		Non
		now

We are moving fast towards an intelligent world where everything is connected. The digital economy, which is underpinned by digital and intelligent technologies, has become a key driver of social advancement. Emerging technologies like 5G, cloud, and artificial intelligence (AI) are converging, catalyzing digitalization across industries like manufacturing, energy, and transportation. While digitalization creates business value by delivering productivity gains, it also provides significant social value by enabling safer and more hospitable working environments.

This brochure is a collection of digitalization projects that Huawei and its partners have worked on over the past year. They offer just a glimpse of how digitalization is transforming the way people work and live for the better.



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## onnectivity+

### **Connecting Everyone and Everything**

The booming growth we have seen in the digital economy is being matched by the emergence and wide adoption of new digital technologies like cloud and Al. These applications are now expanding well beyond the conventional connectivity realm to make work and life much easier. However, the digital divide remains. An estimated 2.7 billion people are still unconnected. For more than 30 years, Huawei has been committed to connecting ever more people and promoting sustainable development through ongoing innovation. We want to make sure no one is left behind in the digital world.

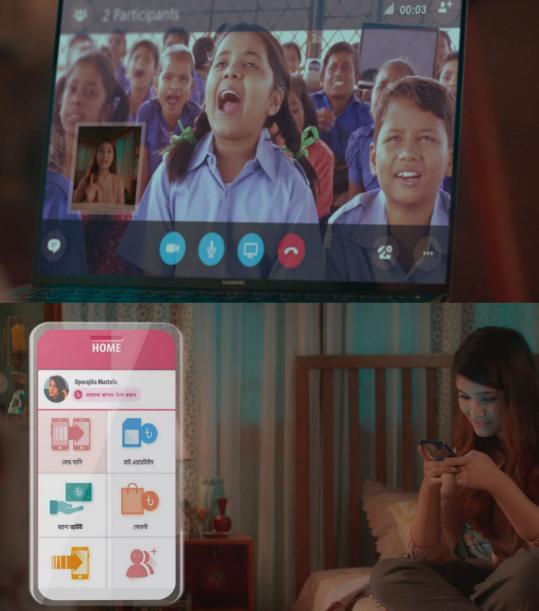


n Bangladesh, at the beginning of the 21st century, very few people owned mobile phones, mainly due to poor coverage outside of major cities, with some areas having no coverage at all.

In 2006, Huawei undertook a project to connect remote mountain villages to the internet, with a demanding timeline. The first phase required the establishment of base stations in 100 villages, which was more than three times the normal deployment rate. To reach some villages without road access, Huawei team members used ox carts and rickshaws, and sometimes even carried network equipment by hand. Despite numerous challenges, the project was a huge success.

Every shift in connectivity leads to a transformation in transaction patterns, which in turn profoundly impacts people's lives and drives societal progress. For example, the mobile payment wallet launched by the local payment platform bKash, in collaboration with Huawei, enables people to access deposit and withdrawal services with just a tap on their smartphones. This has brought a broad range of banking services to the previously unbanked, driving financial inclusion.





### Delivering Digital Education Wherever There's A Need

Kenya: Digitruck – Digital Classroom On Wheels



In October 2019, Huawei set up the DigiTruck program, in partnership with the Belgian nonprofit Close the Gap, UNESCO, GSMA, Computers For Schools Kenya (CFSK), and the Kenyan telecom carrier Safaricom. The DigiTruck is a shipping container that has been converted into a mobile digital classroom. The 12-meter-long classroom is equipped with smart devices like laptops, LED screens, virtual reality (VR) headsets, smartphones, and routers. Students can use the smartphones and laptops in the truck (it has Wi-Fi) to learn Internet skills. The entire truck is solar-powered, so classes can be held in remote areas that lack a power supply.

By September 30, 2022, Huawei's DigiTruck had provided more than 40,000 hours of digital training in rural Kenya, benefiting more than 2,000 children, teachers, and students. Moving forward, DigiTruck will continue to deliver digital skills to even more people in remote regions.

Morld Bank report estimates that 230 million jobs in Sub-Saharan Africa will require digital skills by 2030 as the global digital economy is continuing to develop rapidly. This sits in stark contrast to the widespread lack of digital skills in the region. Even in Kenya, where ICT infrastructure is relatively mature, less than 50% of people use the Internet. This is not just because over 75% of Kenyans live in remote areas without a stable power supply. It is also because many people do not realize the economic value of digital skills and have never before used a smartphone or been online.





