



Huawei Cloud

Accelerate Intelligence with Everything as a Service

TAKE
A CLOUD
LEAP

云上有为

PROLOGUE



For as long as humanity has existed, we've been asking questions. Many of which still remain unanswered.



More than 2,000 years ago, the Silk Road connected countless merchants across the Eurasian continent, and commerce for the first time crossed the dawn and dusk meridian.



Today, more than 3 million customers around the world are closely connected to Huawei Cloud. Their trust surpasses borders.

More than 200 years ago, the Romans discovered a flower in China and brought it back to Europe, where it became known as the rose.

Today, Huawei Cloud's infrastructure has been deployed in more than 170 countries and regions, enabling digital to bloom around the world.

We believe that to talk the talk you need to walk the walk. We would like to join you in exploring the way forward.

From sensing everything and predicting everything, to coordinating ports and building mines. From advancing healthcare and powering FinTech, to bettering lifestyles and safeguarding nature.

...

Over the past 30 years, Huawei has been relentlessly working towards a better connected world.

Over the next 30 years, we will strive to build the cloud foundation for an intelligent world.

Let's explore unanswered questions by venturing on a digital journey together.

01

RESHAPING INDUSTRIES WITH AI

- 02 AI Weather Prediction: More Accurate, in Just Seconds
- 06 Shenzhen Futian District Government: Smarter City, More Efficient Government, Improved Lives
- 10 First Affiliated Hospital of Xi'an Jiaotong University: Developing a Super Antibiotic Using an AI-Supported Drug Design Service
- 12 Runda AI Medical Assistant: Enhancing Medical Services with Smart Diagnosis and Treatment
- 14 Zhengzhou Railway Group: Accelerating Freight Train Inspection with Smarter TFDS
- 18 Shandong Energy Group: Exploring All-Scenario AI Applications in Coal Mines
- 22 FAW Jiefang: Pangu Automotive Model at Every Stage
- 24 Guizhou E-commerce Cloud: Intangible Cultural Heritage on Global Stage
- 26 Virtual Clothes Try-On: Meitu, "Generating" Great Things

02

ACCELERATING INTELLIGENCE

- 30 A National Government Cloud Drives Thailand Towards ASEAN's Digital Hub
- 34 MAPA (Brazil): More Efficient with Cloud
- 36 Wuhan: Taking a Digital Leap
- 38 Changsha: A City on Cloud
- 40 Krungthai Card (KTC): A "Cloud First" Strategy for Faster Service Development
- 42 100-Year-Old PSBC: Migrating Mission-Critical Systems to the Cloud
- 44 GLDB: Singapore's First Digital Bank on Public Cloud
- 46 BNC: Going All-in on Cloud with Agile Transformation for a Ubiquitous Digital Banking Service
- 48 SCB's New Digital Growth Engine
- 50 M-Pesa: Offering More User-Friendly, Smarter Mobile Payment Experience through Cloud Transformation
- 52 Aljasser Group: ERP on Cloud for 30% Higher Monthly Transaction Processing Capacity
- 54 Xinyi Glass: Data Drives Smart Manufacturing
- 56 Hailiang Group: Modern Digital Factory with Data-AI Convergence
- 58 SERES: IoV Rollout in Europe in Just One Month
- 60 Digital Chery: Data-Driven Innovation on One Cloud
- 62 Great Wall Motor: Tech-Fortified March into Latin America
- 64 Tianjin Port: Building a World-Class Smart Port
- 68 A Single, Unified Cloud for CTG Smarter Dam Operations and a Better Ecosystem
- 70 State Grid Henan: Unlocking the Value of Renewable Energy on Cloud
- 74 Dialog: Hybrid Cloud Deployment for a Consistent User Experience
- 76 CMPak: A Digital Lakehouse Platform for Better User Services
- 78 Teleperformance: Workspace Delivers a Premium Experience for Massive Agents
- 80 Sunway: Cloud as Core Strategy
- 82 MV: Migrating Data to GaussDB for Better Healthcare
- 84 Neogrid: Smart Solutions for Every Store
- 86 UCV: Online Education Modernized for 180,000 Students
- 87 Dynamic DNA: Equipping Youth for Career Success
- 88 CJ More: Scaling for Tens of Millions of Members
- 90 Digital Bailian Group: All Workloads on Cloud for New Retail
- 94 Meiyijia: Data Intelligence Makes 33,000 Convenience Stores Even More Convenient
- 96 Hee Kee Crab General: AI Crab Farming

03

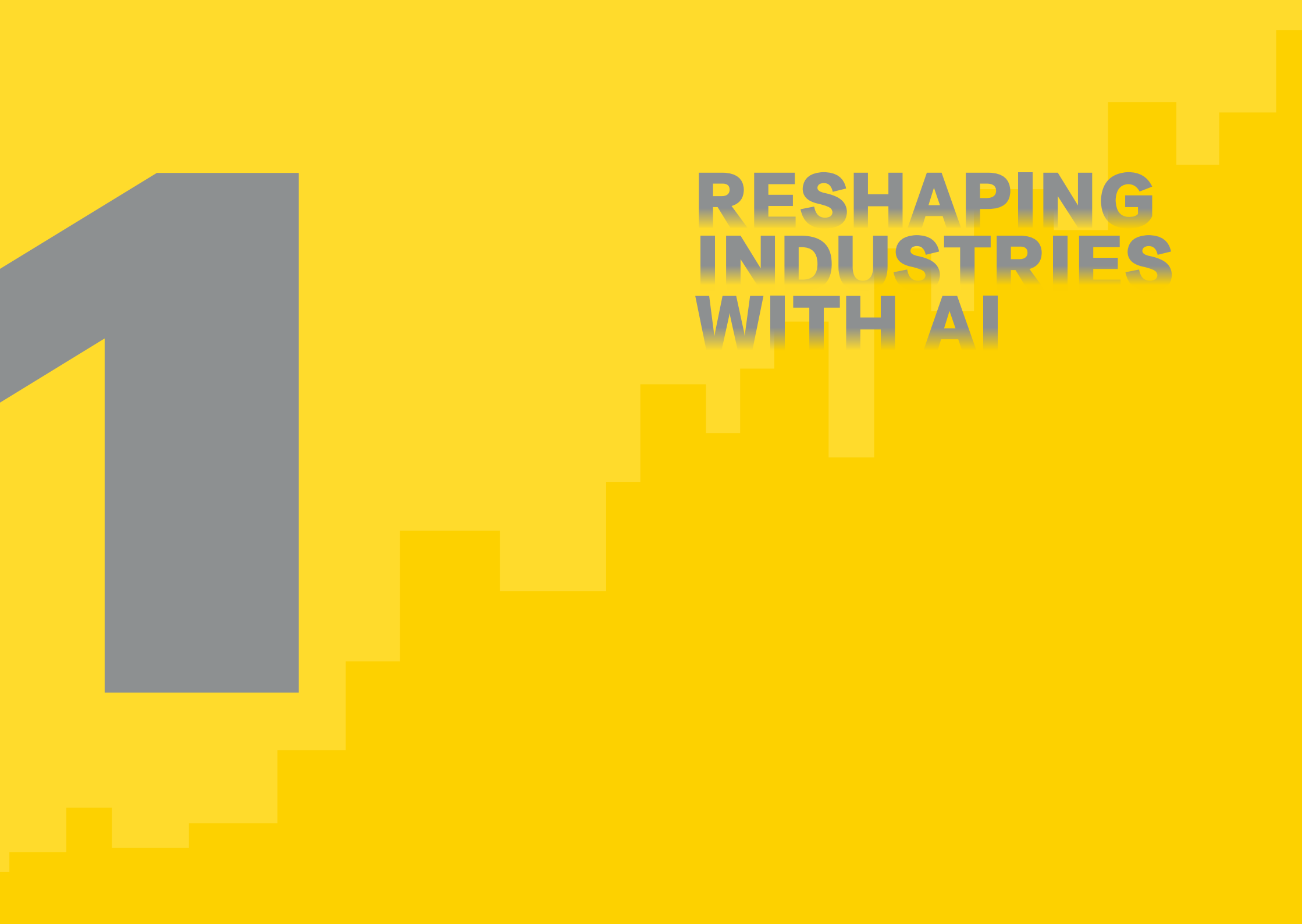
UNLOCKING NEW GROWTH FOR INTERNET SECTOR

- 100 SMU: Cloud Native Reconstruction for Accelerated Full-Channel Service Innovation
- 102 IPEKYOL: Zero Breakdowns Despite Promotion Frenzy
- 104 DingDongFresh: An Innovative Architecture Keeps Food Sweet and Fresh
- 106 Ebdaadt: Improved User Satisfaction Translates into 23% Higher Monthly Subscriptions
- 108 BluTV: Premium VOD of Popular TV Series on the Cloud
- 112 BBTv: Cloud-Cloud Collaboration Unlocks Superior Video Services
- 114 MNC: One-stop OTT Media Elevates User Experience to New Heights
- 116 Hunan TV: Technology Innovation Takes Variety Shows to New Heights
- 118 433 Football: From Fans to Fortune
- 120 Bilibili: Virtual-Real Integration and Smooth Streaming of Major Events
- 122 TravelgateX: Go Cloud, Go Global, Exploring New Opportunities on the Cloud
- 124 TianYanCha: Service Rollout from Weeks to Days
- 126 CMGE: Stable Gaming Experience for Millions of Concurrent Players Online
- 128 HERO GAMES: Huawei Cloud Helps Develop Quality Games for Players

04

SAFEGUARDING NATURE WITH TECH

- 132 Protecting the Wild with Tech and AI
- 134 Cloud Helps 140,000 Rangers Safeguard the Forest and Beyond
- 136 Safeguarding the Last 36 Hainan Gibbons
- 138 Nature Guardian for a Global Ecosystem



RESHAPING INDUSTRIES WITH AI

AI Weather Prediction

More Accurate, in Just Seconds

Pangu Weather Model



Pangu-Weather will "make people reevaluate what (weather) forecasting models might look like in the future, ...the opening of models like Pangu-Weather will surely help with progress in the field."

Peer reviewer at Nature

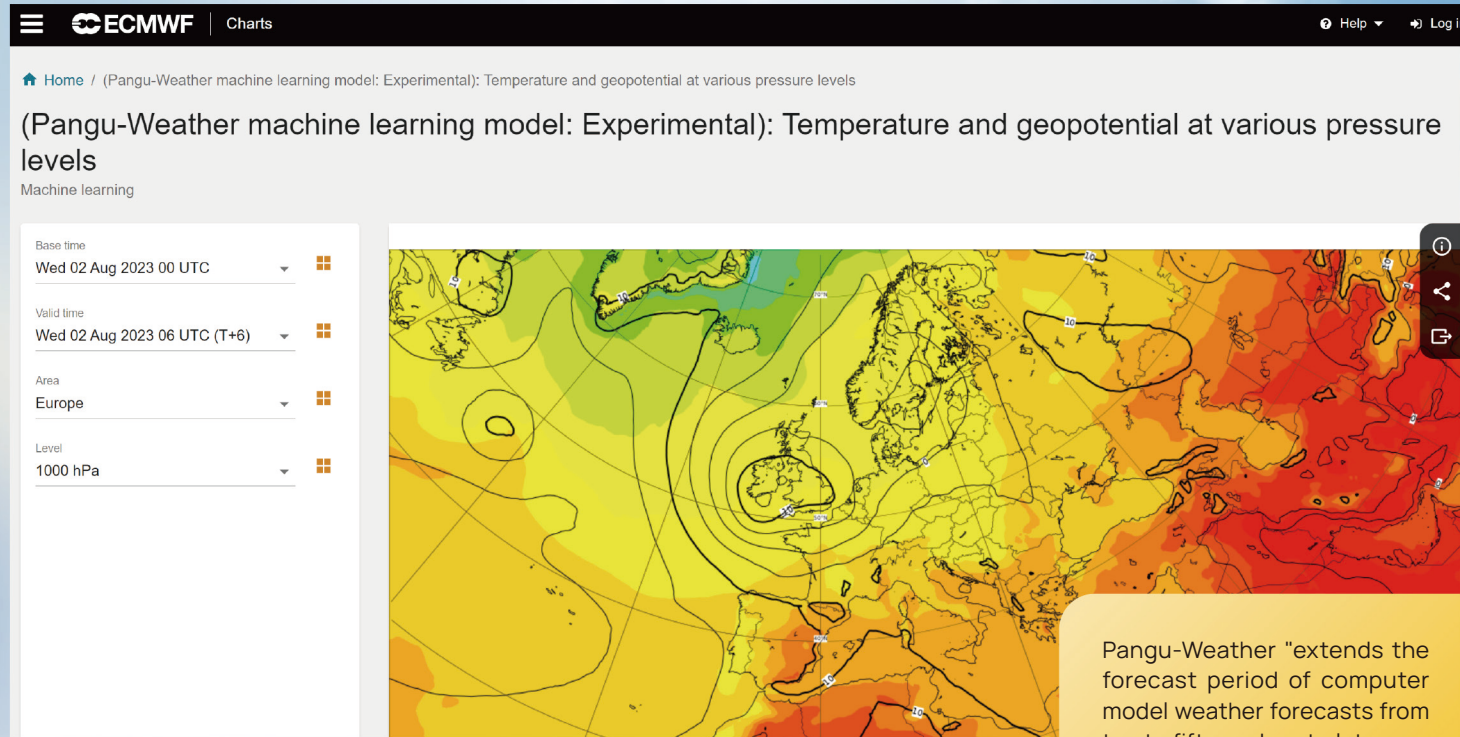
Huawei Cloud's Pangu-Weather Model is the first AI model that can predict weather more accurately than state-of-the-art numerical weather prediction (NWP) methods, and at a speed that is 10,000 times faster. In the past, predicting the path of a typhoon for a 10-day period took 4 to 5 hours of simulation on a high-performance cluster of 3,000 servers. Now, Pangu-Weather can do that in 10 seconds on a single one-GPU server. Pangu-Weather can generate a global weather forecast within seconds, with all factors taken into consideration, such as geopotential, humidity, wind speed, temperature, and sea-level pressure. Besides typhoon paths, it can also accurately predict precipitation, cold and heat waves, and more.

