche Telekom asked its employees not to buy Huawei phones for business purposes because it's not clear whether you can use Google services and Facebook services in the long term. Can a standalone operating system by Huawei survive if customers in Europe cannot use Facebook or WhatsApp?**

Eric Xu: It will depend on how far we can go with our own ecosystem. In fact, it doesn't have to be entirely built by Huawei. I know digital sovereignty is a hotly-debated topic throughout the EU these days. So why doesn't Europe develop a smart device ecosystem? If European companies can develop such an ecosystem,

Huawei will be more than happy to join it. Then the problem will be solved, won't it? With a European ecosystem, coupled with the open-source Android and HarmonyOS systems, the digital sovereignty issue may well all be solved. Of course, this ecosystem should also be open to US applications.

09 Sven Afhueppe: European companies, including Nokia, tried, but they failed. Microsoft and Samsung tried and failed too. So now we only have two left: Apple and Google. What makes you confident that Huawei can crack this market?

Eric Xu: First, we must always have hope for the future. Second, we've already laid a solid foundation for a new ecosystem in the Chinese market, which contributes about 60 billion US dollars to our annual revenue. Even if our smartphones won't be sold in overseas markets, our consumer business group will still take in 60 billion US dollars, if not more, in revenue.

All we need is patience. We can wait for new ecosystems to be built up in different countries. We also fully support European companies in building up their own ecosystem. We could develop an ecosystem by ourselves. But we think an ecosystem led by European companies is a better idea. And one more thing, we are committed to long-term investment.

10 Sven Afhueppe: To make sure if I understand you right, you are trying to build up a European or Asian ecosystem without Apple and Google?

Eric Xu: No, the iOS ecosystem already includes Google applications like the Google search engine, YouTube, and Google Maps. A European ecosystem could include applications from the US and from the rest of the world. Europe can build its ecosystem based on open-source Android and HarmonyOS systems.

11 Sven Afhueppe: Huawei founder Ren Zhengfei talked about the "live or die" moment in an internal memo to employees. How difficult is the situation? Can you describe the situation in your own words?

Eric Xu: We've done one thing recently, which is to hand a flag showing the bullet-riddled Il-2 aircraft, from our carrier business group over to our consumer business group. There are two big holes in the "aircraft" of our Consumer BG: the Android ecosystem and the Windows OS you just mentioned. All other holes have basically been patched up.

This is no longer a crisis for us. We are thinking about how to patch up the two holes in our consumer business under the premise that it would be a 60-billion-US-dollar business. The night before I left for Europe, I

had a meeting with Richard Yu's team for over an hour. We talked about how to fix these two holes, and we are aware it will be a long process. As a Chinese saying goes, the long march has just started. As for other holes, we have basically patched them all up.

12 **Sven Afhueppe: But you were talking about two holes, very big holes. An airplane without steering wheels is not going to fly. So I didn't quite understand how you are going to fix it. We asked about how many and you said maybe that's not the way to go, and you talked about European solutions. Could you be a little bit more specific how you are going to patch those holes?**

Eric Xu: I'll discuss this with you in the near future when we have finished communicating with our partners, reached a consensus, and started taking action.

I can tell you how we will patch up the holes. One thing is certain. We are building an open operating system called HarmonyOS, and we want to work with Germany and other European countries on this system. HarmonyOS is a distributed operating system that can be used on all types of smart devices. We will use the operating system to patch up these two holes.

The biggest challenge we currently face is to build an ecosystem surrounding HarmonyOS. We are holding

discussions with our partners about how to build this global ecosystem. We will adopt different approaches in different parts of the world. After we figure out how to build the ecosystem, including related strategies and plans, I can share these with you. However, there is no clear timetable, plan, or strategy yet. I believe we will be able to clear things up at the end of this year or early next year.

13 **Sven Afhueppe: Can we come back just for a moment to the political side on that topic? There are some experts who compare the attacks of the White House against Huawei to a new cold war between the US and China. They say it is more about a technological race to a political race, and it is a question of who will be winning the global race of the two superpowers. What do you say to that?**

Eric Xu: I'm not in a position to predict that because I don't know much about politics. I don't think people in any parts of the world want to see conflict between China and the US. In the current economic environment, I believe moving forward, all companies hope to see collaboration, rather than conflict.

China and the US are two economic powerhouses, while Huawei is like a sesame seed stuck between them.

We have been trying to avoid being the center of the conflict between China and the US, and have done a lot of work to prevent this. However, unfortunately, we have failed and unwillingly come under the spotlight in the conflict between these two countries. We are still working to get out of the spotlight during the China-US trade war. In addition, we don't want to become part of the trade negotiations between China and the US.

We have clearly told the Chinese government, both in public and privately, that we don't want to become part of the trade negotiations between China and the US, and we will work out our own issues by ourselves. The worst case scenario is that our revenue may decrease by dozens of billion dollars, but we will still be able to survive.

14 **Sven Afhueppe: Protectionism is rising in the world, including in China, the US, Europe, and Russia. Do you see globalization at all in danger? Would you say that globalization is at a crossroads?**

Eric Xu: I think you are right about that. Populist movements generally emerge every 80 years.

15 **Sven Afhueppe: If you are right, I believe that Merkel will lead Germany for 40 years more.**

Eric Xu: According to the book *Zero Hour*, God has arranged everything, and everything is destined to work out. It's normal that we are now at a crossroads, and globalization is the trend moving forward. We are just at a turn in this process. I believe that globalization will continue, and we will get back on track.

It's easy to explain these problems using Chinese philosophy. In China, we have a saying, which is "that which is long divided must unify; that which is long unified must divide." This is also true for populism, protectionism, and globalization. Globalization is like unity, while protectionism is like division. The world tends to become more divided after a long period of globalization, and it will become more globalized after a long period of division. Chinese philosophers explained this issue quite a long time ago.

16 **Sven Afhueppe: In the technology sector, there is a very close interaction between companies in the United States and companies in China. For example, with Apple, they design products in the US and they will assemble in China. Huawei also has a very close relationship with companies in the US. Taking what you have just said, do you think we are at the split where two technological sides would emerge, China on the one side, US on the other?**

Eric Xu: There are numerous technologies out there, so it would be impossible for all technologies to go against each other or become fragmented. But we cannot rule out the possibility that a given technology can become fragmented.

This did happen in the past when we were working on previous generations of mobile communications. At the time, it was not that China and the US were split on 2G. It was actually Europe and the US. Europe adopted GSM, while the US used CDMA. But China suffered the most, because it had to use both communication standards.

When 3G arrived, the US introduced CDMA2000, Europe opted for WCDMA, and China chose TD-SCDMA. These three different standards put our industry in a difficult situation. Since then, we have been working hard to unify the standards for 4G and 5G. And we have made it.

All businesses are willing to work hard to unify standards for a single technology, rather than split it. Why? Because this allows us to work more efficiently and gain high-yield returns on investment. Technology fragmentation has happened twice in history, and might not be avoided in the future. However, not all technologies will become fragmented.

17 **Sven Afhueppe: 5G is now. Huawei is leading the technology, but the governments in Europe including Germany are afraid of espionage and sabotage. Can you guarantee that Huawei's 5G technology is absolutely safe?**

Eric Xu: It depends on from which angles you look at security. We must be clear about one thing: European carriers build, operate, and manage their 5G networks. Once 5G networks are deployed, the responsibility to guarantee security is also handed over to the carriers. I'd like to ask a question: Are cars secure? It's not just the responsibility of car makers to ensure the security of cars. Drivers, roads, traffic management, and the environment all have a role to play. This is also true for the security of 5G networks.

18 **Sven Afhueppe: The main question is dealing with a backdoor solution of Huawei technology.**

Eric Xu: First, our founder Mr. Ren has clearly stated, on several occasions, that there are no backdoors in our equipment.

Second, the UK NCSC has been testing our source code for years, and has publicly stated that no backdoors have been found in Huawei's equipment. BSI in Germany is also fully aware that no backdoors are

implanted in Huawei's products.

Third, we have been operating globally for years, and no backdoors have ever been found in our equipment.

In fact, about 96,000 employees hold shares in our company. We can say that these employees invest what they have earned at Huawei back into Huawei's growth. Some employees have even taken loans and invested the money borrowed into Huawei. We will not put the fate of our company at stake. We will not put the money of our 96,000 shareholding employees at risk. There is not a single company in the world like Huawei. All Huawei employees expect Huawei to survive, so we are not going to do something reckless.

19 **Sven Afhueppe: But what NCSC and BSI are assessing are only products at the point of this time. Both institutions said that the risk is something might change in the future, especially if there is government pressure. Could you say no if the Chinese government asked you to help with, for example, security stuff?**

Eric Xu: We've given an answer to this question about a hundred times, which is that we will never do such things. But even if we answer this same question a thousand times, people will continue asking it. Mr. Ren and I have clearly stated our position on many different

occasions, but some people inherently just don't believe our statement. So how can we answer this question? If some people won't believe us, no matter how many times we give an answer, then what is the point of answering?

20 **Sven Afhueppe: The founder of Huawei offered the no-spy agreement to Germany and the interview was with Handelsblatt of course. What was the response by the German side or the German government, if you know that already?**

Eric Xu: Currently, Merkel is taking a smart and fair approach, which is to establish high security standards for all players.

21 **Sven Afhueppe: Just to follow up, you didn't answer the question about possible government intervention. That is the most crucial part about drafting those security regulations. As BSI and Bundesnetzagentur are drafting this, they are afraid that if there are companies based in countries without the same rule of law standard as we have in Europe, there's always the risk that if these companies weld into the supply, they might get under pressure of the government in the location of the headquarters. So how do you counter**

that criticism or conflict?

Eric Xu: I've answered this question many times. I don't feel I need to repeat myself.

Both Chinese and German media should guide the public in the right direction. If you say 5G may cause problems, then what about self-driving cars in the future? While Huawei provides 5G technology for Germany, German companies sell large numbers of cars to Chinese people. We all know that cars will be connected and intelligent in the future, so they will have the same problem. If 5G networks could become controlled by certain entities, so could these connected cars.

Are Chinese journalists asking Mercedes-Benz, BMW, and Volkswagen to make security commitments in the same way Western media are asking us to with 5G? Is there any value to do this? Chinese media could ask Mercedes-Benz, BMW, and Volkswagen whether they will install backdoors if the German government or the EU requires them to.

22 **Sven Afhueppe: It is a fair question. Are you in talks with German car manufacturers? BMW, Daimler or everyone?**

Eric Xu: Yes, with all of them. As I just said, the industry should manage and guide public opinion in the right

direction. We are going to have a digital, intelligent society, and the German government's approach of setting standards for all players is the best solution. When I was in China, I also said that common standards are fair for everyone, as we all need to satisfy the same standards. There is extremely extensive collaboration between China and Germany, as well as the EU, in many areas including technology and products. German companies that provide products to China, including network connectivity products, might face the same questions that you have asked.

23 **Sven Afhueppe: How much do you feel the European economy is slowing down?**

Eric Xu: It's not active, to say the least. As for specific numbers, we would need to check the statistics.

24 **Sven Afhueppe: In Germany, we are pretty close to a recession, so that might be a special concern for you. Are you concerned about your investment in Europe?**

Eric Xu: We are not worried about this, as the overall situation of the ICT industry is pretty well off. In addition, the results from our investments here in Germany will be shared between our global offices.

25 **Sven Afhueppe: For a lot of industrial companies in Germany, 5G is not a small step, but a big one, as they want to connect almost all devices. And many of these companies are very concerned about the production details they have. They are afraid of theft. So we see that Nokia and Ericsson are now massively lobbying and saying their European companies headquartered in Europe, so they are more trustworthy than Huawei. How are you approaching these companies?**

Eric Xu: I don't think their lobbying approach is appropriate. Of course, it is understandable that they adopt this as part of their marketing strategy, but let me give you a figure. The number of 4G base stations deployed by Ericsson and Nokia in China is three times that of Huawei in Europe.

26 **Sven Afhueppe: There are government investigations against Nokia in China. Do you see that there is a government influence in how much business companies like Nokia and Ericsson can do in China?**

Eric Xu: I've never heard of this investigation. China has always welcomed Ericsson and Nokia to develop its market. You can confirm this with them. Huawei also supports their development in the Chinese market, as always. As you know, China Mobile opened up

invitations for bids of its core network – the most essential part of 5G networks and that has been discussed a lot in Europe. Ericsson has managed to secure 34% of the share of this project. This example proves that China is completely open to Ericsson and Nokia. Whether you can enter a certain country depends on the competitiveness of your products.

Of course, we can't rule out the possibility that our sales employees may talk to our customers, saying that as we are a Chinese company, maybe you should buy more from us. But that's how they pitch products. As an executive of Huawei, I believe, with a level playing field, product competitiveness is the key to success in a market.

27 **Sven Afhueppe: Since the attacks of the White House and the US president, Huawei has become one of the best-known companies in the world. Is it a positive or negative effect? What do you say?**

Eric Xu: Of course, there is a bright side. Suspicion from all those who want to buy from us gets cleared up. They know they just buy from the best supplier. This is actually a hard sell for us and helps reduce our marketing costs greatly.

But there is a flip side to this too. With some political

considerations in mind, politicians are paying more attention to us. Such attention is not a good thing.

28 **Sven Afhueppe: If you had one wish free for the future as deputy chair of Huawei, what would that be?**

Eric Xu: I have never thought that the US will take us off its Entity List.

29 **Sven Afhueppe: There is one solution – moving your headquarters to Europe.**

Eric Xu: That wouldn't solve the problem since we are Chinese. If doing so would address the problem, then it would be easy. But even if we move our headquarters to Europe, it won't solve the problem. Government security officers won't trust us anyway. Our developers are working in China. Government officials won't trust us no matter how hard we try to persuade them. If we talk too much, it would make us seem pretentious and like we are trying to cover up something.

Eric Xu's Speech at the Ascend 910 and MindSpore Launch

August 23, 2019
Shenzhen, China

Thank you everyone for being with us here today. At Huawei Connect last year, I announced our AI strategy and full-stack, all-scenario AI portfolio.

I also outlined ten major changes we need to make if we hope to make AI more pervasive and accessible, including changes related to technology, talent, and ecosystem development. Huawei hopes that all industry players will work together to drive these changes and close the gaps between the stellar achievements already made in AI and its otherwise lukewarm adoption.

At Huawei, we've been working hard on several of these changes.

Please allow me to brief you on our AI strategy.

- Invest in AI research: Develop fundamental machine learning capabilities in computer vision, natural language processing, decision and inference, etc. Focus on:
  - » Data and power-efficiency (i.e., use less data, computing, and energy)
  - » Security and trustworthiness
  - » Automation / autonomy
- Build a full-stack AI portfolio
  - » Adaptive to all scenarios, including both

standalone and cooperative scenarios between cloud, edge, and device

» Abundant and affordable computing power

» Efficient and easy-to-use AI platform with full-pipeline services

- Cultivate talent and an open ecosystem: Collaborate widely with global academia, industries, and partners
- Strengthen existing portfolio: Bring an AI mindset and techniques into existing products and solutions to create greater value and enhance competitive strengths
- Drive operational efficiency: Use AI to automate high-volume, repetitive tasks for better efficiency and quality

As part of this strategy, we have developed a full-stack, all-scenario AI portfolio. I'd like to take this opportunity to introduce it for those who aren't familiar.

Our portfolio covers all deployment scenarios, including public cloud, private cloud, edge computing, IoT industry devices, and consumer devices. The portfolio is also full-stack: It includes chips, chip enablement, training and inference framework, and application enablement.

- Ascend: AI IP and chip series based on a unified, scalable architecture. In this series, we have Ascend Max, Mini, Lite, Tiny, and Nano.
- CANN (Compute Architecture for Neural Networks): A chip operators library and highly automated operators development toolkit
- MindSpore: A unified training and inference framework for device, edge, and cloud (both standalone and cooperative)
- Application enablement: Full-pipeline services (ModelArts), hierarchical APIs, and pre-integrated solutions

Our Ascend 310 processor has already seen wide adoption in a broad range of products and cloud services.

Our Mobile Data Center (MDC) solutions are based on the Ascend 310 processor, and they have been used by many leading global automakers in shuttle buses, new-energy vehicles, and autonomous driving. The Ascend 310-powered Atlas series accelerator card and server are now part of dozens of industry solutions (e.g., smart transportation and smart grid) developed by dozens of AI partners.

Ascend 310 also enables HUAWEI CLOUD services

like image analysis, optical character recognition, and intelligent video analysis. There are more than 50 APIs based on this processor. At present, the number of API calls per day has exceeded 100 million, and this figure is estimated to hit 300 million by the end of 2019.

Next, I'd like to share some progress we've made with ModelArts. ModelArts provides model development services spanning the full pipeline, from data collection and model development to model training and deployment. At present, developers are using ModelArts to handle more than 4,000 training tasks per day, for a total of 32,000 training hours. Among these tasks, 85% are related to visual processing, 10% are for processing audio data, and 5% are related to machine learning. Currently, more than 30,000 developers use ModelArts.

That's the progress we've made so far. Today, I'm here to announce yet another huge step forward: the Ascend 910 processor. Ascend 910 is the world's most powerful AI processor. In October last year, we disclosed its specs. Now I will show you more about how it actually performs in tests.

Test results show that the Ascend 910 processor delivers on its performance goals with much lower power consumption than originally planned. For half-precision floating point (FP16) operations, Ascend 910 delivers 256 TeraFLOPS. For integer precision calculations

(INT8), it delivers 512 TeraOPS. Despite its unrivaled performance, Ascend 910's max power consumption is only 310W, much lower than its planned specs (350W).

Ascend 910 performs much better than we expected. It is used for AI model training. In a typical training session based on ResNet-50, the combination of Ascend 910 and MindSpore trains AI models about two times faster than other mainstream training cards using TensorFlow. Ascend 910 can train 1,802 images per second, while existing training cards can only train 965 images per second.

Moving forward, we will continue investing in AI processors that meet the needs of a broad range of scenarios. In addition to the existing Ascend 310 processor, we plan to launch the Ascend 320 processor in 2021 to support edge computing.

Our MDC uses Ascend 310 to support research and development efforts for autonomous driving solutions. Soon, we will launch the Ascend 610 and Ascend 620, which will support large-scale commercial solutions in this field. The Ascend 910 launched today focuses on AI training, and in the future we will also release the Ascend 920.

Today I would also like to announce the release of MindSpore, our full-scenario AI computing framework.

AI computing frameworks are critical to making AI application development easier, making AI applications more pervasive and accessible, and ensuring privacy protection.

At Huawei Connect 2018, we announced the three development goals for our AI framework:

- Easy development: Dramatically reduces training time and costs
- Efficient execution: Uses the least amount of resources with the highest possible OPS/W
- Adaptable to all scenarios: Including device, edge, and cloud applications

MindSpore marks significant progress towards these goals. It is adaptable to all scenarios – across all devices, edge, and cloud environments – and provides on-demand cooperation between them. Its "AI Algorithm As Code" design concept allows developers to develop advanced AI applications with ease and train their models more quickly. Through framework innovation, as well as co-optimization of MindSpore and Ascend processors, our solution can ensure stronger performance and more efficient execution. In addition to Ascend processors, MindSpore also supports GPUs, CPUs, and other types of processors.

Many people have asked me the same question, "What's the point of MindSpore if we already have TensorFlow and PyTorch?"

The fact is, none of the existing frameworks can support all scenarios. At Huawei, our business covers devices, edge, and cloud solutions. Furthermore, these days privacy protection has become more important than ever, and support for all scenarios is essential for enabling secure, pervasive AI. This is a key component in our MindSpore framework. Resource budget environments can be big or small as needed – MindSpore supports them all.

MindSpore helps ensure user privacy because it only deals with gradient and model information that has already been processed. It doesn't process the data itself, so private user data can be effectively protected even in cross-scenario environments. In addition, MindSpore has built-in model protection technology to ensure that models are secure and trustworthy.

MindSpore is built on a concept called "AI Algorithm As Code". This design concept allows developers to develop advanced AI applications with ease and train their models more quickly. In a typical neural network for natural language processing, MindSpore has 20% fewer lines of core code than existing frameworks on the market, and it helps developers raise their efficiency by

at least 50%.

Through framework innovation, as well as co-optimization of MindSpore and Ascend processors, our solution can help developers more effectively address complex AI computing challenges and the need for a diverse range of computing power for different applications. This results in stronger performance and more efficient execution. In addition to Ascend processors, MindSpore also supports GPUs, CPUs, and other types of processors.

MindSpore will go open source in the first quarter of 2020. We want to drive broader AI adoption and help developers do what they do best.

With today's launch of Ascend 910 and MindSpore, Huawei has unveiled all the key components of our full-stack, all-scenario AI portfolio. We promised a full-stack, all-scenario AI portfolio. And today we delivered.

This launch is a new milestone in our AI roadmap; it's also a new beginning. We will work closely with our partners to make AI more pervasive and accessible, and help bring the benefits of digital technology to every person, home, and organization. Stay tuned for a more groundbreaking AI product at the upcoming Huawei Connect 2019 in Shanghai.

Reshape the Computing Ecosystem to Advance Intelligence

David Wang's Speech at the World Artificial Intelligence Conference

August 29, 2019
Shanghai, China

Good afternoon,

Mr. Vice Minister, Mr. Deputy Mayor, ladies and gentlemen, friends,

It's a great honor and pleasure to be here for the second World Artificial Intelligence Conference. Today, I'll share with you some of Huawei's progress in AI, our ideas on AI, and how industries can embrace AI to go intelligent.

Statistics show that the number of companies adopting AI has increased from 4% in the previous year to 14% today, and the global AI market has grown by more than 30% over 2018. That means an intelligent world powered by AI is arriving faster than we imagined.

AI will boom in multiple industries in the next decade

This curve represents our view on the long-term development of AI. As a general-purpose technology, AI is moving from phase 1 to phase 2. AI is now interacting more with our society, and we are finding synergies in many places. But we find that AI on the Internet has run into a developmental glass ceiling over the past few years. Huawei's Global Industry Vision report predicts that 86% of global companies will adopt AI by 2025. Now is the time for industries to embrace intelligence.

Moving forward, we expect to see an AI boom in industrial applications, and AI will become deeply integrated with every aspect of the real economy.

Computing power is the basis of AI

Compared with labeled data and algorithms, computing power is bricks and mortar of AI.

In the academic world, those with the most powerful computing capabilities usually produce more research results, and faster. It is reported that Google contributes 30% of AI papers each year. This is because Google has its tensor processing units, with very powerful computing engines.

Autonomous driving, for example, requires huge computing power to support intelligent analysis in real time. Before carmakers release any autonomous driving software, they need to do massive amounts of autonomous driving model training in data centers. Therefore, computing power directly determines when autonomous driving vehicles are ready for commercial use.

It is also predicted that the demand for AI computing power will grow 10-fold every year. That means computing power will play an increasingly important role in helping all industries become intelligent.

Diversity in applications and data requires diversified computing

With advances in 5G, IoT, smart devices, and autonomous driving, increasingly diverse industrial applications for AI have emerged. Device-cloud synergy, intelligent edge computing, and massive data processing are finding applications in more and more different use cases. More applications means more diverse data, including structured and unstructured data, numbers, text, images, and video.

To cope with diversified applications and data, we will need more diversified computing power. The traditional computing ecosystem around x86+GPU can no longer meet the computing needs of industrial AI applications.

Ascend and Kunpeng reshape the computing ecosystem to advance intelligence

Over the past 30 years, Huawei has been committed to delivering the world's best connectivity through innovation. As the intelligent world draws nearer, we are shifting our focus from connectivity alone to connectivity and computing. With this new strategic focus, we aspire to provide abundant and more affordable computing power and to create long-term value for our customers.

In Q3 2018 and Q1 2019, Huawei launched two new processors, Ascend and Kunpeng. Ascend is primarily designed for AI computing, and Kunpeng for general computing. Huawei is going to build its core computing competitiveness into the Ascend and Kunpeng processors. With the Ascend series, we will develop full-stack AI solutions applicable in all scenarios, and Kunpeng will serve all industries. We have completed system-level verification for mainboards, servers, operating systems, cloud services, and applications.

With Kunpeng and Ascend onboard, we hope to drive the computing industry towards more diversified computing, including x86, ARM, GPU, and NPU; and to build a fully connected, intelligent world.

Ascend AI processor: AI for the full stack and for all scenarios

Around a year ago, we announced our AI strategy and full-stack, all-scenario AI portfolio right here. But a lot has changed over the past six months, and many people have been concerned about our progress with the AI strategy.

First, I'll talk about Ascend 310, which we launched last year. Based on Ascend 310, we have put our Atlas and mobile data center (MDC) products into commercial

use. We have worked with carmakers around the world on shuttle buses, new energy vehicles, and autonomous driving. Dozens of AI partners are using our Atlas series acceleration cards and servers in dozens of different industries, such as smart transportation and smart grid.

We've also launched HUAWEI CLOUD services using Ascend 310. This includes over 50 APIs for image analysis, optical character recognition (OCR), intelligent video analysis, and other services. Currently, there are over 100 million API calls per day. The number is rapidly increasing and we estimate that it will reach more than 300 million by the end of the year.

Next, I would like to update you on the commercial use of ModelArts. ModelArts supports full-pipeline model production, from data collection and model development to model training and deployment. It performs over 4,000 training tasks per day, which is a total of 32,000 training hours. 85% of the training tasks are visual tasks, 10% of them are audio tasks, and 5% of them are machine learning tasks. ModelArts is now being used by more than 30,000 developers.

Just a week ago, we launched Ascend 910 and MindSpore in Shenzhen. Ascend 910 is the industry's most powerful AI processor and MindSpore is the all-scenario AI computing framework. These two products show that we have built a full-stack, all-scenario AI

portfolio and that we are actively pushing our AI strategy forward.

Kunpeng general-purpose processor: Linking up industries, system-level verification completed

We launched the Kunpeng 920 processor on January 7 this year. It is the industry's highest-performance Arm-based processor. To build a computing ecosystem around Kunpeng, the key is to fully unleash Kunpeng's huge computing power.

The Kunpeng processor boasts high performance, multi-core and high concurrency, high throughput, and Arm-native compute. Huawei uses Kunpeng widely in its own products and services, including servers, storage, databases, big data, and HUAWEI CLOUD services.

By adapting to business scenarios from end to end, the Kunpeng processor can link up industries across the entire ecosystem. Huawei has completed system-level verification for Kunpeng, laying a solid foundation for the Kunpeng computing ecosystem to prosper.

Large-scale commercial use of Kunpeng in multiple industries

Together with our partners, we have provided Kunpeng-

based data center infrastructure and services to customers in several different industries, such as smart city, telecoms, finance, and Internet. The telecoms sector, for example, has extremely high standards for network performance and quality. And China Mobile Zhejiang has already made the first VoLTE call using Kunpeng.

At Huawei, we believe those who make parachutes should be the first to try them. Since 2016, we have been using Kunpeng in our own IT systems. These systems are accessed more than 300,000 times each month, and they continue to provide solid support for Huawei's R&D, manufacturing, and other day-to-day work.

As of today, we have deployed over 100,000 Kunpeng-based devices in data centers across the world. These devices include servers, storage devices, and network equipment. We believe that as Kunpeng becomes a more fundamental component in many industries, Huawei and its partners will develop more industry solutions and benefit industry customers with more diverse applications.

Hardware + software to unleash huge computing power

Windows and Intel have long been close partners in the X86 ecosystem, working together to make full use of the

computing power available and to build a prosperous ecosystem. Data shows that servers will unleash their computing power to the fullest extent when we integrate them with operating systems, compilers, the tool chain, and an acceleration library. This is how we guarantee the success of a computing ecosystem.

Many companies made efforts to offer diversified computing power, but failed to effectively integrate servers with operating systems, compilers, and the tool chain. Within many ecosystems, the operating system may not be updated for years at a time, making it difficult to fully unleash the computing power of servers. To address this problem, Huawei will integrate hardware with software in the Kunpeng ecosystem, delivering vast computing power to the entire world.

Open source and open ecosystem to enable partner success

The Kunpeng ecosystem cannot grow without the concerted efforts of both upstream and downstream partners. To unleash the computing power of Kunpeng servers, we will stay committed to open source and an open ecosystem to help partners succeed.

For example, we will help hardware partners develop computing products like servers and PCs, and enable

software partners to innovate with Kunpeng servers.

For online scenarios, we will use Kunpeng to develop more diverse HUAWEI CLOUD services, allowing our partners to develop their own cloud applications on Kunpeng. For offline scenarios, we will offer a tool chain, compilers, and an acceleration library to help partners and developers migrate and debug their applications more efficiently.

Reshaping the computing ecosystem powered by Kunpeng

The success of the IT industry depends on the success of its ecosystems. Huawei is committed to enabling partners in the Kunpeng ecosystem, and will create value for the industry in the following three ways:

- Integrated industry applications: Huawei will foster a complete ecosystem and a range of competitive solutions for key industries, including government, finance, telecoms, and Internet.
- Alliances to develop standards: We will develop basic hardware and software standards through the Green Computing Consortium and Edge Computing Consortium, and build a healthy industry.

- Developer community: Developers are the core of any industry. Huawei will build the Kunpeng developer community into a major computing community, with the goal of having one million developers in five years' time.

Moving forward, we will seize the future and reshape the computing industry with technological innovation. We look forward to working with partners and customers to foster an open computing ecosystem around Kunpeng, and to making the intelligent world a reality.

Build, share, and win with Shanghai

We welcome more partners and organizations to join the Kunpeng ecosystem, and share its benefits and successes with us. Right now, at the Huawei Intelligent Computing Session, Huawei and the Shanghai Municipal Government are launching the Kunpeng Industry Ecosystem Innovation Center.

The innovation center is located in Xuhui District in Shanghai, and will build links with all of the innovation hubs in Shanghai and the surrounding cities. It will be focused on strategic investment in IT application and innovation, particularly in benchmark projects for the Kunpeng ecosystem. The innovation center will bring

together upstream and downstream companies and drive industry upgrades, so that businesses in this region can achieve higher quality, more efficient growth.

The innovation center will use Kunpeng technology to act as an enabling platform for technologies, businesses, and talent, and support innovations of companies in this region. Its ultimate goal is to foster a competitive Kunpeng ecosystem across the globe.

At this year's HUAWEI CONNECT 2019 to be held from September 18 to 20, Huawei will continue its tight focus on AI and computing. This event will bring together industry leaders, ICT experts, engineers, and analysts to discuss how to take the industry forward. At this year's event, we will announce more heavyweight solutions and industry applications. Please stay tuned.

Thank you for your time!

Ren Zhengfei's Interview with The New York Times

September 9, 2019
Shenzhen, China

Thomas L. Friedman, Op-Ed Columnist, *The New York Times*: I just want to first thank you. I've had a fantastic day here at Huawei with your team. I could write a book on what I learned this morning.

Ren: This afternoon, please ask whatever questions you want. I will be very frank in my answers, including with any of your trickier questions.

01

Thomas L. Friedman: I'm looking forward to it. I know you will be. Let's get right to business. As I have explained to your colleagues, there are two stories in the world right now. There's the US-China trade story and then there's the US-Huawei story. My view is that the US-Huawei story is more important than the US-China story.

Ren: I am flattered.

Thomas L. Friedman: US-China will figure that out, more soybeans, more Chinese goods. But US-Huawei, I think, is so important because of what Huawei represents. And I'll explain.

Ren: Actually, we can also find solutions to the US-Huawei problem. For example, Huawei can buy more chips from Qualcomm and Intel, and buy more software suites from Google and Microsoft. We can also support

the research of more professors from US universities without asking for the results of their research in return. Doing this will help ease the conflict.