### A Futuristic, Sustainable Development Featuring All-Optical Networks

Dubai: A Smart Community Billed As The World Of Tomorrow

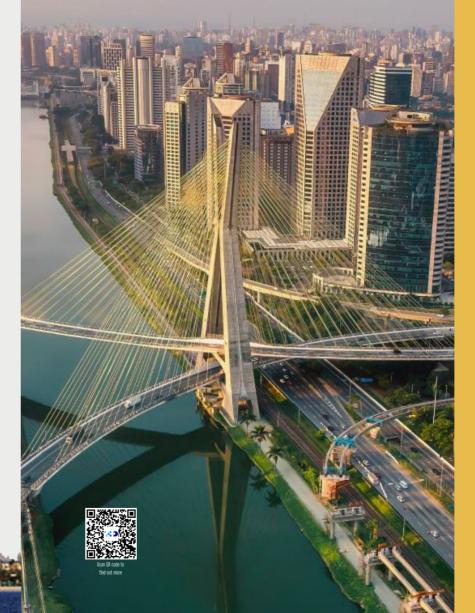
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Unbai Creek Harbour is a leading international smart community, developed by Emaar Properties, that is at the heart of a bold new vision for Dubai. The project offers over 7.3 million square meters of residential space and 3.2 million square meters of retail, hotel, office, cultural, and community space. It represents a vision of a high-density urban district capable of accommodating over 200,000 residents and a total working population of 450,000. The mega-development is described as the "World of Tomorrow" as broadcasting, music, video, and Wi-Fi services are readily available via Wi-Fi throughout the densely scattered high-rises. These services consume huge amounts of bandwidth, so Emaar needs a highly secure, reliable, and flexible all-optical 10G PON network that will reduce OPEX and support future-oriented network evolution.

Huawei's 10G PON solutions are a perfect fit for Dubai Creek Harbour, as they offer top network performance with a minimum energy footprint to support a variety of services like digital media, broadcasting, and music.

According to Muzamil Abdulkarim, Senior Director of IT at Emaar Properties PJSC,

"With Huawei's cutting-edge technologies, we are aiming to build a world-class,
green, and smart community with multi-functions. What we are trying to build
are more than just the bricks, concrete and glass, but the future inspiration
and highest aspirations of human beings."



### Fiber-to-the-Room Solution Enables Smart Homes

Brazil: Seamlessly Connected To Optical Networks

Brazil is the largest and most populous country in Latin America. With digital home applications booming and demand for high-definition video, cloud gaming, video office, VR, and AR services increasing, traditional home Wi-Fi connections have become a bottleneck in user experience. For example, when faced with a poor connection experience, users often cannot resolve Wi-Fi problems on their own and carriers need to send technicians to visit users' homes.

To tackle this bottleneck, Huawei has teamed up with Brazilian carrier Oi. Huawei's Fiber to the Room (FTTR) Wi-Fi solution brings high-speed, reliable, and premium coverage to every corner of the home. The solution provides users with 400 Mbit/s to 1 Cbit/s high-speed broadband and Wi-Fi services. In addition, flexible packages enable users to enjoy digital services like high-definition videos and cloud games anytime and anywhere from the comfort of their own homes.

The partnership has already resulted in new network services provided in a first batch of nine cities, including Sao Paulo, the largest. Moving forward, Huawei hopes to work with more partners to facilitate Brazil's digital journey, through technology and innovation.



### Climbers, Guides, And Environmentalists Get 5G Signal On The Highest peak

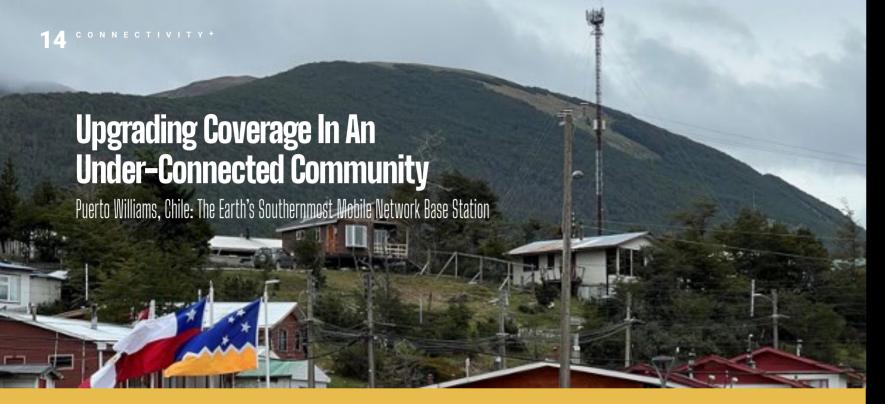
The Himalayas: World's Highest 5G Base Station