On July 5, 2023, Nature, the world's top scientific journal, published a paper titled "Accurate medium-range global weather forecasting with 3D neural networks", which provided a detailed report on the research results of the Pangu-Weather model.



NATURE

At the 19th World Meteorological Congress, the European Centre for Medium-Range Weather Forecasts (ECMWF) claimed that Pangu-Weather, a purely data-driven AI model, has been able to make such accurate weather forecasts that they can rival even their own, which were made using the conventional NWP method. Since late July, 2023, Pangu-Weather has been made available on the ECMWF website. On this website, global weather forecasters, meteorologists, weather enthusiasts, as well as the general public can now view Pangu-Weather's 10-day global weather forecasts for free.



Pangu-Weather "extends the forecast period of computer model weather forecasts from ten to fifteen days to let users prepare for potential changes in weather in advance."

Hong Kong Observatory

The Hong Kong Observatory has also officially launched Pangu-Weather on its Earth Weather webpage, where visitors can view 15-day forecasts on weather elements such as wind direction, wind speed, temperature, and sea-level pressure. Pangu-Weather accurately predicted that Typhoon Koinu would not reach Hong Kong before October 1, 2023, so that on that day, the people of Hong Kong successfully held their famous National Day fireworks display at Victoria Harbour.

Shenzhen Futian District Government

**Smarter City
More Efficient Government
Improved Lives**

Pangu Government Model

Futian District is the center of government administration, finance, commerce, and international exchanges in Shenzhen. It has the highest population density and most active economy not only in Shenzhen, but among the world's largest cities. Working with Huawei Cloud, the Futian district government is using the Pangu Government Model to power three smart government projects: Public Service for Citizen & Business, Gov Governance Digitalization, and Gov Office Digitalization, with the goal of making the city run more efficiently, cultivating a culture of innovation, and enabling sustainable growth that benefits all.

Making the city run more efficiently
Cultivating a culture of innovation
Enabling sustainable growth

Futian



To support the Public Service for Citizen & Business project, the Futian District government deployed its smart government service assistant Xiaofu, which is fine-tuned on massive amounts of government data, both local and national, equipping it with extensive knowledge on government policies, regulations, and government service processes. Powered by Xiaofu, Futian's smart government hotline system has demonstrated remarkable performance in multi-intent understanding and government policy association.

City governance is an extremely complex project that requires the collaboration of over 40 government agencies and bureaus to handle more than 4,000 event scenarios, such as traffic accidents, burst water pipes, objects thrown at a height, and illegal parking. To support Gov Governance Digitalization for a large city district like Futian, the Pangu Government Model must be able to correctly perceive and understand city events based on various types of sensor data, quickly find the responsible departments, and provide appropriate handling suggestions. A highly digitized city generates thousands of petabytes of data a day, including sensor signals from hundreds of types of devices, such as cameras, charging piles, and gas meters. All the collected data is fed into the Pangu Government Model, which is a

combination of the NLP and CV models. The model dynamically analyzes multimodal data, including text, videos, and images, and is thus able to accurately understand up to tens of thousands of types of events that are happening in the city in real time. Besides detecting and reporting events, the Pangu model also analyzes their root causes, identifies departments that are responsible for handling each event, and offers handling suggestions. A typical event can be discovered in seconds and correctly dispatched within minutes. City governance efficiency is hugely improved.

With regard to the Gov Office Digitalization project, the Pangu Government Model has been trained on over 400,000 government documents from more than 20 provinces and cities across China. The model accelerates the speed of knowledge search by 100%, with a 30% higher accuracy, and its accuracy in answering complex questions exceeds 95%. Take document generation as an example. The Pangu Government Model can generate 15 types of documents based on outlines, definitions of different roles and responsibilities, and reference documents provided by government employees, offering them an intelligent, personal assistant that improves their office efficiency by 200%.



The Shenzhen Futian district government recently deployed Xiaofu, a smart government service assistant powered by Huawei Cloud's Pangu Government Model, to power several smart government projects. Xiaofu offers a range of intelligent capabilities, including Q&A bot, AI copywriting, city video sensing, video-based multimodal understanding, and open-vocabulary object detection, enabling a closed loop of intelligent event handling that includes perception, understanding, handling, and decision-making.

First Affiliated Hospital of Xi'an Jiaotong University

Developing a Super Antibiotic Using an AI-Supported Drug Design Service

Pangu Drug Molecule Model

Typically, the development of a new drug takes 10 to 15 years and requires an investment of over 1 billion US dollars

According to the World Health Organization (WHO), antimicrobial resistance (AMR) is on the rise around the world, with 1.2 million deaths each year being caused by AMR. This makes AMR more deadly than HIV. Sadly, no new antibiotics have been developed over the last 40 years. One of the biggest challenges in new drug discovery is finding the most promising drug candidates from vast libraries of known drug-like molecules.

Using an AI-supported drug design service powered by the Huawei Cloud Pangu Drug Molecule Model, Professor Liu Bing and his team at the First Affiliated Hospital of Xi'an Jiaotong University was able to hugely accelerate the screening of drug molecules. This approach reduced the lead compound discovery time from several years to just one month, and cut R&D costs by 70%. Now, they have successfully discovered a new super antibiotic called Cinnamobactin.

By targeting HU proteins using an innovative bacteriophage-like mechanism that inhibits DNA replication in bacteria, it is expected to become the world's first new antibiotic in nearly 40 years with a brand-new target and in a category of its own.



© CASE VIDEO

Runda AI Medical Assistant

Enhancing Medical Services with Smart Diagnosis and Treatment

Pangu Medical Model

"Typical medical services at a hospital involve two steps: diagnosis and treatment, with testing being a crucial part of the diagnostic process."

Hu Zhenning,
Director and Deputy General Manager
of Runda Medical Technology



Test reports are essential for doctors to make accurate diagnoses, but they can be difficult to interpret. For patients, understanding the complex numbers and metrics in these reports can be confusing and anxiety-inducing. Even for doctors, mastering the interpretation of numerous metrics within their own field of expertise requires extensive training. But, with dozens or even hundreds of test reports to read every day, the task can be overwhelming.

Runda Medical Technology is China's largest in vitro diagnostics (IVD) solution provider, offering a wide range of IVD products, technical support, and operations support for different types of medical labs. Its information systems are connected to over 2,000 hospitals.

The Huawei Cloud Pangu Medical Model is pre-trained on high-quality, unstructured data from 16 million academic journals, as well as knowledge graphs that incorporate over

"Powered by the Huawei Cloud Pangu Medical Model, the Runda AI Medical Assistant builds the world's largest medical testing knowledge graph."

Zhang Nan,
CTO of Runda Medical Technology

1 million high-quality examples from clinical practice (diseases, medicines, operations, etc.). Through further supervised fine tuning (SFT), the model acts as an intelligent assistant in medical testing, diagnosis, and personal health management.

Trained on massive datasets, the Runda AI Medical Assistant can explain more than 4,500 test items and 2,800 diseases. In answering questions based on clinical report interpretation of real cases from 10 different departments, it achieved an overall accuracy of 87.74%, comparable to specialized human doctors. In clinical practice, the assistant considers patients' medical histories, symptoms, and other relevant factors, providing comprehensive evaluations and treatment suggestions, helping doctors and patients in choosing the best treatment options. It also helps in identifying rare diseases.

Take adrenal insufficiency in the elderly as an example. This disease is easy to miss in preliminary diagnosis as it is rather rare and its symptoms are quite similar to cardiovascular diseases and respiratory infections. Early detection is crucial for successful treatment. The Runda AI Medical Assistant has successfully helped doctors diagnose this rare disease by analyzing patients' sodium and potassium levels in their blood while ruling out the administration of adrenocorticosteroid drugs. In the three months since its deployment by the Second Affiliated Hospital of Sun Yat-sen University, this smart assistant identified 11 high-risk patients from 4,268 people. These patients were then transferred to the endocrinology department, where they were confirmed with adrenal insufficiency. All 11 patients have now recovered after treatment.

Zhengzhou Railway Group

Accelerating Freight Train Inspection with Smarter TFDS

Pangu Railway Model

China's railway network spans 155,000 km with over 1 million freight trains. The Trouble of moving Freight car Detection System (TFDS) is used to detect faults and defects on moving freight trains. This system uses high-speed camera arrays installed at both sides of the railway track to capture images of the bottom and lower parts of the trains, which human inspectors then examine.

The overall detection rate has reached

99.8%

The system filters out

95.75%

of all camera-captured freight car images

The detection rate of major faults has reached



However, processing the sheer volume of images is a daunting task. Take the 5T inspection center of Zhengzhou Railway Group as an example. This center processes over 2.8 million images from 40,000 cars of 800 freight trains per day. An inspector has only 5 seconds to process each image and detect anything suspicious. This is both intense and prone to human error due to fatigue or boredom, leading to potential misjudgments.

In 2021, China State Railway Group identified the intelligent TFDS solution as a key project.

The 5T inspection center of Zhengzhou Railway Group, Huawei, and Huitie Technology were commissioned to work together on this project.

In this project, the Pangu CV model acted as the "AI trainer" for the TFDS system. Pre-trained on a huge number of unlabeled images, the Pangu model is capable of continuous learning and few-shot learning. For example, there is only sample available for a disconnected bolster center plate in all of China. By training on this single sample, the

Pangu model can now accurately recognize this type of fault. The Pangu model can also generate new samples at scale based on existing samples and use the new samples to train the TFDS system.

In December 2022, the TFDS system, powered by Huawei Cloud's Pangu CV model, was deployed for trial use. By learning from collected data samples, the new TFDS system can automatically extract component features and find anomaly patterns, and continuously improve its performance over time.

This new, AI-powered TFDS system can now accurately recognize more than 430 types of faults and defects on 67 types of freight cars. The detection rate of major faults has reached 100%, and the overall detection rate has reached 99.8%. The system filters out 95.75% of all camera-captured freight car images, leaving only 4.25% for human inspection. This significantly enhances fault detection accuracy and efficiency for freight trains, making them safer.

Shandong Energy Group

Exploring All-Scenario AI Applications in Coal Mines

Pangu Mining Model

Shandong Energy Group is a large energy corporation whose business covers mining, high-end chemical products, electric power, new energy materials, high-end equipment manufacturing, and modern logistics and trade. It is China's 3rd largest coal producer and a global leader in smart coal mines. Nine of its mines are national-level showcases for smart coal mines.

Utilizing Huawei Cloud Pangu models, Shandong Energy Group has established a corporate AI training center, and applied the Pangu Mining Model to nine major coal mine processes, including mining, drivage, equipment control, transportation, ventilation, and separation. The Pangu Mining Model integrates the capabilities of four foundation models: computer vision, GNN, multimodal, and NLP. With all-scenario AI applications used at scale, Shandong Energy has reduced its underground workforce while running its coal mines just as efficient and safe.



Better AI Models

High training efficiency

Leveraging cloud-edge synergy, data is streamlined between the corporate central cloud and the edge (i.e. coal mines). The model excels in continuous learning and few-shot learning, allowing it to achieve high accuracy with limited training data. The model is trained at the Xinglongzhuang Coal Mine, Shandong Energy's smart coal mine showcase, and can then be quickly replicated across its other 70+ mines.

Massive data processing capacity

The model, trained on over 1 billion images and 100 TB of video data using unsupervised learning, delivers extraordinary visual representation and recognition performance.

Good generalization

Compared with small models, large models offer better generalization performance. The pre-trained Pangu model can be quickly adapted to new tasks at new coal mines and achieve passable accuracy by generalizing over new data. There is no need to train new models from scratch.

High sample screening efficiency

The Pangu model can efficiently obtain defect samples for brand new task scenarios. Compared with traditional methods, the Pangu model cuts the data labeling workload by 85%.

High accuracy

Task-specific models can be quickly trained for various tasks, covering production, safety monitoring, and decision-making, based on the principle of "anything unexpected is abnormal". With few-shot learning, these models achieve 10% higher accuracy than conventional models.

Higher Productivity

In the past, human experts set the input parameters for processes like coal separation and coking coal blending based on their own experience. Now, by modeling real-world production data, the Pangu model accurately predicts outputs based on input parameters, and optimizes these parameters to balance quality and cost, thus maximizing productivity and benefits.

In the case of coal separation, the Pangu GNN model was used to build models that predict the outputs of heavy-media separation and ash content. Parameters are optimized for relevant processes, such as the cyclone. The density of the coal separation media and the inlet pressure can be automatically adjusted

based on the ash content of the cleaned coal. The ash content of cleaned coal is stabilized and the yield of cleaned coal is increased by 0.1% to 0.2%. This means a coal mine the size of Jining No. 2 (a coal mine operated by Shandong Energy) is able to increase its production of cleaned coal by 8,000 tons annually. Replicating this solution, coal mines in China could increase their annual production of cleaned coal by an average of 2,000 tons per mine.

In the case of coking coal blending, graph neural network techniques are used to train a coal blending optimization model, which helps accelerate coal blending time from 1 to 2 days to mere minutes for the coking process.



Safer Coal Mines

The Pangu Mining Model powers intelligent video surveillance and inspection in harsh underground coal mine environments. Human inspection is now required only weekly, reducing labor costs and improving safety.

According to results from the Xinglongzhuang Coal Mine Project Phase I, the model achieved over 90% accuracy in detecting human presence in hazardous areas, 10% more accurate than conventional small models. This helps prevent safety hazards from progressing into accidents by issuing prompt warnings. Prompt and accurate warnings on non-compliance worker behavior also help to improve workers' safety awareness.

Drilling depth is a key parameter in anti-burst and pressure relief projects. Lilou Coal Mine in west Shandong used the Pangu Mining Model to monitor this parameter. Dedicated cameras monitor construction in real-time. Videos are uploaded and analyzed by AI in real time. When drilling depth is insufficient, audio-visual alarms are generated promptly. The model also supports functions like construction plan management, video recognition result query, drilling depth verification, and drilling hole counting, enabling prompt and accurate oversight and inspection, while cutting human labor costs by 80%.



FAW Jiefang

Pangu Automotive Model at Every Stage

Pangu Automotive Model

“

The combination of foundation models and services improves everything from requirement collection to product optimization, enabling us to respond faster to market changes.