Thomas L. Friedman: So let me ask, let's go right to that issue. To me, over the last 30 years, trade between America and China was mostly of what I call "surface things" and "shallow things"; the clothes we wore on our back and the shoes on our feet. What Huawei represents in wanting to sell 5G to America is not "surface trade" any more, it's "deep trade". You're the front end of China now, making many technologies that actually go deep in our streets, our homes, our bedrooms, and our privacy, and that is a new thing.

When it comes to the exchange of "deep things", we were able to sell China these kinds of "deep things" because you didn't have any other options. We had it and if you wanted it, you had to buy from Microsoft or Apple. But now that China wants to sell us "deep things". Because it's advanced technologically, the problem is we don't actually have the level of trust yet needed to be trading in "deep things". That's why, I believe, either we solve the Huawei problem, or globalization is going to fracture.

Ren: Well first, we have no plans to sell our equipment to the US, so I don't really think there is such a deep-rooted contradiction between Huawei and the US.

Second, we have been more than open to sharing our 5G technologies and techniques with US companies, so that they can build up their own 5G industry. That would create a balanced situation between China, the US, and Europe. This is something we have been ready to do, but the US side has to accept us at some level for that to happen.

Thomas L. Friedman: So let's talk about that. That's a very interesting proposal. So, in that case, maybe a company like Cisco could license your 5G, the entire set of 5G production techniques and software. Is that the idea that an American company could license all of that and use Huawei's technology to build a 5G network on a kind of license basis, so then Americans wouldn't have to worry about Huawei spying on America?

Ren: Yes. It doesn't have to be Cisco. It could be Amazon. They have a lot of money. Apple could do as well.

Thomas L. Friedman: Interesting. Mr. Ren, that's a very important proposal. Has this proposal ever been made in public before?

Ren: This interview is considered public, right? I guess you are the first to hear it.

Thomas L. Friedman: So this has not been discussed

with any American companies yet?

Ren: No.

Thomas L. Friedman: So another question that we have is, would you consider listing Huawei shares on the New York Stock Exchange or the NASDAQ for transparency assurance?

Ren: What I just said has nothing to do with Huawei doing business in the US. It's about helping US companies use our technologies to do business in the US. Based on the 5G technology we provide, US companies can continue to work on 6G. They can also modify our 5G technologies to meet their security requirements. It is impossible to develop successful 6G without having 5G. Millimeter wave spectrum is too short for 6G, so it would be very difficult for US companies to build a 6G network without our technology. That won't happen for another 10 years though.

Thomas L. Friedman: Interesting, so if I were Amazon or Microsoft and I wanted to do this, I would pay Huawei like a licensing fee. Would that be the idea?

Ren: Yes. It would be even better if you hired me as well. I am good with a salary a bit less than Tim Cook's. I am always blown away by the high salaries executives have in the US.

Thomas L. Friedman: While we are on that subject, can I buy just one share in Huawei while I'm here?

Ren: Not possible. You aren't a Huawei employee. Only Huawei employees can buy Huawei shares. We'd welcome you if you want to come on board though.

02

Thomas L. Friedman: One of the things we'd heard was that Huawei was in talks with the Department of Justice about trying to settle some of the outstanding issues of the past. Do you think there's a deal to be had there? Are you in talks? Would you be ready to be in talks with the Department of Justice on these issues to try to clear up all the old baggage?

Ren: I don't think we have had these kinds of talks, and we wouldn't proactively reach out to the US government. We instead will continue to follow the legal procedures. During that process, if the US reaches out to us in good faith and promises to change their irrational approach to Huawei, then we are open to a dialogue.

Thomas L. Friedman: Let's talk about that for a second. When you say, "change their irrational approach", what specifically would be required?

Ren: The US shouldn't try to destroy Huawei over something trivial. If the US feels we have done

something wrong, then we can discuss it in good faith and find a reasonable solution. I think we can accept that approach.

Thomas L. Friedman: Open to a dialogue with the Department of Justice on those terms?

Ren: Yes.

Thomas L. Friedman: Some people say Huawei and Mr. Ren would be happy to settle, but Beijing won't let them?

Ren: No. This is an issue about Huawei itself; it has nothing to do with Beijing. Beijing is not interested in these problems. Without 5G, there would be 6G; without 6G, there would be 7G. We see a long road ahead of us. With money, we can buy almost anything. We planned to sell our business to US companies, but they didn't want us.

03

Thomas L. Friedman: So this is a sensitive question. They're all sensitive but this one in particular. Are you comfortable with the way that Beijing has treated two Canadians who are detained in connection with your daughter's situation in Canada?

Ren: I cannot say whether these two cases are connected. My daughter is innocent and I'm not satisfied

with her detention by the Canadian government. I don't really know about the relationship between the two countries.

Thomas L. Friedman: You're not being consulted on it?

Ren: Never.

04

Thomas L. Friedman: One of the interesting things I learned today with Vincent and the team is, if Huawei were able to build 5G in America on a competitive basis with other countries, that it could save up to 240 billion US dollars in the buildout of 5G across America, if Huawei were there competing with its alternative. Talk for a minute, Mr. Ren, what America loses by not having Huawei compete to build our 5G infrastructure?

Ren: I just said that I would agree to transfer our 5G technology to US companies. If that becomes a reality, the 240 billion US dollars you mentioned would go to those US companies, not us.

05

Thomas L. Friedman: Mr. Ren, if President Trump were sitting here, and you got to talk to him directly about Huawei's situation and its aspirations for the American market, what would you say to President Trump?

Ren: First, it's unlikely that he might be sitting here. Second, I think collaboration for shared success is the

way forward in the future. I read your book, *The World Is Flat.* Globalization will lead to optimal allocation and utilization of global resources. For example, if there is only one company that produces a component and supplies it worldwide, then there is no need to make repeated investments into the research of that component. This will translate into lower R&D costs. In addition, the global market is big enough to help bring down the cost of the component. If the product is both high-quality and affordable, it will contribute a lot to humanity. Actually, it is the US that put forward the notion of globalization in the first place. It was a very smart move back then, and they should stick with it.

When it comes to the security of the supply chain in the natural environment, no company would rely on only one vendor for a component, or put all their eggs in one basket. They may find alternative vendors. When there is an earthquake, fire, or when a machine breaks down, one vendor alone cannot ensure the security of the global supply chain. So a component needs at least two vendors to limit risks because it can help secure supply in the event of a natural disaster. However, this causes redundant R&D investments, halves the market share, and drives up costs.

If security is approached from a political perspective and there is a lack of mutual trust, the world would

be split into two or even three different parts. Even the US does not dare to place all their bets on a single company. The reason why the US passed the Antitrust Act is that they wanted to have at least two players in every sector in the US market and in markets outside the US. As a result, a company that used to serve the global market now only serves a quarter of it at most. And R&D expenses have quadrupled. This is a huge waste for our society.

Globalization is in the best interests of humanity. The US is best positioned in the tech sector. Everyone wants to buy chipsets from US companies. If US companies sell more chipsets, quality will go up and costs will go down. Then other companies will find it hard to compete with them. Microsoft Windows and Office are good examples of this. It's unlikely that we will see another vendor in that field.

Thomas L. Friedman: If President Trump says, "Sorry, Microsoft, you cannot sell Windows to Huawei. Google, you cannot put Android on Huawei's phone. Intel, you cannot sell chips for Huawei handsets." What will Huawei do? Will it go out of business or develop its own version of Windows, its own version of Android, and its own chips?

Ren: No matter which company decides not to sell a product, there will always be other alternatives. We

should believe that humanity will not just die out. When there was not enough food, people ate wild fruits or even tree bark and survived, right?

Thomas L. Friedman: Huawei will not die either. I mean, you will survive this.

Ren: As long as there is market demand, there will always be alternatives.

06

Thomas L. Friedman: It seems Huawei has a lot of enemies. It has challengers in our intelligence community. They say it's a front for PLA spying. It has competitive enemies like Qualcomm and Cisco. All these companies are saying Huawei stole this and that. Is that just competitive jealousy? Is it just conspiracy theories? What are the things that Huawei has done in its rapid growth that it regrets now?

Ren: You said the world is flat. Maybe not necessarily 100% flat, in my opinion. There are also bumps, and ups and downs. There may even be glaciers in between. From that perspective, Huawei is mentally prepared to embrace all the different ways people see us.

If you look at the history of China and also the development trajectory of the Chinese society, Huawei was born by accident. During the 10-year Cultural

Revolution, China's economy stagnated and even went backwards to the extent that the economy was on the brink of collapse.

That was a time when tens of millions of young people had no jobs and were sent to rural parts of China. After the Cultural Revolution ended, those tens of millions of young people looked to return to cities, causing much unrest in society. The central government agreed to have them come back to the cities where they originally came.

At that time, workers in factories did not have enough work to do, let alone extra jobs for those young people coming back. The country was concerned about the employment of these people because if they had nothing to do, it would only lead to social unrest and instability.

Then the government mobilized some businesses to set up labor services subsidiaries to work on stuff like cleaning. But still, there were not enough jobs for all of those young people.

Some people who could not find their way out started to sell big bowls of tea or steamed buns in street stalls. That's how China's private sector started, from those stalls selling big bowls of tea, steamed buns, and things like that.

The government then found this was a feasible way to create sufficient jobs. So they gave permission to these small private businesses selling noodles, steamed buns, and big bowls of tea. This was not the delicate tea like we are having now. Back then, they only sold big bowls of cheap tea under shabby tents in the street, a cent or two each.

After some time, some businesses did quite well and grew bigger. But the central government issued a document saying businesses were not allowed to employ more than five or eight people; otherwise, they would be capitalistic. China's private sector was forced into existence, not planned.

Huawei was founded at that time. We had more than eight employees, and we operated under huge pressure. It was very difficult for us to add even one more person to the workforce, because we could not get licenses from the government of the Shenzhen Special Economic Zone.

However, as we often say in China, you cannot keep spring in just one garden. Since private businesses were more efficient, and their employees worked much more diligently, they grew very fast. In the end, the government acknowledged the private sector as a new economic form in China.

But that only happened after a long time of

struggling with the old mindset. I would say it was only until recent years that the private sector got a legitimate social status in China. At that time, we were considered communists outside of China; back in China, we were considered capitalists, because people in China saw us holding corporate shares and thought having money was a form of capitalism. Therefore, the challenges that we have encountered do not necessarily come from outside of China, but also from within.

Thomas L. Friedman: One thing that strikes me in learning the Huawei story today and talking to your colleagues and listening to Mr. Ren now, is that you guys really had to fight your way to the top.

Ren: You know, we have always had lots of cuts and bruises, so we're not that concerned to add several more.

07

Thomas L. Friedman: When I talk to Chinese people, I find they're proud of Huawei. Are you like a rock star in China, Mr. Ren, when you go down the street or into a restaurant, like Steve Jobs and Bill Gates have been in the US?

Ren: I actually think I'm quite a pathetic person. If I go out on the street, people will take photos of me. This means I have no freedom at all. I'm not like the pop

stars in other countries, who have their own private jets and can go wherever they want for their holidays, and I cannot hide myself from the public. I can't even enjoy a cup of coffee on the street.

I'm actually afraid of holidays, because there is nowhere I can go. I could only choose to stay at home, drinking tea, watching TV, or taking a nap. So holidays actually feel like tough periods for me. The mid-autumn festival is approaching, but I have no clue where I will spend those three days.

Thomas L. Friedman: But what do Chinese people say to you on the street?

Ren: They say, "Can I take a photo with you?" And then they post the photo on the Internet. I have very little privacy. Wherever I go, people spot me, take photos with me, and post the photos on the Internet. I often feel like a rat that can't find a hole to hide myself in.

08

Thomas L. Friedman: So I want to go back to one of the hard questions. I had a senior American official say to me that Huawei has a little device, the size of a pin head, which can be installed on its PCBs or cell phones for the purpose of espionage, to create backdoors. This official said that we can't trust Huawei. He said to me, "Tom, if you only knew what I know, you would never

buy a Huawei phone or use Huawei's 5G equipment."

Ren: I would say that this is more like fantasy or science fiction. If Huawei was that capable, why would we sell 5G equipment? I think, for any company, there will always be some areas that are highly sensitive and closed off to journalists. But when The Associated Press came to Huawei, we gave them a lot of time to film our entire exhibition hall, including the circuit boards of our new 5G base stations. We also allowed them to take photos of all our equipment. Huawei is a business organization. What is the point of Huawei developing a tiny device, like what you just mentioned?

09 **Thomas L. Friedman: It's very interesting. I've never seen a company that so many people had such strong and contradictory feelings about. "Great." "Love it." "Dangerous." "Espionage." Why is that?**

Ren: The world will always have two extreme positions on things. If those who call Huawei a great company said Huawei was actually a little squirrel missing its big tail , then those who currently call Huawei a dangerous company would stop saying so. The two sides compete with each other, making exaggerations and trying to see who can get more attention.

10 **Thomas L. Friedman: Who are your role models in technology? Bill Gates, Steve Jobs, Gordon Moore, Robert Noyce, or Jeff Bezos? Who are the people you look up to as role models?**

Ren: Since I was young, I've held great admiration for all those outstanding figures, including great scientists like Einstein and Turing. When I was young, China was still quite closed, and I couldn't see much of the outside world. But I still admired them a lot, because they had created great development opportunities for humanity.

11 **Thomas L. Friedman: As we come to the limits of Moore's law, what's the next frontier for Huawei? 6G or basic breakthroughs in science and physics? What's the next mountain that Mr. Ren wants to climb?**

Ren: AI.

Thomas L. Friedman: So what do you mean by that? Why and how?

Ren: We are building a platform to support AI.

Thomas L. Friedman: So this is a software platform, basically?

Ren: Both hardware and software. On September 18, we'll announce an AI cluster that connects 1,024 Ascend

chips. This will be the fastest and largest AI platform in the world. So we don't create all the AI applications ourselves. Instead, we will provide a platform to enable all of society to participate in the development of AI.

Thomas L. Friedman: Are there other competitors around the world with an AI engine as powerful as Huawei's? Is Huawei catching up or is it leading in that area?

Ren: Google and NVIDIA can do similar things. It's just that Huawei is currently doing this better.

Thomas L. Friedman: What do you think AI will unlock in the next 10 years? What changes will we see with such a powerful AI engine? What will be its impact?

Ren: Our production line can now turn out a complete premium mobile phone every 20 seconds with basically no manual operations. If you have time, you are very welcome to visit our production line.

Thomas L. Friedman: What about the future? Would it take just two seconds to produce a phone in the future?

Ren: I think it will be faster in the future. We will have more advanced manufacturing with even fewer manual operations. It won't be down to just two seconds though.

Thomas L. Friedman: Incredible.

12 **Thomas L. Friedman: When you look at America today, with our President saying, "No Huawei, nothing, you'll never eat in this town again", "We're going to pull American businesses out of China", "I'm going to win, you're going to lose." What do we look like to you?**

Ren: I think the reality might be the opposite of what you just said. The US might lose.

Thomas L. Friedman: Why and how?

Ren: If the US opts out from globalization, how would it win? The US is sitting at the top of the world with many cutting-edge sciences and technologies. It's like the snow on the top of the Himalayas. This snow creates value only when it melts into water, and then flows down the slopes of the Himalayas to irrigate the land at the foot of the mountains. The land can then produce harvests, and people can share in these harvests.

If the US blocks the snow water from flowing down the slope, those companies at the very top of the mountain will be left out in the cold. Their employees will have to feed themselves. If there is no water to irrigate the farmland at the foot of the mountains and they cannot share in the harvest, then how can they have enough money to buy, say, steaks?

The US has strong advantages in the high-tech sector. If the US does not sell its technologies to other

countries, I think it's highly unlikely that the US will achieve a trade balance. If that happens, then how can US workers expect a pay rise?

Thomas L. Friedman: Are we possibly facing, therefore, a digital Berlin Wall and an end to globalization?

Ren: Possibly. If the US government continues its current approach, it's possible that a wall like this could come down between us. If that happened, US companies who have dominant positions in the global market would see a reduction of their global market shares. They would probably be able to only maintain half of the market share that they hold now. As a result, they would have to slash their budgets and lay off employees. The lives of Americans will be made more difficult, instead of better.

Thomas L. Friedman: So if Google can't sell Android and Microsoft can't sell Windows and Intel can't sell chips to Huawei, that won't be a small thing for American workers and companies. There'll be a huge impact.

Ren: Indeed. They will have to reduce their operating budgets.

13

Thomas L. Friedman: You've talked about AI and the next-generation technology businesses being a natural evolution of Huawei's business. Are there other

businesses Huawei is interested in exploring in the future which don't follow this natural evolution?

Ren: We don't have time or resources to solve other problems. Huawei's addition to the Entity List has caused a lot of holes in our businesses, and our priority now is to fix these holes. It's not a time for us to get involved in other businesses. Huawei is like a bullet-riddled aircraft with hundreds or even thousands of holes. We need to fix these holes, or we will be unable to fly back home.

14

Thomas L. Friedman: So, on the Department of Justice, one last question, would there be any restrictions on what they could bring to the table to discuss? Or is it simply that you're open to talking with them about whatever is on their mind, you're saying, provided they come with a proper attitude? Just so I can clarify that.

Ren: There are no restrictions on what we would be willing to discuss with the Department of Justice.

Thomas L. Friedman: As long as they came with the right attitude?

Ren: Yes, exactly.

Thomas L. Friedman: I can't wait to get to Hong Kong and share this with the world.

Ren: I think that once the information is shared,

something will happen. You know, the US is in a leading position when it comes to AI. The US has the most advanced super computers and the most advanced storage capabilities in the world. But the two must be connected at high speeds. The analogy is this: On an ordinary road, once the vehicle arrives at the destination, it is already late.

Thomas L. Friedman: And that's where 5G comes in?

Ren: Yes. You either need fiber or 5G. And fiber and 5G are the very areas where the US is currently lacking capabilities. The US is placing hope in 6G. But even for 6G research, Huawei is leading the world. However, we do not think the commercial use of 6G will begin for at least another 10 years. I don't think the US can afford to miss out on the next 10 years of AI development. At the moment, the speed of evolution for AI is doubling every three or four months. So, everyone has to run very fast to catch up. Maybe by the time we catch up, I will have already died. But no matter what, society will continue to develop.

Thomas L. Friedman: But what you're saying is that they can't run fast without Huawei right now?

Ren: Yes.

Thomas L. Friedman: I'm really excited to be the conveyer belt for what I think is a very important conversation. Thank you.

Ren Zhengfei's Interview with The Economist

September 10, 2019
Shenzhen, China

01 **David Rennie, Beijing Bureau Chief and "Chaguan" Columnist, *The Economist*: Mr. Ren, before we ask you questions about Huawei, we would like to ask you a question about globalization and about how technology is challenging globalization, because you're also a very important global business leader, and you now have big companies that are selling products and services that can only make sense in a world of a great degree of trust. You know, it's not selling tennis shoes or tennis rackets. It's selling an autonomous car or a medical device. So this globalization is now seeing trade in products that requires a lifetime of trust, at the same time as countries like China and America find it very difficult to trust one another. Can this problem be resolved? What is your view on how this problem can be solved?**

Ren: Please be straightforward in your questions. I will also be very frank in my answers.

Economic globalization can bring substantial benefits to all of humanity. This is because it will play a significant role in driving the optimal allocation of resources and reduction of service cost, thereby accelerating the pace of social progress. Economic globalization was a concept put forward by Western countries. Their guiding principle was to allow the West to trade their advanced technology and equipment for developing countries'

raw materials and cost-efficient labor forces. This enabled global trade. But the West did not expect that developing countries would slowly begin to move up the value chain with low-end production.

The West had a serious economic crisis in the 1960s and 1970s, brought about by conflicts between employers and employees. Some Western economists suggested higher pay, higher commodity prices, and higher consumption would solve this crisis. This theory worked well to address the West's problems for a while. For the next several decades until the end of the last century, their economy grew very quickly. Sustaining such an economic model requires very high yields though. Without high yields, it's going to be very difficult to ensure that you have enough wealth to distribute. Although developing countries created a massive market for Western countries to sell in, many products from these developing countries also entered developed markets. The clashes and contradictions that arose during the process are not an inherent problem with globalization, but occurred because of a lack of effective coordination between countries of these two different development stages.

Let me use the Europe-China relationship as an example to explain how we could possibly address this problem. China has made a commitment to the World

Trade Organization (WTO) that it will significantly open up its service and manufacturing sectors. Over the last two years, this opening up has been accelerating, even though it is still a bit behind the promised schedule.

The UK and Europe have accumulated hundreds of years of experience in the service sector. China has a huge demand for services. In this sense, if the export of large quantities of services is allowed from the West into China, it will facilitate the social advancement of China. In addition, the money earned by China from Europe through the export of products will return to Europe through the export of products and services, creating a more balanced economic situation.

Let's look at another example. China will reduce automobile tariffs to a very low level over the next five years. The UK and Europe produce the world's highest quality automobiles, while Japan produces the most cost-effective quality automobiles. Today, we need to address the problems arising from globalization one at a time, through consultation. There is nothing wrong with globalization itself. These problems are arising because the development mechanism has failed to adapt to some of the changes in our new environment and the different players involved are not sitting down to have good discussions about how best to coordinate on these problems.

Let's take Russia as another example. If Russia had been accepted as a member of the European Union, I estimate that the trade between Russia and other Western countries would represent at least one trillion euros, because of Russia's energy exports and Western countries' machinery and equipment exports. These transactions would bring a lot of money into Europe, which would help Europe address the issues they are seeing related to increasing economic disparity.

I've had very good talks with George Osborne and David Cameron in the past. Back then, Osborne had already lowered the UK's tax rate to 21%, but these cuts didn't impact their national revenue. Why? Because the UK only allowed welfare to be distributed under certain conditions. To receive welfare, recipients would have to be actively seeking a job or make some form of contributions to community service, such as caring for the elderly or engaging in public health activities. The reduction in tax revenue equaled their reduced social welfare spending, and thus ensuring stability within the country.

Afterwards, Theresa May's administration announced that it would further lower the tax rate to 17%. All of these policies adopted in the UK are serving as the DNA for it to become an investment center again. All in all, this proves that different players have to keep adapting

to the new globalized environment. A one-size-fits-all approach won't work.

This is my humble opinion.

02 **David Rennie: I know my colleagues have many questions about Huawei. The one country you have not mentioned is the US. So you have talked about Europe and Japan. They can see the economic globalization. When you look at the US-China relationship, are you worried about the future of globalization?**

Ren: Yes, I think China-US relations will affect the future of globalization. The US is the most powerful country in the world. It used to maintain order as the "policeman" of the world, and in return it was rewarded with the US dollar becoming the world's currency. The US collects seigniorage from the world by issuing US dollars. If the US continued to maintain world order, it would not stand to lose anything.

However, the US has destroyed this mechanism. People no longer believe that the US is trying to maintain order in the world, or that the US dollar is the most reliable reserve currency. When the world's confidence in the US and the US dollar starts to wane, the national debts and stock markets in the US will face crises, which will cause great economic and political

turmoil in the US.

03 **Patrick Foulis, Business Affairs Editor, *The Economist*: During 2019, US diplomats have made a big effort to persuade its allies not to use Huawei. Could Mr. Ren talk about how successful those efforts have been? Clearly it's focusing on its core allies like Britain and Australia, but it also looks as though countries like Vietnam have been put under heavy pressure not to use Huawei products. So how successful has the US boycott been?**

Ren: First of all, it's perfectly normal for customers not to buy Huawei's equipment. In fact, many customers did not buy Huawei's equipment in the past. Most customers make their decisions based on commercial considerations.

When it comes to 5G, I think the US may be wrong to politicize 5G or treat it as something dangerous. Countries should make their decisions about 5G to facilitate their development rather than fulfil political agendas.

Let me give you an example. About 1,000 years ago, China was the most powerful country in the world. The prosperity depicted in the famous painting "Along the River During the Qingming Festival" was not made up; it

was real.

Several hundred years ago, the philosophical thoughts and social systems in the UK led to the Industrial Revolution. The British invented the train and steamship. However, China continued to rely mainly on horse-drawn carriages for transportation. Those carriages travelled at much slower speeds than trains, and they could carry far less cargo than steamboats. That's why China was left behind.

The UK became an industrial powerhouse, and managed to sell its products all over the world, hugely impacting social progress in many countries. Today, about two-thirds of the world's population speak English. With this example, I want to say that speed determines social progress.

5G is a connectivity technology that delivers high speeds, high bandwidth, and low latency. 5G represents speed in the information society. Countries that have speed will move forward rapidly. On the contrary, countries that give up speed and excellent connectivity technology may see economic slowdown.

The British are very intelligent, and British universities are among the best in the world. If the UK wants to make a comeback in industry, it needs speed in the information society.

Optical fibre networks and 5G technology that is based on optical fibre networks will connect supercomputers and super storage systems to support AI. If AI is able to increase productivity by ten-fold, then the UK will become an industrial power with a workforce equivalent to hundreds of millions of people. When I say AI can increase productivity by ten-fold, this is just an estimation. The truth is that in some rare cases, with the aid of AI, efficiency can increase by 100 times or even 1,000 times.

Alan Turing, the father of AI, was British, as was the scientist who cloned Dolly the sheep. I simply cannot imagine what the world will be like when genetic and electronic technologies come together. I believe the UK has enormous potential for revitalization. Speed will determine whether the UK can be successful again.

04

Patrick Foulis: Could I ask some questions about Huawei in the last few months and the implications of the American actions against the company? So the first question is, could you talk about the financial performance of the business since May when the Entity List began? Have you seen a drop off in your revenues?

Ren: Our revenue has grown by 19.7% by the end of August, while our profits were similar to last year's.

Our growth rate has declined from about 30% in the beginning of the year, to 23% by the end of June, and now down to 19.7%. Our profits didn't increase largely due to a significant increase in our strategic investments. We have recruited a few thousand more employees worldwide, mostly high-end talent like young geniuses and fresh PhD graduates, to help patch our holes caused by the Entity List.

We have patched our holes in our network business, from 5G to core networks. On September 18, we will announce an AI cluster that connects 1,024 Ascend chips. This will be the fastest AI platform in the world.

Currently, the Entity List still impacts our consumer business, and it will take some time to patch our holes in this area.

Patrick Foulis: Can I ask, so if you look at the consumer business now and just take a snapshot, is it declining? Is it shrinking outside of China?

Ren: Our smartphone sales once declined in markets outside China, but the rate of that decline is now decreasing, now at around 10%.

05

Patrick Foulis: Later this month, I think you'll be launching the Mate 30, the new handset. At the moment, will it have Android and Google apps

available on it? What's the latest on that?

Ren: The Mate 30 series won't have the Google Mobile Services (GMS) ecosystem pre-installed.

Patrick Foulis: That leads to my next question. If you launch a handset that doesn't have the full suite of Google apps on it, is it correct to think that the volume you sell outside of China will be much lower than in the past? And following from that, does that suggest that the company faces quite a big financial hit in the second half of the year, in the fourth quarter?

Ren: We would like to continue using Android, because we remain on good terms with Google. Even if the US government won't allow us to continue using Android, we have our alternatives. It will take us two to three years to replace Android with our own system, during which time our phone sales in markets outside China will see some decline. We think it is understandable. Our smartphones have their unique features in addition to ecosystem applications, so we believe there will be many more customers who will like and accept our products. We will launch the Mate 30 series in Munich on September 19, and you can find out what features they will have then.

Patrick Foulis: Over this period when you may have to roll out your own system, do you think it's possible

that a company can be pushed into making a loss?

Ren: No, our growth will slow down, but we won't see losses.

Patrick Foulis: If I was running Google and Huawei ends up pushing its operating system out globally, how worried should I be?

Ren: Google is trying to persuade the US government to allow us to use their ecosystem. In this regard, we are willing to work with Google. Our operating system wasn't initially intended for smartphones. Moreover, Google's operating system is open source, so we can continue to use it. The US limits our use of Google Mobile Services, GMS. That ecosystem includes thousands of partners, and Huawei wouldn't be able to build a comparable ecosystem in just a couple of days. If the US government allows us to continue to use Google's ecosystem, the US would maintain its dominant position in this field. If the US government refuses to grant the license, it will hurt them in the long run.

06

Patrick Foulis: Part of your job is to try to rebuild trust. Are there some radical options open to the company that tries to rebuild trust? For example, welcoming a foreign investor or perhaps even selling parts of the 5G business operated outside of China. Could Mr. Ren

talk a bit about the radical options of changing the structure of the company that might help rebuild trust?

Ren: It's unlikely that we will consider introducing external investors, because they often focus on profit. For Huawei, we put our aspiration above profit. Would we license our technologies to Western countries? Yes. We would even be open to licensing all of our technologies. Our aspiration is to "serve humanity and achieve the pinnacle of science". Collaboration is consistent with our values, so we are willing to license our equipment to Western countries.

Patrick Foulis: Would this be a sale of the business, perhaps, the 5G business in some geographies, or licensing the technology to other manufacturers? Perhaps you could elaborate.

Ren: We can license technologies and production techniques. Whoever gets the technologies can develop new things based on them.

Patrick Foulis: Would Huawei employees and facilities be transferred to the new owners or just the intellectual property?

Ren: We would most certainly not transfer our employees. It would just be the technological know-how.

Patrick Foulis: Who do you think would be the partners? What kind of companies in America, for example, might be counterparts?

Ren: I haven't had any of this kind of discussion with anyone else yet, so I have no idea.

Patrick Foulis: Many people in Silicon Valley and in America will read this article, so this is the chance to explain to them the plan.

Ren: Right. I hope this article can help clear up some conflicts.

David Rennie: Both Mr. Foulis and I were based in America for many years. So more than half of our readers live in America. So if you're telling the American political world and the business world that you understand trust is a very important question, some American politicians really say, "I'm not interested in hearing about this piece or that piece of Huawei technology." They have a bigger problem: Why would you let a Chinese company build something as sensitive as 5G? So the political problem that you have in America is very hard to solve. Could you just explain a little bit more how big a transfer you could imagine? How big a solution are you thinking about to solve this problem? How radical a transfer of 5G technology?

Ren: If we transfer all our technologies to the US, then

they can modify the code themselves. Neither Huawei nor anyone else in the world will be able to access these technologies anymore. The US will have independent 5G. Security won't be an issue as long as the US can properly manage its own companies. Then it will not be about us selling 5G in the US, but rather about US companies selling their own 5G in the US.

Hal Hodson, Asia Technology Correspondent, *The Economist*: Mr. Ren, would you envisage Huawei competing with this hypothetical new entity in 5G technologies, outside of China, obviously not inside the United States, but in Africa or parts of Europe? Would you imagine competing with this new entity or how would that work?

Ren: Huawei can compete with new entities in those markets as well.

Stephanie Studer, Senior China Business Correspondent, *The Economist*: Is that a ballpark figure, Mr. Ren, on how much this sale would cost?

Ren: I don't have a number right now. This was just brought up, and I haven't done any calculations yet.

Stephanie Studer: Not even a range?

Ren: No, but we can talk about the range of technologies.

David Rennie: Politically, would it be better to have an American partner for 5G, or a European or Japanese partner? Or do you think your problem is American, so you should look for an American company willing to buy your 5G technology?

Ren: It depends on how big a market the potential partner would be able to carve out. If they could only capture a little market share through the purchase of our technologies, then that wouldn't be worthwhile. Such a deal is only feasible when they can anticipate a large market share using our technologies. This is an evaluation process our potential partners will have to go through.

Patrick Foulis: What would be the time horizon for a radical project like this? Would it take a couple of years to achieve or could it be done quickly?

Ren: Pretty quickly.

Patrick Foulis: Before the 2020 election, perhaps?

Ren: This has nothing to do with the US general election. When I talk to you all, the general election is never a topic.

07

David Rennie: Can I ask you another political, kind of cultural question? When I worked in America, many

very important American politicians would say, "China is rising very fast, but America has a magic weapon. Its magic weapon is it's a democracy and we have freedom of speech, and our university students are free to study and think whatever they want. China is an autocratic country so they cannot achieve real innovation." Now, people look at China and companies like Huawei are innovating. The Chinese political system is a one-party system, where students cannot see everything on the Internet and cannot read any book they want. Does that impose any limit on Chinese innovation or creativity? Is there an advantage to being a democratic country in the field of innovation?