n 2020, China Mobile and Huawei jointly constructed the world's highest-altitude 5G base station and gigabit optical network at the 6,500-meter high Advance Base Camp, providing the top of the Himalayas access to two gigabit networks.

This project involved deploying three 5G base stations all the way along the climbing route from Base Camp (5,300 meters above sea level) to Camp 3 (8,300 meters) and then on to the peak of Everest (Chomolungma in Tibetan). The base stations provide a smooth 5G network experience enabling social media, HD videos, and VR views of the Himalayas. It also supports scientific research, surveying and mapping, and environmental protection activities. This historic breakthrough embodies how 5G technology can help humans succeed in the toughest challenges while providing better protection to a global heritage site.







uerto Williams in southern Chile is the southernmost town on earth. Until 2018, the town only had 2G coverage. Local residents had no Internet access and their only way to contact with the outside world was through traditional phone calls. But the phone signal was unstable, often fluctuating with the weather. Without Internet, Puerto Williams and its 2,000 permanent residents were practically excluded from the digital world. "When I came here in 1999, it was like an isolated island," recalls local resident Williams Solis. As years went by, the need for stable high-speed connections kept growing.

Thanks to a Chilean government's initiative to improve connectivity around the nation, Huawei and

its partners deployed 4G wireless base stations in this small town in 2022, finally providing local residents with high-speed data connections. Technology changes lives. Better coverage has opened up new business possibilities while making distance education and healthcare feasible. Luis Gomez, chief of a local indigenous community, says, "I was among the first young people who went to school in other places. Now more indigenous youths are looking for a new life in the cities. When I was young, we didn't have phones or Internet here. But now, I can talk to my son who is studying in another place using video calls." Connecting the southernmost town to the rest of the world means more opportunities and possibilities for everyone in the town.





# hanging Industries

#### **Industry Digitalization**

Digital and intelligent technologies enable industry upgrades and boost economic growth. They create business value by delivering productivity gains, while also providing significant social value by enabling safer and more hospitable working environments. Technological innovation drives industrial digitalization and creates both business value and social value.



### Getting To Your Seat Is A Lot Easier With Machine Vision Doing Security Checks

Shenzhen Airport: Boarding Without A Boarding Pass Or ID





Unina's annual Spring Festival travel rush always results in huge amounts of traffic when millions of people go back home to their families. During the Spring Festival in 2023, Shenzhen Airport handled a total of 6.5 million passengers, in excess of 160,000 passengers per day, on average. 43,400 flights took off and landed at the airport, or around 1,000 flights daily. The airport was able to efficiently handle the surge largely thanks to self-service smart solutions such "one-pass" customs clearance, face scanning security checks.

These smart services let passengers on all domestic and a few international flights check themselves and their luggage in, pass security, and board without a paper ticket. Their face and IDs are scanned once at check-in, and from then on, machine vision recognizes the facial characteristics of each traveler. Face scanning services have cut flight delays, and reduced much of the frustration resulting from having to show one's ID or passport repeatedly. Since 2017, Shenzhen Airport and Huawei have been jointly developing technologies delivering constant improvements in airport operations and passengers' experience. The technologies involved so far include 5G, Al, China's BeiDou positioning system, and big data. In the future, the two will continue to develop applications that boost security, reliability, and efficiency of operations.





# Digital Technologies Help Mines Safer and Efficient

Smart Coal Mine: Shaanxi Hongliulin Mining Industry

usty, hazardous, and yet essential. Mining is an indispensable industry that has been chronically unpleasant. Until now. But this is about to change.

In China, Huawei has been working with partners to create integrated smart mining solutions at both open-pit and underground mines. The results are dramatic. At open-pit mines, remotely-located operators can man up to four driverless trucks to ferry the ore from the excavator to the processing facility for crushing and processing. As for the excavators, they are also remote-controlled. Fewer miners in the pit means fewer chances of mining deaths or injuries.