—
Song Lei,
Director, Digitalization Dept,
FAW Jiefang

This leading enterprise in China's commercial vehicle industry is making continuous innovation and transformation. Since 2005, FAW Jiefang has digitalized and linked its R&D, production, supply, sales, and service systems in Phase 1.0. In Phase 2.0, it migrated its services to cloud. Now, foundation models accelerate its digital transformation into its third phase of data-driven, intelligent decision-making, thanks to the revolution in construction and operation models.

FAW Jiefang partners with Huawei to provide its staff with personalized intelligent assistants, its users with one-stop vehicle services from selection to replacement, and its bottom line with a profitable vehicle model built on Huawei Cloud Pangu models.



Guizhou E-commerce Cloud

Intangible Cultural Heritage on Global Stage

Pangu Digital Human Model



Danzhai County exudes opulent local allure. This village is home to multiple peoples in the mountains of southeast Guizhou, China. Out of the clouds and greenery rises an intangible legacy – batik.

This is how stories transcend the ages. A batik handiwork takes a dozen handmade steps to unveil its charm. However, like many other non-heritage skills and handicrafts in the mountains, batik is hidden from the world outside. Mountains are the stumbling stones for villagers going in and out.

Nevertheless, Guizhou Province has recently strived to promote e-commerce. Its "From 10, 100, to 1,000, 10,000" initiative fuels featured industries. Integrated "province + city + county + village" livestreaming sites help export Qianzhou village goods. As a service platform under the Guizhou Business Department, Guizhou e-commerce cloud introduced Huawei Cloud virtual humans to reinvent livestreaming.

Building on the Pangu virtual human model, Huawei Cloud MetaStudio quickly creates a digital twin for villagers in just one day. All it takes for livestreaming is a 5-minute video, and this virtual human introduces products and interacts by text and voice with audiences in real time. Most importantly, it only needs training in any one language to be fluent in more twenty – propelling product sales overseas.

Currently, the Danzhai virtual host has already appeared on various livestreaming platforms. Guizhou e-commerce cloud will continue to bring virtual human livestreaming to more platforms and other livestreaming sites such as Guiyang headquarters and Leishan. Guizhou leverages Huawei Cloud technology to bring the region's wine, cuisine, fruit, and other specialties to the world.

Virtual Clothes Try-On

Meitu, "Generating" Great Things

Pangu Multimodal Model

Founded in 2008, Meitu is an AI-driven technology company that has made "beauty" one of its core missions. From lifestyle apps such as Meitu Pic (Meitu Xiu Xiu) and BeautyCam, to image generation productivity tools such as Meitu Studio and Action (Kaipai), Meitu offers a wide range of fabulous tools that you can use to work with images and videos. By December 2022, Meitu's monthly active users (MAUs) totaled 243 million, 79.76 million of which were from outside of China.

The time needed to generate garment images

Days

↓ Seconds



In 2022, Meitu launched Meitu Studio, which offers AI workflows for digital product and graphic designs, helping small and micro businesses quickly roll out products while simultaneously reducing costs. Since its launch, Meitu Studio has served more than 60 million customers and users in a wide range of sectors, including e-commerce, new media, offices, and private businesses, designing over 300 million images in total.

In June 2023, Meitu and Huawei Cloud entered into a joint innovation agreement, under which the two parties agreed to work together to explore ways to utilize Huawei Cloud's Pangu models to drive innovation in Internet applications. The cooperation is expected to focus on Internet image product and solution design, generative AI models, and innovative AIGC applications. Together, they developed a virtual clothes try-on app, which they jointly launched as a SaaS service at HDC.Cloud 2023 in July 2023.

It is well known that in the fashion and apparel retailing industry, having models try on newly designed clothes is a time- and labor-consuming

process. It becomes even more challenging if the clothes target different groups of people, as the designers will have to try the clothes on different types of models, leading to prolonged time to market (TTM). The virtual try-on feature consists of three steps: uploading the images of models, real people, and garments; extracting garment images; and using AI to combine the models and garments. The designer can quickly see high-quality, realistic images of the garments on different body types. The Pangu model uses techniques like automatic image repair and precision local control to retain the details of garments while adapting the garments to different body types. The time needed to generate garment images is reduced from days to seconds, allowing new products to reach the market much faster.

Looking forward, Meitu and Huawei Cloud plan to work together to further drive innovation in e-commerce, fashion and apparel, and more by focusing on algorithms and solutions for AIGC, image processing, and image recognition, as well as AI-supported business design.

A National Government Cloud Drives Thailand Towards ASEAN's Digital Hub

Huawei Cloud Stack



Thailand's GDCC opted for Huawei Cloud Stack to establish a national government cloud.

The cloud leverages Huawei Cloud Stack's on-premises, full-stack hybrid cloud capabilities to serve as many as **219** departments and **3,065** systems throughout Thailand. It has helped the government of Thailand save **THB850 million** in IT investment annually and take their public services to the next level.

ASEAN remains one of the world's most vibrant and fastest-growing economic regions. The burgeoning digital economy in this region continues to grow. Thailand, situated in the heart of ASEAN, has been leading the development of digital economy in this region. The government of Thailand initiated the Thailand 4.0 strategy, a strategy focused on leveraging innovative technologies like big data and AI to promote Thailand's economic transformation, achieve the goal of a digital Thailand, and make Thailand a digital hub in ASEAN.

As digitalization continues to advance, in Thailand, there are as many as 300 government data centers now, with an annual investment exceeding THB10 billion. However, the country is challenged by repeated, siloed IT construction, low utilization, and high investment costs. To keep pace with the demands of Digital Thailand 4.0, the country requires innovative technologies to support the development of smart cities, smart transportation, and Industry 4.0.

Against this background, the Government Data Centre and Cloud Service (GDCC) project was released by the Prime Minister's

Office, managed by the Ministry of Digital Economy and Society, and constructed by National Telecom (NT), a Thai state-owned telecommunications company. This project aims to create a more centralized national government cloud platform that is easier to design, breaks down data silos, provides a wide range of government services, and enables data sharing across all government organizations.

"GDCC will help the government of Thailand develop and leverage cutting-edge technologies like AI and IoT to make government operations more efficient."

**Mrs. Vunnaporn Devahastin,
Secretary-General for Office of
the National Digital Economy and
Society Commission in Thailand**

Serving as a national government cloud, GDCC has strict requirements for security, compliance, and product and service quality. They selected Huawei Cloud Stack as a secure foundation for their government cloud. Huawei Cloud Stack is an on-premises hybrid cloud solution from Huawei, the only cloud service provider with a cloud Region in Thailand. Using the same architecture as the Huawei public cloud, Huawei Cloud Stack provides over 80 out-of-the-box cloud services as well as full-stack capabilities spanning big data, AI, Pangu models, and blockchain to support the country's Digital Thailand strategy. The tailored OCR service serves local users well, and blockchain technologies enable trusted transmission. All these are set to support Thailand to become a future ASEAN hub.

Since its launch, GDCC has provided services to 219 departments and 3,065 systems, saving THB850 million in IT investment annually while enhancing public services. For instance, the Ministry of Land Transport established Smart Bus Terminal, a smart bus platform that enables users nationwide to access real-time bus schedules online. It

makes daily commutes easier and smarter. The provincial police bureaus have developed a multi-dimensional crime map, which replaces the tedious onsite visit with a QR code scanning system that allows real-time crime reporting. That simplifies the communication between the police and the public. Additionally, the Ministry of Public Health has created a Digital Healthcare Platform that visualizes the management of epidemic cases, both from the internal system and public networks. By collaborating with medical centers to optimize medical resources, the Ministry has significantly improved pandemic prevention and control.



MAPA (Brazil), More Efficient with Cloud

Cloud Native Infrastructure

One out of every three cups
of coffee comes from Brazil.

Brazil is the world's largest coffee producer and exporter. It is also one of the world's top producers of sugarcane, citrus, soybeans, and beef. Agriculture is a pillar of their economy. It has made Brazil the world's granary for the 21st Century.

By collaborating with Huawei Cloud, the Ministry of Agriculture, Livestock, and Food Supply (MAPA) of Brazil improved the availability, scalability, and performance of their applications to deliver excellent customer services.

In the first year of using Huawei Cloud to optimize the National Rural Environmental Registry System, MAPA reduced their IT costs by 77%, reduced their infrastructure costs by 90%, and improved their IT efficiency by 60%. The time needed to respond to end users was cut from 7 seconds to just 680 milliseconds.

MAPA believes that Huawei Cloud is a solid partner for their journey towards cloudification.

Wuhan Taking a Digital Leap

City Cloud

Today, the city is proudly striding forward into an age of smart cities. Wuhan megacity governance stands out from the crowd.

The city built four centers for digital economy enablement, urban operations, digital talent training, and tech incubation. These centers enable five key aspects of smart cities: government management, citizen services, urban governance, industrial innovation, and habitability improvement.

All government service systems are integrated to Wuhan Cloud, which runs as a unified command and control center covering:

- The medical insurance system, which now can be iteratively upgraded
- A "Five Cloud" service system for the Municipal Health Commission, now with access to abundant computing resources
- Decision-making assistance for the Municipal Science and Technology Bureau

As a result, data of more departments is being converged on Wuhan Cloud, and services are

able to reach out farther and cover a wider area. City governance is smarter, and using the cloud eliminates costs associated with building servers for each department, while also safeguarding data.

People in Wuhan are now enjoying a more convenient life and a more favorable business environment. This cloud has set the lifestyle of citizens on track towards a smarter digital future.

As of December 2023, Wuhan Cloud had served 91 municipal agencies (65 commission bureaus and 26 enterprise organizations), including the Government Service and Big Data Administration, Urban Administration, Medical Insurance Bureau, and Housing Provident Fund Administration of Wuhan, with a total of 279 service systems.

Wuhan chose Huawei to build its new infrastructure - Wuhan Cloud. Positioned as Wuhan's digital foundation, Wuhan Cloud was officially launched in September 2021, the first city cloud in China. It established a new paradigm, along with a new speed record for building a city cloud.

Changsha is a city of history and scenery. Today, the city is in its prime. Changsha has been crowned one of **the happiest cities in China** for 15 consecutive years.

Changsha A City on Cloud

City Cloud

Changsha builds its e-Government system on Huawei Cloud. A central cloud, with a cloud native architecture, connects **400+ application systems of 70+ government departments** to deliver secure, stable services efficiently.



More and more people come to settle here. For those seeking a job, Changsha has its own job search website running on the cloud, with 200,000 daily visits. Powered by big data, the website precisely matches jobs to job seekers. For those starting their own business, Changsha has a business registration platform where startups can submit their company information, and business licenses will get approved in just one day. The Wangcheng District has gone a step further by offering one-stop e-certificate services supported by cloud blockchain technology. No hassle of using physical certificates anymore.

People enjoy slow living in this city, especially the local food delights, secured by a robust food traceability system. This system traces the entire supply chain from production, logistics, to sales, analyzing data with AI.

Slow living in this city does not mean wasting time. Smart buses come and go on time, thanks to an intelligent transport platform responsive in real time and taking pedestrians, vehicles, roads, networks, and the cloud into consideration.

Another life hack is My Changsha, an e-government app re-architected to become cloud native. Now citizens get served by simply tapping on their mobile devices. In 2021, 1.32 million users claimed digital yuan vouchers smoothly in the My Changsha app. "Changsha is the only city whose e-gov app didn't crash during the digital yuan test rollout "



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Krungthai Card (KTC)

A "Cloud First" Strategy for Faster Service Development

Cloud Native Infrastructure

Krungthai Bank is one of the largest state-owned commercial banks in Thailand. It has a number of branches around the world and is committed to providing high-quality financial services. KTC is Krungthai Bank's credit card center. It provides a wide range of financial services and products, including credit cards, payments, loans, leases, e-money, and merchant services. As of March 31, 2023, KTC had about 3.3 million accounts, including 2.5 million credit card accounts and 700,000+ individual loan accounts.

All of KTC service systems, including the Acquiring System, Issuing System, Royalty System, Workflow, and DB2, all ran on traditional servers, but traditional servers are expensive and hard to scale or maintain. It had been handicapping the rapid service development. With the "cloud first" strategy, KTC planned to build an agile service platform on cloud to support flexible resource scaling and rapid service development. KTC chose Huawei Cloud for secure and reliable service deployment.

Huawei Cloud's Cloud Container Engine (CCE) Turbo cluster solution supports elastic resource scaling and provides KTC with sufficient computing resources at any time. By using container security groups in Cloud Native Network 2.0, KTC can control access from containers running different services to on-premises data centers, setting up a more secure network environment. Additionally, the master node and worker nodes are distributed across three AZs for higher reliability.

Huawei Cloud's Landing Zone solution uses the Enterprise Router service to centrally control the inbound and outbound traffic of multiple projects across accounts, preventing unauthorized public network access. Enterprise projects are managed separately by production and non-production accounts to reduce the adverse impact of faults on services. Different projects share the same private line bandwidth across accounts, eliminating the need to purchase bandwidth for each project.

By October 2023, KTC has deployed their Royalty System on the cloud, providing services for 5,000 merchants and 3.3 million users. Benefits:

- Simplified O&M, reduced private line costs, and 30% lower O&M costs
- Stable, reliable services, 10 million transactions processed per day
- Service rollout shortened from years to months thanks to unleashed productivity and faster iteration using elastic computing and cloud native

10 million
transactions processed per day

100-Year-Old PSBC

Migrating Mission-Critical Systems to the Cloud

Huawei Cloud Stack, GaussDB

Mission-critical service systems are the heart and soul of a bank. They represent the bank's technological strength.

In 2022, Postal Savings Bank of China (PSBC) deployed a next-generation mission-critical distributed system for personal services.

In 2023, PSBC & Huawei Cloud GaussDB scaled the unified query system to be able to hold over 600 TB of data.

The PSBC legacy system for personal services was built in 2014.

The system had hundreds of terabytes of historical data and hundreds of billions of data records in a single table. During peak hours, it had to process tens of thousands of concurrent requests. In the face of the massive amounts of data to be processed, the legacy system became overwhelmed. The storage, concurrency, data security, and performance, all struggled to keep up. PSBC urgently needed to develop a new system, one with a distributed architecture.