Ren: Academic freedom is the foundation of innovation. The freedom to have different academic ideas and to study whatever you want is very important. Undoubtedly, the US has the world's most innovation-friendly environment. Thanks to the Internet, people have easier access to information. Science and engineering papers have nothing to do with ideology, so they can be published and shared all over the world.

For example, the very source of 5G technology is a mathematical paper written in 2007 by Erdal Arikan, a Turkish mathematics professor. Two months after he published the paper, we read it. Then we put a lot of work into researching the paper and turned it into

today's 5G standard.

China still has an inclusive environment when it comes to science and technology. On top of that, Huawei has a large number of non-Chinese scientists. We are doing our best to take in the nutrients of the times we are in, so we can move forward faster.

David Rennie: Clearly on the Internet you can see scientific papers, but there are also large parts of the global Internet that talk about politics, that talk about history, that are not available inside China to most people, because the Chinese government closes that off. You have built this beautiful campus in Dongguan, full of beautiful European buildings. Do you also make sure that your designers and your researchers have VPNs so that they can see foreign news or foreign politics to look at big important questions that are not available to Chinese people?

Ren: If our engineers became politicians, Huawei would have collapsed. Engineers should focus on developing good products. They don't need to read about politics. What's the point of them caring about political issues? If our engineers are all out protesting, who is going to pay them?

David Rennie: To ask on that point, there was a famous speech that Deng Xiaoping gave in March 1978 about

science in China, and he said exactly that it was time to allow scientists to do science and not to ask them to read too many political essays or to study politics. When I talk to professors at Chinese universities, they complain that the pressure now is to study Xi Jinping's thoughts and to study a lot of politics, and they feel that the time to think is being limited. You're a private company. Do you feel pressured to have your scientists studying politics, or do you protect them, like Deng Xiaoping said, from studying politics to let them focus?

Ren: I was there when Deng Xiaoping made those remarks at a national science conference. I was one of the 6,000 representatives, and I burst into tears when hearing his speech. Deng said we should spend five days at work and one day for political studies. Back then, Chinese people worked six days a week, and too much time was spent on political studies. We were very happy that we could spend five days a week at work. I have always believed that politics should be done by politicians, and engineers should focus on technology. Engineers who don't understand technology aren't worth their wages.

David Rennie: You are a party member, and party members now have an app for studying Xi Jinping's thoughts on their phones. Do they worry that some people in the Chinese Communist Party are forgetting

the wisdom of that speech in 1978, and they now want engineers and busy people like you to spend maybe an hour or two every day studying politics?

Ren: President Xi's speeches cover a lot of areas, such as agriculture, healthcare, and rural development. These topics are not strongly related to us. As we are a technology company, we mainly study his speeches about science and technology development. Of course, those who work for the Party or government or those who want to become party or country leaders may need to spend more time learning about all those areas.

I listen to President Xi's speeches. In his speech at the Boao Forum for Asia, he spoke about China further opening up to foreign investment. When it came to his speech at the China International Import Expo in Shanghai, he talked about reducing tariffs for vehicles. These speeches contain his instructions, and we are pleased that our country continues to develop under these instructions. The tax for small and medium-sized enterprises in Shenzhen has been significantly reduced, and low-income workers such as taxi drivers no longer need to pay income tax. This is a lesson learned from Hong Kong. China Central Television broadcasted lessons learned from Hong Kong. Caring about poor people's lives is one such lesson. We should provide poor people with accommodation. If their lives are up to a certain

standard, there is a much lower chance they will cause problems. Even if a small number of people do stir up trouble, they will have few supporters. These points are also part of President Xi's thoughts, which I saw on TV.

08

David Rennie: Just on the question of Hong Kong. We recently saw that a private company, Cathay Pacific Airways, was forced to change its senior leaders and some employees for reasons that are 100% political and related to the protests in Hong Kong. When you see the Chinese central government using its strength to make a private company take political decisions, does that make life more difficult for every private company in China, when you want to tell foreigners that you are not controlled by politics? When they did that to Cathay Pacific, did they make your life more difficult?

Ren: The issue in Hong Kong has been caused by extreme capitalism. Large capitalist institutions have made enormous amounts of money, and they even control many newsstands, underground garages, and coffee shops in Hong Kong. They have gained a lot of benefits, but the general public don't have much money, and many have fairly low living standards.

I saw the notice issued by Civil Aviation Administration

of China (CAAC) in relation to Cathay Pacific. This notice said that some pilots and cabin crew members who worked for Cathay Pacific had been involved in questionable activities related to the Hong Kong protests. So CAAC had concerns about these pilots. That's why CAAC asked Cathay Pacific to regulate and control its flights to the Chinese mainland. I think CAAC's action makes sense, because it was taken to ensure aviation security. In addition, there have been no such limitations to Cathay Pacific's flights to other places.

I personally believe the Chinese central government has acted sensibly in dealing with Hong Kong. China adheres to the "one country, two systems" principle. The system in the Chinese mainland and the system in Hong Kong are different. Demonstrations, protests, and shouting slogans are allowed in Hong Kong, but I do not think violence is appropriate.

The Chinese central government still hasn't taken any action in Hong Kong. If the current situation in Hong Kong continues, business, finance, and tourism in Hong Kong will be affected, and it will be more difficult to address the issues with the poor there.

A lesson we are learning from the current situation in Hong Kong is that the divide between the rich and the poor shouldn't be too large, and extreme poverty should be eliminated.

The Chinese central government has made great efforts to eliminate poverty. In recent years, I have personally travelled through several provinces along the Chinese border, such as Xinjiang, Tibet, and Yunnan, places previously known for being very poor. From what I saw, the living standards of the people there have improved a lot, especially in Tibet. Tibet has improved faster than Xinjiang, and both places seem to be enjoying much stability. I didn't know the real situation there until I had gone there and seen how people's lives had improved with my own eyes.

I think more foreign journalists should also be able to visit these places. I have been to some of the most poverty-stricken areas in Yunnan, Guizhou, Tibet, Xinjiang, and other regions, and I don't think a color revolution will happen in China.

09 **David Rennie: One last quick question about politics. So many interviewers have asked you about your daughter Meng Wanzhou in Canada, but there are also two Canadian citizens currently being detained in China, and the Chinese foreign administration has said that the detention should be a lesson to the Canadian government. We know that because the Canadian embassy said these two Canadian detainees, one of whom is a former diplomat, are not allowed to see**

their family or make any phone calls. They have not spoken to anyone except some Canadian diplomats. They were allowed a book, and then they had their glasses taken away, so they can't read a book. I'm sure people have described the situation to you. Do you think that the conditions of these two Canadian detainees, Michael Kovrig and Michael Spavor, are appropriate conditions, or do you think that the Chinese government should give them access to a lawyer? They have no access to a lawyer or access to their families. But your daughter has access to a lawyer and access to her family, and can travel around Vancouver. But they are locked up in an unknown location with no access to lawyers. What do you think of the conditions of the detention of the two Canadians citizens?

Ren: I don't know anything about these two individuals. I don't know how the government deals with such cases. I only know Meng Wanzhou has not committed any crime. Her arrest was wrong from the beginning, and her case needs to be addressed according to the law. No one has told me anything about the situation you just mentioned, because they would have no reason to. I also have no channels to get that kind of information.

10 **Hal Hodson: Huawei is one of the biggest infrastructure companies in the world. And surely over the last 20 years, it has become larger and larger, and has been the target of intelligence agencies. I'm not just talking about backdoors, but in terms of infiltration, and in terms of operational security. Can you tell us a bit about how Huawei approaches operational security and how much you spend on counter intelligence?**

Ren: First of all, at Huawei, cyber security and privacy protection are the company's top priorities. Huawei resolutely incorporates requirements of the EU's General Data Protection Regulation (GDPR) into all of our business processes. We are now investing heavily to upgrade existing networks and build new networks.

Second, for more than 30 years, Huawei has provided network services to over 1,500 carriers in more than 170 countries and regions, serving approximately three billion users. We have maintained a proven track record in security. In fact, we have never had any major security incidents.

Besides, we are more than willing to submit ourselves to strict oversight in countries where we operate. At present, the UK has conducted the most stringent oversight of Huawei. Why is the UK determined to continue using our equipment? Because they still trust us despite the few problems and flaws they have found

with our equipment. They may even trust us more than other suppliers because we have been more rigorously reviewed.

11 **Stephanie Studer: Mr. Ren, one of the other pioneers of China's technology sector, Ma Yun of Alibaba, retires today, September 10. When he announced this last year, he was the great exception in handing over the reign. As I'm sure you know, many other Chinese bosses don't do this until too late to the detriment to their companies. What do you think the costs and benefits would be to your retirement? Do you think it could be an expedient to have an earlier one, given the current political climate that Huawei finds itself in?**

Ren: I will retire when my thinking slows down. Currently, I still have many creative ideas, so I will continue working for some time.

Stephanie Studer: How soon do you think that retirement might be?

Ren: I don't know. It depends on the circumstances.

12 **David Rennie: Have you seen the American documentary called "American Factory"? If you have seen it, did you get any ideas about the difference between American**

and Chinese ways of working?

Ren: I heard this was produced by Obama. Someone described it to me, but I have not seen it yet.

13 **Stephanie Studer: You spoke earlier, this rather bold idea you had this morning, to sell the core of your business really. I imagine by that you mean 5G, and you would continue to work on 6G, the next generation. So could you tell us more about what motivates you to do this? Because I imagine that it might just be pushing the problem down the road. Your 6G may be also not accepted when it is up and running globally. So how does this help you exactly? What would be the main reason for doing this?**

Ren: I'm talking about licensing our 5G technology. Licensing 5G to others does not mean that Huawei would stop working on 5G itself. We hope that the speed of technological development in the West can increase, so we are looking at the licensing of all our 5G technology to help facilitate this process. I think Huawei will continue to take the lead when it comes to 6G research, but our judgment is that the commercial use of 6G won't begin for at least 10 years.

Therefore, transferring 5G technology to other companies does not mean we will stop working on it.

Instead, the money we get from this transfer will allow us to make greater strides forward.

Patrick Foulis: Just to be clear, it's not licensing in the sense that there's an annual payment, like what Arm does. It's a one-off transaction which gives the buyer the permanent right to use the technology and intellectual property.

Ren: Yes. It is a one-off payment.

Patrick Foulis: What do the executives of the company think about this plan? I'm not sure you had a chance to discuss it but would they be shocked to hear that you are preparing to do something so dramatic?

Ren: I don't think they would be shocked. Because for Huawei, we hope to see a balanced world. A balanced distribution of interests is conducive to Huawei's survival in this world. This same concept was put forward by the UK more than 100 years ago.

David Rennie: You sometimes use this very powerful image of the old Soviet airplane that is still flying with many holes. When I hear you talking about your thinking about 5G, it is a bit like an airplane pilot who is worried about going down so you maybe throw something heavy out of the airplane and you can keep flying. Does that reflect your thinking?

Ren: No. Licensing 5G to other companies would allow Huawei to get some money. It's just like adding more firewood to fuel our scientific research efforts.

Hal Hodson: Mr. Ren, do you think that the US business and political community has what it takes to take this 5G IP package and make it a global competitor to Huawei?

Ren: I don't think so.

Hal Hodson: So just a nice gesture then?

Ren: Yes. But if the US wants to buy from us, we will be serious about pursuing that option.

Hal Hodson: So you see it as creating a fair technological race and giving up your lead and resetting the clock if America will go for it?

Ren: Yes, that's right.

David Rennie: Thank you very much for your time.

Ren: Welcome to see us often. If you want to know if Huawei can survive, you can come and see us at the same time next year.

Ren Zhengfei's Interview with Fortune

September 19, 2019
Shenzhen, China

01 **Alan Murray, CEO, *Fortune*: Thank you very much for taking the time to meet with us. We really appreciate it. I think the main question I have, which relates to your picture here, is whether this reflects a kind of a short-term bump in the globalization of the global economy. Or do you think we are heading towards some kind of decoupling that's going to profoundly change the way the global technology economy works in the future?**

Ren: When we use this picture to symbolize our situation, there are not such profound implications. We just feel as though we've been riddled with bullet holes since the US added us to its Entity List. If we can't patch up these holes, our "aircraft" may not be able to land safely. Still, we remain an advocate of globalization. Patching up these holes won't stop us moving forward along the road of globalization. We are still waiting for the US Department of Commerce to approve requests from US companies, allowing them to continue supplying us.

The longer this process drags on, the more harm it will cause to the US. The US is the world's most powerful country in terms of science and technology, but US tech companies need a global market. If the US heads towards decoupling its tech from the rest of the world and creating a digital divide, that would be a blow

to its leading companies. Take Microsoft as an example. This company has established its dominance in the global market through Windows and Office. But if the US government doesn't allow certain markets to access Microsoft's products, alternatives will appear in these markets. This will then eat into the shares of this leading company.

When you pull out of a market, you leave your market space to emerging companies. It's like grass. Without the weight of a stone, grass grows even more happily. Therefore, from this point of view, it makes sense if an underdeveloped country chooses to back away from globalization and gives up on certain markets. But if a developed economy does so, that's not a smart move.

I have always been a firm supporter of globalization. Once the US corrects some of their ideas, we may slow down the speed at which we are patching up the holes in our "aircraft" or simply stop flying even after we have fixed these holes. We will be willing to do so if it is in the best interests of our US partners.

02 **Alan Murray: And what about in the other case? What if Huawei remains on the Entity List, and then US companies can't sell to Huawei? Obviously, it hurts**

in the short term, but if you look five years, ten years down the road, what effect will it have on Huawei?

Ren: In the short term, it won't have a substantial impact on us. We don't need US components at all in our 5G and core networks, which are what the US is most concerned about. It will only affect our consumer product ecosystem, but we believe that impact can be mitigated within the next two to three years.

Alan Murray: By building your own ecosystem?

Ren: Yes.

Alan Murray: And is it possible that in the long run, you'd be better off to go that direction and have your own ecosystem?

Ren: In the long run, it might be a good thing for us. As Huawei grows larger and larger, our fate will be increasingly not up to us. This makes us uneasy. We firmly embrace globalization, but how can we survive? To survive, we'd better build our own ecosystem. Meanwhile, we will not turn away from ecosystems built by others, and will instead support them. We have signed agreements with some companies, and we will continue to work with them if circumstances permit.

The US was among the first to propose globalization, but now it is also the US that breaches the rules of

globalization. I have always been pro-US, and have tried to temper our employees' impulsiveness. Recently, I signed off something for our Business Process and IT Management Department. In that document, I encouraged them to use American, European, and Japanese bricks to build our Great Wall. I have done everything I can to make sure our employees don't try to go it on their own for our internal IT management platform. Doing that is not only costly but a huge burden to us.

03 **Alan Murray: You made an extraordinary offer the other day to license your technology, for the first time, I think, to someone in the US in order to allay security concerns. I'm curious about two things. One, has anyone suggested they will take you up on it yet? And two, do you think anyone will take you up on it?**

Ren: I would like to start by explaining why I made this offer. We think there should be a balanced technology ecosystem between the US, Europe, China, Japan, and South Korea. This technology ecosystem is different from the Google ecosystem. We are entering an era of artificial intelligence (AI), but the US has fallen behind in the rollout of Fiber to the Home (FTTH) networks. If the US also lags behind in 5G, it might lose its leading position in AI.

So first, we are willing to license our 5G patents to a US company following the fair, reasonable, and non-discriminatory (FRAND) principles. Second, we are open to licensing our proprietary 5G technologies, including the whole suite of 5G network technologies and solutions, such as software source code, hardware design, manufacturing techniques, network planning and optimization, and testing methods. We are willing to license all of these technologies without reserve to a US company. By doing this, American, European, and Chinese companies will be able to run from the same starting line and continue to compete on new technologies. Third, the US can either choose to use general-purpose chips that they make themselves or "American chips + Huawei chips" to power their 5G base stations. We are also open to licensing our 5G chipset technologies.

This is in the best interests of Huawei. By doing this, we can allay international concerns while simultaneously enhancing the strengths of our competitors. If our competitors were not strong enough to compete with us, we would begin to decline. Therefore, we are rather open in this regard. We think the information market will be huge in the future, and that there is a lot of room for further development. The market size will be large enough for several big companies and tens of thousands of small companies to compete and provide services. When Huawei takes a dominant position in too many

fields, it may also be closer to collapse.

Alan Murray: "When Huawei takes a dominant position in too many fields, it may also be closer to collapse." What do you mean by that? Could you elaborate on that?

Ren: There are numerous examples of this in history. Dynasties waxed and waned. When a nation is at its prime, it becomes the target of others. Take the swimmer Michael Phelps for example. He won many world champion titles, but eventually stopped. Athletes around the world set him as a goal post and tried their best to beat him in terms of swimming techniques. How could Phelps continue to win gold medals in face of that? We had been on the brink of ending up like that before Trump launched his campaign against us.

Alan Murray: So Trump did you a favor?

Ren: Yes. He pushed Huawei to change. For one thing, our technology is advanced, so it is not that difficult for us to win contracts. Our employees in local offices might not have to work hard to get their work done, and they can slack off after winning contracts with customers. This can breed laziness and eventually undermine the whole company. In addition, our headquarters have been scaling up, and our office environment has been improving. Employees could easily get paid, even if they

were just tapping away on a keyboard to handle some very simple processes. If it were that easy, we wouldn't have anyone willing to work in hardship countries and regions. The revenue of our regional HQ in Dusseldorf hasn't increased much, but the number of employees has increased several times over. When Trump launched his campaign against Huawei, we keenly felt a threat to our very survival. For our employees, that means if they don't work hard, they might get replaced. This applies to our senior managers as well. Over the last year, Huawei has been revitalized. Everyone is working hard.

04

Alan Murray: So back to the offer, have you had discussions with American companies about this licensing idea?

Ren: This is a major issue. It's not something that will be decided overnight. There are many big players in the US reaching out to us about this.

Alan Murray: You must have had a company in mind when you made that offer. What company would it be?

Ren: First of all, it should be a large company. If they bought the license for this technology but couldn't carve out a big market, it wouldn't be a good deal for them.

Second, there is no geographical limitation on which

markets that company can sell. It can sell in the US market or any other market on this planet, including China. Maybe not on Mars, the moon, or the sun. Then we can fully compete with each other.

Third, that company needs to have some expertise in communications and come from an industry similar to Huawei's. It can modify the source program or source code of the technology we offer, so that it becomes a totally independent system from ours. Then the technologies used in their system will be unknown to Huawei. Perhaps this approach could help alleviate the national security concerns of the US.

Before they've finished making the modification, we can share in real time Huawei's technological advancement with them in a very transparent way. This will ensure they can keep pace with our technological advancement.

After they've finished modifying our technology to the point that Huawei no longer knows what's in their system, Huawei will continue to work with that company for the next 10 years. We will be sharing the concepts of Huawei's own progress with them.

We are very sincere in our offer for this technical licensing arrangement and will do it in good faith. We will not hide anything or keep any trade secret

to ourselves. We will be open and transparent to the potential licensee. This is not because we are stupid, but because we want to create a strong competitor for Huawei's 190,000 employees to stop them from becoming complacent.

Alan Murray: I think this is unprecedented. I can't think of anything like this in my 40 years of covering business. I think some people would say it's crazy, and because it seems so crazy, they might question your sincerity.

Ren: Now I have the whip in my hands to urge Huawei to move forward. In the future, I'll hand it over to a US company. When the US company becomes a strong competitor, it will push our 190,000 employees to always be on their toes.

05 **Clay Chandler, Asia Executive Editor, *Fortune*: When you were asked whether you had a particular company in mind when you made this licensing offer, you listed a series of conditions. But it leaves me wondering: What are the subsets of companies that would meet those conditions? Can you name some companies or people who would be worthy partners for Huawei in this endeavor?**

Ren: I don't think it is appropriate for me to name

specific companies because that would be an offense to them. But I believe there must be one US company out there that is ambitious enough to seize a dominant position in the global market. If there are speculations in the media, that's out of my control.

Alan Murray: Who should they call if they're interested in this extraordinary one-time offer?

Ren: They can call anyone at Huawei, because they will definitely get transferred to top management. They can get in touch with our PR department or send an email to me.

Alan Murray: May we print your email address?

Ren: Of course!

Clay Chandler: OK, I will print this and see what comes in.

Ren: You have my support.

06 **Clay Chandler: And what about the regulatory complications of this arrangement? Have you thought through whether there might be some government opposition or reservations about this arrangement? And have you heard anything from the US side?**

Ren: No, I don't think there will be any regulatory

complications. Some people in the political community in the US will pay attention to this offer. This is purely a business transaction, so I don't think it's necessary for it to be approved by the Chinese government. We are not selling all of our technologies. We are just planning to license our 5G technology to a US company, but will continue to build our 6G on this technology. The US company to be licensed can also develop their 6G on the basis of this technology. Then we can compete with each other on an equal footing.

I don't think it's necessary for the US government to approve the transfer, either. 5G base stations are a completely transparent system, where data packages are not opened and are just directly transmitted to other parts of the network. Security issues that people often talk about are about the core network, which is software-centric. Many US companies have the ability to develop core networks. If the US needs Huawei's core networks, we are also open to licensing related technology. As I just said, we're even open to licensing our chipset technology.

So this is a very transparent model. After a US company gets our technology, they can modify it as they see fit and build an independent security system that Huawei has no access to. We'd then have no idea what changes they make.

In the future, we will be entering a world of AI. However, it will continue to be based on the architecture put forward by John von Neumann, a great US scientist. He put forward this brilliant architecture in 1946. This architecture is about supercomputing and mass storage, and the US leads the world in these two areas.

However, supercomputing and mass storage require super-fast connections. If the US does not use the best 5G technology, a lot of advanced AI technologies will not be widely adopted in the country. As a result, the US might fall behind in the future. When that happens, some people in the US will attack whoever is in the lead, and it's possible that Huawei will become targeted again.

To avoid this situation, we'd rather help the US address the issues they are currently facing regarding super-fast connections. By licensing our 5G technology to a US company, we'll be running from the same starting line. I would rather have that US company outpacing Huawei so that we can sustain our success.

Clay Chandler: I just want to confirm that this is an offer that is extended only to American companies, and that it's not something you would consider if a European company would come forward, or Japanese company, or perhaps, even a South Korean company, saying, "Yeah, it sounds great, we're interested."

Ren: Europe has its own companies, so they don't need this offer. On top of that, the US is a relatively large market.

Alan Murray: Cisco? Are you okay with that?

Ren: I'm okay with that. Why are we so sincere in making this offer? It's because the US is still moving in the wrong direction on many future technologies. I want to tell you a few stories.

At one time, the telecommunications standard that Germany chose was ISDN. With ISDN, the data rate was only 128 Kbit/s. When the German market was saturated and a German telecom vendor wanted to expand its business to the global market, they suddenly realized that the world had changed and ISDN was no longer needed. Today, the world has evolved further towards GPON. With this standard, homes can have data speeds of up to 1 Gbit/s or even 10 Gbit/s. This is one reason why this German company declined.

To prevent foreign telecom vendors from entering the Japanese market, Japan used the uplink frequency for downlink and the downlink frequency for uplink, which was the reverse of the global standard. Then when the Japanese market was saturated and Japanese vendors sought to expand in the global market, they found that their equipment could not be accepted. And as a result,

Japanese telecom vendors also declined.

Now let's look at the then three major telecom equipment vendors in North America: Lucent, Nortel, and Motorola. They pushed the world to accept CDMA and then WiMAX, because they believed that WiMAX was a great technology. As WiMAX was designed by computer companies, this technology worked perfectly in local area networks but not in global networks. These companies started in home networks with WiFi and aimed to build a global network with WiFi as well. European and Chinese companies all chose WCDMA and worked on wider area networks before extending their reach to home networks.

As it turned out, US companies chose the wrong path, because WCDMA turned out to be the global communications network standard. And after that, US telecom vendors collapsed. Only European and Chinese companies are still standing. The collapse of US companies was not because of the rise of Huawei.

I'd like to tell you another story. Japan had the strongest expertise in the electronics industry in the 1970s and 80s. They made a lot of money and were purchasing many properties in the US. Then, in the 1990s, the US used digital circuits on a large scale, getting a higher yield rate than that of the analog circuits which used operational amplifiers in Japan.

Operational amplifiers required very stringent linearity, resulting in a yield rate of only about 5%.

But the US was designing products with digital circuits, meaning the yield rate for their chipsets was over 33%. The US staged a comeback in the electronics industry. Of course, the yield for chip fabrication today is higher than 99%. The same is true for a company. If a company is too overwhelmed by their past, it's likely they will fail.

Now, let's get back to Huawei. Once Huawei becomes strong in every aspect, will our leadership also become stubborn and rigid? Is it possible that they could become like the US, jumping to conclusions without thorough consideration?

The US often attacks any country they want, and only tries to find evidence to justify these attacks afterwards. I'm concerned that our next generation of leadership might be overwhelmed by the success the company has achieved. So I would rather support the development of several strong competitors in the US so that our next generation of leadership will stay on their toes.

After my explanation, you may not find my idea mysterious. Actually, this is something that everyone in our top leadership agrees on. It's not simply nonsense that I am saying while taking an interview.

Alan Murray: When you find your partner, will you tell us first?

Ren: I cannot guarantee that. We may need to sign an NDA before we enter into serious negotiations. Once the negotiations are complete, we will inform the public. It's hard to say who will get the news first.

07

Clay Chandler: Can I ask a quick question about something that's in the news today? It is that in Munich at 8:00 tonight you'll be unveiling the Mate 30 phone. There are a lot of speculations about whether you would actually put that on sale in Europe without permission to use the apps from Google, like Gmail, Google Maps, the Play Store, etc. Some people think you'll just go ahead and roll it out anyway even without the apps and see what happens. But other people have speculated that it would be sort of useless for European consumers to buy an expensive piece of hardware like that without those apps that they often use. What's going to happen? Are you going to sell it in Europe? Or not roll it out at all?

Ren: For now, we cannot precisely predict the outlook of our consumer business in overseas markets. Our phones, though, have some unique features that do not necessarily depend on Google's ecosystem. Even if

Google Maps cannot be used in our new phones, there are other map developers in different countries, so we can download their map apps.

No matter what happens, we remain committed to offering Huawei smartphones in overseas markets, even if the sales in these markets may slow down or decline. We will see how these markets react to this.

08 **Clay Chandler: It's fascinating. Can I ask a quick question about the Harmony operating system? How confident are you that you can develop this into being the equivalent of say, an Apple operating system over the next two or three years? Would it take longer than that?**

Ren: I think it will take less than two to three years. Since I'm part of the company's leadership, I need to be a bit more conservative when discussing timelines; otherwise, I may end up putting too much pressure on our staff. But in truth, I personally don't think they need a full two to three years.

Alan Murray: But your strength has always been hardware, not software?

Ren: That's true, and we need to further improve in terms of software. We're somewhat weak when it comes

to big software architecture, but we are the world's strongest player in embedded software – software that is built into hardware systems. We need to improve our software capabilities. Working on a big operating system is difficult, but we are confident that we can do it. We are not just saying we are confident; we have already started preparing.

That said, we hope the world does not split into different camps. We still hope to continue to use Google's operating system, and we remain committed to friendly cooperation with Google. We hope that the US government will approve Google's request.

Alan Murray: When do you think you'll know if you're going to get approval to use the full suite of Google's software?

Ren: We don't know. It would be better if you asked the US government.

09

Clay Chandler: The Huawei issue and the trade issue have become tangled up over last year. This is partly because of certain actions, deliberately at the choice of the US President, who has said we will settle all these deals together and Huawei might be part of the trade deal. What's your view on that? Is that something that's helpful for you? Or would you rather

these things be kept on entirely separate tracks and in separate discussions?

Ren: Huawei has virtually no business presence in the US, so the trade talks between China and the US have nothing to do with us.

The only connection between Huawei and the US is that we buy chips and electronic components from the US. If the US government doesn't allow US companies to sell to us, then those companies will suffer financially, but there has been no real impact on us. If you go and see our production lines, you'll find that everything is business as usual. But the impact on the US has been quite substantial, with many US companies losing orders worth billions of US dollars a year.

If the US government approves the requests of US companies currently affected by the Entity List, this will help those companies.

Alan Murray: Who are the companies? Who are your larger suppliers? Obviously, Google and Qualcomm. Who are the main companies that sell equipment to Huawei?

Ren: It is reported that the US Department of Commerce has received more than 130 applications from US companies who wish to continue their supply to Huawei.

10 **Alan Murray: You said that it would not hurt even in the short term. Won't this hurt European sales if you can't use Google products?**

Ren: We are currently seeing a drop of 10 billion US dollars in our sales revenue. That's not a big impact on us.

Alan Murray: Well, we look forward to reporting on your new partner.

Ren: I look forward to welcoming you back to our campus, so you will know our company is surviving.

Alan Murray: We have little doubt about your survival.

Ren: We are also confident about our own survival. We definitely do not want to see a situation where globalization becomes fragmented because of the conflicts between Huawei and the US.

A Coffee with Ren II: Innovation, Rules & Trust

September 26, 2019
Shenzhen, China

Christine Tan, Anchor, Managing Asia, *CNBC*: Welcome to another session of A Coffee with Ren. Today we're talking about a very interesting topic: Innovation, Rules, and Trust. We will focus on innovation simply because there are so many changes happening in the world of technology and such huge impacts that new technology can bring. We will also look at rules and how to manage risks and disputes when it comes to new technologies. This is without mentioning the issue of trust, which has become very critical as we explore new technologies, as has the prospect of a global framework that can really govern new technologies, and what this means for everyone.

Let me introduce today's panel to you. The man himself, Ren Zhengfei, CEO and founder of Huawei. And with him, two celebrated scientists and futurists on my left from the US – Jerry Kaplan also a futurist, best known as a pioneer in pen computing and tablet computers. Welcome Jerry. Please also welcome Peter Cochrane, fellow of the Royal Academy of Engineering, winner of the Queen's Award for Innovation, and the former CTO of British Telecom. And last but not least, we have President of Corporate Strategy Department, Zhang Wenlin. Thank you all for being with us.

Let me start with Mr. Ren.

01 Christine Tan: Mr. Ren, this is a discussion about innovation. How do you see the future? What new technologies do you see evolving?

Ren: I believe that society is on the eve of another explosion of new theories and technologies. Electronic technologies will evolve towards being three nanometers or even one nanometer in size and won't stop there as Moore's law approaches its limits. It's just that technology will continue evolving in a manner that we cannot predict yet. In the past, we thought graphene would be this evolution. However, we don't know for certain if that's still true until today.

Significant breakthroughs will be made in genetic technology over the next two to three decades, which will help trigger huge breakthroughs in life science, biotechnology, and nanomedicine. We are not sure how these breakthroughs will change people's lives. If our electronic technology is reduced to one nanometer precision and to a level that can be combined with genetic technology, what new scenarios will emerge? What surprises will be in store for society? This is beyond our imagination. Today, science and technology are so advanced that we can use molecular technology to synthesize materials that never existed before. An endless stream of new materials and technologies is constantly being discovered. We can't tell what the

trends of the future will be.

AI will certainly start being applied on a large scale. But still, we cannot envision how it will drive society forward or create more wealth. The breakthrough and penetration of quantum computing will trigger the explosion of the information society. Although we know the impact will be significant, it won't be the same as we thought, not to mention the extensive application of optical technologies... During this period, breakthroughs in a single discipline will present us with a dizzying variety of new opportunities. The reverberations from breakthroughs in interdisciplinary studies will hugely shock us all. Any breakthroughs will be accompanied by an explosive growth in data traffic. We can't foresee what demands there will be in terms of computing, storage, transmission, and processing of this super large amount of data.