Huawei's 5G smart mining solutions can be deployed deep under the ground as well as in open pit mines. This will help the industry to become safer and more efficient, while requiring fewer people for undesirable and dangerous assignments.

20 CHANGING INDUSTRIES CHANGING INDUSTRIES 71

> he East-West Gate Intermodal Terminal in Fényeslitke, Hungary is the largest smart railway logistics terminal in Europe, and a truly unique technological feat in railway logistics. The terminal loads and unloads one million twenty-foot equivalent units (TEUs) between five broad-gauge railway

tracks and five standard-gauge railway tracks each year, so the efficiency and safety requirements for the terminal are exceptionally high.





## Reliable Connectivity Enables Real-Time Communication And Smart Monitoring

Laos: Southeast Asia's First Smart Potash Mine





AG industrial ring network that can be upgraded to 5G was deployed in the smart mining area of Asia-Potash International Investment in Khammouane province, which is 350 km away from Vientiane, Laos' national capital. This marks the first time that a Huawei smart mining solution has been implemented in Southeast Asia.

Production capacity has greatly increased at the site in recent years, with headcount growing from hundreds to over 3,000 staff. To better manage the increased scope of operations, the company plans to introduce several technical upgrades that will boost productivity as well as site safety. Fast communications are the foundation for enabling these upgrades.

In future, operators will comfortably sit in offices above ground, remote-controlling mining vehicles that are operating hundreds of meters below in heat, dust, and humidity. QC will be performed using automated techniques largely based on machine vision Al. And the scheduling of transportation vehicles is constantly being optimized based on demand. These technologies will all require high bandwidth, low latency communications systems to provide full coverage throughout the site.

It took only two months to deploy Huawei's Smart Mining Solution at the site, consisting of both wired and wireless (46) networks. Wireless networks can provide coverage in parts of the mine where it's too difficult to deploy fiber. This will enable the deployment of capabilities like automated QC or immediate response to incidents anywhere in the mine. As for the fiber network, it is comprehensively deployed above ground and partially in underground operations. Fiber provides huge amounts of bandwidth and low latency, essential for constant monitoring or remote operation of major equipment. Once in place, smart mine technologies will maximize staff safety above and below ground.



### Networked Drones Help To Optimize Use Of Water And Pesticides, Cutting Waste And Boosting The Harvest

Austria: Making Vineyards More Sustainable With 5G

Ustainability is now more critical than ever, and digitalization has the potential to make agriculture, one of the world's oldest industries, more environmentally-friendly and energy-efficient. In 2021, Dronetech and Huawei launched the first 5G Smart Farming project in Austria, aiming to tackle the major issues facing farming: high labor intensity, soil pollution caused by pesticides and other chemicals, increasing energy costs, and low management efficiency.

At the Nussböckgut vineyard, a centuries-old estate in Upper Austria, Huawei and Dronetech are working together on 5G-based drone solutions. Equipped with high-resolution cameras and sensors, drones capture images and data that are then processed by Al with the support of technologies like 5G and cloud. This helps farmers detect insects, monitor crops, and predict harvests, allowing them to significantly reduce the use of pesticides and fertilizers. The solution also helps farmers work more efficiently, reducing labor costs and improving the sustainability of the food supply chain.



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### ICT Technologies Make **Steel Production Safer And More Efficient**

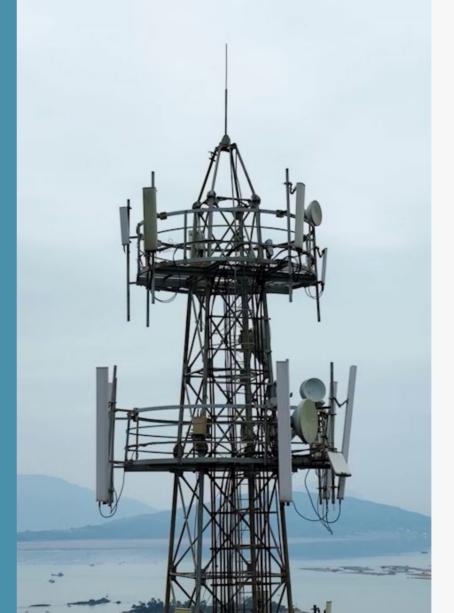
Liuzhou Steel Group, China: A 5G And Cloud-Powered Steel Mill