In 2019, PSBC worked with Huawei Cloud to plan and build a next-generation mission-critical distributed system for personal services.

PSBC has been using the new system since April 2022. More than 600 million individual customers have been migrated online to the new system, which has smoothly replaced the old one.



Thanks to this next-generation mission-critical distributed system for personal services:

We are now able to process 2 billion transactions per day and 67,000 transactions per second during peak hours for 650 million individual customers and more than 40,000 outlets. Transaction processing is 40% faster than before.

The average online transaction processing time was reduced from 93 ms to 65 ms, 30% less time than the legacy system needed.

The batch processing time was shortened from 4.5 hours to 3.

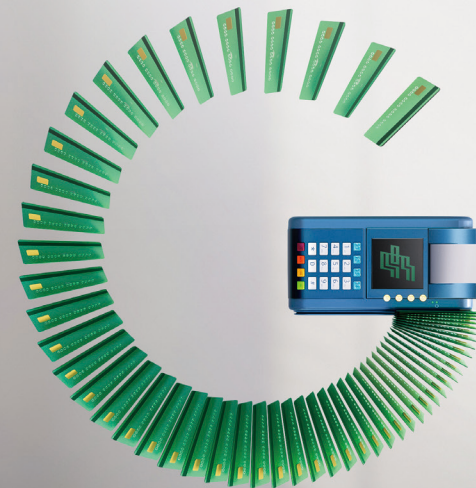
This has proven that Huawei Cloud GaussDB can ensure security and reliability of our mission-critical systems.

Niu Xinzhuang,
Chief Information Officer of PSBC

In 2023, PSBC and Huawei Cloud pushed their cooperation forward by using GaussDB to rapidly scale PSBC's unified query system to carry over 600 TB of data accumulated in the past 10 years. 207 new nodes were deployed for the system with intra-city, active-active DR and remote DR supported. This database cluster is the largest in the finance industry. The number of users served by mobile banking alone reached 344 million with a peak TPS of 130,000.

This is the first time that a large bank adopted both enterprise-level business modeling and a distributed microservice architecture. The system is based on Huawei Cloud Stack and a GaussDB database.

The new system is a key financial technology for China's banking industry, completely replacing their traditional legacy database system.



GLDB Singapore's First Digital Bank on Public Cloud

Cloud Native Infrastructure, Database, Big Data

Huawei Cloud helped Green Link Digital Bank (GLDB) become Singapore's first digital bank on the public cloud. With Huawei Cloud, GLDB acquired security compliance certifications from Monetary Authority of Singapore (MAS) quickly. Thanks to the superior performance of cloud native, GLDB provides users with faster, safer, and smarter financial services.

GLDB is committed to providing supply chain finance services and financial products (such as digital loans, payments, and savings) for micro, small, and medium enterprises (MSMEs) and technology innovation enterprises in Singapore with the goal of "faster, safer, and smarter" services. They have continuously improved their service quality, eventually becoming one of Singapore's top ToB FinTech companies. This will promote better cooperation and communication between Singapore and China in the financial sector.

GLDB launched its banking services in Singapore on June 3, 2022. It was built on Huawei Cloud and became Singapore's first digital bank on a public cloud. Temenos, a leading banking software solution provider,

developed a digital core system for GLDB based on Huawei Cloud containers.

GLDB now provides users with faster, safer, and smarter financial services than ever before.

· **Faster:** Launching of new functions and products (such as digital loans and supply chain finance) just takes a few days, which used to take months. Cloud native technologies, such as containers, databases, and big data, are used to build a high-performance, high-reliability financial cloud foundation for GLDB to accelerate service iteration.

· **Safer:** There is a stable and prosperous ecosystem compliant with regulatory requirements and compatible with open source. Huawei Cloud leveraged extensive experience ensuring compliance to help GLDB quickly acquire security compliance certifications from MAS. With experience accumulated in serving financial customers around the world, Huawei Cloud has been able to quickly interconnect with more than 50 ecosystem partners.

· **Smarter:** GLDB provides an excellent user experience driven by big data and AI. Data read and analysis requests can be responded fast, and loans can be approved quickly, providing users with flexible, reliable, and convenient experience.

BNC

Going All-in on Cloud with Agile Transformation for a Ubiquitous Digital Banking Service

Huawei Cloud Stack

Akulaku is a leading fintech unicorn in Asia Pacific. Akulaku-backed Bank Neo Commerce (BNC) provides Indonesia's premier digital banking service and is committed to delivering an optimal digital banking experience. They developed the neobank app to let tens of millions of users enjoy more convenient, secure financial services.

BNC had been using a virtualization architecture typical of most traditional banks. Their resources were managed and maintained by the IT department. Business departments needed to apply for required resources from IT personnel, and then the resources were manually provisioned and deployed. With this traditional approach, application iteration

took months, which was hindering innovation. In addition, multiple existing environments of BNC were managed and maintained separately. VMs, physical machines, and networks had to be managed and maintained on different GUIs, which was labor-intensive work.

With fast-growing new financial businesses and an ever-expanding platform, BNC needed to leverage cloud computing to quickly provision and elastically scale resources. They needed a cloud platform that could provide ever-evolving advanced services like big data and AI services to promote innovation. They also wanted to establish a more future-oriented, more efficient O&M system.



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Huawei Cloud Stack provided BNC with a solid cloud infrastructure:

Huawei Cloud Stack helped BNC upgrade their traditional IT architecture to a full-cloud architecture, launch financial applications with agility, and deploy applications automatically. Huawei Cloud Stack's self-service capabilities helped BNC accelerate iteration, shorten the time taken to roll out new products from months to days, and enable faster response to market requirement changes. For example, just several days are needed to launch new features for activities, such as a lucky draw for the Lebaran holiday or a gold coin collection game based on product configuration. In addition, BNC tripled their system capacity, and they also increased their customer base by 10-fold in just nine months.

The first phase of this project provided over 20 mainstream cloud services including mobile payments and wallet services that were moved over from the original virtualization platform. Huawei Cloud Stack will continue expansion to provide more than 90 cloud services for BNC to spur innovation and elevate customer experience.

BNC's virtualization architecture was cloudified. An independent Virtual Data Center (VDC) can be configured for each business department. In VDCs, comprehensive security isolation, rights- and domain-based management, custom resource quotas, and fine-grained operations are supported. R&D teams can request their own cloud resources, and the requests can be approved by their respective departments. The entire resource management process is automated for faster service rollout. Huawei Cloud Stack also provided BNC with a wide range of open northbound APIs. With these APIs, BNC has created an open ecosystem and is working with more partners to serve numerous customers.

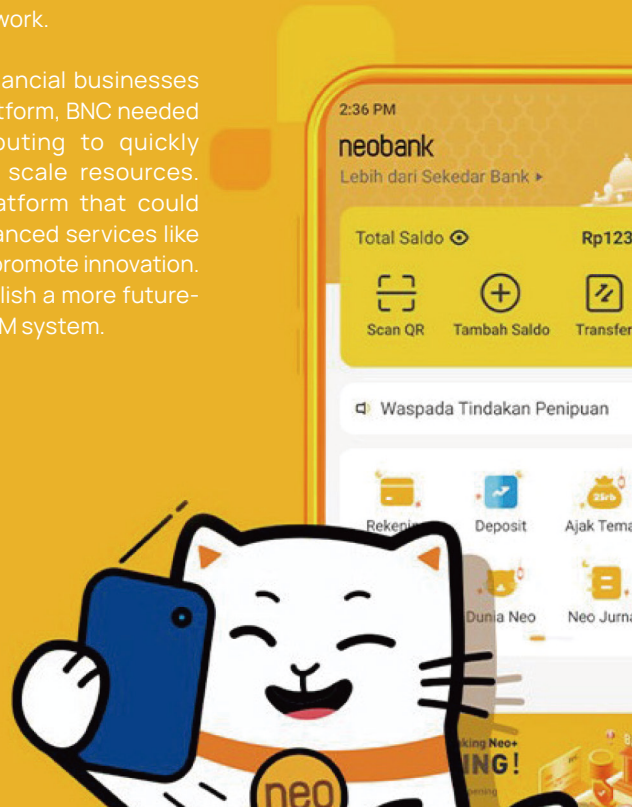
The Huawei Cloud O&M center remotely assists BNC with O&M. Thanks to the extensive expertise provided by Huawei Cloud O&M experts, proven O&M tools, and 24/7 online support, faults can be located within minutes. This has helped BNC greatly reduce their IT maintenance workload, free technical experts to focus more on service innovation, and transform passive support into proactive operations.

10-fold

customer number increase in just nine months

Tripled

system capacity



SCB's New Digital Growth Engine

Cloud Native Infrastructure

Siam Commercial Bank (SCB), the second largest Thai commercial bank with 14 million digital users, a market penetration up to 84% and a benchmark for digital transformation in Thailand's banking sector.

Offline banks have been issuing fewer loans than they once did. Digital loans are going to be critical to driving service growth. SCB had been exploring how to build a new digital finance ecosystem and how to develop food & drink, healthcare, and other services. The goal is to gain 200 million digital users by 2026.

Digital loan services can handle high concurrency access, support elastic scale-out, and ensure high resource utilization thanks to a cloud native infrastructure. A data-driven automated process allows a huge number of loan requests to be processed within 5 minutes. The transaction performance of digital loan services is two times that of traditional loan services.

Huawei Cloud built DBank, a cloud native digital loan platform, for SCB. It features scalable resources, supports agile innovation, and provides high security and reliability. Huawei Cloud's partner Sunline, a leading banking software and technology services company in China, developed containerized digital loan applications for SCB based on DBank.

Only three months after digital loan services were launched, SCB acquired 45,000 new digital users, with THB204 million in loans issued.

Only three months after digital loan services were launched

45,000
new digital users

THB204 million
in loans issued



M-Pesa

Offering More User-Friendly, Smarter Mobile Payment Experience Through Cloud Transformation

Huawei Cloud Stack

M-Pesa (M stands for mobile, and Pesa means money in Swahili) is a mobile phone-based money transfer, payments, and micro-financing service, launched in 2007 by Vodafone and Safaricom, the largest mobile network operator in Kenya.

M-Pesa has expanded to Tanzania, Mozambique, Lesotho, Ethiopia, and Democratic Republic of the Congo (DRC). It has become the largest mobile payment service that covers the most areas and has the most subscribers in East Africa.

M-Pesa has been stepping up efforts to accelerate digital transformation. However, with fast-growing service needs, M-Pesa had to keep scaling out resources for their traditional on-premises systems, which

made management and maintenance more complicated than ever before. Meanwhile, their traditional processes, along with their deployment and testing approaches, needed transformation. And M-Pesa cloud not dramatically improve their customer experience due to their outdated development architecture.

To address these challenges, M-Pesa upgraded their platform to M-Pesa 2.0. M-Pesa 2.0 was designed to provide smarter, more user-friendly services for users in more countries and help M-Pesa Africa (MPA) cut costs and improve efficiency. M-Pesa 2.0 needs to run on a cloud platform that can centrally manage O&M across multiple countries and deliver better scalability and SLAs.

Huawei Cloud Stack is such cloud platform. M-Pesa 2.0 uses Elastic Cloud Servers (ECSs) from Huawei Cloud Stack to support large-scale cluster deployment and multiple specifications. The Elastic Load Balance and Auto Scaling services of Huawei Cloud Stack enable load balancing and elastic scaling for M-Pesa 2.0. The Host Security Service and Web Application Firewall services of Huawei Cloud Stack protect M-Pesa 2.0 from hackers.

Huawei Cloud Stack also provided a unified management platform, ManageOne, for M-Pesa 2.0 to streamline management across multiple countries, improve O&M efficiency, and reduce management costs. The version management consistency enables M-Pesa 2.0 to provide services tailored to different countries, which improves operation experience.

Deploying M-Pesa 2.0 on Huawei Cloud Stack is a significant step in MPA's digital transformation journey. They can now stay focused on service innovation without being chained to infrastructure.



Aljasser Group ERP on Cloud for 30% Higher Monthly Transaction Processing Capacity

Cloud Native Infrastructure

Aljasser Group (Aljasser for short) is a well-known manufacturer and leading retailer, specializing in office and home decoration and operating in the Gulf Cooperation Council (GCC) region. It has a wide network of retail outlets and has been consistently expanding its businesses by opening new retail outlets.

Aljasser's ERP system for managing distributed retail outlets was deployed based on on-premises infrastructure. The high probability of performance bottlenecks, complex backup and O&M, insufficient network flexibility and scalability of the on-premises infrastructure were holding back Aljasser's business development. To address these issues, Aljasser embarked on a journey of cloud transformation.

Aljasser used the Server Migration Service (SMS) provided by Huawei Cloud to quickly migrate their ERP applications and databases to Dedicated Hosts (DeHs) of Huawei Cloud. The utilization of automatic migration and incremental synchronization significantly reduced downtime to just a few minutes and facilitated the successful migration of mission-critical databases for Aljasser. After the core systems were migrated, the automatic synchronization of SMS allowed Aljasser to run both the old and new environments simultaneously with almost no interruption until all verification and testing was complete.

Reduce storage costs

50%
—
80%

Before using Cloud Backup and Recovery (CBR), Aljasser used standard automated tools, and they had to spend two hours manually backing up the ERP system every day. With CBR, the cloud native servers, disks, and file systems of the ERP system could be automatically backed up based on a preset backup policy. This helped Aljasser lower their labor costs and reduced the maintenance downtime to almost zero. In addition, the incremental backup of CBR reduced storage costs by 50% to 80% and greatly enhanced data protection against accidental deletion, software faults, and hardware faults. The point-in-time recovery provided by CBR also ensured security and recoverability for the data of Aljasser in different scenarios.

Aljasser benefited a lot from cloud transformation. The business departments of Aljasser had to process a large number of transactions every month, including customer orders, invoices, and payment receipts. Migrating their ERP system to Huawei Cloud enabled Aljasser to achieve a 30% increase in transaction processing capacity. The new retail outlets could be quickly launched and accessed anytime and anywhere, accelerating the business expansion in the GCC region.

Xinyi Glass

Data Drives Smart Manufacturing

DataArts

In China, we are always reflecting on the manufacturing industry's most recent trends, rules, and processes.