All these new technologies, which will be applied on a large scale, are likely to generate breakthroughs over the next 20 to 30 years. How will we usher in a new era in the face of these opportunities? I have no ready answer to this question.

This new era will open an enormous window of opportunity for us. We need to work even harder and join the forces of scientists and engineers from around the world to welcome this new era. This is what we

expect. Despite this, we don't need to feel uneasy about the unpredictability. Instead, we should embrace this new era with great courage.

Christine Tan: Let's talk about AI, which is artificial intelligence. A lot of people have been focusing on artificial intelligence and worry that it might displace jobs. How do you see this?

Ren: AI will just create greater wealth and generate higher efficiency for society as a whole. This greater wealth and increased efficiency will then address the employment issue in a new way. AI will be the core variable that will influence and shape a country's future capabilities and bring disruptive changes to that country. This means AI will fundamentally change how the international community develops. The development of a nation depends on its basic capabilities. Basic capabilities are about education, talent, industry maturity, algorithms/computing power, and infrastructure. With support from infrastructure that includes supercomputers, super-large storage systems, and ultra-high-speed connectivity, humanity will welcome a new level of prosperity.

As for jobs, I believe this raises new requirements for each society and each country. We've already been through the Industrial Revolution. At that time, each worker was a good fit for society as long as they had

received secondary education. In the AI era, we must improve the education and sharpen the skills of the world's entire population. Every country should endeavor to do so. To succeed, they don't have to be a big country. Thanks to AI, many small and middle-sized countries will be able to significantly boost their production capacities. As long as these countries are capable of creating more wealth, they will offer their people more opportunities.

Christine Tan: You're an expert in AI. Do you agree with what Mr. Ren just said?

Jerry Kaplan: First of all, it's an honor to be on the panel with such a prominent entrepreneur who is respected around the world, so thank you very much for having me. Following Mr. Ren, who's made such an eloquent explanation, I feel a little bit like I'm being asked to talk after Shakespeare though. So I'm not sure that I'll have too much to add.

You also want us to be a bit argumentative on the panel. So, there are a couple of things that are important to understand. AI is not magic. It's not really about intelligence at all. It's simply a new wave of automation. To understand what's going to happen with AI, you simply have to look at previous waves of automation. And then you can understand how it will affect labor markets and what is likely to happen.

Now, while it may seem technology is moving very quickly today, the people who study this, the academics, have surprisingly found that the rate of change in the past was actually faster than it is today. We are seeing an age in which technology and innovation is actually quite a bit slower. The invention of the railroad, the electric light, the computer, the television, all of these transformed society. And we haven't seen that kind of pace of transformation.

But I think that ultimately, Mr. Ren is correct, the future will be bright. While automation disrupts labor markets, it doesn't cause jobs to disappear. New jobs will be created. As we become wealthier, demands will be created. We get a new middle class and new demands for goods and services. And in fact, automation will change the nature of labor, not put people out of work.

Christine Tan: Peter, I've got to ask you. On AI, who do you think is going to dominate in AI? Will it be China or will it be the West?

Peter Cochrane: I think that AI will decide. Right now, it's very task-specific in the same way that when Jerry, Mr. Ren, and I first entered the industry, if you bought a computer for the payroll and that's all it did. Nothing else! And right now, we've got general-purpose computing. We don't have general-purpose AI yet! But I would like to frame this against a bigger picture,

a bigger ambition. What are we trying to do? First of all, we have to try and create sustainable societies. To do that, we have to get away from the idea that we can polish and improve what we've got. It won't work. Transformation demands biotech, nano tech, AI, robotics, and the Internet of Things.

Because anything we create for the future has to be recycled, repurposed, reused, and the only way we can orchestrate this is with the IoT. And there's a further thing that we have to achieve, and it's a big challenge. I don't know if Mr. Ren would favor this, but I would phrase it like this, we have to stop producing more and more for the few, and we have to start providing sufficient for the many. If we do not, we will never see a stable planet where people are living equitable lives.

There is sufficient on this planet to support every human, but with the technology we have right now, we stand to destroy our ecosystem. So we have to change the way we live and the way we do things.

02 **Christine Tan: Innovation changes the way we do things and where we go. Another big word that has become very important is "trust". Mr. Ren, let me address this question to you, because Huawei has been under a lot of scrutiny as a leader in 5G. Why is there**

so much distrust around what you do?

Ren: Hundreds of years ago during the Industrial Revolution, some people did not trust the machines used in textile mills. Some even saw them as symbols of devilry and tried to destroy the machines. Eventually though, people accepted the machines. Without these machines, the high-quality fabrics we use today wouldn't exist. Now some of the highest quality fabrics in the world are still produced in the UK. The emergence of these machines did not deprive textile workers of their rights, but improved the quality of their textiles. When the train was first created, it was ridiculed because it was slower than a horse-drawn carriage. Today, trains are widely recognized as one of the fastest ways to transport heavy cargo. When the train was introduced to China in the beginning of last century, people thought they were powered by ghosts, and couldn't figure out how they ran. Similarly, when China's high-speed rail began operation, an accident occurred on the Ningbo-Taizhou-Wenzhou line. At that time, almost everyone was against high-speed rail. But now no one complains about them at all. I think almost all people would say high-speed rail is a good thing.

Now AI is still in an early stage of its development. Advances in super computing, super-large storage, and super-fast connectivity technologies are creating

opportunities for AI applications. Now people are very concerned about AI. They are worried that AI will cause unemployment, disrupt social structures, and distort our ethics. They worry too much. If we look back, our population is several times larger than it was a few decades ago. Before, huge swathes of the human race were hungry. Now though, we are in an era of excessive material abundance; we have more than we can consume. That's because advancements in technology have helped us create more wealth.

The emergence of 5G was something unexpected. 10 years ago, Turkish Professor Erdal Arikan published a mathematics research paper. Huawei came across this paper earlier than some others, invested heavily into that area, and kicked off our 5G. 5G itself is a tool, just like the ballast beds that train tracks are laid on. That's all it is about. Right now, there are heated debates around 5G, but only history will tell if 5G, AI, and other new technologies will create value for humanity.

In short, people should have more trust and tolerance towards new things. The most prominent feature of innovation is that it gives everyone academic freedom, allowing people to explore. With a little more tolerance in the world, Copernicus's theory of a heliocentric universe would have been accepted long before his death. People also suspect that genetic engineering

has negative effects. But that can only be proved after experimentation. We should be more understanding of genetic scientists.

Christine Tan: Are you disappointed and sad that there's so much distrust around your 5G technology?

Ren: China used to be very poor and lag behind the rest of the world. People thought that China would never catch up. However, China turned out to be a crazy sprinter, able to catch up with anyone else. It's just like a train, which eventually runs faster than carriages. When new things are discovered, people don't trust them, but I think eventually the trust will grow.

Now, Europe still presents Huawei with a wide scale of opportunities. Actually we still see many opportunities all around the world. I think many people are quite tolerant of us, and that makes me happy. After all, we cannot expect everyone to understand us, at least not within a short period of time.

Zhang Wenlin: For what we see about distrust, I think that was caused by a lack of knowledge about 5G and the industry. For those that have sufficient knowledge of 5G and the industry, such as telecom carriers, industry partners, standards organizations, and the governments of countries seeking economic and industrial development, they generally trust us. That's why our 5G business is

developing very well despite all the noise and obstacles.

03 **Christine Tan: Actually you offered to license all of your 5G technology to Western companies for a one-off fee. You put the proposal out there. Any interest so far?**

Ren: First, we don't intend to license our technology to all Western companies. We'll license it to only one Western company. We'll give it an exclusive license, so that there will be a large market for them. We think this company should be a US company. Europe already has its own 5G technology, so do South Korea and Japan. They just need to make some improvements and adjustments to its development. Since the US doesn't yet have any 5G technology, we should exclusively license it to a US company. With our 5G technology, that US company will be able to compete with us worldwide, not just in the US market. Of course, competing on Mars, the moon, or the sun, is another story. But we can compete anywhere on the earth. Our aim is to start from the same place with the rest of the world in this new race. I believe we'll still be able to win on that new horizon.

5G is not that amazing; its power is exaggerated by politicians. AI will have an even brighter future. I hope we will not be added to the Entity List again in the AI

era. Anyway, that would be unlikely, because AI is a software-based technology and we will probably surpass other companies in this area. Hopefully, we won't run into any new conflicts over this. We want to work together to serve humanity and the new digital society.

Peter Cochrane: I think it's totally distorted. There's no distrust between engineers, scientists, managers, or companies.

Christine Tan: Then what is the issue?

Peter Cochrane: The issue is political. It has nothing to do with the technology or the people working on it. It is political. The technology fear factor is normal; it happened with 3G and 4G. But there's a subtle difference, as social networks are now distorting perceptions. People associated truth with quantity. And if the social networks do anything, they generate quantity!

A single blog can generate 20 million postings, and this number just keeps going. And so, there's been no concerted effort by the industry to allay people's fears. We should be doing that. There is no proven problem with any of these technologies. If there were, we would have policemen queuing at the hospital with brain cancer. We've had mobile technology for a long time. We've been using military radios with far more power in close proximity to human beings with no difficulty at all.

There's no proven problem.

There are problems such as influenza or gun-shot wounds. But there's no proven danger with 5G. In the UK, for example, the number one concern is that everybody wants services but nobody wants to see towers or masts.

Christine Tan: Mr. Ren, a follow-up, very quick question, in terms of licensing out your 5G to one US company. What would that package look like? Would it be, hardware, software, or code? What would it involve essentially?

Ren: First, we'll license all our patents to this partner on fair, reasonable and non-discriminatory (FRAND) terms. Second, we'll license them everything related to 5G network technology, including software source code, hardware designs, production technologies, as well as network planning and optimization and testing solutions. If they need, we can also license our chip design technology to them. We just hope that we'll be able to start on an equal footing with companies from Europe, Japan, South Korea, and the US, so that we can continue to contribute to humanity together. We are confident that we will win the race, so we're open to offering the license.

Christine Tan: But essentially this opens up the

opportunity for another Western company to be a giant competitor to you. Are you willing to accept the fact you might lose your 5G leadership? Is that something you're willing to accept?

Ren: First, we will get a lot of money from the licensing. That will be like adding firewood to fuel our innovation in new technologies. It will mean that we will have a better chance of maintaining our leading position.

Second, we will bring in a strong competitor. This will prevent our 190,000 employees from becoming complacent. They'll know that if they sleep on the job, they might wake up and find they have lost their jobs. It is simply not enough for me to keep pushing our employees to work hard every day. Sheep become stronger when they are chased by wolves. I don't worry that a strong competitor will emerge and drag Huawei down. In fact I would be happy to see that, because this would mean that the world is becoming stronger. The slower sheep from a herd will be eaten by wolves. Therefore, if we think of Huawei like a herd, it doesn't need to lay off its slow-moving employees, as they will be eaten by "wolves". This is not a bad thing. I don't think a competitor poses a threat to us; instead, it will push us to move forward.

Christine Tan: Jerry, how do you think this would sound to a US company and is licensing a way to rebuild that

trust?

Jerry Kaplan: Let me address the trust issue. First of all, in this conversation we're conflating two issues. Peter is talking about trust and fear about the technology. Mr. Ren is talking about trust and concern about suppliers. Trust in English is a fraught word. It's an emotional word, like you don't trust me. It's about emotions. The truth is you don't need trust to do business; what you need is predictability to do business. Those are very different things. It's just like marriage. You don't need love to be married; it helps. But you need respect to have a good marriage.

So the issues are the same here. What we need is a better expression of mutual respect, which, to be frank, the United States at a political level is not doing and therefore is not able to engage in a productive dialogue. Licensing is just one possible approach to this. There's a whole variety of technical approaches. There's clean room. There's second sourcing. There're all kinds of techniques to ensure that every nation, including the US, has a right to protect its critical infrastructure. But that doesn't mean Huawei cannot be an effective supplier and there's no reason, in my view, Mr. Ren should give away his business. If he can outcompete American companies, that's the American way.

Christine Tan: Mr. Ren, would you want to give away

your business?

Ren: I can understand that.

Christine Tan: Peter, what do you think about this issue?

Peter Cochrane: I don't actually think it's about the technology or 5G or networks. I think the real power in this situation is what we are going to do with it. It's the enabling function of 5G that I think is the real driver. We can transform things like healthcare, logistics, and manufacturing. It's a really good way of very quickly orchestrating the resources of a country, and the planet, to great effect.

I don't think that some new company coming into this field, or a company that's already in the field, that takes the technology from Mr. Ren, is suddenly going to become superior. There's a very powerful research team here. They've got terrific scientists and engineers already thinking what's beyond 5G.

The reality is, if we're going to get 5G rolled out across the planet really quickly, we need more than one company doing it. When any market becomes stabilized, and a product becomes a commodity, you usually only finish up with only 3 or 4 suppliers, but in the early stages you need a lot of suppliers to get it out there. I think the urgency is related to global warming and

transforming societies.

04 **Christine Tan: Mr. Ren, I read that you're open to the idea of signing a no-backdoor agreement, something you're exploring with some countries in Europe. Can you clarify your situation? Is that happening? What's the latest?**

Ren: Over the past 30-plus years, Huawei has maintained a solid track record in cyber security worldwide. This has proved that Huawei's equipment has never caused a large-scale network breakdown, and has never experienced malicious security incidents.

In the UK and Germany, we are subject to stringent scrutiny. No other equipment vendor has been subject to the same kind of rigorous tests. These tests have proven that there are no problems with our products and solutions. It's true that the UK has found some issues with our solutions, but we will take them seriously and make improvements accordingly.

We have never had any malicious intentions. We support Europe in subjecting equipment vendors and carriers everywhere to these tests. The purpose is to ensure that no one installs backdoors. We have full confidence in signing no-backdoor agreements with various countries, and we are sure that we can deliver

on this commitment.

We are investing heavily in R&D to ensure that we are at least up to the EU's cyber security standards and the requirements of the General Data Protection Regulation (GDPR). We have determined that our top goal for the next five years will be to ensure cyber security and privacy protection. On top of that, we will build simplified network architecture; simplified base stations, transmission networks, and core networks; and simplified transaction models. We will also build secure and trustworthy networks while protecting privacy. This will make networks faster, simpler, more secure, and more reliable.

We are working hard on these goals. And that's why we dare to promise to governments worldwide that our equipment contains no backdoors.

05 **Christine Tan: So the issue of trust is very real. Even though you want to sign a no-backdoor agreement, there is the issue of "if I don't trust you, I'm going to develop my own technology instead." This talk has given rise to the fact we are facing a scenario where we could see two separate tech worlds, a tech decoupling of sorts. One in China and one in the US. How real is this possibility, Jerry?**

Jerry Kaplan: Well, it would be a terrible economic travesty for both sides and both countries, as Mr. Ren has written about extensively. However, if you're just talking about 5G, let me point out that this is a replay of things that happened between Europe and the United States with 3G and 4G. The standards were different, and your phone didn't work in the other place. Ultimately chips were developed that operated on both standards. It's a surmountable problem. This isn't the end of the world.

Christine Tan: Peter, if we get one standard in China and one standard in the US, where does that put Europe?

Peter Cochrane: I don't think it's a sustainable solution for the planet. It's just very expensive. What really happens in the tech world is that we spend billions developing technology. We have to get it out there in large numbers to amortize that investment, and then the prices fall and we can spread that technology across mankind in general. But if we have a smaller market, the prices are going to be higher. The cost of development is much higher.

The reality is, not the United States, not Europe, China, or India, or Russia has got all the resources, all the people, all the technologies, all the manufacturing facilities, or all the know-how. We are in a global market; we are dependent upon each other. And I don't

think the politicians understand either the technology, or globalization, or markets. Otherwise, they wouldn't be doing such stupid things.

Christine Tan: Mr. Ren, to what extent do you think Huawei can decouple from technology in the West? To what extent can you reduce your reliance on foreign technology? And does this force you to develop your own technology instead?

Ren: In the early years of railways, there were narrow tracks, wide tracks, and standard tracks. These differences impeded international transportation and hindered industrial development. The same problem has occurred in the communications industry. There are three standards for 3G and two standards for 4G, and it's widely agreed that these different standards have slowed down the development of communications worldwide and imposed high costs. For 5G, there is only one unified standard, which is the result of collective discussion among tens of thousands of scientists from more than 100 countries over the past two decades. As a result, the whole world will be connected by one standard network architecture, and this will bolster the development of AI and social progress.

I don't support any technological decoupling, whatever the cause. My position is very clear: If US companies are allowed to sell components to Huawei,

we will buy from them, even if this means cutting the production of components we have developed in-house. We support globalization and we will never seek to develop entirely on our own. We will never close ourselves off. The actions we are taking now in response to suspension of supplies don't represent our long-term ideal, which is to become an integral part of the world.

US companies are constantly making changes so that they can gradually resume their supplies to Huawei. We welcome this and we are happy about it. Decoupling is the last thing I want to see. It takes a lot of work to create a unified technology. Decoupling will only jeopardize the creation of new wealth for humanity.

Market fragmentation can only lead to high costs, even if it's possible to develop the required technology. The purpose of globalization is to support large-scale adoption of technologies and reduce the costs of quality services to benefit the seven billion people who share this planet. This is something we have been working hard to achieve. Fragmentation and decoupling should be avoided whenever and wherever possible.

06 Christine Tan: Operating systems are the next big technology for China. What would you say to that?

Ren: The development of HarmonyOS has taken us

seven to eight years. This OS is originally intended for the Internet of Things and industrial control. Low latency is the biggest feature of HarmonyOS. You may be wondering whether it will be used for consumer devices. In fact, we are working to make that happen. Google has been friendly to us, and it is very capable. If the US government prohibits Google from providing Google Mobile Services to us, we will have to work hard to solve the issue.

Jerry Kaplan: I want to talk about the standards issue for a second. We're conflating a whole series of things. Standards allow interchange and permit innovation if they're good standards that can be different underneath. Now 5G is a much more complicated thing than the two letters, 5 and G, sound like. It's a whole series, a stack of layers. It's quite possible for the US to adopt the same standard as China and yet for the world to bifurcate because of silly trade issues and commercial issues that neither government has any business imposing on the world's corporations. So I think it's important to understand that. But, we've been through this before, fax machines, same story. Everyone had their own standard, and nobody profited. When there was one standard, everybody's machines could talk to each other, so there was plenty of room for people to make money. Personal computers were just in the United States. IBM released the personal computer in 1982, if I'm remembering

correctly. I'm old enough that I was around with the horse and buggy, so I think in 1982 they released that and it wasn't until they opened it up and licensed the design to everybody that the personal computer revolution really took off through standardization. So we can have that standardization and interchangeability. We do it with telephones, we do it with airplanes, we do it all over the place, and it's separate from other economic issues.

Peter Cochrane: The worst case scenario is we have to put a box in the middle to translate between the two. It's an awful engineering solution, but it does cure the problem. But I think you should recognize that it's not just Huawei that's being affected here. I'm over here with my Apple computer. I have two Gmail accounts. I have other American products that are suddenly not working so well or not working at all. This is not the technology or the people engaged in the markets; it's brought on by politicians. So these somewhat ridiculous impositions have no place in the future.

07

Christine Tan: So, gentlemen, I'm going to be really controversial here. Let's just say we did have that two tech worlds and there was a decoupling, and we could never say "No" because the world is so uncertain these days. Who would win out the tech race? Will it be the

US or will it be China eventually? Indulge me with an answer.

Peter Cochrane: It will be China and all its customers, because you have to remember that the entire United States population is less than 4% of the world's population and so where are people going to go?

Zhang Wenlin: The standards that are most open and global will win. This has already been proven in the communications industry. In the 2G era, the standard of 3GPP was more open than another standard which was relatively closed even though it was more technologically advanced. Since then, from 3G to 4G and now with 5G, the standards of 3GPP have been embraced all over the world. Companies that supported advanced but closed standards have taken the wrong track. Huawei has witnessed this historic journey, and we are a staunch supporter of globalization, openness, innovation, and collaboration for shared success.

Ren: I think it's unlikely that our world will be divided into two camps.

Though we have not been allowed to interact with US scientists and professors, sooner or later we will still see the papers they release. For example, we can see the papers of a Turkish professor two months after they are released. We may end up seeing the papers of a US

professor three years after they are released. It's just a matter of time. And when we can see their papers, there will be impacts on our technology. It always takes time to transform new theories into engineering practice, but we can catch up if we run as fast as we are able during this period.

Even though the US is a bit ahead of us, the "snow water" on top of the Himalayas may still be the same. The US is the world's most powerful country and has the best technologies, which are like the snow water on top of the Himalayas. Technological decoupling is like building a dam to prevent snow water from flowing downhill, and the crops growing at the foot of the mountains will die from drought. In this way, the water will not be put to effective use to create value. The better approach would be to let the snow water flow down the slope, so that it can be used to irrigate the crops at the foot of the mountains. That way, the water itself creates value from crop yields. This is what globalization achieves.

How can the US become more prosperous if its companies are not allowed to sell their great products? Crops can't survive without water. When the mountain streams stop flowing, a farmer can dig a well for irrigation. If a developing country is barred from buying from a certain country, they will find alternative suppliers.

If water can't flow down the mountain, it brings no benefit to those at the top of the mountain, either. Scientists and ordinary workers have to make a living. A country's economy will shrink if its technologies can't be turned into products or can't secure the global market. Objectively speaking, no country can thrive if it distances itself from the rest of the world. No country can create a regional market that keeps foreign countries out. That said, I have to admit that the landscape is very rugged.

There's a book named *The World Is Flat.* I have always believed that the world is flat, albeit with glaciers in some places. It takes great effort to traverse the glaciers, and you have to be extremely careful even where the surface is flat. All roads in the world, however rugged, are connected to each other. We are in an Internet era, where technological decoupling and regional separation are impossible.

A moment ago, Zhang Wenlin explained which type of standards will win. In the 2G era, CDMA was more technologically advanced than GSM. Who saved GSM? It was China. The country refused to accept the harsh requirements of CDMA, so China bought GSM products in huge quantities. The call drop rate of GSM networks was high at first due to poor product quality, but issues were identified and fixed as China put GSM products into wider use, and the products themselves became

better during the process. Against this backdrop, 3GPP has made rapid advances. GSM is more open. Tens of thousands of companies have come on board to support the 3GPP standards, form an ecosystem, and make achievements, including today's 5G. The success of 5G is the success of the 3GPP organization.

Christine Tan: So you are sure technology decoupling will not take place. Are you willing to say to this crowd and people tuning in that it will not take place?

Ren: Why am I sure that decoupling won't take place? Because the Internet has made widespread communication possible. With the Internet, it's impossible for US professors to hide their paper in a fridge from everyone else. Otherwise, American engineers wouldn't be able to make products based on this paper either. So the paper will be visible to everyone if it gets published, and those who read it will build on the theories developed by US scientists. They could also follow the theories of European scientists or Russian mathematicians. Eventually, they will form parallel ecosystems, with some on a higher level and some lower. However, there will be no fundamental differences with regard to the entire ecosystem.

Peter Cochrane: There's not a single instance in our history where isolation has succeeded. Not for a company, not for a country, not for the planet. Mr. Ren is

right. It's just a question of time.

Jerry Kaplan: However, with respect to artificial intelligence, it's a bit of a different dynamic. There's this mythology about who's going to win. There's some kind of race. Politicians, and I'm talking about a lot of the media people here, love to talk about it as though it's an international competition. But artificial intelligence is a software technology. It consists of two parts, you have programs, and mostly the value is in data, large amounts of data. And all that AI is, when you really look at it, it's programs that analyze and find patterns in very large collections of data. That's what current AI is. Now the problem is that everybody is going to have the technology and it's easy to transport and American companies are giving it away. That's not going to be an issue. The question is what happens with the data.

What I would like to point out is that the data that is collected in China is not necessarily useful or as useful as in other places. A bifurcation in terms of data is just as true in artificial intelligence as it is in any other kind of database. AT&T can't use China Unicom's data. It's not a useful thing to do. The technology that does face recognition in China isn't necessarily going to work well on the range of faces that it's going to see in the United States. The best analogy I can use is the movie industry. It's like saying "Who is going to win?" American films

or Chinese films? Because it is also data. And with that I think you can see, I don't think anybody in the US is worried about Chinese films taking over Hollywood, and I don't think anybody here is worried about Hollywood films taking over whatever wonderful films you have here in China that I've never watched. So this is a big myth, and the investment and worry the governments have about this is completely misplaced. It is not like nuclear energy where you can in fact bottle it up and have a unique advantage.

Peter Cochrane: Just correct me on this, but the only other instance I can think of like this in the US was with Japan and it was over automobile manufacturing. Autoworkers in the United States were being laid off because the Japanese were producing cheaper, better quality, and more reliable cars. A trade war broke out, as I recall.

Jerry Kaplan: I thought you were going to mention the 5th-generation computing project, which is a complete coincidence, ironically, it's 5G. This went on for years. Japan and the US were worried. They had a major reaction and started a big government project. And the same thing happened in Japan, because it was happening in the United States. Both countries wasted their money. It came to nothing. And we can go through that same pattern and replay it with artificial intelligence,

but if we're smart, we're not going to do that.

08 **Christine Tan: Jerry, I'm glad you talked about data, because that's something I want to bring up. In the West and in the US, there are lots of issues about data protection and privacy. In China, Mr. Ren, correct me if I'm wrong, there's a willingness to share data to improve on existing technology. I know you may say the West is still going to be ahead in terms of technology. Don't you think that's a big point for China to drive ahead? Because data and privacy protection is going to drag down technology innovation in the West.**

Zhang Wenlin: I'm a fan of Jerry, and I've read many of his books. I admire his in-depth insights, but I do disagree with him on this particular issue. Data is obviously very important to AI. For AI, data varies with regions, and has unique value to particular regions. This is what I like most about data. Data of one region may not be as attractive when it is transferred somewhere else. This means that AI will create business for every region, and every region can get deeply involved in the development of the new AI industry.

In terms of technological breakthroughs, the more pressing, key issue is computing power. The concept of

AI has actually existed for a while. But it has just begun its basic application now, 60 years after the concept was put forward, because many related technologies have only recently become ready to support the use of AI. These include connectivity technology and high-performance computing.

Only after extraordinary breakthroughs are made in information infrastructure, especially computing power, will AI likely become ubiquitous and always available like electricity is today. Therefore, we believe infrastructure capabilities, including connectivity and computing, are vital to AI.

Ren: First, different countries have very different views on data and privacy protection. China used to be a conservative country that lagged behind the rest of the world, but it's becoming increasingly open these days. Many young people post their daily lives online, voluntarily. Some people may say that you should not post your pictures online for safety considerations. But many people just keep posting. Chinese young people today are different from my generation. They don't see protection the way we do.

Second, I think privacy protection should be done in a way that promotes the safety of individuals and the security of society as a whole, and drives social progress. Excessive protection will do more harm than good for

society.

Let me give you an example. About 10 years ago, there were an annual average of 18,000 cases of motorcycle riders snatching purses from female pedestrians in Shenzhen. But last year there were 0 cases like this. And all of the 94 serious cases last year were solved. It turns out China has become one of the safest places in the world now. But during this process, many people have experienced a reduced level of privacy. Whenever I go out for a drive, I get photographed by CCTV; we all do. Those photos go into databases, but the access to the photos is limited, even to the police. They have to get certain permission to access them. As a result, security in the city of Shenzhen has improved significantly.

When the economy doesn't work, some people may risk engaging in wrongdoing. But China has been changing in many ways, which is good for productivity and employment. There is a common feeling in the West that privacy should not be given up, but this could actually reduce the security of societies. The US, in particular, has suffered from gun violence from time to time. If they are willing to give up on their privacy a little bit more, then when a security guard spots a customer carrying a gun entering a department store, they can stop them to prevent a shooting. Otherwise, this one

person's privacy may be protected, but many lives may be at stake.

When it comes to protecting privacy, we must take a scientific approach. This is particularly true for a sovereign state in how it should manage its information and data, and it is ultimately up to the sovereign state to decide this for itself. There's no universal standard on this. Every sovereign state is entitled to choosing their own approach to data governance as long as no innocent people get hurt during this process and the security level of the society as a whole changes for the better.

Christine Tan: That's the plan to protect their data, trying to protect their privacy. Where are innovative companies, where are technology companies going to get their data from, to improve their technologies?

Peter Cochrane: People will volunteer for free. Let me give you an example. Suppose I'm ill tonight, and my medical records are in the UK, you can't get them. They are now constrained by GDPR. They're my records, and I want to give them to you, but at the moment I'm prevented from doing so. But believe me, there are many personal things and a lot of my personal information I will gladly give away. So if we have a study on some ailment or illness, I will gladly donate all my data. The question is, does it pose a security threat for me or my

family, and does it make a contribution? And best of all, for me, does it make my life easier and safer?

Christine Tan: Does it? Does it make your life easier?

Peter Cochrane: If you want my medical record, I will give it to you on a memory stick, and then while I'm here you can act as my agent, if I'm ill, you can look after me.

Jerry Kaplan: It's perfectly appropriate to have different laws for protecting privacy in different places, because this is a social and cultural issue. People have a different attitude in China than they do in the United States for long historical reasons, and the same thing is true in Europe. The only problem is AI likes a lot of data. It so happens that China is in a much better position to take advantage of artificial intelligence and to benefit from it more than it would have been in the US, even if you completely separate the data sets, because China simply has more data. People in the United States don't realize and they don't appreciate the scale. I found out today that Shenzhen has 15 million people. It's more than Los Angeles. I was in Shanghai. The population in Shanghai is more than the State of Texas. There are more English speakers in China than there are in the United States. There are all kinds of amazing facts and figures about this. It's a big market. There is more data, and the barriers to being able to centralize the data into large

data sets are smaller here than they are in other places.

Zhang Wenlin: I'd like to add something else. I don't think we need all the data to make technological advancements. In most cases, we only need data that is valuable for training, such as data corrected or labelled by specialists. We don't need to acquire every kind of data, especially not personal data. In the early stages, some Internet companies didn't actually know what types of data they really needed. However, people have gradually realized the importance of respecting data and privacy and protecting data sovereignty in order to sustain robust industry development. As Peter said, we will use our data in exchange for services. Tech companies are responsible for creating maximum value by taking only minimal amounts of data. At the same time, they should try their best to keep users informed and give them the choice to decide whether to participate in the exchange.

Christine Tan: Is it only a matter of time before China puts in place privacy and data protection laws? Do you think that'll happen?

Ren: I believe China should enact a very stringent *Privacy Protection Law*, and under this law, anyone who illegally acquires and uses others' data should be punished. Just now I said sovereign states have the right to manage their data. For example, police officers and

people with judicial power can control data. I did not mean regular citizens should.

In China, some people sell off data for a quick profit. For example, some sell data about expectant and new mothers to infant formula manufacturers, who then target their product promotions to these mothers. It's wrong to leak personal information like this. There are also people who steal private phone numbers and send them to scammers. I think China should strengthen privacy protection and legislation in these areas and impose severe punishments against those who infringe upon privacy. This is a necessary step to move society forward.

I firmly support the EU's GDPR, and our equipment fully complies with this regulation. I also support China in making step-by-step progress in information management. In fact, significant progress has been made and regulation has been tightened in this area over the past two years. China needs to gradually improve its privacy protection to create a more secure and harmonious environment for its people. This is the happiness people desire most.

09 **Christine Tan: This brings us nicely to regulations, rules of governments. What policies and controls should they put in place to manage these risks? In terms of**

companies, what sorts of principles should they put in place when it comes to developing new technology so they don't breach any privacy issues or data protection issues? What are some of the ideas that you have about how this could take place? The broad framework, how we can come up with some sorts of viable regulations that everybody can agree upon and can move forward in this tech world?

