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## BUSINESS

# Huawei, Seen as Possible Spy Threat, Boomed Despite U.S. Warnings

Chinese telecom giant has gobbled up huge global market share; now Washington is warning anew about alleged spy threat as U.S. telecoms embark on \$275 billion 5G network build-out



Huawei Technologies Co. showed off a new smartphone at last year's Mobile World Congress in Barcelona. PHOTO: JORDI BOIXAREU/ZUMA PRESS

By *Stu Woo, Dan Strumpf and Betsy Morris*

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SHENZHEN, China—Huawei Technologies Co. may be considered the bogeyman of the global telecom equipment industry in some Washington circles, but in Mountain View, Wyo., it's a hero.

That's where Union Wireless, a 103-year-old carrier that provides telephone and wireless service to 50,000 customers in five Western states, is singing its praises. Four years ago, Union turned to Huawei after its previous equipment vendor fell behind schedule on a critical network upgrade, says Brian Woody, customer relations chief.

Huawei "worries about getting the problem fixed first and then worries about getting paid," Mr. Woody says, which is important to a family-owned business working to maintain communication systems in mountainous territory. "We've had many vendors over the years. Huawei has treated us better than anybody."

Huawei appeared shut out of the U.S. six years ago after congressional investigators determined that its equipment could be used for spying or crippling the U.S. telecommunications network. Their conclusions and recommendations, delivered in a report in 2012 just as Huawei was gaining traction in the U.S., effectively killed Huawei's chances to win

business from major U.S. carriers. There was no law saying they couldn't partner with Huawei, but the political costs could have been steep.

Not so for small carriers such as Union Wireless, which fly under the national radar. The Chinese telecom giant has given them a much-needed equipment option in a quickly narrowing field. Four years ago, Mr. Woody says he had about five suppliers besides Huawei to choose from. Today, he has only two.

Now the U.S. telecom industry is in a bind. Huawei has positioned itself to dominate future global telecom networks, according to several U.S. telecom executives, providing stiffening competition to incumbents Nokia Corp. of Finland and Sweden's Ericsson AB. This comes just as big U.S. carriers are expected to invest about \$275 billion over seven years to deploy fifth generation, or 5G, networks that can carry huge amounts of data for high-quality mobile video and self-driving cars, according to Accenture. Early commercial deployments of the technology are to start later this year.

Since 2012, Huawei has expanded to 170 countries from 140, and now claims 45 of the world's 50 biggest wireless carriers as customers. Huawei, which also runs a popular smartphone brand, made \$75 billion overall in 2016. About \$26 billion came from its telecom equipment and software business, making it the leader in the \$126 billion-a-year global market, according to research-firm IHS Markit Ltd.

Huawei's dominance is again stoking fears among Washington security and intelligence experts, who worry major U.S. carriers might be tempted to turn to Huawei.

Last month, members of the Senate and House intelligence committees sent a letter asking the Federal Communications Commission to review any relationship with Huawei and requested that the FCC get briefed on the security concerns raised in 2012. The letter also raised concerns about Huawei's growing smartphone business, now the world's No. 3 brand behind Samsung Electronics Co. and Apple Inc.

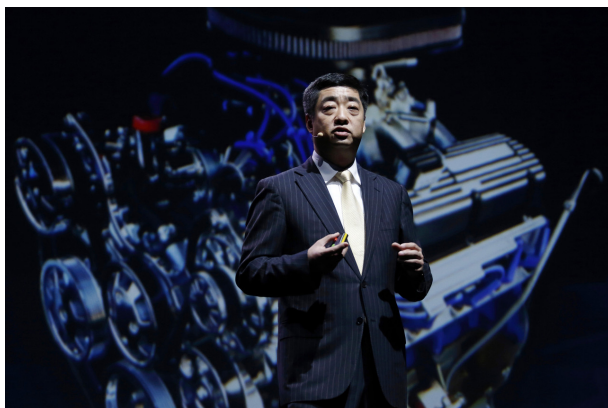
The pressure may have already had an impact. Huawei planned to announce Tuesday at a Las Vegas trade show that it had struck an agreement to sell its smartphones through AT&T Inc. Instead, say people familiar with the matter, AT&T walked away from the deal. It couldn't be determined why AT&T, the country's No. 2 carrier by subscribers, changed its mind.

An AT&T spokesman declined to comment. A Huawei spokesman declined to comment on conversations with AT&T, saying only that "Huawei has proven itself by delivering premium devices with integrity globally and in the U.S. market." Though it can't sell smartphones bundled with service plans in Verizon or AT&T shops, Huawei makes them available to U.S. consumers online through Amazon.com and in stores at Best Buy.

All this frustrates Huawei. Ken Hu, one of Huawei's three chief executives, said in a recent interview the company isn't a security threat. Its "global business is testament to the fact that Huawei is not a vehicle for any government or any agency of putting surveillance on another country," he says.

Part of the suspicions about Huawei stem from its origins. It was founded in 1987 by Ren Zhengfei, a former engineer for China's communist People's Liberation Army. Huawei today has three CEOs, who take rotating turns at the helm. Mr. Ren, now 73, remains deputy chairman and de facto boss.

Mr. Ren started Huawei with \$3,200 when he was 43 as a telephone-switch resale business. The businessman shocked employees early on by telling them the company would one day be China's biggest telecom-equipment provider, recalls Richard Yu, now head of Huawei's consumer business. "Oh my God. Everybody was wondering whether we can survive."