Xinyi Glass is a world-leading glass manufacturer that has stable, environmentally-friendly, and energy-saving production processes powered by advanced smart manufacturing technologies.

The key factor affecting glass production efficiency is kiln capacity. A kiln usually works well for at least 10 years before it needs replacement. So, upgrading equipment in the short to medium term for efficiency improvements is negligible. Improving efficiency under these circumstances requires a digital factory, capable of simultaneously saving energy, reducing consumption, and increasing production.

In 2020, Xinyi Glass started working with Huawei Cloud to deepen data governance. So far, it has:

- Built a data-driven, intelligent control center that streamlines all systems;
- Integrated IT and OT data assets, improving overall operational efficiency;
- Shortened the time for preparing a monthly operational report from a week to an hour;
- Cut down the time for tracing glass quality from 10 person-days to a few hours;
- Built a digital twin system that automatically reports alarms in seconds upon any device exception;
- Enabled visualization of consumption data for energy such as natural gas in seconds and reduced natural gas consumption by 3.8%, saving tens of millions of CNY each year.

Hailiang Group Modern Digital Factory with Data-AI Convergence

Data-AI Convergence

Hailiang Group built a unified data lake platform based on the data-AI convergence solution of Huawei Cloud to streamline the end-to-end process of the digital factory, power business with data and improve efficiency with AI, reduce energy consumption per product by 300 kWh, and improve the labor efficiency of some processes by three times.

Hailiang Group focuses on three core areas of business: non-ferrous material manufacturing, education services, and ecological agriculture. With a global presence in 12 countries and regions, the group's marketing network radiates around the world. Hailiang Group has been included in the Fortune Global 500 list for four consecutive years. Zhejiang Hailiang Co., Ltd, a subsidiary of Hailiang Group, has 22 production bases spanning Asia, America, and Europe. It is a world leader in the copper pipe rod processing industry.

Hailiang Group runs more than 100 system services and faces the following pain points: First, IT governance is complex, but the company used to lack such professionals, and its digital capabilities failed to keep up with business growth. Second, analyzing the data assets in different services and systems collaboratively required frequent data migration, which may cause data redundancy, a long analysis link, and low analysis efficiency. In addition, data could not be reused. The more complex system integration is, the more development and maintenance cost. As a result, the value of data assets was not fully unleashed.

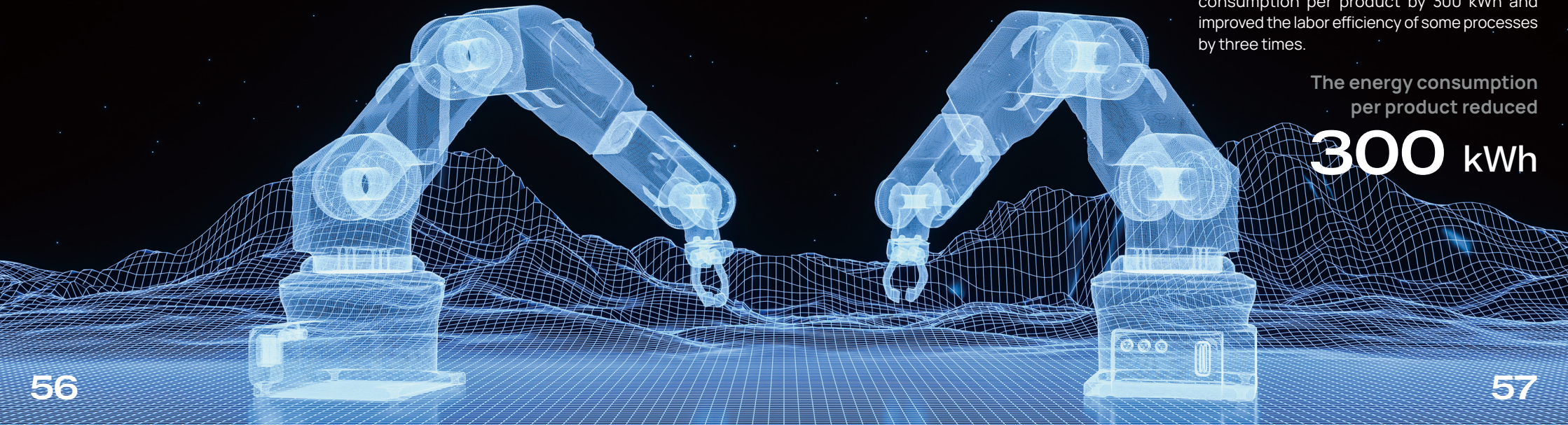
To address these challenges and accelerate digital transformation, Hailiang Group has migrated all of its core systems to the cloud to manage resources centrally and improve efficiency. This change in deployment mode has helped Hailiang Group reduce the resource use costs by more than 40% and shorten the average update time of application systems from 3 hours to 10 minutes. Moreover, more than 90% of the company's cloud systems are deployed in HA mode and active-active DR is enabled for key services.

To manage data more efficiently, Hailiang Group built a unified data lake platform based on Huawei Cloud DataArts (data governance pipeline). With this platform, Hailiang Group managed to import over 5,000 data tables from more than 100 systems to the data lake and use unified data standards and rules to improve data quality, streamline the end-to-end process of the digital factory, achieve end-to-end data management, and enable efficient data flow.

The data service capabilities provided by DataArts Studio help Hailiang Group power AI applications better with data. In addition, Hailiang Group has reduced the energy consumption per product by 300 kWh and improved the labor efficiency of some processes by three times.

The energy consumption per product reduced

300 kWh



SERES

IoV Rollout in Europe in Just One Month

Go-Global Solution

This key NEV automaker has been exploring the global markets in response to the Belt and Road Initiative. The European market is its strategic focus.

The first challenge is compliance. The EU's General Data Protection Regulation (GDPR) makes it harder for Chinese automakers to enter the European market by demanding cyber security certification for vehicle products. Huawei Cloud leverages 20 years of global experience, 300+ authoritative compliance experts and data protection experts in multiple jurisdictions to ensure that SERES fully complies with GDPR.

Based on Huawei Cloud's technical capabilities in global storage and compute network, distributed cloud native

Cloud-necting Across China and Europe

infrastructure, AI big data, cloud security, and global access, SERES launches its European IoV system in one month and provides the same great experience across the world.

Huawei's experience in commercial, legal, finance, and tax compliance, enterprise operations, local policies, and localized products with 24/7 multi-language technical support also ensures SERES's efficient IOV operation.

In addition, Huawei Cloud joins Utimaco in

Germany in localizing an encryption solution, and aggregates application and products such as voice assistant, in-vehicle map, and IoV SIM cards through cloud-cloud collaboration.

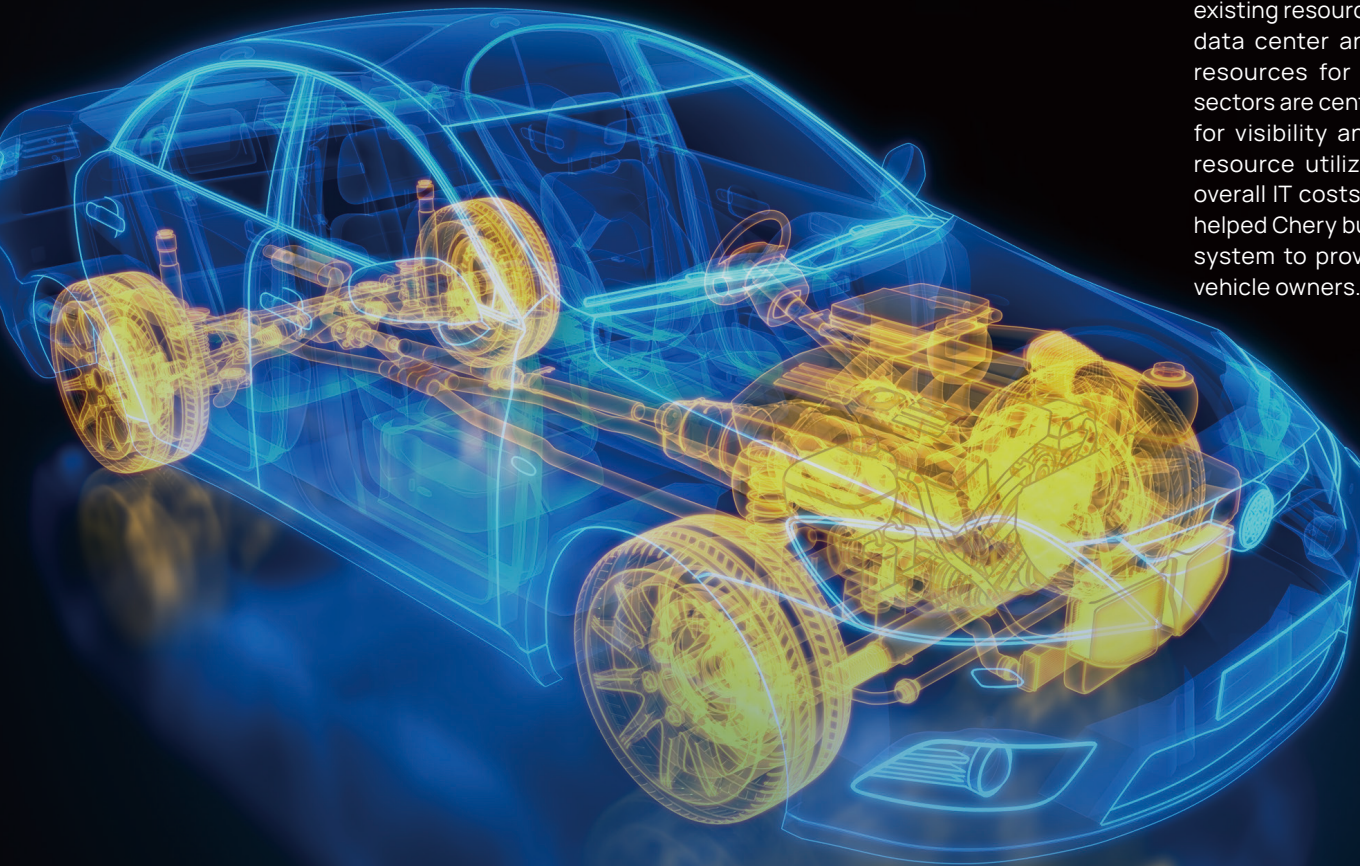
Huawei Cloud is not only a solution provider, but also a comprehensive partner of automakers going global. On the initial launch of SERES 5 in Belgium, SERES secured contracts with over 20 strategic partners and received orders for more than 20,000 new vehicles.

Digital Chery

Data-Driven Innovation on One Cloud

This automaker started their digitalization journey in 2021 with a mission to seize CASE (connected, autonomous, shared, electric) opportunities and shift focus from fossil fuel vehicles to intelligent connected vehicles. They built a unified organization cloud to maximize data value, drive business operations with data, and quickly set up digital and IoV platforms.

Data-AI Convergence, IoV



Huawei Cloud sent dozens of experts to Chery. The team first worked on a unified digital platform for Chery to centrally manage existing resources, including Wuhu corporate data center and Bozhou super factory. IT resources for the group's eight business sectors are centrally provisioned by the group for visibility and controllability, increasing resource utilization by 40% and reducing overall IT costs. Huawei Cloud's IoV solution helped Chery build an intelligent connectivity system to provide premium experience for vehicle owners.

Chery's digital platform and IoV platform feed massive volumes of IoV time series, GIS, driving behavior, cockpit, and core component status data into Huawei Cloud's data lake. This data then undergoes management, development, and modeling processes with Huawei Cloud's data+AI, big data, and data governance services and built-in time series and analysis functions. Finally, it is opened for use in six major scenarios: vehicle running, marketing decision-making, enterprise operations, procurement and supply, R&D platform, and production planning. For example, real-time vehicle running data and historical driving data help generate maintenance reminders for vehicle owners; vehicle running duration profiles car owners for smart marketing decision-making.

In the future, newer, better scenarios will arise with the rise in data volume and variety.

Great Wall Motor Tech-Fortified March into Latin America

Containers, RDS, OBS

Founded in 1984, this automaker is the largest in China. In 2022, GWM's global revenue was CNY137.3 billion and their overseas sales volume reached 173,200 units, a year-on-year increase of 21.28%. GWM is now one of the few Chinese auto brands to have sold a million units outside China.

At the end of 2021, GWM set up a subsidiary in Brazil in a bid to reach 4 million unit sales by 2025. At the end of 2022, GWM launched its Brazil brand comprised fully of new energy vehicle (NEV) models, marking GWM's entry in the Latin America market. GWM's sales volume ranked No. 1 among Chinese auto brands in the Chilean market from January to May 2023,

and No.1 in the Brazilian NEV market from May to June 2023.

Intelligent connectivity is an important NEV feature. Unlike fuel vehicles, NEVs generate more than 500 types of data related to battery, motor, electric control conditions, and drivers. The petabytes of data are updated frequently, so handling massive concurrent connections and data is crucial and precisely what intelligent connectivity is good at. To ensure

premium user experience and brand reputation while delivering 100,000 new vehicles each year, GWM needs stable, comprehensive, and hustle-free cloud services.