Peter Cochrane: I don't think we have to make this very difficult. Any company and organization that comes to me and says: "We would like your data, this is what we are going to do with it, and we guarantee that we will protect that data." Then on that basis, I will afford them my data. If then as a matter of negligence, my data gets out, I think there's a price to pay for being careless. I always feel any organization that is attacked by a 15-year-old in a bedroom using a laptop, this is a good punishment, because if their security is so poor, they really have not spent enough money. But I have seen governments. I have seen defense departments. I have seen banks, all kinds of big organizations that have lost a huge amount of data. Fortunately, it's not been too damaging.

Christine Tan: Isn't that dangerous also, when it comes to technology? Companies like Huawei are developing technology so fast, but at the same time government

officials don't quite understand how it works. This is skepticism. (Peter: That's an understatement.) Yeah, they don't know the risks. They think "Oh, it's new technology. It's dangerous. Let's ban it completely," because they don't understand. If they don't understand the new technology, how are they expected to put rules and regulations in place to govern this new technology? Jerry?

Jerry Kaplan: Well, there is no good answer to that question, but when you talk about protection of data, there are ways to parse this part that I think really gave point to some kind of an answer.

The issue is not the collection of data. The issue is the use of data, and the retention of data. If it is collected, you have to be informed about the purpose and it has to be restricted to be used for that purpose and you should know that it expires after some period of time. So it can't fall into the wrong hands or be used for purposes which you did not know. And transparency about what these purposes are and communicating them so they're understood by the person providing data is very important. That's the problem we're having in the United States right now. People on Facebook and Twitter, their data is being used for purposes that they did not know. People might not want it to be used for political purposes or police work or something like that.

And so we need to put those kinds of restrictions in place.

Christine Tan: Mr. Ren? Do you have an opinion on that?

Ren: I think our society needs to show more tolerance towards new technologies. Inventions and innovations would be impossible without academic freedom and freedom of thought. Some innovations and inventions benefit people and some don't. Whether or not innovations and inventions will bring benefits must be verified gradually through practice.

Take atomic bombs for example. They were invented based on nuclear fission theory and are obviously disastrous for humanity. But after further research into nuclear theory, nuclear energy will provide huge benefits for humanity. So we should take a tolerant attitude towards new technologies. If we adopt a stereotypical approach to assessing scientific breakthroughs, I think it would be very hard for new technologies to emerge, and social progress would be very slow, just like what we saw in the Middle Ages.

Let's take genetic technology as another example. I think it takes time to tell whether genetic technology will ultimately be beneficial or harmful for humanity. Some gene editing technology may do harm. However, the experiments on a few people may bring happiness

to billions of people. We shouldn't jump to conclusions about whether a technology is good or bad.

At Huawei, we adopt AI primarily to improve our production process and products. We do not study the social or ethical implications of this technology. Some sociologists have put forward some pessimistic ideas about AI, but I don't think those ideas will prove true, not at least over the next three decades. I think we should also adopt a more tolerant approach to AI. We cannot prevent advancements in AI due to some hypothetical fears about it.

New technologies, sciences, and ideas are often not easily accepted by the general public. The truth is in the hands of the few. If you put a new idea or technology in a poll on the Internet, you may not get a lot of support for it, as most people just don't understand the value that it will create. So I think we should show tolerance towards and protect the few innovators in our society through government policies, laws, and ethics. Even if the innovators go past the boundaries, we should show tolerance towards them, so that they will come back. If we don't show a tolerant attitude towards new things, social progress will slow down, and it will take a long time for a country to improve its competitiveness.

When Huawei was founded, China was in the early stages of its reform and opening-up period. At that

time, 20 million young intellectuals had just come back to the cities from rural areas. They didn't want to continue staying in rural areas where the environment was tough and they felt lonely. The government agreed to let them come back to the cities they originally came from. However, they weren't able to find jobs in cities and were thus allowed to sell big bowls of tea, steamed buns, and things like that from street stalls. That's how China's private sector started.

The central government issued a document saying businesses were not allowed to employ more than eight people; otherwise, they would be considered capitalistic and would not be allowed to move forward. At that time, Huawei already had more than eight employees. Fortunately, the local government showed tolerance towards us. We were not labeled as being capitalistic and were allowed to develop step by step.

Every year, we pay 20 billion US dollars in taxes to the Chinese government and other governments around the world. This does not include the social progress facilitated by our employees' consumption, and other contributions. Huawei would not have become what it is today without the tolerance we benefited from in our early years.

We should be more tolerant towards new things and give them more free rein. This is the only way we will be

able to create a brighter future.

Zhang Wenlin: This is a very key topic in the industry. People have concerns, fears, and high expectations for technology. I think the best way forward is to have an open discussion about the nature and stages of technology with people like sociologists, scientists, regulators, and tech companies. ISO and IEC have established the JTC 1/SC 42. Huawei is actively participating in this initiative. It is the most important platform that collects people's concerns and feedback about technology and seeks global solutions. As digital technology develops rapidly, tech companies really need to take any negative impact that may be caused by data protection very seriously, and help find solutions to mitigate the impact. Tech companies must first abide by the laws of every country where they operate. Also, they must use trustworthy and secure technologies to protect customer privacy and data sovereignty, and then provide secure, trustworthy, and high-quality products.

Ren: No matter how many people sit down together and talk about this, I don't think a consensus will ever be reached. We should let everyone express their thoughts, and then let society assess those thoughts.

Zhang Wenlin: I think our industry is making progress, and we need the industry to sit down to make a common framework and generate trust. Otherwise,

those who don't understand technology will cause a stir, and those who do understand it will refuse to share information about it. If they don't understand and talk with each other, technological advancements will not be possible. Take this HUAWEI Mate 30 smartphone for example. The pages turn automatically even without me touching the screen. Even tech-savvy people find it cool and amazing. The technology behind this is actually not mysterious. We use AI to identify gestures, which is similar to facial and image recognition technology. It's like revealing the secrets of a magic trick. People will understand and believe it if the truth is not something that is beyond their imaginations.

With more dialogue among industry players, I think we will work out a trustworthy management framework based on a more reasonable and clear understanding of technology. Then we will help more people understand technology and see it in a rational way.

No tech company should try to use their expertise in technology to deprive users of their right to having a choice. As tech companies, we should do everything in our power to take on complexity ourselves, enable our users to understand the key nature of technology and the rights they have, and give them more choices. We should also help regulators understand technology and establish governance rules to avoid the misuse of

technology. This way, we will gradually earn users' trust and continue building trust from society as a whole.

10 **Christine Tan: Mr. Ren, my question to you is: Since you operate here in China, how open are Chinese officials or Chinese regulators when it comes to new technologies? Do they always understand and support what you're trying to develop at Huawei?**

Ren: I think the priority for China is to enhance basic education and basic science. This will allow China to stay abreast with the rest of the world. Currently, Western countries like the US and the UK have very advanced education systems, which are very open and encourage academic freedom and intellectual freedom. Some students in the US, for example, can choose from 1,600 courses to study. Each student can only choose four courses each semester, which means one student could select just 32 courses over eight semesters. However, two students in the same class may have selected completely different courses for their 31 remaining credits.

This is not the case in China. China has unified textbooks and unified exams, meaning that most students are basically at the same level. Of course, both of you are at a level a little higher than me, but not by too much. Breakthroughs in science and technology in

China need pioneers and leaders.

I believe the current situation represents a historical opportunity for us. At Huawei, we take a global approach to research. We do not confine ourselves to just China. We have research presence in countries on and above the Tropic of the Cancer, including the US, Canada, the UK, Russia, and Japan. We have more than 30,000 non-Chinese employees, including a huge group of scientists spread across those countries. We have about 70,000 to 80,000 R&D staff, and some of them are also scientists and top experts in their fields. When they concentrate their efforts, they can make breakthroughs. We are currently frontrunners in this area, unfettered by restrictions.

We want to contribute more to humanity in terms of new technology. We have never thought of completely dominating the market. We are not a public company, so we don't pursue pretty financial reports. Instead, what we want is to become stronger. Nothing limits us.

11 **Christine Tan: We have come to the end of our discussion but very quickly I would like to get each of you to think ahead. We're talking about new technologies and innovation. Now we are looking at AI, what's the next big technology you think is going**

to happen? What's going to be the next big thing in the world of technology? Can you make a prediction for us? Jerry, let's start with you.

Jerry Kaplan: Well, some things will impact consumers and others will impact the industry, but people are interested in what's going to be for them. I think it's going to be a concept called augmented reality. That's going to make a big difference. And that's basically being able to put on a pair of glasses which will overlay images over what you're seeing, so that you can play games or interact with images of other people. You'll be able to have a conversation with a friend who appears to be sitting at your dining room table, with their arms over the table and legs underneath. It'll bring people closer together and create a very different feel in the way we care about other people and the ways in which we interact. It will be so realistic. It would be like having a very realistic ghost right there in front of you. I think that's probably the way in which people will see the impact of 5G and AI most effectively over the next decade or two.

Peter Cochrane: Last week a paper appeared and quickly disappeared. It was a paper by Google, and it claimed quantum supremacy, that is, a quantum computer that could outclass any super-computer on the planet. I'm not sure why that paper disappeared but

it was a 72-qubit machine.

Why is quantum computing very important? If we can get it to work, it would allow us to truly understand chemistry, biology, life, and intelligence for the first time, and it would allow us to tackle some very difficult, deep-seated problems like protein-folding and communication between the genome and protein, which is probably the source of about 98% of all human illnesses.

But without quantum computing, we're going to struggle to make a giant leap in our understanding and technology that will impact all humanity in positive ways that are hard to quantify. Quantum computing will change everything; we can get 100 qubits, and we become powerful. If we can get 1,000 qubits, we effectively become gods!

Christine Tan: Mr. Ren, what are you getting your engineers to develop at your labs? Is it going to be the next big thing? What's the secret you're working on?

Ren: I'm not sure what the world will look like in the future. We are on the cusp of breakthroughs in multiple frontiers. I can hardly imagine what the world will be like when there are multi-disciplinary breakthroughs. I hope our company can find its place, a strategic high ground, in the future. I think our strategy will remain focused on the strategic high ground. Our current goal is to channel

data traffic, and process and distribute data.

I think there will be a huge flood of data traffic coming, just like the flood shown in the movie *2012*. It will become increasingly huge. As long as you can deal with the huge amounts of data traffic, you will have opportunities to succeed. I think the amount of traffic that 5G networks can support is still relatively small. Even if optical networks can enable data rates up to 800 gigabit/s, I think this would still be insufficient to handle huge amounts of data traffic. We can continue down this path.

Zhang Wenlin: In general, I share the same idea, but my way of expression or focus is different. Simply put, I think AI will be the most important technology in the future. AI is not a single technology; it is a combination of multiple technologies. AI is just beginning to be used because technological breakthroughs are only beginning to support its application today. AI still has a long way to go. During this process, further breakthroughs need to be made in many domains, including materials science, biotechnology, and molecule-level manufacturing, which will very likely drive AI to develop rapidly.

As AI continues to evolve, it will generate more data, just as Mr. Ren said, massive amounts of data traffic, like the floods shown in the movie *2012*. The ideal of Huawei is to make data processing and computing

simpler, more efficient and affordable, as well as ubiquitous. It's just like how you use electricity. You don't know where the electricity is generated or how it is transmitted, but it is plug-and-play anytime anywhere. That's the breakthrough that we at Huawei want to make – computing power.

12 **Christine Tan: Huawei is developing the next generation, 6G? Is that in the work? Is that in the pipeline?**

Ren: Development is being done on 5G and 6G in parallel. We started our 6G research quite a long time ago. 6G is mainly a millimeter wave technology. It will have high bandwidth, but it might not be able to cover long distances. We still have a long way to go before we can roll out 6G on a large scale.

Zhang Wenlin: What will 6G look like? It'll be something we will see 10 years from now. In our industry, we see a new generation of technology every 10 years. I was involved in the conceptual phase of 5G development. What impressed me most was the 5G concept that a professor at the University of Surrey shared with us when we discussed how 5G should look 10 years ago. He said that within one kilometer, the number of connections will reach one million. We found

it difficult to understand because it was different from our traditional understanding of communications. At the time, I even thought it was irrelevant to the technology we were talking about.

But it happens to be what we are seeing today. As Mr. Ren just said, we are still exploring 6G. Right now, we are still exploring, looking at the concept and making theoretical verifications. In our communications industry, if any company or any country wants to wait or skip a certain generation of technology, they will miss many opportunities. The next generation of technology has to be built on the previous generations. If one country performs well in 3G, they generally do well in 4G. The same is true for 5G. A solid foundation in 4G is key to success in 5G. If a country or company wants to skip 5G and go directly for 6G, they are bound to fail. All cases we have seen are failures.

Christine Tan: Do you think Huawei will lead in 6G?

Ren: Yes, definitely.

13 **Audience: I'm Glen Gilmore from the United States. I'm a member of the adjunct faculty at Rutgers University and also a Huawei KOL. A question for Mr. Ren, if I might, what will it take to liberate technology to rise above national boundaries so that tech for good will**

truly become tech for all?

Ren: We think technology is only a tool, like a screw driver or a wrench that can be used anywhere in the world. We should think of 5G as a base station, and not as an atomic bomb. It can be used by anyone. Technology should not be politicized. People should choose technologies based on their business needs and market competition. This way people can share the benefits brought by a new technology.

Christine Tan: Does anyone else here want to answer the question? Whether tech for good can be made tech for all?

Peter Cochrane: I think it's inevitable with globalization. If a nation decides to isolate themselves from that globalization, there is a cost. And we've never actually seen that policy succeed anywhere in the past. I can't see it lasting very long.

14

Audience: With the development of AI, do you worry that this technology will increase social inequality? People that only have small amount of data to use and the majority of us that generate data may not be able to use the data. Mr. Ren, at your last coffee talk, you mentioned that Huawei's revenue will decrease by 30 billion US dollars due to the recent incidents.

Last month, a Huawei executive said it would not be as much as that, and that the revenue decrease could be about 10 billion US dollars. What changes and adjustment have you made to change the forecast?

Ren: Will AI widen the gap between countries? Definitely. AI's development needs the support of education and talent. Second, it needs the support of infrastructure. AI is an all-inclusive set of software that needs a support system. That system requires tens of thousands of high-performance computers or supercomputers, instead of just one or two. It also needs the support of large-scale data storage systems and super-fast connectivity systems. Building this kind of infrastructure will also require heavy investment. If the software is good but the investment into infrastructure is lacking, the software will not be able to work. It'll be like having cars but no roads. Your car won't be able to do anything.

Wealth disparity will continue to be a problem in the future, so the world needs to come up with rules. Well-off countries should help poorer countries with things like education. This will gradually help the world prosper as a whole. However, AI is set to contribute to increasing disparities between countries, and those disparities are going to widen faster.

Regarding the predicted drop in our company's

revenue, we have not said that our annual revenue would be less than last year's. We have simply lowered our expectations for this year's revenue growth. Some people say, that drop will be about 10 billion US dollars. I think that sounds kind of accurate, but it may end up being less than that. It's hard to say. I cannot tell you the exact figure, or else our Finance Department won't have anything to announce next year. I will leave the opportunity to them.

Jerry Kaplan: Briefly, artificial intelligence is automation. And as Karl Marx explained and understood, automation is the substitution of capital for labor. Therefore, the people with capital are in the position to reap the primary economic benefits of the technology. And like other forms of automation, artificial intelligence will be a force for increasing wealth inequality. What we need to do is to stop thinking about our social policy as being in the service of economics, but start thinking about economic policy as being in the service of the goals of society. We should be trying to maximize overall happiness, not trying to build a GDP solely for the benefit of the few.

15 **Audience: The guests here today mentioned issues with trust. One of the professors thinks that trust contains one's attitude and stance, and it is subjective.**

I would like to ask Mr. Ren and the two guests, for people who inherently oppose you or are biased against you, do you think it's even possible to gain their trust? We have also noticed that Mr. Ren has been speaking with the international media more frequently this year. Previously, this was uncommon for Huawei and Mr. Ren. How effective do you think Huawei's communication has been over the past year?

Ren: As we continue to talk with the media and share real facts through the media, I think the media coverage on Huawei has gradually improved from being very negative last year to being almost good. It wouldn't be possible for all of the media coverage on Huawei to be completely good. The media helps us to communicate what we are doing across the world. At the beginning of this crisis, no one believed we would make it. However, we survived. Some people say it's because we had enough inventory to support our production. We produce over 100 billion US dollars in hardware, which would need 70 billion to 80 billion US dollars in materials. We don't have the capital to hoard that much material. We aren't relying only on our previous inventory to support current production. Our financial results in the first half of this year were not bad, so people are interested in this. The sympathy of our customers may be the reason that we did well. The results from the latter half of this year will prove that we can do well because we have

real strength.

Why do customers trust us? We have spent 20 to 30 years building our relationships with them, and they believe that Huawei is a good company with integrity. Second, many Western companies have already started receiving products from us that contain no US components. Their confidence has increased and they believe that we can continue to supply them with goods. Why have guest visits to our offices increased by 69%? Because they want to see if we are still up and running. First we take reporters to see the company shuttles that employees take to come to work and get home. If people are coming to work, then they are still working. Second, we take them to our canteens to see how full they are. Then we take them to the production lines which haven't gone down once yet. We do this to strengthen our customer's trust in us. Trust spreads little by little as we show people how we are doing. Of course, the media also helps us a lot by reporting what we show them.

I estimate that the financial results for H1 of next year will continue to be good. There will not be any sharp increases though. When we see the financial results for the first half of next year, we will know that we have survived the storm. By the end of next year, people will also see that Huawei has made it. In 2021 and beyond, people will see our revenue growth continue to recover,

and they will say that we have started to grow again by solving our own problems. We will gain their trust not by talking but by working hard. We can only gain their trust through our own efforts. Whether people will trust us or not depends on facts, so we believe that we can regain their trust.

Jerry Kaplan: Just very briefly, if you listen to the political dialogue, what you hear is mistrust, insults, and accusations. But it's important to understand that the political dialogue is actually not aimed at each other but aimed at the local audiences. The truth of the matter is, if you live like where I live, in San Francisco, you would understand something that is not well reported in the press here in China, which is that the Chinese people are very highly respected and they're excellent neighbors and members of the community. So the distrust and conflict you see at the political level makes constructive dialogue impossible. But from people to people, it is a very different story. I want the people here in China to understand that they're highly respected and treated as real members of the community inside the United States.

16 **Audience: I have two questions, the first one I want to ask Mr. Ren about licensing technology to an American company. Do you mean that Huawei do not**

rely on US suppliers so you can produce the products? I mean for all the products you ship now, are they fully independent of US supplies? And another question is that since Huawei has registered for a bond issuance for around 30 billion, is that the correct number and what is the timetable to finish that kind of bond issuance? Because it is the first time Huawei has issued this bond in China. Will banks offer preferential policies to you?

Ren: First, can Huawei survive without relying on the US supply chain? The answer should be yes. However, we can still use US components. In August and September, we are undergoing a run-in period so we can only produce around 5,000 base stations each month during that period. However, we will begin mass production in October. In 2019, we will be able to produce 600,000 base stations. Next year, we will produce 1.5 million base stations. Of course, we hope that the West will resume their supplies of components to us. We have been working with our Western partners for 30 years, and we have formed close ties with them, so we cannot just make money on our own, without them making any money. We cannot do that.

Second, regarding the issuance of bonds, I didn't initially know about this. After the bonds were issued, I learned about it from the news, so I called people in the

treasury management department and asked why they had done this. They said that we must issue bonds while our company was experiencing its best period to increase people's understanding of Huawei so they would trust us more. They also said that we shouldn't postpone the issuance of bonds until we meet with difficulties.

In addition, the cost of bond issuance is low. If we keep increasing employee investment in the company, the cost will be too high, because the dividends are often too high. However, the cost of financing from bond issuance is much lower, with an interest rate of only 4%. So why can't we increase our financing through this means?

In the past, our financing mainly came from Western banks. Now that the channels of financing through these banks have become less smooth, we are now trying a shift to Chinese banks for our financing. I don't know what the exact amount of total financing is this time. Maybe it will be 30 or 20 billion yuan. The amount will be decided by the treasury management department because we have sufficient funds right now.

Peter Cochrane: In the last decade the center of gravity for many technologies has moved from the United States and the West towards the East. Flat panel displays, the latest 7nm chips, and batteries, are all sourced in Southeast Asia. So it's not such a giant step

to conceive of autonomy. But it's not really a good policy to put everything into one basket. It is better to share technology and encourage its spread. Bilateral trade is absolutely essential.

17

Audience: I am with *The Times of India.* I'm a little surprised that India is so advanced in science, basic research, and technology, but you don't have much of a center there. However, you're looking for a market in India. What do you think about the Indian market and what kind of challenges, regulatory or legal challenges, do you expect in India? This is a question to Mr. Ren.

Zhang Wenlin: India has very good talent and a very solid foundation. That was why we established a large research center in Bangalore 15 years ago. This research center has more than 3,000 employees, and has been playing an important role at Huawei. The Indian market has always been important to us. Over the years, our operations in this market have been quite good. In addition, the Indian government has been relatively open in communicating its regulatory policies and has had smooth communication with us.

Ren: In the past, the regulations of the Indian government were based on rules for voice communications. Today,

after they shift to data communications through broadband networks, they need to adjust their regulations and policies. Infrastructure is the foundation for a country's economic development, and communications is a very important part of this.

Eric Xu's Interview with Bilanz

September 2, 2019
Geneva, Switzerland

01 **Dirk Schütz, Editor in Chief, *Bilanz*: You started at Huawei in 1993, when it was still a very, very small company. So can you give us an idea of how the company evolved and what the big differences are between 1993 and 2019?**

Eric Xu: We never imagined what we would look like in 2019 back then. From 1993 to 2000, we just focused on stored program control exchanges. Even back then, we were aiming to become one of the three major players in the world, but we never expected that we would encounter the challenges we are facing today in 2019. In 1993, Huawei was still a very small company, and I joined the company simply because Huawei was engaged in the communications sector.

02 **Dirk Schütz: How many employees did Huawei have when you joined?**

Eric Xu: When I joined Huawei, there were more than 300 employees and our revenue was about 10 million US dollars. From my point of view, the company could have collapsed at any time. That's how I felt when I joined the company.

03 **Dirk Schütz: You have come a long way since then, growing into an extremely big company over that**

time. What were the main difficulties along this long road?

Eric Xu: Huawei's challenges have varied at different stages of its development. From 1993 to 2010, our biggest challenge was gaining customer recognition. During our early phases, we had to gain recognition from Chinese customers. At that time, China was transitioning from a planned economy into a market economy, and Huawei, as a private company, found it really difficult to gain extensive recognition.

We had to spend large amounts of time explaining to our customers that we could survive. Back then, telecom carriers in China were our customers, and were also the judges of our product quality. Back then, we focused on switches, and our major competitors in China were foreign companies. China had eight kinds of switches, which came from popular vendors in seven other countries, including Siemens from Germany, Alcatel from France, Lucent from the US, Nortel from Canada, Ericsson from Sweden, and Fujitsu and NEC from Japan. Our carrier customers established joint ventures with these vendors, and at the same time they bought from us. This meant we were in a kind of competition with our customers. Therefore, our biggest challenge back then was gaining recognition from customers, the public, and governments.

Our second stage of development started around 1998, when we first entered the global market. We needed to build a global reputation at that point. I was the president of our International Marketing Department between 1999 and 2000, and I was in charge of leading our expansion in the global market. When I talked to customers about China and Huawei, they all shook their heads and couldn't believe that China had its own high-tech companies. Every customer would ask me: Where did you get your technology? Did you get it from other countries? I would tell them that we researched and developed technologies ourselves. China was still relatively closed at the time and many thought it was a very poor country. Some people still thought Chinese men had the Qing dynasty ponytails they would see in old movies. Because of this, we initiated our New Silk Road Plan to invite customers to come visit China and see where our products were already being used. During that trip, we would have customers enter in Beijing, and then have them travel in Shanghai and Shenzhen before seeing them off in Hong Kong. Or we would do it the opposite way around, having them enter in Hong Kong, and depart from Beijing. At the time, these cities were all quite well-developed and our equipment was already being used in these cities. This helped us build customer confidence and we were able to gradually expand into the global market.

In 2004, I came to Geneva to attend the ITU Telecom World. That was our first real introduction to the world stage. Our revenue outside China was about 200 to 300 million US dollars at that time. We had no idea the company would become what it is today, and so our goal at the time was just to grow our overseas revenue to 1 billion US dollars.

04 Dirk Schütz: How did the company culture evolve during that time?

Eric Xu: Our corporate culture has not changed much from what was established by our founder. Many people ask how Huawei has become what it is today. I have thought long and hard about this question. I believe the key to our success has been our value sharing system, our Employee Stock Ownership Plan. The company belongs to our employees. They are not just employees. They are also the owners of the company. The employees' interests are closely connected with the company's interests. This has helped build an enterprising corporate culture that seeks business success. The success of the company, in turn, benefits all employees.

Since I joined Huawei, I have received dividends every year, and my investment has never suffered any losses.

I've then invested my dividends back into the company by buying more shares.

05 **Dirk Schütz: So from the day you arrived you were a co-owner of the company?**

Eric Xu: The first year that I joined Huawei, I was allowed to buy some shares in the company, and became a co-owner of the company.

We have just invested all the money we earned to buy the shares. This is why our company has remained strong and grown stably since being added to the Entity List on May 16. If our people just positioned themselves as employees who simply work for their boss or employer, then many of them would look for jobs elsewhere and leave.

At Huawei, shareholding employees are the owners of the company. They have invested most of what they've earned back into the company. If our company survives, then the investments of our employees will be paid off; otherwise, their investments will be gone. So despite the difficult times we are currently going through, everyone is working harder than before and becoming more united than ever. We must ensure that the company can survive and thrive.

06 Dirk Schütz: Coming to the ban. Why did they single you out? What's your view on why the US and the president have focused so much on Huawei?

Eric Xu: The US has to find a target to attack, especially in the tech sector. If you look at Chinese companies, few are truly globalized. Then, when you look at Chinese companies in the tech sector, only Huawei is a truly globalized company.

07 Dirk Schütz: Your founder Ren Zhengfei is calling the current situation a live-or-die moment for the company. Will Huawei still be alive in 12 months?

Eric Xu: The live-or-die moment may have already passed. The other day, our Carrier BG handed a flag, showing a bullet-riddled Il-2 aircraft, over to our Consumer BG. Our Carrier BG has now finished fixing its holes, while our Consumer BG has two big holes left. One is Google Mobile Services (GMS), around the Android operating system, and the other is Windows – Microsoft's operating system. These two holes will put a large dent in our revenue. That said, things are changing for the better and I believe that we will survive the next 12 months. This process will represent a rebirth for Huawei. It will make us stronger. We will also use this opportunity to trim off some of the unnecessary fat.

08 **Dirk Schütz: There's a 90-day ban relief which expired in mid-August. And then there's another 90-day reprieve until November 19. What's your outlook on that? Can you influence the negotiations? Do you think the ban will then take place? Will the sanctions hit you hard?**

Eric Xu: The 90-day license doesn't mean much to us. We didn't rely on the 90-day license for survival. If we just rely on these 90-day licenses, we will die off. So the extension of another 90 days doesn't mean much to us.

09 **Dirk Schütz: So the sanctions would not hit you hard then? And other suppliers will not be allowed to sell to you?**

Eric Xu: Why would we buy from them? We can make our products without using US components.

Dirk Schütz: Customers are not buying yours as well?

Eric Xu: It doesn't work that way. Let's be clear on how the Entity List works. Our customers and suppliers around the world have been examining the laws and regulations related to the Entity List. Basically, the Entity List prevents companies from selling us the technologies that are subject to US jurisdiction. It does not prevent Huawei from selling to our customers because the

US simply cannot stop global customers from buying Huawei's products.

10 **Dirk Schütz: But what will happen if the 90-day reprieve is no longer prolonged? What will happen to you?**

Eric Xu: The current 90-day license has no impact on us, neither will future 90-day licenses, if there are any.

The first 90-day license was issued to address the Entity List that restricts US companies from selling components to us. We don't have to rely on the components from the US. That's why it doesn't matter if there's another 90-day relief. We can continue our business without relying on US components. But still we need to patch two holes – GMS and Windows.

11 **Dirk Schütz: During the conference you announced your own operating system, HarmonyOS, to make you independent from Google. How do you want to build up an ecosystem because if you really want to be independent from Google, you need thousands of applications?**

Eric Xu: Richard Yu has made it clear that HarmonyOS is not the first choice for our smartphones on condition

that Google is still allowed to give us access to its GMS. If we can no longer access GMS, then we would have no choice but to use HarmonyOS on our smartphones and other smart devices.

It's very challenging to build an ecosystem surrounding HarmonyOS. It's almost an impossible mission. That said, the branding campaign for our consumer business is 'Make it Possible'. So we aspire to make the impossible possible through hard work.

Dirk Schütz: How long will it take?

Eric Xu: It's not a matter of time, but a matter of whether we can do it or not.

12 **Dirk Schütz: But if you could do it, what is your time frame?**

Eric Xu: Three to five years. It's very challenging. Many companies have tried to build the world's third OS and the corresponding ecosystem, but all of them failed. However, Huawei has its unique advantages compared to those companies.

First, the ecosystem is not a problem for us in the Chinese market, where our HarmonyOS can access the ecosystems in China. This will bring us at least 60 billion US dollars in revenue every year. Based on that, it is

not impossible for us to build our ecosystem country by country.

Second, we have built our own mobile phone brand and developed a huge consumer base.

13 **Dirk Schütz: But you will never get any American companies to develop apps for the new system because they will be sanctioned again.**

Eric Xu: Even if they don't provide applications to us, applications are useful only when they are used. We only provide a platform, and consumers can find and download the applications that they want themselves on the platform.

14 **Dirk Schütz: How do customers react to those pressures from the US? Do you have a lot of negative reactions from them? Or do they just keep on doing business with you as if nothing has changed, like consumers and enterprise customers? I will take the US, as it is the key. I will take the US and Europe. How do they react to that?**

Eric Xu: We have not done business in the US for a long time. As for the enterprise customers in Europe, most customers are still doing business with us as usual after

some communication.

Dirk Schütz: Did the cooperation not go down?

Eric Xu: A small number of customers scaled back their cooperation with us, but only very few. As for consumers, at first many of them worried that our devices could not use Google's OS, so sales slowed down for a while. I admit that this was because we failed to promptly communicate with our consumers at that time. But our consumer business is now recovering.

15 **Dirk Schütz: What is your personal opinion on President Trump?**

Eric Xu: It's not appropriate for me to comment personally. Chinese culture is different from American culture, where you could even curse at the president with no problem. If I were an American, I may be more comfortable giving you a comment. Of course if I were the executive of a US company, I would also have to be careful making comments about President Trump.

16 **Dirk Schütz: Do you have any influence on the US-Chinese trade talks that will start again in September? Do you give input there or are you involved yourself? Because you are the main target, you should give your**

view on all those problems.

Eric Xu: Our founder Mr. Ren has commented on this on multiple occasions. Over the years, we have tried to avoid becoming a focus point in the conflict between China and the US. Unfortunately, we have failed and been unwillingly put under the spotlight during this conflict. We have been telling the Chinese government, both in public and privately, that we don't want to become part of the trade negotiations between China and the US. We believe we can work out our own issues ourselves. We don't want to sacrifice China's interests in order to protect Huawei's.

For us, the worst case scenario would simply be a revenue drop in our consumer business by dozens of billion dollars.

17 **Dirk Schütz: But still I mean in a way the trade talks and the Huawei issues are closely linked. It is not a real trade conflict anymore; it is a technology conflict and you are a part of it. So what kind of input did you give to the Chinese government when you talked to them?**

Eric Xu: The trade talks involve two countries – China and the US – and we don't want to become part of them.