Ken Hu, one of three rotating CEOs of Huawei Technologies Co. PHOTO: TOMOHIRO OHSUMI/BLOOMBERG NEWS

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Eventually, to help Huawei expand globally, Mr. Ren learned Western business management practices, in part from International Business Machines Corp. , which was trying to expand in China. IBM helped Huawei learn disciplines such as product development and financial

management. That and its improving technology helped Huawei gain ground in Europe, where its major customers today include Britain's Vodafone Group PLC, France's Orange SA and Germany's Deutsche Telekom AG .

European mobile operators also liked that Huawei offered a wider range of products than competitors and top-notch customer service, according to current and former European wireless executives.

Smaller U.S. carriers had similar experiences. When wireless upstart Clearwire chose Huawei as a major vendor in 2010, the Chinese firm assigned nearly 800 engineers to the project, a person familiar with the effort recalled. A problem discovered one day would be solved by the next, the person said, unlike some other vendors that would debate whose fault it was before fixing it.

When Sprint Corp. moved to acquire Clearwire in 2012, the year Congress issued its report, the U.S. government required that Huawei's equipment be removed from Clearwire's network. It eventually found replacements, but with regret.

"Their design cycles, their innovation cycles, I think have been the fastest of anyone I've seen because they have the R&D resources to throw at these things," this person said.

Early on, Huawei was notorious for reverse engineering competitors' products, most notably in 2003, when Cisco sued, accusing Huawei of copying router code down to identical model numbers to make it easier for Cisco customers to switch to less expensive Huawei versions. Huawei settled the suit without admitting wrongdoing and agreed to stop selling the routers.

Eventually, though, Huawei ramped up its own research and development, spending \$11.8 billion in 2016. Ericsson and Nokia, which lack Huawei's major consumer business, spent \$3.8 billion and \$5.9 billion, respectively.

Huawei began to compete against U.S. tech companies for talent, and built a campus in the bustling southern Chinese city of Shenzhen that looks as if it belongs in Silicon Valley. Employees come to work in T-shirts and sneakers.



Huawei founder Ren Zhengfei, right, shows Chinese President Xi Jinping around the company's London offices. PHOTO: MATTHEW LLOYD/BLOOMBERG NEWS

Union Wireless says it learned about Huawei by word-of-mouth from another small carrier. Huawei also sponsored the Rural Wireless Association's networking lounge at a big mobile-industry trade show in San Francisco last September.

Huawei engineers and executives also make regular visits to U.S. carriers to show off new technology, and the potential cost savings are "significant"—sometimes even half off competitors' prices, says one former U.S. telecom executive.

In August 2016, it looked like Huawei might get a seat at the table when AT&T published a list of possible 5G vendors that included not just Ericsson and Nokia but also Huawei.

In the following weeks, when congressional staffers met with AT&T executives in Washington to express concerns, they were told Huawei was offering equipment for 70% less than competitors, according to a person familiar with the meeting. AT&T executives told staffers they felt trapped between the security concerns and their duty to shareholders.

National Security Agency director Michael Rogers and James Comey, then-director of the Federal Bureau of Investigation, personally spoke to senior AT&T management, the person said.

AT&T declined to comment on the extent of its discussions with Huawei. "We expect to solicit information and bids from a large number of equipment providers as we continue to build out our next generation networks," an AT&T spokesman said.

Huawei disputed the characterization of its conversations with AT&T, saying it wouldn't have known how much its 5G equipment and services would cost in 2016 because it was well before international 5G standards had been set.



Huawei's Paris offices. PHOTO: LUDOVIC MARIN/AGENCE FRANCE-PRESSE/GETTY IMAGES

An FBI spokeswoman and a lawyer for Mr. Comey declined to comment. The NSA didn't respond to requests for comment.

Recently, Huawei's Mr. Hu said it would be open to employing in the U.S. a model he says alleviated security concerns in Britain—a lab near

Oxford, England, where employees with British security clearance physically disassemble Huawei equipment and inspect the hardware and software for vulnerabilities and “back doors.” Huawei funds and operates the lab, which is overseen by a board with senior British intelligence and government officials, as well as one Huawei executive as the vice chair.

British authorities say the arrangement is working. In its most recent annual report, published in April 2017, the board concluded that the lab “fulfilled its obligations in respect of the provision of assurance that any risks to U.K. national security from Huawei’s involvement in the U.K.’s critical networks have been sufficiently mitigated.”

Nigel Inkster, a former director of operations and intelligence at MI6, the British foreign intelligence agency, isn’t so sure. He says the lab was set up “to calm the concerns of the British government. It could be seen as closing the door after the horse has bolted.”

It’s a dilemma for the industry—and eventually consumers. Huawei’s meager presence in the U.S. market is one of the reasons for the high cost of U.S. wireless service, says Stephane Teral, executive research director at IHS Markit.

U.S. wireless service costs \$41 per month per customer on average, according to the data and analytics firm—second only to Canada, which also largely discourages Huawei equipment. In the U.K., where Huawei is allowed but closely scrutinized, the average wireless bill is \$23 a month.

Meanwhile, the field of competitors has dwindled. French-based Alcatel and U.S.-based Lucent merged in 2006, and Nokia ended up buying the combined Alcatel-Lucent company in 2016. Nortel Networks Corp. folded in 2009 in Canada’s biggest bankruptcy case.

Both Nokia and Ericsson have warned that 2018 will be challenging. Ericsson has changed chief executives, laid off thousands of employees, warned of sales cancellations and faces pressure from an activist investor. Ericsson and Nokia’s combined revenue is less than that of Huawei.

U.S. security officials and telecom executives alike worry about an increasingly lopsided landscape. Says Mike Rogers, the former congressman who chaired the House intelligence committee and co-wrote the 2012 report on Huawei: “Given current market trends, it’s hard to imagine Huawei not being the only option in 10 years.”

—Ryan Knutson, Drew FitzGerald and Aruna Viswanatha contributed to this article.

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