U teel workers have to work in high-temperature and dusty environments every day. To ensure the quality of steel, workshops often need to stay between 60°C to 70°C, and workers are regularly close to molten iron that is over 1,400°C. With 5G, however, this is all changing.

production process, including II domains such as wharf transportation, stockyard, iron-making, steel-making, and steel rolling. This has incubated a series of innovative applications, including a 5G-powered "Cloud Eye" for welding quality inspection, cloud-based solid waste

In the "Cloud Eye" welding quality inspection project, for example, Liuzhou Steel installed 600 cameras and uploaded HD video over a 5G network at its Fangchenggang City factory. This is China's largest 5G camera cluster, boosting





### **5G Enables Selling At Sea, Dispute Resolution**

Fujian, China: Connecting With 5G Fishing Boats Out At Sea

U ceans typically lack network coverage. There are almost no mobile sites available, and site selection and construction is often considered practically impossible. The cost of providing power and laying optical cables to any potential site are among the top constraints. However, along the coast of Xiamen in China's Fujian province, there are nearly 100 offshore 5G base stations, supporting fishing boats up to 50 kilometers out to sea.

Currently, several 5G-enabled smart ocean applications are being incubated and some are already widely used. This includes an integrated platform for smart ocean management, smart fishing rafts, and 5G-powered offshore wind power monitoring.

Strikingly, 5G enables an offshore dispute resolution system, the first of its kind in China. Fishermen can quickly resolve their differences online instead of having to return to shore and then book a court date. 5G also enables offshore live video broadcasts where sea food are sold online while still at sea. 5G and Al-enabled machine vision also help to automatically detect sailors going overboard as well as intruders coming aboard. A number of other 5G smart ocean applications are also under development.



### **5G And Cloud Bring The Provision Of Quality Services To Rural Clinics**

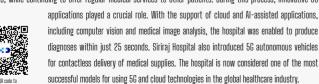
Bangkok, Thailand: Siriraj Hospital Delivers Better Care With 5G

ounded in 1888, Siriraj Hospital is Thailand's largest public hospital and one of the largest in Southeast Asia. It is visited by more than 3 million patients every year. Due to an aging local population and rising healthcare costs, Siriraj Hospital urgently needed to introduce digital technologies to increase the efficiency of its services and onerations.

So the hospital turned to True, a telecom carrier in Thailand, who worked alongside Huawei and other partners to build a digital solution enabling new medical applications using an MEC-based 5G private network, a hybrid cloud, and a 5G + Wi-Fi solution. These applications include 5G-based remote consultation, unmanned vehicles for drug delivery, and remote first aid on ambulances. The solutions helped the hospital slash costs and improve efficiency, and also provide patients with faster and more convenient medical services.

At the start of the COVID-19 pandemic in early 2020, Siriraj Hospital became the hub of the country's fight against the virus, while continuing to offer regular medical services to other patients. During this process, innovative 5G

> including computer vision and medical image analysis, the hospital was enabled to produce diagnoses within just 25 seconds. Siriraj Hospital also introduced 5G autonomous vehicles for contactless delivery of medical supplies. The hospital is now considered one of the most





### **Building A High-Quality Smart Hospital With All-Optical Networks**

Shenzhen, China: A smart hospital powered by Huawei Campus OptiX

☐s hospitals go digital faster, telemedicine, teleconsultation, and Internet-based diagnostics and treatment services are becoming increasingly popular. All these changes are being driven by the evolution of information infrastructure and particularly the evolution to F5G. F5G is the fifth generation of fixed networks that provides high bandwidth, low latency, and all-optical connections over fiber networks. Compared with traditional networks, F5G makes deployment and operations and maintenance (0&M) easier, delivers better network performance, and enables faster data transmission.

One hospital in the Nanshan district of the city of Shenzhen has deployed Huawei's Campus OptiX Solution. With a simplified architecture, it provides fiber connections that help build the hospital's Internet of Things (IoT). This solution has enabled highquality information sharing in diagnostics and treatment rooms, wards, and CT scanning scenarios. After the all-optical network architecture was deployed, data access has become smoother than ever. Take medical imaging for example. About 1,000 images are generated during a dual-source CT scan. It might take 20 to 30 seconds to access this group of data during service peak hours over a traditional network, but with the new all-optical network architecture, reading such data only takes one second.