18 Dirk Schütz: How will the trade war continue in your expectation, and what do you think will happen?

Eric Xu: I'm not optimistic about China and the US reaching a deal on this trade conflict. In the early stages of the negotiations, both the Chinese government and the people wanted to reach a trade deal with the US through trade negotiations. However, as the negotiations have drawn out, it has become apparent these negotiations aren't just about trade. The Chinese economy is mainly consumption-driven, so the trade conflict has not had that huge impact on China. Considering these factors, the Chinese government and the people are all basically on the same page now: China will not compromise by sacrificing its principles during these negotiations.

I'm sure you have seen the three "red lines" China has put forth recently.

19 Dirk Schütz: Can you give us your view on this?

Eric Xu: China has drawn three "red lines" that the US may find unacceptable. Then China draws another three "red lines", and both sides may find it difficult to reach an agreement. The Chinese government and its people are prepared for a "no-deal" result. However, the US has not got prepared for this. They are not ready for this

future situation.

20 **Dirk Schütz: To what extent do you think this is all related to the presidential election? And does the president just want to use this to help get re-elected?**

Eric Xu: I've no idea. I don't know much about the US politics.

21 **Dirk Schütz: Is it your hope that the president will not be re-elected next year?**

Eric Xu: Actually, I don't think there will be a big difference no matter who is elected president. The US parties seem to have reached a consensus to contain China, and they don't appear to disagree in terms of attacking China. This is why I don't think there will be a big difference regardless of who is elected president.

Making their relations with China get worse and worse is a bipartisan policy in the US, so it doesn't matter who will be elected.

22 **Dirk Schütz: You announced plans to build an R&D center in Switzerland with a thousand employees. Why did you choose Switzerland?**

Eric Xu: We have already established an R&D center in Zurich. It's mainly because Switzerland has strong innovation capabilities and it's both stable and neutral in terms of politics.

23 **Dirk Schütz: Do you already have any details like where you want to build the R&D center or what are you going to do with this center?**

Eric Xu: Certainly, we are planning to build one in Zurich or Lausanne.

24 **Dirk Schütz: What exactly are you going to do there? What kind of research and development?**

Eric Xu: It will be mainly related to computing architecture and communications engineering technologies.

25 **Dirk Schütz: How will you convince local experts to work there? Because there is huge competition from Google, IBM, Facebook, etc. They all want to hire Swiss IT talent.**

Eric Xu: Talent serves society. Companies can always find a way to hire the talent they want.

Dirk Schütz: Competition is normal, but Huawei is not currently in the best situation. I mean political situation. I can imagine people would rather go to Apple, IBM, or Google, because there is no risk compared to Huawei.

Eric Xu: That's not entirely true. This is a matter of what both the company and the experts find most appealing. Experts tend to pay more attention to what they are hired to do. Other companies may not conduct research in domains that are similar to those Huawei is investing in. Therefore, Huawei is more attractive to experts who want to work on these domains. If Huawei is willing to invest in certain domains and provide experts with competitive compensation, and the experts are interested in working on these domains, then Huawei is more attractive to these experts. These experts can continue with their research at Huawei as long as Huawei survives. Even if Huawei went out of business, they could find another company, after working at Huawei for a couple of years and obtaining experience in the domains they are most interested in. This is different from hiring CEOs or directors.

From the experts' perspective, sometimes the more challenging the work is, the more willing they are to join the company. You will notice that there are many challenges at Huawei, and this might make some top

talent even more willing to join us and help us overcome these challenges.

Experts do not only work for money, but also for their interests.

26 **Dirk Schütz: You used to have the system of rotating CEOs. Now you have a system where the chairman is rotating. Why?**

Eric Xu: The system of rotating CEOs is no longer being used. Now we are implementing the system of rotating chairmen. The major reason is that the system helps our management team remain vibrant and have a balanced focus. Different people have different backgrounds in personal growth and education, so they may have different areas of focus. If someone takes charge of a company for a long time, the company may become stronger only in the areas that they are focused on, while weakening in other areas.

Our system of three rotating chairmen helps us balance the areas that the three of us don't focus on, and make up for the wrong or improper decisions made by anyone of us.

27 **Dirk Schütz: How do you ensure continuity?**

Eric Xu: We are a team. In his tenure, the responsibility

of the rotating chairman is to select the topics for discussion. People who take part in those discussions do not change.

28 **Dirk Schütz: How about your founder? Does he still have the last word when there are very crucial, long-term decisions to take?**

Eric Xu: He has veto power because he is our CEO.

Dirk Schütz: And he is also the largest single shareholder.

Eric Xu: Yes. He owns 1.14% of our total shares.

29 **Dirk Schütz: Have you ever thought about an IPO, or going to the stock market? Is this an issue for you or is it just a bad idea?**

Eric Xu: We have never seen that as an option. Huawei is already wholly owned by its employees, so we don't need an IPO.

Dirk Schütz: But part of the suspicion that Western countries have towards you is due to the lack of transparency. Going to the stock market will solve the problem.

Eric Xu: I don't think so. We are making the company

as transparent as public companies by releasing annual reports and providing disclosures. I don't think transparency is the solution to the US issue. If we were a public company, the May 16 incident would have dealt us a heavy blow. We are not a public company, so we don't have to worry about this.

30 **Dirk Schütz: On the other hand, maybe the employees would like it because they would benefit from it. They would cash in the shares and they would have a public traded share. Normally it goes up. Maybe it could be in their interests.**

Eric Xu: That's what we want to prevent, because we hope our employees stay with us.

31 **Dirk Schütz: But you could give them some shares any way, but the point is they are traded publicly. That's a difference.**

Eric Xu: At Huawei, we have always advocated for getting our employees rich step by step, rather than trying to get them rich overnight. We are willing to share dividends with our shareholding employees every year. If we went public, some shareholders might get rich overnight and would quit their job immediately because

of the Chinese culture they believe in. Eastern cultures tend to be quite different from Western cultures. In the West, people often continue to work hard despite their wealth. Like in Switzerland, people are rich but they are still very innovative. But in China there is a different culture. If someone gets rich overnight, they are very likely to leave their jobs.

I think the way Huawei has found for its development is well suited for Chinese culture. We aim to help our employees accrue wealth steadily over time and live a decent life, but we have to avoid getting them rich overnight. All Chinese companies we've seen get rich overnight have had their core teams leave the company. It will be disastrous if executives and top experts leave in droves.

Mr. Ren came up with Huawei's development model based on his years of experience. This model suits Chinese culture and it has continued to work for us even in our current situation. It unites our employees and allows for value sharing. I think this model is a best fit for Huawei.

China tends to explore solutions to its problems through practice, and we happened to have found this development model. It is difficult for new Chinese companies to follow this model any more.

Early Huawei employees participated in this system without knowing what it really was. We have since worked to continually optimize this system to keep it up-to-date. This value sharing system takes account of most employees while incentivizing those employees who have made huge contributions. We joke that this system is a combination of socialism and capitalism, like something that also exists here in Switzerland.

32 **Dirk Schütz: One last question, when I was at the campus in Dongguan, which was built after European cities, there is also the city of Freiburg. We both get our studies in Freiburg, so why did you choose Freiburg?**

Eric Xu: It was designed by a Japanese architect. We learned of this city from him, but we know there are many more beautiful towns in Switzerland.

Catherine Chen's Interview with France 5

September 5, 2019
Shenzhen, China

01 Romain Besnainou, *France 5*: Could you introduce yourself, including how long you've been working at Huawei and the different roles you have assumed?

Catherine Chen: Welcome to Huawei. I have been working at Huawei for 25 years. I joined the company soon after my graduation, at the age of 24. I began my career here as a saleswoman, and have held managerial positions since. In 2010, I was elected as a member of the company's Board of Directors. At the beginning of this year, Huawei held another election, and I was lucky to be elected as a member of the Board of Directors again. I am in charge of our company's global public affairs and communications.

02 Romain Besnainou: When Huawei was established in the 1980s, what was the economic situation in China like? How did Huawei take advantage of China's reform and opening-up policy to start up, develop, and expand?

Catherine Chen: In the early 1980s, to be more accurate, since 1978, China has started its reform and opening up. Before this initiative was taken, China was in extreme poverty and our economy ranked very poorly when compared to other countries. Our gross domestic product (GDP) per capita was just 156 US dollars, but in

Sub-Saharan Africa, this figure was over 490 US dollars. More than 80% of our population, which was almost one billion at that time, lived in poverty according to the poverty standards defined by the United Nations.

Against this backdrop, the Chinese government decided to start economic reforms. Shenzhen, Zhuhai, and Xiamen were among the first four special economic zones in China to pilot a market economy. This type of economy is common in China today. But back then, there were no private companies or foreign ventures in China. Under those circumstances, Huawei was set up as a private company in Shenzhen Special Economic Zone.

Mr. Ren raised 21,000 yuan to start the company. During the startup, we only had a couple of employees. Huawei chose to engage in the communications industry primarily because the Chinese market had a huge demand. China had eight kinds of switches, which came from vendors in seven other countries. But these vendors could not keep up with the development of the market, as it had a huge demand. That's why Mr. Ren thought this was a great opportunity.

03 **Romain Besnainou: Ren Zhengfei is the founder of Huawei. Can you explain his background and how people perceive him here in China? He has explored**

infinite possibilities in the tech industry. Do you regard him as a visionary person?

Catherine Chen: When Mr. Ren graduated from university, China was planning to construct a chemical fiber factory in Liaoyang. This factory would introduce equipment from two French companies – Technip and Speichim – to assemble a production line that made chemical fiber into cloth. The factory would be built in Northeast China and the local environment there was very harsh. So the government assigned the military to build the factory. That was when Mr. Ren was enlisted as a technician.

During the construction process, he, for the first time in his life, learned about advanced technology from the West. In addition, he made a technological invention. At that time, few people in China made technological inventions. This made his invention stand out, and he became a prominent figure at that time.

In the 1980s, all of China started transitioning to a market economy and its military disbanded large numbers of soldiers. Mr. Ren was a member of the military's Engineering Corps, which was disbanded in its entirety. Following this, he came to work in Shenzhen.

At Huawei, we really admire Mr. Ren. He took R&D and innovation very seriously when our company was

very small. At the time, he decided to invest over 10% of our revenue in R&D every year. We spent over 100 billion yuan on R&D in 2018 alone.

There are many other things that we admire about Mr. Ren. For example, since 1997, he decided to spend about 3% of our revenue annually on management systems and processes from Western consulting firms. Most of our management systems and processes came from the West.

In addition, Mr. Ren created the benefit sharing system that Huawei uses to this day. This system is widely discussed in China and in both business and academic circles. Huawei's Employee Stock Ownership Plan allows every employee to unleash their full potential at Huawei. Employees who make contributions to the company are entitled to benefits and authority, and share in our company's growth.

04 **Romain Besnainou: You mentioned Huawei's Employee Stock Ownership Plan. Huawei is not a public company, and your shares are owned by more than 90,000 employees. Would you please explain Huawei's management structure and decision-making process?**

Catherine Chen: Our Employee Stock Ownership Plan was created when Mr. Ren started this company.

We have more than 96,000 shareholding employees, who collectively elect 115 Representatives. These Representatives then elect members of the company's Board of Directors.

The 115 Representatives form the Representatives' Commission, which is our company's highest authoritative body and makes decisions on Huawei's major investments and profit distribution. The Board of Directors leads the company to achieve its business goals.

Romain Besnainou: Are you a member of this decision-making body?

Catherine Chen: Yes. I was elected as one of the 115 Representatives. These 115 Representatives then elected me as one of the members on the Board of Directors.

05 **Romain Besnainou: Would you please give a brief introduction to your campus in Dongguan? Can you give us some data about it? For example, how many employees work there? How much did it cost you to build it?**

Catherine Chen: I believe you've already visited our campus at Songshan Lake. It covers an area of more than 200 acres, and has 12 zones, each of which was

modeled on a European city. Each zone has about 2,000 R&D employees. The campus cost us about 10 billion yuan to build.

06 Romain Besnainou: Why did you choose to build such a magnificent European-style complex rather than just regular office buildings?

Catherine Chen: We wanted to create a beautiful, pleasant work environment for our employees. A good environment helps better unleash the potential of our scientists and engineers. We haven't decided to only use European styles though. While our campus at Songshan Lake has been built in a European style, our new campus that is being built in Shanghai will have a modern urban style like that seen in Chicago. Our campus in Guizhou actually uses a Peruvian-style design. Regardless of the style we use, we always have the same goal in mind. We want to inspire our employees and help them unleash their full potential by giving them a good work environment.

07 Romain Besnainou: If I wasn't familiar with Huawei at all, how would you describe Huawei's business to me in a few words? Some people think that Huawei is just a phone company, but it isn't really, is it?

Catherine Chen: Currently, Huawei is most famous for its 5G technology. This is mainly because of the publicity Trump has given us. He wants the whole world to know that he does not want any other country to have better 5G technology than the US.

Everyone knows our smartphone business has grown rapidly over the past two years, but people are often unaware of Huawei's other businesses because they are based on very specific technologies. Just look at our AI chipsets such as Ascend and Kunpeng chipsets, HarmonyOS, and the corresponding ecosystems.

Our advanced technology is not what we are most proud of. The high-quality communications services we provide in some of the world's most remote and most underprivileged areas are what we are most proud of.

08 **Romain Besnainou: Can you tell me how many countries and regions Huawei operates in, for example in Africa, Asia, and Latin America? Can you tell me about the major technologies that you provide for different regions?**

Catherine Chen: Huawei operates in more than 170 countries and regions around the world. We provide a wide range of technologies in all of these countries and regions. Currently, I think the US and North Korea might

be some of the only countries and regions where we virtually have no business.

09 Romain Besnainou: You just mentioned 5G. How important is 5G to Huawei in terms of its future development, technology, and economic returns?

Catherine Chen: 5G is the next natural evolution of 3G and 4G. Because of its compelling features, everyone is talking about 5G at the moment. For example, the low latency we can achieve in 5G networks enables autonomous driving and industrial manufacturing. In addition, the faster speeds mean we can develop many new industry applications. That's why 5G is different from previous generations of mobile communications technologies. The biggest change 5G brings to consumers is that they won't need to limit the time of calls just to save money. Phone calls will be more affordable than ever with 5G.

Broadband access around the world is still limited. Half of the world's population still don't have access to mobile broadband or home broadband services. 5G will give people all over the world affordable access to broadband services, allowing them to access networks at any speed and any time they like.

10 **Romain Besnainou: You've just talked about what 5G means for the future. What role does Huawei play in 5G development?**

Catherine Chen: Huawei began investing in 5G research as early as 2009, and so far, we have invested more than two billion US dollars in 5G. This year alone, that number will grow to about 10 billion yuan. We have more than 10,000 engineers and over 500 experts working on 5G. While researching and developing 5G technologies, we take into account different use cases in different countries and regions. We have established 10 plus 5G R&D teams in Europe alone to meet differing needs. Huawei is the largest contributor to 5G in terms of the number of 5G contributions, the number of patents held, and the number of papers written.

11 **Romain Besnainou: Speaking of President Trump, 5G is a key factor in the conflict between the US and Huawei. President Trump is worried that Huawei's advanced networks might be used for spying. What would you say to alleviate the concerns and suspicions of US citizens?**

Catherine Chen: This isn't something that Americans need to worry about. President Trump said Huawei was not allowed to sell 5G equipment in the US, and he

launched a campaign against Huawei. I don't know the reason for this. Different people have different opinions. President Trump said he didn't want the technologies from other countries, or Huawei's technologies for that matter, to be better than the US's. Some say Huawei's technologies are too advanced and secure, making it hard for the US to spy on its people and other countries. Personally I don't know which is correct.

12 **Romain Besnainou: Do you think the reason for such allegations or attacks against Huawei could be that the US is jealous of Huawei's advanced technologies and that they want to limit Huawei's growth?**

Catherine Chen: I really don't know why. If I could, I would suggest the US learn from Europe. Europe remains open and has established a unified set of standards.

Let's take a look at our industry. From 2G and 3G to 4G and now 5G, Europe has played a leading role in establishing a unified set of global standards. The benefits are obvious: Manufacturers can provide affordable and advanced solutions to consumers. Many years ago, we had to change our cellphones even if we visited a neighboring country like Japan. It was very inconvenient. So my suggestion for the US is: learn from

European countries, such as France.

France is rich in traditional fine arts, but it also embraces new art forms. Chinese people are greatly impressed by the Louvre and there is a glass pyramid over it.

The US government should embrace innovation. Right now they can only stand seeing themselves and their companies as global leaders, and they are only accepting their own standards, while rejecting those from Europe and China. This approach just won't work.

A report published by the US Department of Defense reflected on why the US has lagged behind in 5G. The report said one reason is that the US didn't adopt the global standard, and often take a different route. Take, for example, the fact that they even chose different frequency bands for 5G deployment from Europe and Asia. It seems they are reflecting on their own mistakes.

13 **Romain Besnainou: Let's hope President Trump will listen to your suggestions. Back to 5G. Has Huawei or Mr. Ren said anything to reassure European consumers and customers that they can use Huawei products without needing to worry about anything? Have you told them that the US has taken the wrong position and that Huawei does not engage in espionage?**

Catherine Chen: We've made it clear on multiple occasions that for the past 32 years Huawei has maintained a proven track record in security. We operate in more than 170 countries and regions, and our networks have always maintained high quality. I think this is a fact understood by many people.

The thing is, European countries, including France, should have faith in the professional judgments of carriers like Orange and Deutsche Telekom, both of which buy our products. These are leading companies with strong technological expertise. They only buy products that are both advanced and secure. This means they trust our products.

To address the US's alleged concerns regarding China's law, Huawei has pledged that we are open to signing no-spy agreements with any government in Europe. This is a public commitment, which will set the course for our own behavior.

There's no other company in the ICT industry whose products have undergone such intense security scrutiny and testing. In countries like France, Germany, the UK, and Canada, we are subject to government-led testing programs in addition to third-party testing programs. All the results have shown that our products are advanced and secure.

14 Romain Besnainou: Given the current situation, how do Chinese people view what's going on between Huawei and the US? Do they think that the US is targeting one of China's national champions? Will the US-Huawei issue have economic implications?

Catherin Chen: I think most Chinese consumers could learn two things from Huawei. First, as long as a company remains committed to long-term R&D investment and innovation, it will become competitive. Second, a company can reach its maximum potential only when it can withstand fierce competition. Huawei started out as a very small company. It has become what it is today through competition with its Western counterparts.

I think the huge conflict between the US government and Huawei that played out this year has helped many Chinese companies see why operational and legal compliance is critical. If Huawei had failed in this respect in the past 32 years, we would have been taken down by the US already. In fact, we did an excellent job when it comes to operational and legal compliance. That's why the US cannot find any evidence to suggest otherwise. These are all positive implications for Chinese consumers and companies.

You asked whether the US campaign against us has caused us trouble. Of course, there are some difficulties,

but our business results for the first half of 2019 are pretty solid, with a revenue of more than 400 billion yuan, which is up 23% from last year. But we are busier now than ever before as you can probably see. The US government is campaigning against us everywhere without providing any evidence. We want to use legal means to defend ourselves, but legal procedures can drag on for a long time. The US government has indeed tarnished our name.

15 Romain Besnainou: Mr. Ren used to be in the military, can you explain why this experience does not prove that Huawei has a close connection with the government?

Catherine Chen: Mr. Ren used to serve in an engineering corps, which had up to a million soldiers. According to the logic of your question, all of these people would be closely connected with the Chinese government. We don't know exactly how to explain this better, and we feel there is no need to explain it at all.

Mr. Ren used to serve as a soldier in the military's engineering corps and started a business not long after he left the military. It's as simple as that. I think the West should be able to understand this. Because this story shows that Huawei is the product of China's reform

and opening-up policy and its transition into a market economy. Competitive companies can be nurtured through an open market and adequate competition.

16 **Romain Besnainou: Given the current situation, will Huawei use new technologies to counterattack, such as the HarmonyOS and foldable phones? Will these technologies make people forget about the situation between the US and Huawei? If so, can you tell us why the HarmonyOS and foldable phones are revolutionary and innovative technologies?**

Catherine Chen: Huawei has always been and will continue to be open and collaborative. We have never thought about developing all the technologies we need ourselves, which would be impossible anyway. No company in the world can develop all the technologies and components itself. We have developed many back-up products simply to prevent security risks throughout the supply chain. Because if we rely solely on one supplier for a certain component, we may be unable to continue serving our customers if our connections with that supplier were disrupted. Therefore, if we only have US suppliers for a component, we will consider also partnering with their counterparts from Europe and Asia. If a component can only be supplied by Asian suppliers, we will consider developing a back-up ourselves.

17 Romain Besnainou: Can you explain what exactly a smart city and a safe city look like, and what role Huawei will play regarding these technologies?

Catherine Chen: I don't know who came up with the name "smart city", but many countries have carried out so-called smart city projects. Essentially, smart city solutions aim to improve urban or community management and services. However, these solutions have different focuses based on the different situations in each city. I'll give you a few examples.

Public security in Shenzhen was quite poor years ago, especially in areas away from the city center, such as the area where this campus is located. Back then, robberies and even some serious criminal offences, like child trafficking, would occur from time to time. So the first step to building a "smart" Shenzhen was improving security. The city's public security has now been significantly improved. Shenzhen is now taking a second step based on this progress, which is to make public services more convenient for citizens. For example, when we want to apply for official documentations, we simply need to fill out the required information online. Then we can print out these materials right downstairs, using communal machines. After greater progress is made in this regard, Shenzhen will move to the third step.

Just imagine what Paris would look like as a smart

city. For example, we are using digital technologies to help the National Opera of Paris build a digital platform, where people from all over the world can access and learn about the Opera's works of art. Take the renovation of Notre Dame Cathedral as an example. If the mayor of Paris uses digital technologies to show the entire world how Notre Dame is being renovated, it will likely resonate with many people, giving them an emotional connection to this great building. This will also attract more donations. This is how I understand smart cities.

18 **Romain Besnainou: You have spoken about France. Could you update us on your partnerships with French carriers? You mentioned your partnership with Orange just now. What components and services have Orange and Huawei provided, and what are your roles, respectively, during this process?**

Catherine Chen: Huawei provides mobile communications equipment and services to Orange, Bouygues Telecom, and SFR. But they don't buy all of their equipment and services from Huawei. They have their own firewalls and also buy fiber and transmission equipment from other suppliers. As network carriers, they put different products together to build a network to ensure our calls can get through.

19 **Romain Besnainou: Huawei is growing rapidly in many parts of the world, and you provide a wide range of services. Are you worried that you might face attacks from other countries? Is this really happening now?**

Catherine Chen: The US is indeed attacking us, but we have been working with many countries around the world for one or two decades. They have a good understanding about whether Huawei provides high-quality, secure products. We have full confidence in our products.

For more than a decade, the US government has prohibited US carriers from buying our equipment and stopped consumers from buying our phones. US consumers don't have the opportunity to experience Huawei products directly. That's why they have failed to gain a sufficient understanding of Huawei. As a result, US consumers have suffered huge losses, and have to pay three times more, on average, for communications services than their European counterparts.

20 **Romain Besnainou: President Trump does things in a unique way, and takes special actions towards the Chinese and European governments. Do you think the current actions against Huawei are spontaneous attacks or severe economic attacks?**

Catherine Chen: I really don't know what the purpose is, because he seems so changeable. He is never consistent when he tweets. Sometimes he thinks Huawei poses security risks and actions must be taken against us, and sometimes he doesn't think so. In recent days, German cars have also become a security threat in his mind. He is so unpredictable.

Romain Besnainou: I think he once said that French wine is not safe either.

21 **Romain Besnainou: Are you worried that Google or Facebook will refuse to cooperate with Huawei, making it impossible for Huawei to use the software of these companies? If this happens, what impact will it have on Huawei's mobile phones and sales?**

Catherine Chen: Currently, we still use Google's operating system on our devices, and we will continue using it. Our consumers can also continue to use it. There is no problem with this currently. In the meantime though, we've come up with a backup plan. If the US government interferes with our cooperation with Google, we will have to switch to our own operating system.

You asked if this would affect us. Yes, to a certain degree it would. If we roll out a new operating system, consumers would have to wonder if the system is any

good or even worth trying. So I think that would have some impact on us.

Huawei has basically already figured out its strategy. If we have to use our own operating system, we will make sure it is fully open-source. We will never pursue a monopoly or binding relationships. Huawei's own technical strengths, such as artificial intelligence and our highly-advanced cameras, will continue to attract many consumers, and many companies are willing to develop on our platform.

22 **Romain Besnainou: Huawei has grown from a small company into the company with the largest number of patents in the world. Is this because of the company's heavy investment or the large number of researchers? Could you give us any data on your patents?**

Catherine Chen: Huawei now has more than 87,000 patents. These are the result of our huge investment into R&D. Even when Huawei was still a small company, we invested over 10% of our annual revenue into R&D. In the future, Huawei will invest at least 20 billion US dollars into R&D every year.

Of course, Huawei has a large number of R&D engineers, over 80,000 in fact. In addition to our patents, Huawei submitted over 6,000 contributions to standards

organizations. Every year, on average, we contribute more than 200 academic papers to the industry.

Our R&D investment strategy also uses a 7-to-3 ratio. That is, 70% of this investment is expected to yield actual products, which are then used to generate income. The other 30% is spent on exploring future-oriented cutting-edge technologies. This includes the support we provide to universities. We support theoretical research in universities with no strings attached. This is another feature of our investment strategy. We invest in both the present and the next 10 to 20 years. You might say we are investing for society as a whole.

23 **Romain Besnainou: I have a question regarding Huawei's source of funds. Does Huawei make money through investment, then allocate part of its revenue to investment? Or do you receive funds from the Chinese government?**

Catherine Chen: Throughout Huawei's journey from a small company to what it is today, 90% of our funds have come from our business activities, with the remaining 10% being borrowed from banks. That means, 90% of our money comes from ourselves, including the investments of our 96,000-plus employees. Regarding our loans, 70% comes from foreign banks

and 30% from Chinese banks. But we will borrow more from Chinese banks this year. We have released over 10 annual reports, which were audited by KPMG. These reports clearly showed that Huawei has never received investment from any government or organization.

24 **Romain Besnainou: What meaning does your name and logo carry?**

Catherine Chen: We chose the name "Huawei" at random. Mr. Ren didn't give it much thought; otherwise, he would have realized that the name is not easy to pronounce in Chinese or English. In the past, our company was quite small and poor, and we drew the logo without thinking too much. In 2003, we changed the design of the logo a bit, reducing the 15 petals to eight. But it wasn't a big thing.

Romain Besnainou: I learned on the Internet that your logo is related to the sun. Is that true?

Catherine Chen: No, these are just assumptions made by people outside Huawei. Huawei had been unknown to many people until its 5G caught their attention this year. Before that, people couldn't even pronounce "Huawei" correctly, but now they have learned how to say it, as you have done.

Romain Besnainou: In this sense, Trump has actually advertised Huawei.

Catherine Chen: Yes, we thank him for that.

Romain Besnainou: Because Huawei previously didn't receive as much attention around the world.

Catherine Chen: It's good to think about the situation Huawei is facing in this way. After all, what we are facing is not all that bad.

Guo Ping's UK Media Roundtable

September 20, 2019
Shenzhen, China

Good afternoon to all the media representatives here today. Welcome to Huawei. I would like to say two things before taking your questions.

First of all, over the past 30 plus years, Huawei has attached great importance to and constantly invested in R&D. According to the 2018 EU Industrial R&D Investment Scoreboard, Huawei was the fifth biggest R&D spender in the world last year. This year, despite the new external environment, we are further increasing our investment in R&D, so as to reinforce our leadership in the ICT industry.

Huawei has been doing business in the UK for more than 18 years. We highly appreciate the recognition and trust placed in us by our customers and other stakeholders across the country.

I remember in 2012, I signed an agreement to acquire a UK company – CIP Technologies. At the time, this company had less than 10 staff members, and it was on the brink of bankruptcy. Following our acquisition of the company, we have continued to increase our investment in the development of optical modules which they work on. On top of this, we established a research centre in Ipswich. Today, this research centre has a team of over 90 employees. So this is a very good example of our ongoing technological collaboration with the UK. Our efforts don't just help the technical professionals of the

UK serve a wider community around the world though, but also bring the UK's technology and Huawei's products to the rest of world.

I can still clearly remember, when the acquisition was finalized, we threw a cocktail party in celebration. Many local government officials, including ministers, joined us that night. We were very pleased that this UK technology could stay in the UK and would continue to receive funding for future development. I also hope this kind of R&D collaboration with the UK can continue and grow even further, as it benefits both Huawei and the UK.

Second, I want to keep everyone of you up-to-date about Huawei's current situation. Since May of this year, an international superpower has been using every tool at its disposal to crack down on us. Despite that, we have still maintained solid growth and we are confident that we will survive and thrive. Thanks to our multi-path, multi-source approach to business and also our global partnerships, we have ensured supply continuity of all of our mainstay products. I myself am overseeing the development of our 2020 plan. We are confident that we will see growth next year. Several months ago, Dr. Hermann Hauser, co-founder of Arm, published an article on a UK newspaper where he described that it was possible for global tech companies to build a tech ecosystem without this superpower.

Thank you. I'm now ready to take your questions.

01 ***Computerworld UK*: One of the big announcements at HUAWEI CONNECT was around the extension of the developer program. I was wondering, what was the objective of this decision? And how would you hope to add another five million developer partners to the company?**

Guo Ping: Huawei is focused on three business domains: connectivity, computing, and smart devices. At the most recent HUAWEI CONNECT in Shanghai, we announced our strategies for full-stack, all-scenario computing and artificial intelligence. A little while ago, we also hosted the Huawei Developer Conference, which targets our consumer business.

Both our computing platform and HarmonyOS need support from a vast number of industry partners. So we're willing to do everything we can to support our partners and develop an ecosystem.

We have made some of our operating systems open-source so that our technology is available to everyone. We are publicly releasing our training materials and training systems. As you might have seen from our announcement yesterday, our EulerOS will also be open-source. On top of that, we are giving sufficient funding

to attract and encourage more developers to use Huawei technology and to build an ecosystem. As the ecosystem continues to expand, I believe developers and the companies founded by developers will be presented with tremendous opportunities.

02 ***Verdict*: At HUAWEI CONNECT, there was a lot of focus on artificial intelligence. I was curious to know why Huawei decided to focus on this so much at the moment and also how big a player that you expect and hope to become in this space over the next three years.**

Guo Ping: From a strategic perspective, we focus on three domains; connectivity, AI and computing, and smart devices. In the connectivity domain, Huawei is now a global leader in 5G. We will continue to provide quality connectivity services to our customers around the world.

Connectivity is the very foundation of an intelligent world. On top of connectivity, we need a lot of developments and applications, which will in turn significantly boost the demand for AI. AI represents another domain where Huawei aspires to become a global leader. By providing AI-powered computing platforms and related enabling platforms, we want to

help all industries make full use of 5G and unleash the power of AI to create greater value.

The Industrial Revolution was driven by the steam engine invented by James Watt, which made many different types of industrial applications possible. I hope 5G and AI coming together will become the "steam engine" for the intelligent world. I also hope that just like they did with the Spinning Jenny back in those days, the UK will lead the world again with the applications in the upcoming intelligent world.

03 ***Channel Eye*: You rely very heavily on Arm. I wondered how confident you will be in your relationship with Arm, not just in the next five years, but in the next 25 years?**

Guo Ping: About 10 years ago when Arm was still a small company, Huawei partnered with them and invested heavily in this partnership. If I remember correctly, Huawei has remained the strongest investor in Arm.

Our Kunpeng computing platform, Kirin CPUs, and Ascend AI computing platform are all rooted in Arm technologies. You can see Huawei has continued to be a staunch supporter of Arm and will remain committed to investing in this area. We are very pleased to see that

Arm represents an advanced computing architecture coming from the UK.

In today's computing world, the majority of workloads are distributed computing workloads. That is an area that Arm architecture fits nicely with and there's a lot of potential there.