Huawei Cloud helped GWM migrate its telematics system to the cloud. Huawei Cloud containers scale 3,000 instances in just seconds in response to millions of peak-hour vehicles. NEV data is collected every 30s. Huawei Cloud Relational Database Service (RDS) and Object Storage Service (OBS) help with cold and hot data archival, reducing customer data storage costs by more than 60%. In addition to the sheer volume of data, telematics systems are also challenged by complex architecture, frequent inter-system data interactions, and a wide impact of single points of failure (SPOFs). To address these, Huawei Cloud Cloud Container Engine (CCE) decouples systems to avoid SPOFs and implements tracing and high-concurrency

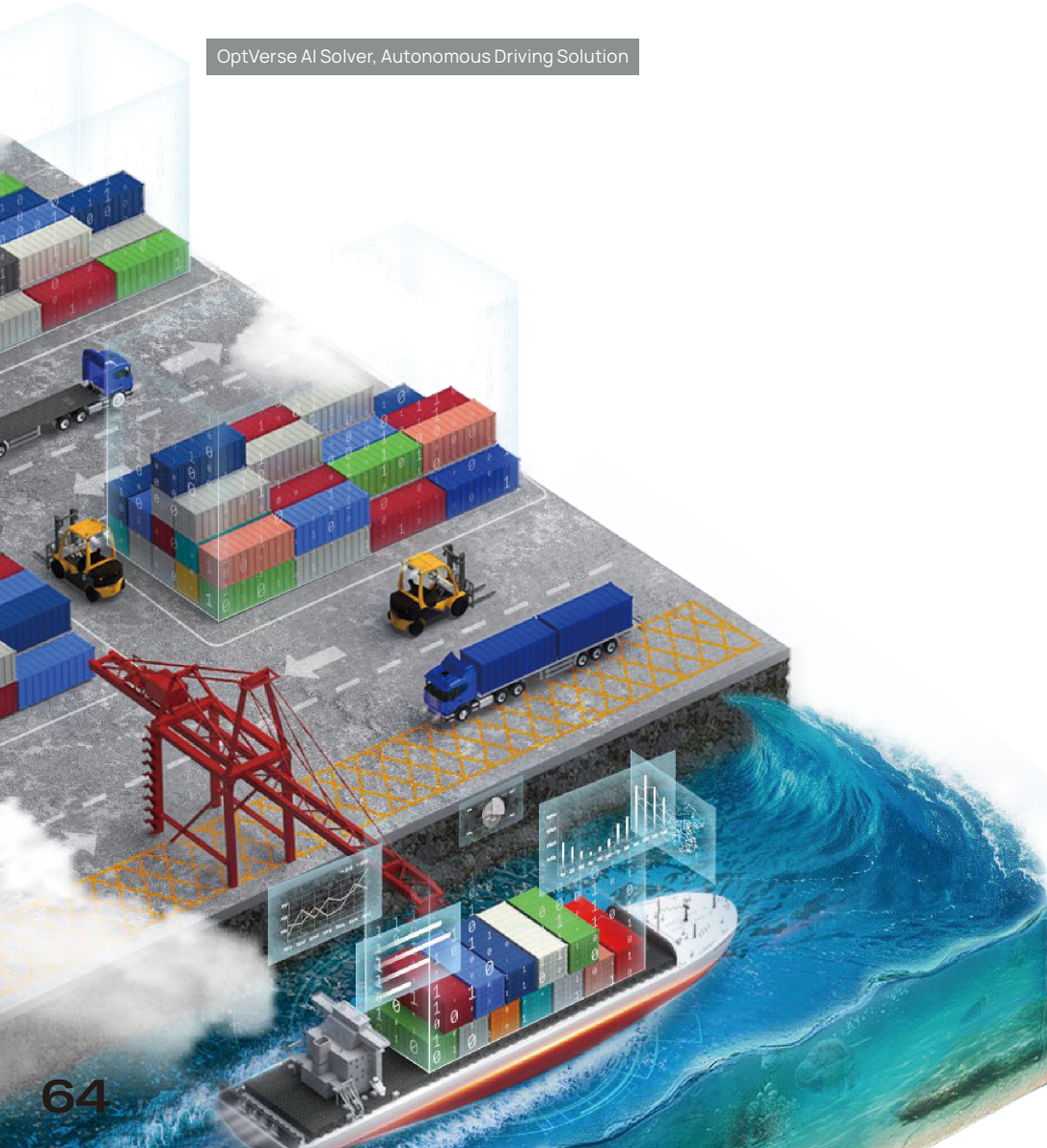
service instance registry and discovery. The solution also features microservice governance capabilities such as load balancing, rate limiting, service degradation, fault tolerance, and fault injection. All of these efforts ensure that the telematics system runs efficiently and smoothly after migration.

Leveraging 30 years of global telecom expertise, more than 20 years of Brazilian carrier partnerships, outstanding coverage in five Latin American countries, and 24/7 local and remote support, Huawei Cloud successfully helped GWM reduce costs, optimize architecture, and ensure stability of their new Brazilian system.

Tianjin Port

Building a World-Class Smart Port

OptVerse AI Solver, Autonomous Driving Solution



1981 saw the birth of China's first professional container terminal, spearheading a whole generation of modern container ports in the country. This landmark port was built and run by Tianjin Port Group, who in 2022 achieved 471 million tons of cargo throughput and 21.008 million TEUs of container throughput. It is now one of the world's top 10 ports, with more than 7% CAGR in the past four years.

For a port, time is money – a ship with 5,000 standard containers costs tens of thousands of dollars every hour it stays in port. If a port can mobilize and schedule people, cranes, trucks, ships, and cargo more efficiently, the reduced ship downtime will enhance its core competitiveness.

Good planning is halfway to success

Intelligent planning platform

Port operations planning is very complex. Past plans were manual and took 24 hours to cover berths, cranes, yards, and stowage. A hypothetical stowage plan needed to account for tonnage, size, and type of ship, arrival time, as well as crane capacity. For a 20-million annual container port like Tianjin Port, tens of millions of variables and constraints need to be considered.

In addition, a plan can only be developed three days in advance, making it difficult to respond to unexpected changes in weather or equipment. Manual planning cannot optimize collaboration among people, cranes, yards, trucks, ships, and cargo either.

Tianjin Port developed a next-generation system with Huawei Cloud OptVerse AI Solver. Thanks to trillions of combinations of results based on tens of millions of constraints and variables, operation planning is accelerated from 24 hours to 10 minutes for 7% less ship downtime. With this improved efficiency, a terminal with a throughput of 3 million standard containers increases its revenue by CNY29 million each year. The time is shortened, plan quality improved, and unexpected changes such as typhoons and equipment faults handled as well.



Tianjin Port also adopted an autonomous driving solution that features vehicle-cloud collaboration, which together with global scheduling unlocks a whole host of futureproof functions. These include precise positioning, path planning, and obstacle avoidance for intelligent guided vehicles (IGVs). Self-driving IGVs automatically adjust their route and speed to real-time cargo requirements and traffic conditions. Vehicles and devices from different vendors interact seamlessly, reducing conflict locking of multiple vehicles to less than 1‰ and improving traffic efficiency by 55%. IGV performance (22 MPH) matches human operations and far exceeds the industry average.

All these advanced technologies have made Tianjin Port an automated and intelligent port. These technologies have transformed Tianjin Port into a fully automated, intelligent port. Its 100 vehicles make up the world's largest driverless fleet. Running horizontal to the shoreline for two years, they have handled a total of 4 million+ twenty-foot equivalent units (TEUs), witnessed a monthly peak of 80+ ship trips, and boosted shoreline utilization by 17%.

Driven by intelligence, Tianjin Port will curate more solutions with innovation to upgrade ports with big data, artificial intelligence, and 5G.

Operation planning

24h



10min



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A Single, Unified Cloud for CTG Enables Smarter Dam Operations and a Better Ecosystem

Huawei Cloud Stack

Central cloud

1

Edge clouds

6

Observation points

600,000



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China Three Gorges Corporation (CTG), devoted to a national "cross-region computing" strategy, has been accelerating digital transformation. CTG has enlisted the help of Huawei Cloud Stack to deploy a cloud platform that allows for centralized resource deployment and efficient data analytics and governance throughout the entire group. CTG has enjoyed many different benefits from Huawei Cloud Stack.

CTG has harnessed cloud computing, big data, and IoT technologies to deploy an architecture leveraging a cloud-edge synergy. This architecture consists of one central cloud and six edge clouds for power stations. Operations for dams can be managed in real time from the clouds. A big

data platform on the cloud accesses statistics centrally collected from stations, underwater robots, generator sets, and motor rotors and performs intelligent analysis to monitor device statuses and report alarms.

An industrial Internet platform was built for China Yangtze Power, a subsidiary of CTG. The platform accesses numerous devices and collects data from about 600,000 observation points. It provides a robust data foundation for computing and monitoring using generic algorithms and hydroelectric power algorithms, and further for intelligent monitoring, O&M, and decision-making.

Plus, CTG has been putting efforts into controlling

water pollution and protecting endangered fish species like Chinese sturgeons. Now, they can collect and analyze dynamic sonar data in real time to reduce the number of rare fishes unintentionally caught or hurt, effectively protecting the local ecosystem.

STURGEON



In the future, CTG will enhance its partnership with Huawei Cloud to build more cloud platforms in multiple regions, providing a solid digital infrastructure for the Yangtze River, the world's largest clean energy corridor.

State Grid Henan Unlocking the Value of Renewable Energy on Cloud

Huawei Cloud Stack

In 2017, the Chinese Academy of Sciences launched a rural energy revolution. Lankao, a typical large agricultural county situated in the Yellow River Basin, was the first county to take part in this revolution. Lankao County lacks fossil energy, but has rich energy resources such as wind, solar, and geothermal, which provides a good foundation for pushing forward renewable energy power generation.

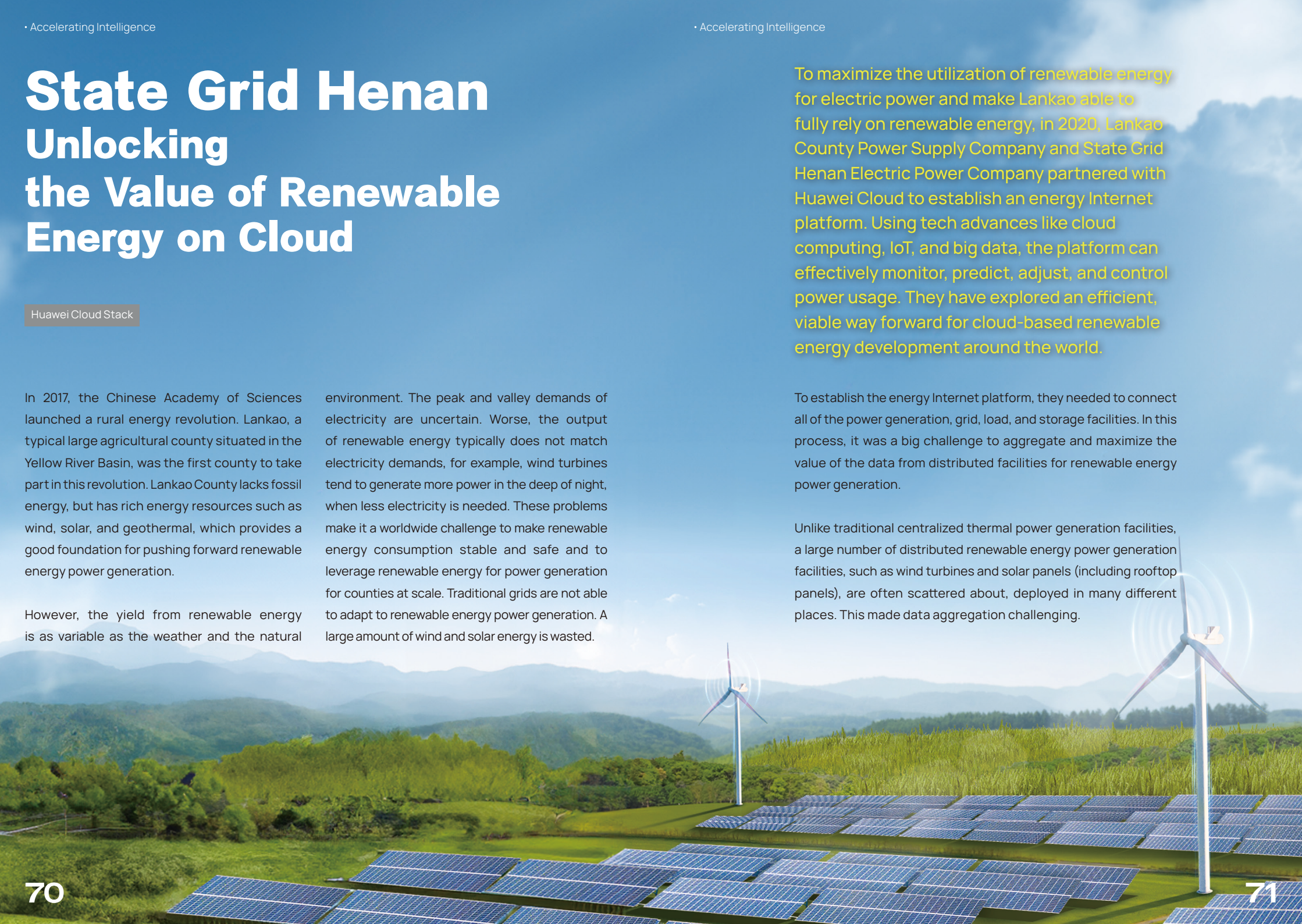
However, the yield from renewable energy is as variable as the weather and the natural

environment. The peak and valley demands of electricity are uncertain. Worse, the output of renewable energy typically does not match electricity demands, for example, wind turbines tend to generate more power in the deep of night, when less electricity is needed. These problems make it a worldwide challenge to make renewable energy consumption stable and safe and to leverage renewable energy for power generation for counties at scale. Traditional grids are not able to adapt to renewable energy power generation. A large amount of wind and solar energy is wasted.

To maximize the utilization of renewable energy for electric power and make Lankao able to fully rely on renewable energy, in 2020, Lankao County Power Supply Company and State Grid Henan Electric Power Company partnered with Huawei Cloud to establish an energy Internet platform. Using tech advances like cloud computing, IoT, and big data, the platform can effectively monitor, predict, adjust, and control power usage. They have explored an efficient, viable way forward for cloud-based renewable energy development around the world.

To establish the energy Internet platform, they needed to connect all of the power generation, grid, load, and storage facilities. In this process, it was a big challenge to aggregate and maximize the value of the data from distributed facilities for renewable energy power generation.

Unlike traditional centralized thermal power generation facilities, a large number of distributed renewable energy power generation facilities, such as wind turbines and solar panels (including rooftop panels), are often scattered about, deployed in many different places. This made data aggregation challenging.



In addition, the power generation at some facilities fluctuates significantly. Precise, real-time predictions for power generation at these facilities require very low latency for data collection, down to just milliseconds.

In terms of data access and collection, State Grid Henan Electric Power Company leveraged the DaaS and IoT capabilities provided by Huawei Cloud Stack to establish a next-generation digital system. The system also used the cloud-edge synergy provided by Huawei Cloud Stack to enable minute-level data collection and data sharing at the sensing, platform, and application layers, with an average latency of less than 100 ms.