This solution has also facilitated referrals between this district-level hospital and community health centers, as it allows for teleconsultation and quicker sharing and access of test results. This helps make full use of the hospital's high-quality medical resources, promotes equity in healthcare, and brings more convenient and quality healthcare services to the general public.



# loud and Ecosystem

In the digital era, the first step that enterprises need to take is to have access to affordable resources of foundational cloud computing. Huawei has been doing its part to help. We share our extensive ICT experience and cloud platform resources, to support enterprises go digital and achieve business success.



UT Corp is one of the five largest conglomerates in Indonesia. Its business covers multiple resources and share data, develop a livestreaming solution for Indonesia's top sports events, difficult. This made it hard to deliver high-quality, HD game broadcasts to fans.

To address these challenges, CT Corp has used Huawei Cloud's hybrid cloud solution to integrate

fields, including media, finance, retail, real estate, and tourism. Its services are used by more and establish a complete service system outside Indonesia. This allows CT Corp to provide the than 200 million Indonesians, detikNetwork, a brand owned by CT Corp. livestreams a number world-class video feeds to media organizations in Indonesia. For example, CT Corp's exclusive of sports events from the country's national stadium, including major league baseball events. In livestreaming of the first Indonesian motorcycle Grand Prix had 700,000 simultaneous viewers, the past, CT Corp's services were scattered across different subsidiaries, making data sharing setting a record for livestreaming in the host country. There were no faults and no instances of frame freezing since this solution was commercially launched 18 months ago. This has made CT Corp a leading video service provider in Indonesia.





### **Al Speeds Up The Search** For Antibiotics As **New Superbugs Emerge**

Xi'an, China: Al-Enabled Antibiotic R&D At Xi'an Jiaotong University

hen we talk about antibiotics, penicillin is the first that comes to mind. The discovery of penicillin 94 years ago greatly reduced mortality rates from small wounds. But over the last 40 years, the field of antibiotics has stagnated. Bacteria have continued to evolve and develop drug resistances, and antibiotics have struggled to keep up. There is often nothing in the

The First Affiliated Hospital of Xi'an Jiaotong University has used the unique "graph-sequence asymmetric autoencoder" architecture powered by the Huawei Cloud Pangu Drug Molecule Model to make a substantial breakthrough. This architecture can convert the structure of drug molecules into quantifiable values, so that it can quantitatively predict and recommend the molecular structure and properties of drugs. With this architecture, the hospital has developed a new broad-spectrum

Huawei Cloud Pangu Drug Molecule Model was critical in this effort as it cut lead compound development time from several years to a single month, reducing R&D costs by 70%. In addition, the structure optimizer of the Pangu Drug Molecule Model allows the R&D team to ease the side effects on human cells of broad-spectrum antibiotics.

### **Enabling Media Startups To Innovate And Develop**

Germany: Volucap Uploads Gigabits Of 3D Video Data In Seconds



Volucap is the first startup in Europe to shoot VR/AR images with wrap-around lens arrays. Their innovative wrap-around lens arrays typically contain 30 to 150 industrial lenses, so they can obtain holographic videos that can be played back and edited at any angle. The images captured can be used for VR video, gaming, and highquality event broadcasts. Both shooting and processing have high requirements for networks, storage, and computing power because of the large amounts of data that need to be transmitted and processed. "The data of all the books in the world is equal to only five minutes of volumetric capture with our current system," according to an employee from Volucap.



With Huawei Cloud, Volucap achieved an average data upload rate of 13 Gbit/s which enabled the company to transfer a half-day shoot transfer in two hours. This is possible thanks to Huawei Cloud's strong presence in Europe. Huawei Cloud has set up R&D innovation centers, O&M centers, and partner cloud support centers in countries like France, Germany, Ireland, and Hungary to better serve its customers in Europe. Through these centers, Huawei aims to develop the best possible products and solutions for the European market and help develop local ecosystems and startups across the continent.





### Spark Incubator Promotes Innovation And Entrepreneurship

Spark Program in Asia Pacific: Together with Startups



### **Digital** now



https://www.huawei.com/en/media-center