Huawei has been granted a permanent license for the Arm architecture, and no matter what happens in the future, Huawei will fully support Arm's instruction sets.

As we move forward, we believe our Kunpeng products will contribute greatly to the future development of Arm. I hope that Arm's technology will play a vital role in the UK's AI platforms in the future.

04 ***Diginomica*: I noticed when the company announced HarmonyOS recently, one of the statements or the implications that came from the announcement, was that this is not just another mobile phone operating environment. And given this week's announcements from the company, it would seem that HarmonyOS is in a position to play a key role all the way up the hardware stack on all the devices and all the systems that Huawei is planning and announcing. I just wanted to know, how far up the stack does it go? Is there any relationship or connection between HarmonyOS and**

Openl Octopus? The implication seems to be that it was attacking or addressing the same marketplace from the high and downwards where HarmonyOS is from the low and upwards. Where is the join?

Guo Ping: Mr. Banks, you are a renowned industry expert. We pay tribute to you.

Around 2007, when Google was launching its Android OS, Huawei was probably the second phone maker to support it. Over the past decade, Huawei has been a major contributor to the development of Android. We are quite pleased to see that Android has played such a key role in the global market, and today, we remain committed to supporting Android.

You probably have noticed that Google is self-evolving. Recently, they launched an operating system called Fuchsia, which aims to address the future needs of an intelligent world. Fuchsia is designed to support all sorts of smart hardware like smartphones, PCs, home appliances, cars, and tablets.

Before Google's announcement came, we had already launched our HarmonyOS. A smart screen product powered by HarmonyOS is already available in China. You may say that great minds think alike. Huawei's HarmonyOS and Google's Fuchsia are basically heading in the same direction: open source and supporting a

variety of devices to enable smart lifestyles.

Fortunately, Huawei identified this opportunity before anyone else. We hope that the UK will be among the first to use HarmonyOS on multiple devices. I'd love you to experience them.

05 ***Data IQ*: My company focuses on data. My question is, if you could just tell me a bit more about the importance of data and analytics at Huawei, such as the size of the team or what kind of data they're servicing? Who they're servicing? What are their internal or external clients? What kind of answers are they planning questions to and if that's in the production of R&D or in the wide business?**

Guo Ping: At Huawei, cyber security and privacy protection are our top priorities. We attach great importance to data and privacy protection, and we comply with all applicable laws, including the EU's GDPR.

Huawei has not and will not monetize user data. This is how we set ourselves apart from Internet companies. Huawei is a technology company, and we earn our profit and revenue through the sale of technological products, rather than monetizing others' data.

Our investment in this regard is embodied in two initiatives: First, we continue investing in R&D to strengthen the ability of our products to protect user data. Second, our investment is related to our technologies on operations. This means customer data involved during operations will not be abused, ensuring we comply with applicable laws and regulations.

Let's look at an example. In the telecom carrier domain, it is UK telecom carriers, not Huawei, that own carrier networks. Because of this, we don't own the data that goes through the networks, and it's the carriers and data owners that own the data. Our technology can ensure that the data passing through our products won't be stolen. This is how we help data owners and data controllers operate in accordance with the law from the perspective of IT process operations.

06 ***IDG Connect*: My question is around Huawei's new investment in the computing industry. That was an emphasis at HUAWEI CONNECT. I was wondering if you could elaborate on how significant you expect Huawei's investment in computing to be and what's its relationship with Huawei's other business units in terms of revenue generating.**

Guo Ping: Computing power is vital for delivering an

intelligent world. One of Huawei's key strategies is to help our customers build up their computing capabilities on top of our connectivity business. The global computing industry is worth two trillion US dollars.

In the computing industry, Huawei has clearly defined its business boundaries. Simply put, we will build up our capabilities in cards and components based on our Kunpeng and Ascend processors and help system providers develop services and solutions for their customers.

We aspire to provide a second computing platform as an alternative for the world. I think this is an important solution that the businesses from the UK and other countries can look to as they seek business continuity and a plan B for heterogeneous computing.

In order to help system players run their business better, we will step up our efforts to empower others. Yesterday, we announced that our EulerOS would be open-source. In fact, our GaussDB powered by Kunpeng will also be open-source so that there will be yet another alternative out there.

We want to provide an alternative computing platform for companies to choose from. And I'm pleased to share with you that even before we officially put the computing platform on the market, we had already been

using it on more than 100,000 of our servers within our company. So, it's already a mature technology.

07 ***PC Pro*: I'm very interested in the thinking behind open source versus the thinking behind selling or otherwise licensing the patent portfolio in the business. How do you see the evolution of intellectual property, because those are two sides of the same subject?**

Guo Ping: That's a very good question. Huawei has always attached great importance to respecting others' IP while protecting our own. Huawei is one of the most important contributors to IP in the world.

Essentially, open source is just one of the business models that leads to business success. A case in point is the competition between Apple II and IBM's PC. IBM chose the open-source model, which resulted in the wide-spread success of today's PCs. In its competition with iOS, Android also opted for an open-source model, which has allowed more vendors to come on-board. As a result, Android has captured nearly 85% of the market share.

The reason why we adopted an open-source approach for our computing platform is that we hope we can attract more vendors and users, and this way, they can benefit more and achieve business success

as they deploy AI and computing platforms. Huawei is willing to make more contributions for this reason.

08 ***Computerworld UK*: In the UK, Huawei has become very popular for its smartphones and 5G technology. A lot of those customers are now worried that political pressures will disrupt those services. What would be your message to those customers?**

Guo Ping: We are very grateful that consumers and customers in the UK have trusted Huawei. Over the last 10 years, Huawei's smartphones and network equipment have been widely used in the UK.

For existing users, their continued use of Huawei equipment will not be affected as it's legally protected. For new smartphones that we are going to launch, if we cannot get access to applications from the US, Huawei will take a responsible attitude and work with the relevant parties to come up with the right solution.

In such a situation, we encourage UK companies to develop more applications so local users can have more choices. As far as I know, there are a lot of applications that cater to local needs in Japan, South Korea, France, Russia, and China. I really hope UK companies working on application development will catch up.

09 ***Verdict*: In your opening comment, you made reference to the idea of a global technology ecosystem that exists without a certain superpower. I was hoping you could elaborate on what that might look like and how that might be achieved.**

Guo Ping: Huawei has established a multi-path, multi-source supply system. We also want to work closely with companies that develop local applications in countries where we operate. As I mentioned just now, there are many different mobile applications in countries like Japan, South Korea, France, Russia, and China, and these applications can also be used in other markets. Consumers would then have more choices instead of relying on a limited number of applications. Maybe this will be a great opportunity for the UK.

10 ***Channel Eye*: What steps is Huawei taking to mitigate the problems with the very delicate supply chain, for example, the supply of Intel chips, AMD chips for your PC-based products?**

Guo Ping: As I just mentioned, we have a multi-path, multi-source, and wide-ranging supply system. We are more than happy to continue working with Intel, but the servers and computers powered by our Kunpeng processors also run pretty well. These processors have

been running on more than 100,000 servers within our company. Your organization can try them out too and see what they're like.

11 ***Diginomica*: I was just thinking about the open-source aspects, and the company's well-reported relationship with North America. I'm just wondering whether you see a situation with HarmonyOS going open-source, a situation where some third party can then take, basically, the fundamentals of HarmonyOS, to create their own distribution of it, and produce an American-approved version, which sort of cuts you out of the picture, rather than you maintaining some sort of control over it. Or the new chips sets and boards you're producing, like Ascend. Do you see them as sufficient as an alternative to having some sort of control over the software?**

Guo Ping: First, we have made our systems open source, because we believe open-source systems are the most competitive. I'm very pleased to see that many open-source organizations have moved their headquarters to permanently neutral states like Switzerland. I believe more open-source organizations will join this trend, as they want their systems to be widely used by the world's seven billion people.

12 ***Data IQ*: My question is on data and analytics: How has that helped Huawei's growth so far and how can it support Huawei's growth going forward?**

Guo Ping: When it comes to artificial intelligence, this comes down to three things: computing power, algorithms, and data. First, because our Kunpeng and Ascend processors and other products can provide basic computing power, we are able to help customers build computing platforms. This opens up possibilities in computing that were once out of our reach. In terms of algorithms, we work closely with our partners to train our algorithms. Internet companies like Facebook and Google have massive amount of data. Huawei has only a limited amount of data, so we have to train and enrich our algorithms with the help of our customers and their data.

As I just said, Huawei monetizes technology. We gain revenue through the computing power provided by our computing platforms. We also want to work with our partners to see returns from the use and sales of our algorithms. Huawei itself, however, is not a company that monetizes data.

13 ***IDG Connect*: Pretty significantly, you announced the Atlas 900 at HUAWEI CONNECT this year. Obviously, the Atlas 900 presents a lot of advantages for public**

sectors, research institutions, and things like education. I was just wondering about the AI computation of the Atlas 900. How significant is that for the private sector? And what sort of industries are you aiming to release that in?

Guo Ping: We announced the Atlas 900 two days ago. Honestly, I don't know the details about the specific sectors or industries it will be used in, but we can get you in touch with some of our technical experts to discuss it further.

14 ***PC Pro*: I'm very interested in your view on the problem of identity. And current solutions are very much within the control and interest of the unnamed superpower in terms of things like blockchain and development around technology. I don't know anybody on this side of the table, and it's very difficult for me to do anything with Chinese online services. Because I don't have a Chinese bank account, and in effect, I don't have a Chinese identity. To face the rest of the world, you're gonna need to do something to let me log into the test server you're proposing to drive. So you need an identity management system of some type. Also, to help break the stranglehold of the superpower, have you got something in mind that is more business-facing? Or is it a challenge that is yet to be resolved?**

Guo Ping: We've seen some other companies like Facebook making a lot of effort in this area. Huawei is providing public cloud services as well, both in China and some other countries. Identity management is certainly one of the fundamentals for public cloud services. But Huawei does not touch upon payment-related matters. We use the payment services provided by others. So, we only require user's ID info when they log into Huawei Cloud or consumer service systems. When it comes to payment and security, we just use existing third-party services. The third parties are responsible for providing payment services and ensuring payment security. We don't have a license for providing third-party payment services in China yet. So, we're not in a position to provide these kinds of services in China, nor do we have such services in other countries.

15 ***Computerworld UK*: Huawei develops a lot of chip technology but still relies on Arm and some other companies as well. Do you envision a future in which Huawei develops its own chips entirely in-house and doesn't need to rely on external chip makers?**

Guo Ping: We have never considered closing ourselves off and independently developing a completely in-house system. Instead, we always want our systems to be open, advanced, and able to create value for all of humanity.

We will continue to develop our systems on top of Arm's architecture, and maintain our partnership with Arm. We always respect the contributions Arm made to the initial development of the architecture, and we pay for the use of related intellectual property. I believe this is a reasonable cooperation model for shared success.

Looking to the future, Huawei will continue to embrace and enhance our partnerships with different players to jointly develop an ecosystem that creates shared success.

I hope the UK can play a bigger role in that journey. I believe that the results of our joint R&D initiatives in the UK will be widely used across Huawei's products and solutions, which will be deployed in countries and regions across the globe.

The UK has been a founding member and a supporter of the global free trade system. I believe that the UK will continue to firmly support and benefit more from free trade in the future.

16 ***Channel Eye*: I would like to ask a further question. There may be a lot of people in the UK that would love to buy servers from Huawei. But Intel has such a grip on distribution and high-end dealer channels. I don't see how you can break into that. How can you**

take over the channels already dominated by Intel and its associates?

Guo Ping: There is a well-known parable in China called The Foolish Old Man Removes the Mountains, which teaches the virtues of perseverance and willpower.

Many sectors in the world are now dominated by some big companies. However, I think companies, including those in the UK, should adopt a multi-supplier and multi-channel strategy to ensure their security and business continuity. Huawei has been able to survive and develop because of such a strategy.

I've recently read a book by Nassim Taleb, who also wrote The Black Swan and Antifragile. In this book, Mr. Taleb asked whether globalization has been humanity's another attempt to build a Tower of Babel.

Likewise, I believe that China, the UK, and many other countries should reinforce communication, and work together to further drive globalization.

However, considering potential risks and business continuity, companies could consider preparing a Plan B during their business development, so that they won't be impacted by political uncertainties. For example, if a company's supply were disrupted, they could use Kunpeng.

17 ***Data IQ*: So over the past couple of days, I've heard a lot about the transparency and openness at Huawei. I'm wondering how challenging it is to have this culture in the background or operate in the context of a country that is a little less transparent.**

Guo Ping: Huawei is not a public company. Since around 2000, however, we have hired an international auditing firm to annually audit Huawei's financials. Each year, we publish our annual report and we keep engaging with all stakeholders, including our customers and suppliers. Gaining the trust and support of our customers, end users, and other stakeholders is of paramount importance to Huawei.

If we didn't do enough in the past, we are now committed to further enhancing our openness, collaboration, and transparency in the foreseeable future. This way, our stakeholders, including our customers and consumers, will have greater confidence in us and choose Huawei's advanced products and services.

18 ***Diginomica*: I'm just wondering what your opinion is on Intel and its x86 family. Why is your commitment in another direction when it comes to AI? What is the weakness of the x86 architecture when it comes to running AI applications?**

Guo Ping: For AI chips, the two main computing platforms are x86 and NVIDIA's platform.

x86 is based on extended instruction sets, so it has an advantage when it comes to large-scale floating-point computing. Our Kunpeng processors are based on the Arm architecture, so they have an advantage in terms of power consumption and distributed computing.

Now, almost all processors for mobile phones and other handheld devices are based on Arm, whether they are from our Kirin series or processors from other companies. So, I would say the Arm architecture can be used more widely.

In the current Internet age and in the future intelligent age, the majority of applications will support distributed computing scenarios. We believe that our Kunpeng architecture has an advantage in most scenarios, and this architecture has already been used in over 100,000 servers for our own internal operations.

I think when it comes to power consumption and distributed computing scenarios, our Kunpeng architecture has a very obvious advantage over the computing architecture provided by other vendors.

19 ***Verdict*: Earlier, the topic of blockchain came up briefly. I was curious to know if there's any blockchain**

technology Huawei has explored and whether you're likely to develop products or applications around it in the future?

Guo Ping: We do follow up on technologies relating to encrypted assets, but we have no plan to invest at scale in this area yet. Huawei is just a company, and so we only have limited resources to focus on our own areas.

20 ***Verdict*: I'm just going to ask, what do you think is going to be the biggest priority for Huawei over the next decade as you move forward?**

Guo Ping: In the foreseeable future, we will continue to focus on our existing businesses, namely, connectivity, computing, and smart devices, in order to provide an enabling platform for the intelligent world. We also hope that countless applications will grow out of our connectivity and computing platforms. We will continue to focus on ICT technology and help industries advance their intelligent agenda. We aim to make even greater strides on that new horizon. Thank you.

Liang Hua's Meeting with Guests from China-Germany-USA Media Forum

September 24, 2019
Shenzhen, China

01 ***Deutsche Welle*: Let's just say you are going through somewhat difficult times. So I'm wondering how you, honestly, look at the next 6 to 12 months. It's likely you will face great difficulties not only with the United States but also with Germany and the rest of Europe.**

Liang Hua: Since Huawei was added to the Entity List by the US, there hasn't been any substantial impact on our business operations. Everything at Huawei is now business as usual. We are able to ship our core products in the ICT domain to meet our customers' needs without relying on US components.

You may have seen the image of an airplane from World War II riddled with bullet holes. Despite this, the plane did not lose its altitude and flew home safely. Huawei is like that airplane.

We are patching up these holes without losing altitude. We've just about finished patching up our ICT infrastructure business, and now we're focused on our consumer business. We are mobilizing resources to make breakthroughs in our mobile operating system and the ecosystem around it, which we believe can be done in two to three years.

We hope to continue using Google's Android operating system and the Google Mobile Services ecosystem to serve our consumers as long as the US government permits.

In the next 6 to 12 months, our top priority is ensuring our survival. We must provide high-quality, new product releases if we are unable to use US components. We're also making investments into future-oriented development. This year, our investments in R&D reached 120 billion yuan, which are allocated to two areas. The first is making sure we can survive, and the other is to ensure long-term development.

Despite the current external environment, our employees are working harder than ever and becoming more confident. We are fully confident that we will be able to survive and even thrive.

02 ***Süddeutsche Zeitung*: You mentioned that you have come under pressure from two sides. One is that you're in the midst of this China-US trade war in terms of US components. On the other hand, you have held discussions in Europe, for example about the critical infrastructure of 5G. These discussions usually revolve around, "Can we trust this company?" If, for example, the German government and others come to the conclusion that they don't trust you or the Chinese government, this will present a huge problem. Because it is a question of trust. What do you plan to do to overcome this issue of mistrust?**

Liang Hua: We have been doing business with customers in Europe for 10 to 20 years. From what I have seen so far, our European customers still trust us and will continue working with us.

Cyber security in the digital and intelligent world is a common challenge for humanity. We believe cyber security should be guaranteed using cyber security standards and assurance mechanisms.

We fully support the proposal from the German government to promote higher, common standards that apply to all players across the entire industry in order to guarantee cyber security. Such standards will be required across the entire industry to ensure ICT infrastructure, like 5G, is secure. Huawei is willing to proactively participate in the development of all related standards and policies.

03 ***Global Times*: Huawei launched the Mate 30 smartphone in Europe and Chinese consumers are really looking forward to its upcoming release in China. I've noticed that the starting price of your Mate 30 is 799 euros, the same as that of the Mate 20. This differs from your normal pricing model, as you usually price your latest Mate model a little higher than the previous model in the European market. However,**

you've kept the Mate 30 at the same price. Does this show that Huawei's consumer business is taking some action in Europe to help maintain their market share in Europe and also globally? If so, what actions have you taken?

Liang Hua: I think the market share of a consumer product like smartphones is determined by many important factors such as consumer preference, consumer experience with the product, and its competitiveness. Of course, pricing also matters.

We do not proactively pursue a larger market share for smartphones. Users love phones that provide a great experience, and we can truly bring convenience to users with new technologies. For us at Huawei, our mobile phone business must turn a profit and contribute profits to the company.

Moving forward, Huawei will offer digital devices, including smartphones, tablets, PCs, and smart screens, for all scenarios. Our aim is to support seamless connectivity and provide smart lifestyles for our users in all scenarios.

04 ***The Washington Post*: How can you reassure those who believe that if the Chinese government tells Huawei to take action, you would have to comply?**

Especially given the national security law that requires Chinese companies and individuals to provide intelligence to the Chinese government.

Liang Hua: First, Huawei has never received any such requests during our operations, and even if we received such requests in the future, we would never execute them.

Regarding China's *National Intelligence Law*, many Chinese officials have explicitly stated on many occasions that China has no law requiring companies to collect intelligence or install backdoors. At the Munich Security Conference, Yang Jiechi, Director of the Office of the Foreign Affairs Commission of the CPC Central Committee, made it clear that China has no law requiring companies to install backdoors or collect foreign intelligence.

Premier Li Keqiang then reiterated this position at a press conference following a recent session of the National People's Congress. He stated, "This is against Chinese law, and is not the Chinese way of doing things. We don't do such things now, and will never do them in the future."

Huawei is a private company wholly owned by its employees. We are a commercial company. Cyber security and privacy protection are and will remain our top priorities. We are now operating in over 170

countries and regions, and we comply with all applicable laws and regulations in every country we operate as well as the laws and regulations of the United Nations.

We always put customers at the center of everything we do and create value for customers. We ensure trade compliance and abide by all applicable laws and regulations at every stage, including product development, marketing, and supply chain.

Because of this, we have managed to build solid trust with our customers over the past 20 to 30 years. And even in such difficult times, our customers continue to trust us and work with us.

05 ***The Washington Post*: You'll forgive my skepticism, but is it really possible for a company in China to say that if it received a request from the government, it would not act on it?**

Liang Hua: Yes, at Huawei, we could.

06 ***NDR*: Huawei established a cyber security evaluation center in the UK in 2010. This center is overseen by the UK's national cyber security center, and the oversight board issues a yearly report based on its findings. The 2019 report is public, and makes for rather grim**

reading, highlighting a series of system defects in Huawei's software engineering regarding cyber security competence in the UK. What's your take on this report? What could the consequences be? Is the cyber security evaluation center in the UK a model that could be used for other countries in which you operate like Germany, Italy, or Norway?

Liang Hua: The UK's regime for Huawei is arguably the toughest and most rigorous oversight regime in the world. We have established a mechanism with the UK's NCSC, and the Oversight Board (OB) releases an annual report. We welcome the fact that the 2019 OB report has identified Huawei's software engineering issues, because when they point out specific problems, we can work on these problems and make improvements. They are not unfounded accusations, rather they point out the actual issues that we need to work on.

This year's OB report also concluded that the UK government thinks Huawei's products and solutions are trustworthy and that these risks can be effectively managed. But the report did point out our specific issues in software engineering. To address these issues, we have decided to invest two billion US dollars over five years to improve our software engineering capabilities, and we will keep the UK government posted on our progress.

We believe that we need to take a fact-based, technical approach to address any cyber security issues associated with new technologies. Equipment vendors, carriers, and regulators need to work closely together to address specific cyber security issues and provide better network assurances so that networks are more secure and trustworthy.

07

***CMM-I*: I have two questions. First, if you look back, is there anything you could have done, in your view, to avoid becoming the center of this cyber security dispute? The second question is: Since you supply almost every company in your industry, could you give us your judgment on the state of telecom infrastructure within the different countries you supply?**

Liang Hua: It was never our intention to become the center of this cyber security dispute. So, I honestly don't know what Huawei could have done to avoid being in this situation. If we discuss the cyber security issue based on facts, technologies, and 5G security standards, I think we can come up with a solution. However, if this is politically motivated or driven by ulterior motives, honestly I don't know what we could have done to avoid being dragged into this.

Why is Huawei leading in 5G? Because we started investing heavily in 5G early on. If we look at the development of technologies over past centuries, every new technology has had its upsides and downsides, but humans have always used rational thinking to address the downsides. I believe this is also the case with 5G. Cyber security concerns about 5G will be effectively addressed in the end.

Huawei has made its fair share of contributions to 5G, telecom infrastructure, and the telecom industry as a whole. From 2009 to 2019, our investments in 5G totaled 4 billion US dollars. Huawei's 5G standard contributions accounted for 25% of all of those approved worldwide. We've submitted more than 18,000 standards contributions to 3GPP, making us the world's largest contributor both in terms of total submissions and approved submissions. In addition, we have declared 2,570 5G essential patent families to ETSI.

5G, the 5th generation of communications technology, is just a tool. 5G supports high bandwidth, low latency, and massive connectivity. With these futures, 5G will reshape the digital economy and people's lives, and it will drive AI and the digital economy forward.

As for your second question, 5G will become part of the telecom infrastructure. One important feature of the telecom infrastructure is interoperability. ICT

infrastructure will become a channel and an underlying platform. Currently, every country is building ICT infrastructure in order to provide basic connectivity, which will make way for their digital economy, a more convenient lifestyle, and higher productivity.

Business, in essence, is about transactions, and connectivity is the foundation for these transactions. Connection speed is also a key part of transactions, and will play a critical role in future economic development. From streets and highways to railways and now data flows in today's digital world, connectivity is always a driver of economic development. How can we effectively manage cyber security and protect privacy during this process? We must take technical measures and put related assurance mechanisms in place.

In fact, 3GPP has laid out very clear standards and protocols to guarantee 5G cyber security, and it has defined effective assurance mechanisms. Huawei complies with 3GPP's 5G security protocols and standards. The development of security assurance mechanisms calls for concerted efforts from government regulators, carriers, equipment vendors, and other third parties.

A good example that could be looked at is the General Data Protection Regulation (GDPR) in Europe. It has defined mechanisms for how data should be

collected and how user privacy should be protected. It also treats all companies operating in Europe equally. Since we operate in Europe, we have to comply with GDPR just like everyone else.

08 ***Robert Bosch Stiftung*: You're a software and hardware company. However, I'm not sure whether the issue you're facing is related to software, technology or soft power. The world is becoming increasingly connected by technology. I can visit any country at my fingertips. But the world seems to be more and more divided by ideologies. Because you are now one of the global players from China, and you're facing this global race, not being seen as a technical competitor, per se, but as a Chinese one. So, I was wondering if you also have people at your company who are thinking about approaching this challenge from a non-technical angle.**

Liang Hua: Huawei is a tech company, so our main focus is on technologies. But we are aware that politics can affect our operations. What you have mentioned now is a broad issue and there should be people looking into it further.

The issues we are facing today are nothing new. They existed decades ago. For example, radio broadcasting was invented by Westinghouse in the 1920s, and this

technology began to see large-scale deployment in the 1930s. In the 1940s, rules were being developed to manage how radio broadcasting was used because it affected how people lived, thought, and learned.

Moving forward, technologies will become more intelligent and advanced. 5G, cloud, AI, IoT, and software-defined everything will become more prevalent. There are also some issues that we need to consider.

Huawei is a company headquartered in China, with global operations. As I've just said, we have business operations in over 170 countries and regions, and we comply with all applicable laws and regulations in every country where we operate. It takes time for a new technology to develop. We can gradually apply new technologies to different scenarios, and think about how to further develop these technologies, like digital technologies and AI. Digital governance and AI governance call for concerted efforts from great minds around the world, such as politicians, scientists, and representatives from industry organizations. They need to come together and think about how to make the best use of digital technologies and AI while effectively managing the risks associated with these technologies.

09 ***Global Times*: Well, Chairman Liang Hua has explained a lot, but they just don't believe it. When you say**

that Huawei's addition to the US Entity List has no substantial impact on the company, they think you are lying and that Huawei is about to collapse. That's one thing. Second, they don't believe that Huawei is free from government influence. They think if the government were to ask you to install backdoors, you would immediately do it. What would you say regarding these points? Can you elaborate on the second point a little bit?

Liang Hua: I'll start with your first question. Huawei was not caught unprepared. We have been bracing ourselves for such a situation for almost 10 years. We began developing our business continuity management (BCM) system a long time ago. The system was originally designed to respond to emergencies such as natural disasters and conflicts. For example, the earthquake in Japan disrupted the supply chain. Was there an alternative supply plan after the earthquake? How were we going to guarantee our supply continuity?

The BCM system was able to answer these questions. As the US attacks against Huawei increased in intensity, we decided to increase the priority of Plan B in our technology research. Thanks to the BCM system, we can now ensure the continuous supply of our core products without relying on US components. That said, if the US government allows US suppliers to continue supplying

Huawei, we will be more than happy to use their components.

Huawei's confidence comes from years of technical expertise and its BCM system. I hope you can visit us again next year to see if our company is still running well.

As for you second question, I suggest you learn more about Huawei, because the more you know about us, the more trust you will have in us. You can start by looking at how Huawei has become what it is today. Our founder Mr. Ren has spoken about the company's history multiple times during his interviews with the press. I don't feel I need to repeat what he said again. If you are interested, I will be happy to send you a copy of the transcript of Mr. Ren's interview with German broadcaster ARD. In this interview, he elaborated on how Huawei was founded.

As a global company headquartered in China, Huawei abides by Chinese law, operates according to the law, pays taxes, and maintains a normal working relationship with regulators such the Ministry of Industry and Information Technology. Huawei exists only to serve its customers. We will never do anything that harms the interests of any country, any organization, or any individual. We make independent business decisions based on our own business needs. I'm not expecting the trust issue, or the distrust issue as you have phrased it, to

be solved overnight. To build that trust, we need back-and-forth communications and deeper understanding of each other.

10 ***Süddeutsche Zeitung*: When Donald Trump ended the treaty with Iran last year, he intimidated European companies by telling them that if they continued cooperating with Iran and doing business in Iran, they would be banned in the US. Now with 5G, something very similar is happening. The US government is saying that if the governments in Europe, for example, allow Huawei to be part of their 5G infrastructure, the US will refuse to let them cooperate on future secret services and expel them from current cooperation. Are you afraid that the governments in Europe could come to the conclusion that continuing to do business with Huawei might harm their interests in relation to the US, because the US would then stop secret service cooperation?**

Liang Hua: Each European country will make its own decision regarding 5G deployment, based on their national interests and economic development needs. Carriers will also choose their partners for network deployment based on technological development and network buildout needs. As things stand, most European countries are choosing to work with Huawei. These

partnerships are set to benefit Europe's 5G development, which will in turn drive the digital economy and AI forward.

11 ***China Finance & Economy Media Group*: Huawei, as a technology company, has invested heavily in technologies for years. But a couple of days ago, Mr. Ren said he would consider selling key technologies to the US and other Western countries. Did he really mean it? Is this a reactive or a proactive move? Aren't you afraid that you will lose your market share after such technology transfer? Aren't you afraid of the resulting competition?**

Liang Hua: When Mr. Ren offered to license our 5G technology to a US company, he really meant it. There are several key aspects to 5G technology licensing:

First, we will license our 5G patents on fair, reasonable, and non-discriminatory (FRAND) terms.

Second, we'll license the potential US buyer everything related to 5G technology, including software source codes, hardware designs, network planning designs, and production and manufacturing techniques. The buyer can then build their 5G systems on US chips or Huawei's chips.

With 5G technology licensed from Huawei, the US company will be able to manufacture 5G equipment that serves the US market. This will not only accelerate 5G rollouts in the US, but also address the US's concerns over 5G network security. The US company will also be able to sell not just in the US market, but around the world. In this way, Huawei will have a rival that competes with us on a fairer and more reasonable basis. This will prevent us from slacking off and drive us to become more competitive.

In addition, Huawei barely sells equipment in the US. We would charge a reasonable fee for this potential one-off technology licensing. The offer to license our 5G technology to a US company was made after consultations with Huawei's internal team. So when Mr. Ren made that offer, he did mean it.

12 ***ZDF Morning Magazine*: I would like to ask you two questions.**

The first is about the cultural differences between China and Europe. We saw your showroom downstairs and we were quite impressed by your solutions for smart cities, health, banking, and so forth. But I think many of us, especially from Germany and the rest of Europe, immediately think about risks more

than possibilities, such as privacy, data security, and surveillance. Why do you think European societies seem to be more concerned about those issues than Chinese society?

Second, why do you think Chinese tech companies are more successful than European companies?

Liang Hua: I'll address your second question first. I don't think it's fair to say that Chinese tech companies are more successful than their European counterparts, because all countries have companies that are competitive in different sectors.

Take Germany as an example. Germany is a world leader in manufacturing and the semiconductor equipment manufacturing. In Huawei's factories, you'll find our production software and equipment are from Germany. In these areas, Germany is much stronger than China. It is important for countries or businesses to follow technological trends and make long-term investments in those directions. Digital technologies and AI are set to impact or even reshape many sectors.

Germany also has a very strong automotive industry. As we move from internal combustion engine cars to electric cars, there will be enormous business opportunities. Enabling technologies such as electric vehicle technologies, digital technologies, and AI will all

promote the transformation and development of the automotive industry.

A car with a traditional internal combustion engine doesn't connect with the external environment in any way. But moving into the future, autonomous driving cars will have numerous connections. This includes connections between people and connections between cars. A car will become like a mobile data center. Then comes the question: How will the data be collected and used?

The evolution from horse-drawn carriages to internal combustion engines, and then to autonomous driving or digital cars naturally gives rise to concerns about data governance and privacy protection. However, the requirements for these issues vary from country to country. We believe that every country is entitled to develop their own rules for governing data and privacy protection. Europe has set a good precedent in data governance with GDPR.

There should be unified standards for autonomous driving cars, because without clearly-defined and unified standards, autonomous driving cars would be unable to travel from Germany to France. Going digital and intelligent is inevitable for the automotive industry. Therefore, it is imperative to develop security, data, and privacy protection rules that are accepted at both national and global levels. Such a move will make it

easier to use new technologies to make our societies more efficient, give people more convenient lifestyles, and ensure more transparent government services.