When a traditional power load prediction model is used, power generation and usage data is imported to a lake every a few hours, terabytes of data needs to be processed, and analysis takes days. As a result, the prediction model usually needs 1 to 2 hours to complete a prediction, and the prediction for the amount of power generated from clean energy is not very accurate, so more thermal power is typically required. With the Huawei Cloud Stack intelligent data lake, power load data can be imported to the lake in seconds, and megabytes

of incremental data can be updated, calculated, and analyzed in seconds. A more refined load prediction model, one that only needs a few minutes, is available for accurately predicting the amount of power generated from clean energy, which makes it easier to control how much thermal power is required.

State Grid Henan Electric Power Company used the intelligent data lake solution from Huawei Cloud Stack to establish a generation-grid-load-storage collaboration and control platform. The platform provides optimization policies for the dispatch of renewable energy and accurately predicts how much power can be generated from clean energy. The accuracy of short-term predictions for the output of renewable energy has reached 96.5%, far beyond international standards.

Xing Ziya, a senior engineer and director of Construction and Application Office, Digital Work Department of State Grid Henan Electric Power Company, said: "The energy Internet platform of Lankao County has increased the proportion of power generated by renewable energy resources in Lankao from 21% to 97.7%. They can now provide power from renewable energy sources 24/5. This means they have achieved self-sufficiency with renewable energy."



97.7%
↑
21%

The proportion of power generated by renewable energy resources

Dialog Hybrid Cloud Deployment for a Consistent User Experience

Huawei Cloud Stack



Dialog Axiata PLC is a Sri Lanka's leading ICT business solution provider and a market leader in unified communications, cloud, data center, and broadband Internet.

With the advent of 5G networks, telecom operators are chomping at the bit to push forward cloud transformation for faster business growth and better efficiency. Their fast-growing B2B businesses require more user-friendly, more cost-effective, and more efficient ICT services. Dialog was looking for a hybrid cloud solution that could be deployed on-premises, connect their local enterprise

customers to public cloud services, and ensure data would not be transferred outside Sri Lanka.

Huawei Cloud Stack's on-premises cloud solution was able to meet these needs for Dialog. It helped Dialog manage their internal applications as well as run mission-critical applications for their customers in sectors like government, finance, and large enterprises. It also empowered companies in Sri Lanka to access essential cloud services, such as compute, storage, and network services, from the Huawei public cloud. It will also expand more advanced cloud services in the future.



After deploying an on-premises cloud, we will expand it to a hybrid cloud and then to a public cloud, aiming to achieve comprehensive cloud deployment.

—
Pradeep De Almeida,
Group Chief Technology Officer, Dialog Axiata PLC

Using Huawei Cloud Stack, Dialog has reduced the time to market (TTM) of applications in the BOM domain applications by 30% and has reduced the total cost of operation (TCO) by 20%. Huawei Cloud Stack provides Dialog with 80+ cloud services, such as IaaS, big data, AI, and database services. Dialog is migrating their workloads to Huawei Cloud Stack phase by phase. Centralized deployment and multi-cloud

capabilities provided by Huawei Cloud Stack help Dialog centrally manage resources from multiple vendors with ease.

With this successful cloud and digital transformation project, Dialog was awarded Sri Lanka's Most Valuable Brand by Brand Finance in 2023.

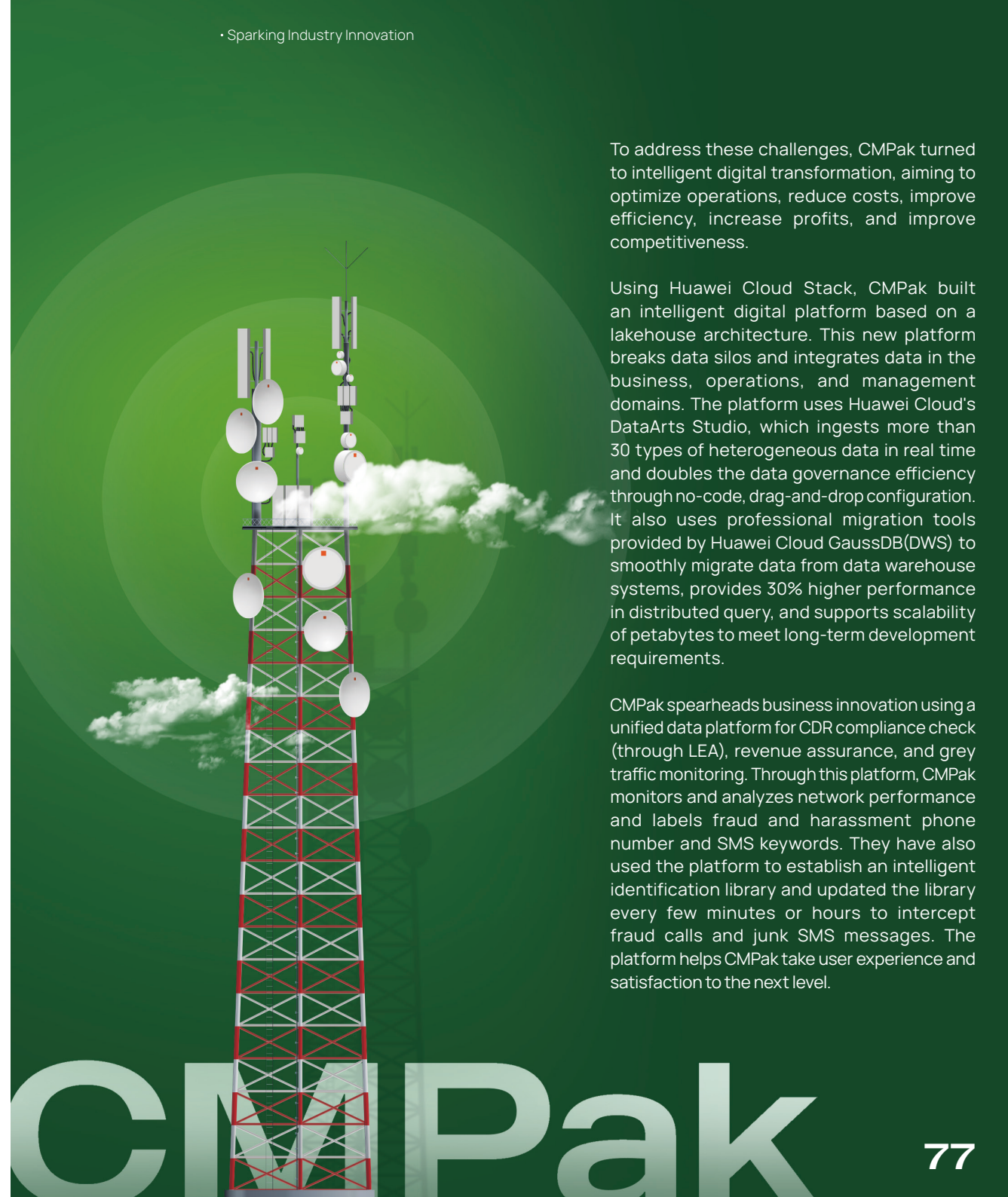
CMPak

A Digital Lakehouse Platform for Better User Services

Huawei Cloud Stack

China Mobile Pakistan (CMPak) is the second largest GSM mobile service provider in Pakistan. It provides wide network coverage, voice and data services, and diverse charging options to 47 million subscribers.

With the rapid growth of communications business, CMPak faces some pain points, such as fraud calls and spam messages, which adversely affect user experience and result in user complaints and churn. In addition, as traditional businesses grow slowly, CMPak needs to maintain their competitive edges by developing innovative B2C and international services. The traditional data warehouse appliances on the live network have a closed architecture, poor performance and experience, and high operating expenses (OpEx). In addition, evolution of the offline versions of the appliances has almost stopped. As a result, the appliances cannot meet ever-evolving business requirements and may affect business continuity.



To address these challenges, CMPak turned to intelligent digital transformation, aiming to optimize operations, reduce costs, improve efficiency, increase profits, and improve competitiveness.

Using Huawei Cloud Stack, CMPak built an intelligent digital platform based on a lakehouse architecture. This new platform breaks data silos and integrates data in the business, operations, and management domains. The platform uses Huawei Cloud's DataArts Studio, which ingests more than 30 types of heterogeneous data in real time and doubles the data governance efficiency through no-code, drag-and-drop configuration. It also uses professional migration tools provided by Huawei Cloud GaussDB(DWS) to smoothly migrate data from data warehouse systems, provides 30% higher performance in distributed query, and supports scalability of petabytes to meet long-term development requirements.

CMPak spearheads business innovation using a unified data platform for CDR compliance check (through LEA), revenue assurance, and grey traffic monitoring. Through this platform, CMPak monitors and analyzes network performance and labels fraud and harassment phone number and SMS keywords. They have also used the platform to establish an intelligent identification library and updated the library every few minutes or hours to intercept fraud calls and junk SMS messages. The platform helps CMPak take user experience and satisfaction to the next level.

CMPak

Teleperformance Workspace Delivers a Premium Experience for Massive Agents

Workspace

Teleperformance is the world's second largest provider of outsourced customer relationship management and call centers. It operates in more than 90 countries and regions and provides services in over 300 languages (including dialects) to more than 170 markets.

With the continuous expansion of business in Chile and Argentina, Teleperformance needed to add 1500 call center agents, but the deployment and O&M of a large number of desktops proved challenging. In addition, Teleperformance's customers have high requirements on data security, as any data loss or leakage could cause severe consequences.

Huawei Cloud's Workspace rose to this challenge, and built a secure and efficient call center office platform for Teleperformance. The powerful cloud desktop service enables quick roll-out and efficient O&M of massive agent desktops, ensuring a good experience for customers across different channels.

- Deployed in the Huawei Cloud region in Chile, the Huawei Delivery Protocol (HDP)-powered Workspace delivers network latency as low as 20 ms and scores 4 in the perceptual



evaluation of speech quality (PESQ). This eliminates frame freezing in office operations and allows for smoother exchanges between customer service personnel and customers.

- Five cloud-pipe-device security capabilities and comprehensive security management policies keep customer data within the cloud, preventing data loss, damage, theft, and accidental deletion.

- User groups, scheduled tasks, and message notifications are supported, allowing Teleperformance to manage the service desktops of different customers in a unified manner. This achieves efficient and cost-effective O&M.

- This turnkey solution enables fast roll-out for Teleperformance to maintain rapid service growth at a 35% lower TCO.

Sunway

Cloud as Core Strategy

Cloud Native Infrastructure

Sunway Group is one of Malaysia's largest enterprise groups with 13 business departments and about 16,000 employees. Founded in 1974, it now serves 50 markets worldwide.

Huawei is Sunway's strategic partner. Leading cloud products, 5G, and intelligent solutions give Sunway the digitalization edge in both the regional and global competition. The partnership seeds the latest cloud and telecom technologies throughout public safety and security, telemedicine, e-learning, hotel, leisure, and retail.

Sunway builds IaaS and PaaS on Huawei Cloud to make its intelligent applications secure, agile, and reliable. Its unique computing capabilities built on Elastic Cloud Servers (ECSs) enable ultra-high I/O throughput and cloud backup and restoration. The Virtual Private Cloud (VPC) and Web Application Firewall (WAF) ensure cross-region availability and network reliability. Cloud Container Engine (CCE) and Elastic Load Balance (ELB) ensure flexible responsiveness to workload surges. Huawei Cloud containers bolster resource efficiency and ServiceStage automates orchestration and management of cloud applications.



“ Cloud is our core strategy. We hope Huawei could help drive it to the next level.

— Kevin Khoo, CIO, Sunway



Migrating Data to GaussDB for Better Healthcare

GaussDB

MV is the third largest IT company and the largest medical information company in Brazil. To embrace the challenges of digital transformation, MV developed a strategic plan to introduce new cloud vendors and an open-source ecosystem to their systems for lower costs and higher productivity. MV planned to migrate all workloads and data to a new cloud and database and quickly replicate success experience to systems in other Latin American countries through SaaS services.

The service systems of MV were excessively dependent on the mainstream commercial database they had been using. Multiple database versions were running concurrently, which lead to high O&M and deployment costs. Additionally, it took too long to query transactions in the existing systems. This was not only affecting the timeliness of the medical information system, but also making it harder for medical personnel to process patient information.

To address this challenge, MV developed a proactive technological innovation program. They planned to migrate their workloads and data to a new cloud and database. MV wanted to introduce new cloud vendors and an open-source ecosystem to the game in the hopes of reducing operational costs and improving system performance. Ultimately, MV selected Huawei Cloud as a strategic partner and used GaussDB to provide solid support for technological innovation. GaussDB features high performance, availability, scalability, and security. A single node of GaussDB can reach up to 1.5 million tpmC, more than most mainstream databases can handle. GaussDB can also be scaled out to up to 1,000+ nodes, laying a solid foundation for MV to provide SaaS services.

GaussDB substantially sped up medical record queries from 3s to 0.5s. This significant improvement not only increased the timeliness of the medical information system, but also simplified medical personnel's work in processing patient information. The internal work efficiency of the hospital was significantly improved. Patients now spend less time on waiting and enjoy better medical services.

MV's technological innovation was not confined only to higher speeds. Compared with the original database product, which only supported single-instance deployment, the multi-tenancy mode of GaussDB is more cost-effective. It helped MV slash the overall cost by 20%. Furthermore, the Database and Application Migration UGO service of Huawei Cloud helped MV easily migrate data to the new database. During the migration, 96.7% of data was automatically converted, which significantly reduced the cost of the migration.



Faster medical record queries

3s
↓
0.5s

Neogrid Smart Solutions for Every Store

GaussDB (DWS)



Neogrid Brazil is a leading provider of supply chain solutions for automation manufacturers, distributors, logistics operators, retailers, and consumers. It collects and processes 2 million data points daily, offering reliable and up-to-date information on sales and inventories of stores and distribution centers.

Huawei Cloud provides a next-generation all-scenario smart data warehouse GaussDB (DWS) to support Brazil Neogrid in analyzing and storing supply chain data in real time. With GaussDB (DWS), thousands of distributors and stores can make data-driven decisions to optimize their supply chain, turn distribution challenges into revenue opportunities and grow their business.