13 ***Chicago Tribune*: Do you see the US action against you as inevitable? Or are there specific steps you feel you could take to convince the US that you're not a national security risk?**

Liang Hua: I think the US government is in a better position to answer this question.

14 ***CCTV*: I have two questions.**

First, the US Congress is currently launching anti-trust investigations into big companies like Facebook, Amazon, Google, and Apple. There is a view that such investigations will further complicate cooperation between Huawei and US companies. Because with the sensitive political environment, US companies will become more cautious when deciding whether to work with Huawei. What's your view on this?

Second, I would like to know your view on the media in general from the perspective of businesses. Do you think that it's possible for the media, regardless of their country of origin, to stick to fact-based reporting as a

media outlet without being impacted by geopolitics?

Liang Hua: I'm not aware of the ongoing investigations against these companies in the US. When we work with US companies, we ensure the partnerships benefit both parties. Many US companies possess advanced or cutting-edge technologies, and we have a long history of working with US companies in areas such as components, spare parts, and software.

I'd like to thank US companies for supporting Huawei's growth. The US government is currently preventing them from selling chips or components to Huawei, which is a loss to them. Huawei supports globalization and believes that collaboration leads to shared success. Collaboration is the only way to achieve win-win results. If the US government does not allow these companies to supply Huawei, we will also be able to develop products that do not rely on US supplies.

Regarding your second question, I honestly have no idea about how to develop fact-based reports since I'm not a media professional. But I do welcome media visits to Huawei. You can visit our campuses, production lines, and canteens, and speak to our staff and managers. I think this will help generate more fact-based news reports about Huawei.

15 ***Politico*: Do you anticipate a trade deal being agreed before the presidential election next year? And do you think China will get a fair deal from Donald Trump?**

Liang Hua: Huawei barely sells any equipment in the US, so US-China trade relations have no significant impact on us. Huawei mainly focuses on its own survival and growth. We haven't done any research regarding the possible outcomes of the trade talks or when a deal will be made.

16 ***People's Daily*: The historical success of Huawei is largely attributed to the top talent that you have at your company. Given the huge pressure that is being placed on Huawei right now, what kind of measures would you take to attract brilliant minds from around the world in order to continue delivering top-notch products and technologies?**

Liang Hua: First, we must survive and even thrive. Second, the industry we work in remains attractive for talent. This year, we've already hired many brilliant minds (including both fresh graduates and experienced hires) and brought many top young minds onboard. As you said, in a high-tech industry, top talent and technical experts are key to sustaining innovations and enabling companies to keep forging ahead.

Huawei's operations are currently sound and we have abundant cash flows. We have established our presence in locations where there are top minds. In addition to our in-house staff, we also work with universities and research institutes. This year, we have earmarked 300 million US dollars for partnerships with universities and research institutes.

When it comes to connectivity, we will continue to research 5G and the next-generation of mobile communications technologies. This means we need to attract more top minds. We have also brought in many talented people in computing, especially intelligent computing. In addition, many talented people have already joined our consumer team, working on the exciting HarmonyOS and the Huawei Mobile Services (HMS) ecosystem. Moving forward, we will continue bringing in more talented people and working more closely with leading universities and research institutes. This will allow us to sustain innovation and product R&D.

Promoting Ethical Standards Worldwide in the Digital Era

Eric Xu's Speech at Swiss Digital Initiative

September 2, 2019
Geneva, Switzerland

Thank you moderator for the kind introduction.

Your honorable President Ueli Maurer,

Ladies and gentlemen,

Good afternoon!

To begin with, I'd like to thank President Maurer for inviting me to today's conference. It's unlike any I have ever attended before. Previous conferences were normally about how digital transformation or technology would create value for human beings. But today's conference focuses on the risks of digital technology and how to apply ethical standards in the digital era.

Despite my many years of following AI developments, careful study of the Swiss Digital Initiative (SDI) has taught me something new about how AI will change our society.

Clearly, many countries, companies, and individuals have drafted countless statements, value propositions, and principles about digital technology. China is no exception. On August 26, Chinese Vice Premier Liu He set out the four principles for AI development in China, requiring it to:

- Create value for humanity,
- Balance efficiency and employment,

- Respect and protect privacy, and
- Adhere to ethical standards.

The ethics of technology has long been an area of focus for me. Today, I'd like to take this opportunity to share some of my viewpoints about it.

Throughout mankind's long history, technology ethics has evolved alongside technological advancements. Simply put, the ethics of technology relates to the relationships between humanity and nature.

In ancient times, when humanity was overwhelmed by nature, these ethics focused on respecting nature. Since the Industrial Revolution though, human inventions have often become more powerful than nature. This has caused the focus to shift in greater favor of humanity. Technological advances have come hand-in-hand with environmental pollution and climate change.

In recent years as information technologies have continued to develop, especially data-driven applications and AI, human beings are no longer simply the creator of technology. We have become an object of its influence. Human beings need to adjust to the issues caused by the technologies we have created. This further affects the relationships between human beings and nature. The impacts will extend around the world and have huge implications on our future and nature.

Therefore, I believe the technology ethics for the digital era should be established, refined, and implemented in a way that puts people first, benefits all, and ensures harmonious coexistence between people and nature.

Different countries have different views on ethical standards for digital technology. These views are influenced by their different stages of development as well as their history and culture. These views also vary between generations and between the rich and the poor. So while pushing for implementation of digital ethics, the SDI should also respect such differences and the choices made by different countries according to their different situations.

The SDI is clearly committed to fostering an inclusive and participatory multi-stakeholder process. I believe that it will contribute greatly to the digitization of countries around the world.

Digital technology can create value for humanity while helping us mitigate potential risks. Value creation and risk do not necessarily come hand-in-hand. Technological innovation can help achieve well-coordinated development.

Take privacy protection as an example. At Huawei, we consider privacy protection a basic requirement and

take privacy into account as early as in the design phase. We have also built privacy protection into our entire product development process. This helps us ensure that our products meet privacy standards and requirements.

We have also doubled down on our efforts in technology innovation to maximize value while ensuring solid privacy protection. For example, we use differential privacy technologies for irreversible anonymization in application information. This improves user experiences while ensuring that user privacy is well protected.

I'm proud to tell you that every day, about half of all people around the world are connected with equipment provided by Huawei. Of course, Huawei is now best known for our 5G products.

In Switzerland, Huawei has helped Swisscom deliver broadband connections exceeding 100 Mbit/s to 85% of households. We have also helped Sunrise roll out its nation-wide mobile communications and 5G networks. These efforts have made Switzerland the home of Europe's highest quality mobile networks, and the first European country to achieve wide-scale commercial use of 5G.

Huawei has also worked with Schindler to create an innovative Internet of Elevators connecting hundreds of thousands of elevators and escalators worldwide, greatly

reducing operation and maintenance costs.

Looking ahead, Huawei will continue to spend heavily in R&D and to provide advanced products and solutions that meet technology ethics. Through continuous innovation, we want to help Switzerland maintain its leadership in the digital era.

Over the past few decades, Huawei has provided innovative ICT infrastructure and smart devices to carriers, enterprises, governments, and consumers from around the world. Our offerings have driven digital transformation and created great value for the global community. It's our belief that to ensure healthy development of society, it's important to actively support the creation, refinement, and implementation of technology ethics, and to help countries define their own digital agenda so that they all flourish in this digital world. Our vision of this is crystal clear and our responsibilities are unshirkable.

Huawei will actively participate in the further refinement of the SDI and the promotion of technology ethics around the world.

Thank you!

From Innovation to Invention: With the World, For the World

William Xu's Speech at Huawei Asia-Pacific Innovation Day 2019

September 3, 2019
Chengdu, China

Distinguished guests, ladies and gentlemen, good morning,

Thank you for joining us at this year's Huawei Asia-Pacific Innovation Day. Chengdu can be considered the hometown of the giant panda and a city of innovation. Around 250 BC, the ancient irrigation system Dujiangyan, which is considered to be a man-made wonder, was constructed in Chengdu.

Today, we have come together to discuss innovation, the future intelligent world, and how technology changes our lives.

We are entering an intelligent world

A decade ago, we might not have predicted that technological developments would bring such huge changes and incredible convenience to our lives today. And today, we are still looking forward to the exciting changes of the future. I think in the next 20 to 30 years, we will enter an intelligent world, where all things can sense, all things are connected, and all things are intelligent.

In the intelligent world, all things can sense, and sensors will transform the physical world into digital signals; networks will connect all things and all data will

be online; and applications powered by big data and AI will make all things intelligent.

These three features rely on advanced ICT. ICT infrastructure, such as 5G, IoT, and AI, will be the foundation of the intelligent world.

All things connected: 5G is the foundation of an intelligent world

5G will serve as the foundation of an intelligent world and enable the connectivity of everything. 5G will play a pivotal role in the digitization of all industries. Right now we are in the process of evolving towards automated, digital, and AI-driven industrial development. And 5G arrived just in time.

5G can provide much greater bandwidth and lower latency than traditional wireless connections, and can support different applications with dedicated network slices. This allows 5G to meet a wide range of industrial needs, and lays the foundation for a fully automated, intelligent future.

At the same time, as more and more industries embrace intelligence, we will see much greater demand for technologies like cloud, AI, big data, and edge computing. With the support of 5G, these technologies

will be able to support far more industrial applications than ever before – and much more efficiently.

5G will help unleash the true power of cloud, AI, and edge computing. It will also help these technologies become more pervasive in industrial settings. Moving forward, 5G will gradually converge with all of these technologies and further accelerate the digitization process in all industries.

5G for safer mines

We have seen many 5G applications in different industries. Today, I would like to share a recent use case with you. This is a rare earth mine in Inner Mongolia. Mines aren't generally located in the best of environments – the climate is often harsh, and the sites can be chaotic. This makes them very dangerous, especially for drivers who have to haul dirt back and forth across the site. At this particular mine, there are 30 trucks, each of which has 4 drivers working in two different shifts. This presents some challenges for the mine operators and their workers.

The first is frequency of accidents. Even the most experienced drivers have trouble avoiding dangerous situations in this type of environment. Second, efficiency is low. The best drivers can only travel about 10

kilometers per hour – anything faster would be unsafe. Third, cost. Truck drivers in this mine make about 250,000 yuan per year – roughly 20,000 per month. This is quite a high salary for drivers in China, but even then the mines have difficulty finding the right people. The environment is just too harsh, and many people aren't interested.

Today, 5G can help the mines solve these problems. With 5G networks and modules, we can enable driverless mining trucks. Cost-wise, this saves roughly one million yuan per year per truck. It also greatly increases efficiency, as the trucks can speed up from 10 km/h to about 35 km/h. Most importantly, because the trucks are driverless, the drivers aren't subjected to dangerous working conditions.

The development of technology aims to help humanity, not replace human workers. The ultimate goal is to improve our quality of life.

Huawei supports global 5G deployment

I'd also like to share some of our progress regarding 5G rollout. To date, we have signed over 50 commercial contracts for 5G worldwide. Many carriers around the world, including those in Europe, the Middle East, and Asia Pacific, are racing to deploy 5G networks. We

would like to express our gratitude to these carriers and partners for the trust and support they have given to Huawei regarding 5G.

How has Huawei become an industry leader in 5G?

- First, we invested early. We started 5G research as early as 2009. That was when 4G was just starting to see commercial deployment.
- Second, we invested heavily, and continue to do so. Over the past 10 years, we have invested 4 billion US dollars in 5G.
- Third, we invest deeply. When we began 5G research, there were no standards to speak of. We essentially had to start from scratch – we couldn't jump into product development right away. Products are only the results you see at the tail end of a very long process. So in the beginning we focused on standards development and basic research in chips, materials, and algorithms. This ongoing investment has helped us stay ahead.

All things intelligent: Providing pervasive intelligence

In a world where all things are intelligent, we will leverage big data and AI technology to provide pervasive intelligence. According to Huawei Global Industry Vision

2025, 180 ZB of data will be generated in 2025, 18 times more than that generated in 2018. In addition, every year the demand for computing power will increase 10-fold. This will create a huge demand for heterogeneous computing.

Huawei has resolutely made strategic investments in intelligent computing and continuously achieved breakthroughs. On January 9 this year, we launched the industry's highest-performing Arm-based CPU: Kunpeng 920.

In 2018, we released the Kirin 980 chip for the consumer domain, and launched the world's first AI smartphone, taking smartphone intelligence to a new level.

In the AI domain, we released the Ascend 310 chip to provide full-stack capabilities that cover chips, chip enablement, framework, and applications. Ascend 310 also supports products and services for all scenarios, including public clouds, private clouds, edge computing, industrial IoT devices, and consumer devices. Ascend 310 provides affordable and abundant computing power that is readily available and enables inclusive AI in all sectors.

Huawei Kunpeng 920: The industry's highest-performing Arm-based CPU

Kunpeng 920 is an innovative breakthrough that boasts high performance, high throughput, high integration, and high power efficiency. It drives a new level of computing. The CPU was independently designed by Huawei based on the Armv8 architecture license. The Kunpeng 920 CPU also boasts the best performance in the industry.

Technology behind the scenes

As I mentioned, with technologies like 5G, what we actually see are products. But the basic technologies behind the scenes are what keep our competitive edge sharp. These technologies include mathematics, chip design, materials, and cooling technology.

Huawei has more than 60 labs focusing on basic technologies, more than 700 PhDs in mathematics, and more than 200 PhDs in physics and chemistry. Breakthroughs in mathematical algorithms are the basis for the birth of SingleRAN. Back in 1991, Huawei designed its first ASIC chip and established its chipset design office.

Huawei has conducted research in corrosion resistance materials to make Huawei products adaptable to various environments. In addition, our research into graphene has significantly increased efficiency in battery

cooling. A fan-free cooling design has also made base stations 30% smaller.

Huawei: From innovation to invention

As Moore's law and the Shannon theorem approach their limits, the communications industry is facing serious bottlenecks and challenges. Our innovation strategy is as follows: We are going from Innovation 1.0 to Innovation 2.0. In Innovation 1.0, we have focused on technological and engineering innovations to meet customer needs. In Innovation 2.0, we will focus on theoretical breakthroughs and inventions driven by our shared vision for the future.

I'd first like to talk about the core concepts of Innovation 1.0. At this stage, we have focused on innovation in technology, engineering, and products and solutions to address customer needs and challenges. This is about going from 1 to N. The key is to help our customers and partners become more competitive, increase their revenue or reduce their costs, and enable them to achieve greater business success. In the past, Huawei made many engineering and technological innovations in wireless, optical networks, and smartphones, and these efforts have generated a great amount of business and social value.

So what's Innovation 2.0? Based on our assumptions about and visions for the intelligent world we are entering, we will aim to overcome the bottlenecks in theories and basic technologies that have hindered the development of ICT. In this stage, we will focus on theoretical breakthroughs and inventions, which means going from 0 to 1.

Methodologies: Visions + technological breakthroughs

Now, let's continue talking about the characteristics of the intelligent world. Driven by our vision and assumptions, we will first research how people will live, work, play, and stay healthy in the future. We will identify the main challenges, then find the appropriate technologies, and seize future technological directions and business opportunities in order to address these challenges. This will allow us to incubate new industries and new products, and research the future intelligent world. We will also explore and research future-proof technologies throughout the entire information lifecycle, from information generation and storage all the way to computing, transmission, presentation, and consumption.

Core concepts: Open innovation and inclusive development

So, what is Innovation 2.0 at Huawei?

At the core of Innovation 2.0 are theoretical breakthroughs and inventions driven by our shared vision for the future. Academia is one of the birthplaces of theoretical breakthroughs and inventions. But to make this a reality, academia needs to work together with businesses. Businesses are expected to articulate the challenges they face and fund university research to crack these challenges. Theoretical breakthroughs and inventions involve a great amount of uncertainty, so a closed approach to innovation will not work. Results and capabilities must be shared.

Huawei's Innovation 2.0 is about open innovation and inclusive development. We will work together with universities, research institutes, and businesses alike to drive breakthroughs.

Strategic initiatives: University collaboration and technology investment

How can we make Innovation 2.0 a reality? We will make this possible with initiatives like funding university research, building labs, and making technological investments along multiple paths. We need to consider industry challenges and academic insight, and also confidence of venture capitalists to conduct joint

innovations.

Today, we need new inventions and breakthroughs in theory. There is still a long way to go in our journey towards an intelligent world. We will continue to explore the unknowns that the future holds for us and boldly go where no one has gone before.

Once again, I would like to thank you for attending the fifth Huawei Asia-Pacific Innovation Day, and wish all of you a wonderful stay in Chengdu. Thank you.

Advance Intelligence

Ken Hu's Speech at Huawei Connect 2019

September 18, 2019
Shanghai, China

Good morning, ladies and gentlemen! Thanks for joining us at Huawei Connect.

Building a fully connected, intelligent world

Two years ago, we announced our company-wide mission: to bring digital to every person, home, and organization for a fully connected, intelligent world. In this world, we believe that connectivity and computing will be woven into the fabric of everything.

Two key technologies: Connections and computing

When most people think Huawei, they think connections. It's true we've been investing nonstop in connectivity for the past 30 years. From fixed networks to wireless, from 2G, 3G, and 4G, all the way up to 5G, we've made quite a bit of progress in the industry.

But our work doesn't stop at connectivity. If our goal is to build an intelligent world, both connections and computing are key – they're inseparable. The two are interdependent, one pushing the other forward, both developing in step.

So wherever there's a connection, you'll have computing. And where there's computing, you'll have connections too.

In terms of Huawei's investment, they're equally important. In the past, we mostly talked about connections. Today I'd like to focus on computing.

People and computers are closer than ever

Allow me to share a few thoughts on the computing industry.

After the birth of the first computer in 1946, we've seen incredible changes in form factors. From old mainframe computers to PCs, from desktops and laptops to tablets, to technology that travels with us – like mobile phones and wearables – computers are getting smaller, more powerful, and closer to us than ever before.

In effect, computers have become an extension of ourselves, our capabilities. And based on this trend, it's clear that computing as an industry has boundless potential.

Our approach to computing is still evolving

For the past 70 years, our approach to computing has been evolving nonstop. I first came into contact with computers back in university. In programming class,

my teacher taught us that all you have to do is give a computer an equation, and it will give you the results.

In the early days of computing, all the industry had was rule-based computing. You could compute anything as long as you could distill it down to a clear set of rules and parameters. And this was great for things like analyzing census data or calculating the trajectory of a moving object.

But for other types of problems for which you can't define clear rules and parameters, like voice recognition, image recognition, or real-time translation, rule-based computing doesn't quite have what it takes.

To solve these types of problems, scientists developed statistical computing models. They are great for dealing with undefinable problems, and this laid the foundation for artificial intelligence.

Statistical computing will soon become the mainstream. We estimate that five years from now, AI computing will account for more than 80% of all the computing power we use around the world.

Computing in the age of intelligence

In the age of intelligence, we'll see three major computing trends.

The first is demand for incredible computing power. Statistical computing is essentially a form of brute force computing; it eats up computing resources.

If you want to train an algorithm to recognize a cat, you need to feed it millions of images and let the system come to its own conclusions about what exactly defines cat-ness. This takes a metric ton of computing power. More complicated applications like autonomous driving, astronomy, and weather forecasting will take even more computing power.

Second, computing and intelligence will be ubiquitous – not limited to the cloud, but present in everything from your headphones and smartphones, to specialized edge computing for things like gene sequencing. These three types of computing – on-device computing, specialized edge computing, and brute force computing on the cloud – form the computing landscape of the intelligent world.

Third, to better serve people in life and work, computing needs to be managed cooperatively across the computing landscape.

The cloud should only handle general-purpose model training, providing background support for personalized on-device AI and specialized edge computing. This not only improves experience, it's also better for protecting privacy.

We have a lot of challenges ahead of us. We need to beef up our computing power, explore new architectures, and develop processors that meet people's needs across all scenarios.

The 2-trillion-US-dollar market

But the bigger the challenge, the bigger the opportunity. According to Gartner, by 2023, the computing market will be worth more than two trillion US dollars. A massive blue ocean market.

Huawei's computing strategy

At Huawei, we've decided to invest more in computing. Our strategy focuses on four areas.

First, architecture innovation.

In a future where computing and intelligence are everywhere, computing power will be the bedrock of everything.

The industry doesn't have nearly enough computing power to meet demand. Computing power relies on processor performance. And since we're reaching the limits of Moore's law, if the industry wants to provide a

steady and abundant supply of affordable computing power, we need to make breakthroughs in processor architecture.

At the same time, Huawei's portfolio covers networks, devices, and public cloud services. The ability to provide seamless intelligence across device, edge, and cloud is a core part of our business.

That's why we developed our Da Vinci architecture. We want to make computing and intelligence as readily available as oxygen, so developing this architecture was the natural next step. Da Vinci is the only processor architecture in the world that can support all-scenario intelligence across device, edge, and cloud, and it will pave the way for future growth in the computing industry.

Second, we are investing in all-scenario processors.

Processors are the basic building block of the computing industry. After years of hard work and investment, we've released several families of processors for different scenarios.

We have a full lineup: Kunpeng processors for general-purpose computing, Ascend processors for AI, Kirin processors for smart devices, and Honghu processors

for smart screens. Moving forward we will release more processors for different scenarios.

Third, our business strategy.

Simply put, there are things we'll do and things we won't. To start with, we won't sell our processors directly. Broadly speaking, we will provide them to our customers in the form of cloud services, and to our partners in the form of components, prioritizing support for integrated solutions.

We will open up hardware like AI servers, accelerator cards, and modules for our partners, giving them the components they need to integrate AI computing into their own products and solutions.

Our software will be open source. That includes software like server operating systems, databases, and AI development frameworks. This will help our partners develop better commercial software more easily.

We will also enable application development and portability. We won't develop applications ourselves, but we will provide tools and teams to help our partners develop and port their applications more efficiently.

By drawing clear lines between what we do and what we don't, we hope to better support the business

development of our partners.

Fourth, we will build an open ecosystem.

Computing has always been an open industry. No single company can prop up the entire industry on its own; healthy growth requires an open ecosystem and global collaboration.

Back in 2015 we announced our Huawei Developer Program. Since then we have made great progress, empowering more than 1.3 million developers and 14,000 ISVs around the world.

I know a lot of Huawei partners and developers have joined us today. I'd like to take this opportunity to thank you very much for your ongoing support.

Moving forward we will invest another 1.5 billion US dollars in our development program. We want to expand the program to five million developers and better enable our partners around the world to develop the next generation of intelligent applications and solutions.

One of my colleagues will share more specifics on Day Three.

General-purpose computing strategy

Next, let's take a look at how we'll move forward with this strategy, starting with general-purpose computing.

General-purpose computing is all about Kunpeng. We will develop the Kunpeng series of processors into the industry's most competitive processors for general-purpose computing.

Building on Kunpeng, we will invest in key technologies and products like accelerator cards, servers, operating systems, databases, compilers, and other tools. We will increase our investment to connect the whole value chain, build out the Kunpeng ecosystem, and give our partners confidence in its growth potential.

Developing the Kunpeng ecosystem

Right now we are working with our partners to lay the foundation for the Kunpeng ecosystem.

Working together with local governments and partners, we're helping different communities make the most of their local industrial strengths by building Kunpeng innovation hubs and incubators. These hubs will bring together partners across the ecosystem, where we can carry out application pilots, cultivate talent, and develop standards as a team.

So far we have set up Kunpeng innovation hubs in

cities like Beijing, Shanghai, and Shenzhen. We look forward to having more partners join us across the ecosystem.

AI computing: Full-stack, all-scenario AI portfolio

Now let's talk about AI computing.

Last year, Eric Xu announced our full-stack, all-scenario AI portfolio on this very stage. At that time we had only launched the Ascend 310 processor for inference and our ModelArts application development platform.

We've made a ton of progress in just one year. This year we released an AI processor for model training, the Ascend 910. And just last month we announced MindSpore, our AI computing framework. After a year of hard work, we've managed to roll out our entire portfolio. So rest assured: We're ready to do this, and we'd love to have you join us.

Today I'm excited to announce the release of a brand new, heavyweight product that brings together decades of technological expertise at Huawei. The Atlas 900.

Atlas 900: The world's fastest AI training cluster

This is Atlas 900, the world's fastest AI training cluster, combining the power of thousands of Ascend processors.

So how fast is it? Using the ResNet-50 model, which is industry standard for measuring AI training performance, we put our Atlas 900 to the test. It finished the entire training in less than a minute – 59.8 seconds, to be precise. This is about 10 seconds faster than the previous world record.

You might think, 10 seconds, so what? But this is some pretty serious stuff. Imagine it like this: A sprinter crosses the finish line, and has enough time to drink a bottle of water before the second person arrives.

Atlas 900 is a powerhouse of AI computing, and it will bring new possibilities to different fields of scientific research and business innovation – anything from astronomy to oil exploration. For models that used to take several months to train, now Atlas 900 can handle them in seconds.

Let me show you some of the cool progress we've made in astronomy. This is an example of the work we're doing with the Shanghai Astronomical Observatory and the Square Kilometre Array (SKA) Organization to process epic amounts of data. In this field, you need as much computing power as you can get.

Atlas 900 demonstration

Thank you, Philip. Your team is doing fascinating work. Space exploration is incredibly important for the entire world, and it's clear that you have a lot of challenges ahead of you.

Let's take a look at how Atlas 900 can help.

This is a sky map of the Southern Hemisphere. There are more than 200,000 stars in this image alone – far more than you can see with the naked eye. This map behind me was compiled with data from the SKA project.

Before Atlas, if an astronomer wanted to find a celestial body with specific features in an area of sky this big, it would take 169 days of full-time work.

Atlas 900 can speed up this process significantly. Take a look.

Atlas 900 was able to scan through mountains of data to locate and identify a specific type of star in only 10 seconds.

From 169 days to 10 seconds. It's revolutionary. And this will free up scientists' time for more important work.

Announcing Ascend-based Huawei Cloud EI Cluster

Services

Atlas 900 packs a ton of computing power, and we want to get it in your hands as soon as possible. So we've deployed it on Huawei Cloud as a cloud service.

We're making it available at a great discount for universities and research institutes around the world. If you're interested, go ahead and apply now – we'd love to have you try it out.

We're confident that Atlas 900 will help bring the power of AI to all industries.

An ocean of boundless potential is waiting

Today, all industries are rushing to go digital, and artificial intelligence is all the rage. The computing industry is booming, and will only continue to grow.

We'll continue to invest. Starting with the most difficult challenge ahead of us – making breakthroughs in architecture – to developing processors, we're going to help expand the industry and build out the ecosystem.

We strongly believe that facing challenges head-on is the only way to build our competitive strengths – the only way to build out the market for our partners. We're going to use the best technology to solve the world's hardest problems. Make the impossible possible.

This is a new age of exploration. An ocean of boundless potential is waiting, but just one ship won't cut it. Today we launch a thousand ships.

Let's work together, seize this historic opportunity, and advance intelligence to new heights.

Tech for all. Pass it on.

Ken Hu's Opening Speech at the TECH4ALL Summit

September 18, 2019
Shanghai, China

Thank you for joining us today. At this three-day event, we will mainly talk about technology. But today I'd like to talk about people.

Over the long weekend, I paid a visit to a friend of mine and his family. When I showed his parents my latest smartphone, they said:

"Hey Ken, this is fantastic... but we don't like it, because we don't know how to use it." "You know, it's even harder for us to get around the city these days, because all of the taxis are booked by smartphones."

We all have parents or grandparents. While we are trying to promote digital technology – AI, smartphones, AR, and VR – to make our lives easier, some people, just like the parents of my friend, are left behind. This is not right.

Digital inclusion – Leaving no one left behind

So today it's a great honor for me to invite all of you to discuss: While we are promoting digital technology, what can we do to bring everyone in? And how can we make sure that no one gets left behind?

TECH4ALL Summary – One, Two, Three, Four, Five

We have an action plan. We call it TECH4ALL. It's easy to remember. Just a few numbers: one, two, three, four, five. Let me give you more details.

One vision

At Huawei, our vision is to bring digital to every person, home, and organization. Through our TECH4ALL initiative, we want to make sure that all of our employees and partners really understand that this vision is not just about technology. Ultimately, it's about people. We want to make sure that every person can benefit from digital technology, and that every person has a place in the future intelligent world.

Two Layers of Value

We want to make sure that all of our innovation can combine social value and business value.

Let me give you an example. We have a special base station called RuralStar. It's for connecting people in rural areas. It's small, easy to install – you can even install it on a tree. And it's solar powered.

With this solution, we have helped more than 100 million people in different countries to access wireless

service for the first time in their life. This is really meaningful, and we are so proud of that.

Three priorities

Technology, Applications, and Skills.

Technology: We want to make sure that all innovation is affordable and accessible for all people.

Applications: We will enable the developer community to develop specialized applications that meet the needs of different groups of people, different regions, and different industries.

Skills: We will work with local communities and governments to make sure that every person has the opportunity to enhance their digital skills.

We hope that, through this joint effort, people like our parents or grandparents – or ANY special group of people – are no longer isolated from digital technology.

Four domains

Digital inclusion is a broad topic, and we have limited resources. We want to keep our efforts focused, and impactful. The UN's Sustainable Development Goals give us a good roadmap, because digital technology can help

with all 17 goals. With TECH4ALL, we will start with four target domains: Healthcare, education, development, and environment protection.

Yesterday afternoon I talked with Topher White, the founder of Rainforest Connection. His team is doing a great job. They are using digital technology to protect the rainforest in 10 countries. They set this up in just a few years.

Topher is here today as well. Topher, where are you? Please stand up! Welcome to the forum. Later today Topher is going to share with us more about his wonderful project.

Now let's talk about our target. Our target is simple. With TECH4ALL, we want to help another 500 million people directly benefit from digital technology in the next five years. This is a challenging goal. We hope that more people will join us to amplify these efforts.

Let me share with you some of the projects we've been working on with our partners.

1. Healthcare – 19 million visually impaired children

According to the World Health Organization, 19 million children around the world are visually impaired. And 70% of them are preventable and curable, if diagnosed

early. Here's a quick video on how we can help with AI and smartphones.

2. Healthcare – Helping every child see

With TrackAI, an untrained professional can do the same work as a very experienced eye doctor.

This wasn't possible before. For these children, it means growing up with the ability to see the world around them. This is really an incredible joint effort between doctors and engineers.

Today I'm really excited to welcome Dr. Victoria Pueyo, the co-founder of DIVE Medical, to share more about this project.

3. Education – Digital skill gap in Kenya

Before the end of my speech, I would like to share an example from Kenya. Right now in Kenya, about 50% of people are not using mobile Internet.

What's the reason? We thought it might be the cost, but we found out that: 32% of people were not interested in using broadband. 20% didn't know how to use a smartphone and 20% didn't know how to use the Internet. This not just cost, but a lack of awareness and skills.

4. Education – Empowering teachers in Rural Kenya

To solve this problem, we are going to launch a DigiTruck later this month with our partners in Kenya.

Here's a picture of the truck. It's a 40-foot steel cargo container that we are converting into a mobile computer lab. It is 100% solar powered.

It's not finished yet, but when it's ready, it will have 20 laptops, smartphones, wireless broadband, and even VR devices. Experienced trainers from a local NGO will drive out to remote villages to teach digital skills to teachers and students. Over the next 12 months, we want to teach at least 6,000 young students and 1,000 teachers.

5. DigiTruck Partners – Joint Program

This is a joint program between Huawei, Close the Gap (an NGO based in Belgium), UNESCO, Safaricom (the leading mobile operator in Kenya), and the local government.

We believe that this joint effort will help build a truly inclusive digital Kenya.

Small progress, big difference

Today we are very excited to welcome our partners to

share what they are working on.

We can't solve the challenge of digital inclusion overnight, but every step counts. With small progress, we can make a big difference. So please join us.

Thank you.

HUAWEI

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