Huawei Cloud provides cloud native expertise and capabilities that enable Neogrid to overcome the constraints of closed source software and databases and adopt open source solutions. Huawei Cloud provides prompt and effective technical support, detects performance issues caused by application code flaws, and offers professional advice to ensure normal service running.

Universidad César Vallejo (UCV) faced a challenge: reaching every student across its 12 campuses. For help at this level, Peru's largest university found the answer in Huawei Cloud.

Reach More, Spend Less: By migrating their Learning Management System (LMS) to Huawei Cloud, UCV doubled concurrent access to 5,000 users. They also achieved a 25% OPEX reduction, freeing up resources for further innovation.

From Pioneer to Powerhouse: UCV does not just embrace technology; they lead the way. Their recent strategic partnership with Huawei Cloud leverages AI, big data, and cybersecurity expertise to transform education.



Dynamic DNA Equipping Youth for Career Success

Cloud Native Infrastructure

This South African non-profit is tackling the nation's youth unemployment challenge head-on. Their mission is to empower underserved black youth with free career training in preparation for the modern workforce. Huawei Cloud plays a crucial role in this noble endeavor.

Partnering with online education expert Ulearning, Dynamic DNA leverages Huawei Cloud's turnkey SaaS solution to seamlessly blend online and in-person learning. One unified platform now connects students, teachers, content, and data. From classroom interactions to exams and student evaluations, this platform puts insightful data at Dynamic DNA's fingertips while upskilling people to bridge the opportunity gap.

“ This partnership pushes our campuses to be the most technologically and educationally advanced in Peru. With Huawei Cloud, we'll equip teachers and students with the skills they need for the future, benefiting the local community, while integrating AI and cybersecurity into our operations to continuously improve education quality. ”

—
Eng. Jorge Peralta Nelson,
Director of UCV Technology Innovation

Cloud Native Infrastructure

UCV Online Education Modernized for 180,000 Students

CJ More Scaling for Tens of Millions of Members

Cloud Native Infrastructure

MORE



CJ More, a popular Thai supermarket chain conglomerate of CJ Express Group, serves more than 10 million members, with the mission of becoming a "community partner" by connecting thousands of communities and partners. With the commitment "More Than Supermarket", CJ More provides "more complete, cost-effective, and worthwhile" experience for their consumers. At present, CJ More boasts over 1,200 stores across 42 provinces in 5 regions of Thailand, and strives to expand to more than 2,000 stores by 2025.

Huawei Cloud provides a wide range of services to facilitate CJ More in migrating core systems, such as SAP, WMS, POS, and HR, to the cloud. Resources are now easily scalable for fast growing business. More than 200 new stores are opened every year. Transactions can be processed with high concurrency. The local nodes realize a latency circle of 10 ms to 20 ms across Thailand, allowing stores to make instant responses and deliver seamless shopping and payment experiences. Infrastructure resources can be auto scaled

to meet service surges in promotions. In the three local AZs in Thailand, Huawei Cloud supports service DR and backup with high security and reliability, and provides a solid cloud foundation for developing innovative, future-proof services such as FinTech, logistics, and e-commerce.

200+
New stores are opened every year

Latency circle
10 - 20ms
Across Thailand

Digital Baillian Group

All Workloads on Cloud for New Retail

Data Services

From a charming local hub, to modern international metropolis, Shanghai has been leading the development and digital transformation of China's retail sector. Baillian Group, an iconic retail brand in China, is going digital together with Shanghai, to serve their consumers better.

An Iconic Milestone All Workloads on Cloud

Bailian Group has been exploring digital transformation as a way to ensure a future oriented digital business system. But it hasn't been easy.

As with almost all retail businesses, Bailian Group has complicated internal and external systems. In contrast with traditional information systems and their siloed architectures, the e-commerce system of Bailian Group has a mesh topology. The company has more than 600 microservices, 1,300 scheduled tasks, and 100 databases on its service middle-end. Not only that, Bailian Group has a large number of associated subsidiaries, such as Lianhua Supermarket Holdings, No. 1 Pharmacy, Sanlian Group, and Bailian Group Finance. They also have nearly 300 third-party suppliers and operate 4,000 stores. All these make it hard to plan and reorganize their systems for cloud migration.

To migrate workloads to the cloud smoothly, Bailian Group worked with Huawei Cloud to design a cloud migration solution. After a full year of planning and preparation, they conducted 10 step-by-step migration tests and organized five migration drills.

On August 16, 2023, after their shopping centers, department stores, and supermarkets closed up for the day, 200 members of Bailian's omni-channel team witnessed a historic cloud migration. In the early morning of May 17, Bailian Group officially migrated all service middle-ends to the cloud, including the customer touchpoints, service applications, shared service middle-end, shared group middle-end, and the basic service and infrastructure layers. The entire migration did not compromise data integrity and consistency and not interrupt the normal operations of the next day.

A Digital and Intelligent Foundation for Future-oriented Retail

Century Lianhua, a subsidiary of Bailian Group, has served consumers for more than 30 years. It has more than 400 direct-sale stores in Shanghai and more than 3,000 stores throughout China. Century Lianhua has an effective digital operations system that digitalizes sales, finance, logistics, inventory, and stores. The system is now interconnected with the HQ data center, allowing the HQ to track store statuses in real time.

These stores sell all sorts of daily necessities, such as rice and flour, oil, tobacco, alcohol, and other beverages. How well consumers, products, information, and finance are managed depends heavily on an intelligent fulfillment system.

With a good system in place, employees can precisely locate and prepare products for order from within a massive catalog. In addition, employees can scan barcodes to accurately replenish products to an empty shelf in a timely manner.

Bailian Xijiao Shopping Mall, which has just recently been upgraded with a new layout

designed for digital sales, a new business paradigm, and new business scenarios. This next stage in Bailian's digital evolution is to establish a "super community". This new intelligent digital system is based on one that was previously established by Bailian for the Hangzhou Outlet Plaza. This system streamlined every stage of the shopping experience, from the passenger flow and shopping environment to the electrical infrastructure. They have expanded the lifecycle of merchant services and enabled data monitoring and routine management through mobile phones.

Bailian Nanfang Shopping Mall is also accelerating digital transformation. Throughout 2023, it has been exploring digitalization and reconstruction. It made all marketing channels digital, boosted conversions from private traffic, built smart buildings, deployed digital operations projects, and explored new methods and means of promoting repeat purchases.

Looking to the future, Bailian Group is well on the way to an operational model that is agile, intelligent, and efficient.



Meiyijia Data Intelligence Makes 33,000 Convenience Stores Even More Convenient

Data Governance, Smart Store Solution

The current biggest convenience store franchise in China (Data source: CCFA, Top 100 Chain Stores in China in 2022), boasts over 600 brands and 6,000 offerings, and serves over 200 million customers every month.

The current biggest convenience store franchise in China (Data source: CCFA, *Top 100 Chain Stores in China in 2022*), boasts over 600 brands and 6,000 offerings, and serves over 200 million customers every month.

Spanning 230 cities in over 20 provinces, Meiyijia has a success recipe for rapid development. Its two key ingredients are standard franchise package and store operations support. The package starts and builds up the business while integrating survey as well as location and product selection. The support helps run the business by covering sales flow, stocktaking, account management, and revenue sharing. These two tools are great but isolated. The resulting slow responsiveness and lack of real-time data export are due to:

- Data silos in production, supply, and sales that undermined data accuracy and timeliness. Operational data was only generated the next day, increasing labor needed for supply, stocktaking, and replenishment.

- Too many management platforms that lacked real-time alarms and dragged down efficiency. Each store ran different hardware and software, and HQ often failed to detect and avoid potential problems.

- Demand for better consumer experience that required more efficient store operations, holiday promotions, self-service checkout, and other innovations.

In November 2022, Huawei Cloud established

a full partnership with Meijia to build smart stores with the following Huawei Cloud tech:

- A data lakehouse to break down silos:** Huawei Cloud sorts data such as organizational structure, stores, commodities, and employees into a (Purchase, Sales & Inventory) PSI-based indicator system. Stores use Huawei Cloud big data services to access customer flow, display, and tooling data uniformly stored in Object Storage Service (OBS). GaussDB(DWS), MapReduce Service (MRS), and DataArts Studio coordinate data analytics, eliminating information silos and achieving data-driven development.

- A unified audio and video interaction platform by Closeli:** Built on Huawei Video Ingestion Service (VIS), this platform connects cameras of different brands using national standards. VIS enables video viewing, playback, and transcoding to support stores unattended from 11:00 p.m. to 6:00 a.m to extend business hours. During the Spring Festival, 10 pilot stores increased their daily turnover from CNY4,000 to 20,000.

- A unified AIoT management platform:** All store devices now connect to the cloud for intelligent

control, unified O&M, greener consumption, and operations savings in over 30,000 stores. Device faults are detected, reported, and fixed in real time to improve customer satisfaction. Batch remote configuration by sales region, geographic region, and store enables tens of thousands of devices to easily upgrade, fix vulnerabilities, and run more efficiently.

- A unified information release platform:** Huawei Petal Ads places and manages ads on different types of screens. In addition, Huawei ad operations experts assist retailers in designing business models, building operations teams, and cultivating operations capabilities.

With Huawei's aid, Meiyijia boosts the efficiency of its success recipe – a store can now open in just 27 days, down from two months. Over 300 new stores that open every month enjoy accurate, efficient data support and accounting, including real-time transaction viewing, surplus goods and replenishment updates, and revenue sharing.



Hee Kee Crab General AI Crab Farming

ModelArts

Founded in 2019, AI Farming is committed to integrating AI and automation technologies into comprehensive aquaculture solutions that increase the yield and quality of aquatic products while reducing their cost. The company operates crab aquafarms in the Yuen Long District in Hong Kong and the Greater Bay Area, where they test digital technologies in aquaculture.

The company's signature offering is AIACHFS — an AI Automated Crab Farming System. They have introduced AI image recognition and automated device control technologies for more refined and intelligent crab farming, improving yields of molting and soft-shell crabs.

Liu Wai-man, CEO and founder of the company, is also the owner of the Hee Kee Crab General restaurant.

Transitioning from a restaurant to a digital startup providing intelligent aquaculture solutions, AI Farming needs to integrate various complex systems for their AIACHFS, including those for automated robot design and assembling, data collection, management, and modeling, IoT sensing,

AI image recognition and object model training and inference. However, AI involves a full technology stack from chips, storage, network,



© CASE VIDEO

distributed computing, computing frameworks, feature engineering, and machine learning algorithms. The complexity of this stack results in a steep learning curve, making the adoption of AI both costly and time-consuming. AI Farming has struggled to develop an efficient, easy-to-manage AI system. Huawei Cloud provides ModelArts, a one-stop and easy-to-use AI development pipeline, which covers the entire process of AI model development. ModelArts provides functions such as data processing,

AI Farming uses Huawei Cloud ModelArts to create a model that predicts when crabs will molt and improves the farming of soft-shell crabs. These crabs have a narrow window of opportunity for harvesting, as their shells



harden within four hours of molting. ModelArts data analysis enables crabs to hibernate under certain temperature and humidity conditions. This allows soft-shell crabs to be preserved for up to seven days. The crabs' meat quality, nutrition, and yield are significantly improved.

Huawei Cloud ModelArts technologies are not only advancing the AI era, but also revitalizing the traditional food industry with every plate of fried crab from Hee Kee Fried Crab.

SMU

Cloud Native Reconstruction for Accelerated Full-Channel Service Innovation

Cloud Native Infrastructure

SMU is the second largest retailer in Chile. It has seven brands in its portfolio, 10 million members, and serves the needs of 80% of Chile's population. Up to 18.3% of local food sales come from SMU. Unimarc, one of SMU's subsidiaries and the largest chain supermarket in Chile, has more than 500 stores. SMU's eight logistics distribution centers supply all goods to these stores, including Unimarc chain retail stores and Alvi warehouse stores.

In Latin America, large-scale retailers have been moving towards an online model. In 2022, SMU invested heavily in constructing their own e-commerce channel through proprietary e-commerce webpages and apps, which they have used to explore service diversity. Additionally, they actively expanded networks for offline stores to improve the offline shopping experience. During this process, they encountered a series of problems and challenges, such as complex multi-brand operations and management, complicated data systems, difficult implementation of AI and big data analytics under the existing architecture, as well as increased logistics investment and customer acquisition costs. SMU's original cloud service providers were unable to support SMU's cloud reconstruction and new service strategies. The traditional ECS architecture was unable to provide the rapid service elasticity they needed. The latency requirements of customers' online services could not be met because there was no local AZ.

Cloud native reconstruction of a traditional architecture has become their top priority.

Huawei Cloud is the only provider offering dual-city AZ nodes in Chile. This allows for rapid deployment of container clusters for SMU's cloud native reconstruction and provides a solid cloud foundation backed on big data and AI. During Christmas and Black Friday shopping promotions, SMU smoothly handled service surges. Huawei Cloud ensured service flexibility and elasticity for order peaks and provided strong support for rapid service innovation.

SMU has migrated their core SAP system to Huawei Cloud with S/4HANA deployed for significantly improved internal efficiency. The Huawei Cloud SAP solution provides higher scheduling accuracy, with an overall rating 13% higher than the industry average. It addresses SMU's challenges of complex multi-brand operations and low-latency requirements for all data. Huawei Cloud SAP uses the platform to continuously integrate people, finance, and materials. The platform enables closed-loop management of all service processes. It gives management processes a comprehensive upgrade.

SMU made changes to their eight logistics distribution centers, optimized the supply chain of their national store network and the seven brands it includes, and interconnected the payment system with the logistics ecosystem. By optimizing EWM warehouse management and the ERP system, SMU can schedule nearly 100 robots within 24 hours for unattended intelligent operations. An automatic logistics system has replaced the traditional "people find goods" mode of operations with an innovative "goods find people" system, helping them efficiently expand services.

SMU has published apps for their four brands in the Huawei App Gallery, and thanks to the large number of HMS users in Latin America, SMU can maintain and grow their existing user base. They enjoy platform traffic dividends and reduce customer acquisition costs.



IPEKYOL

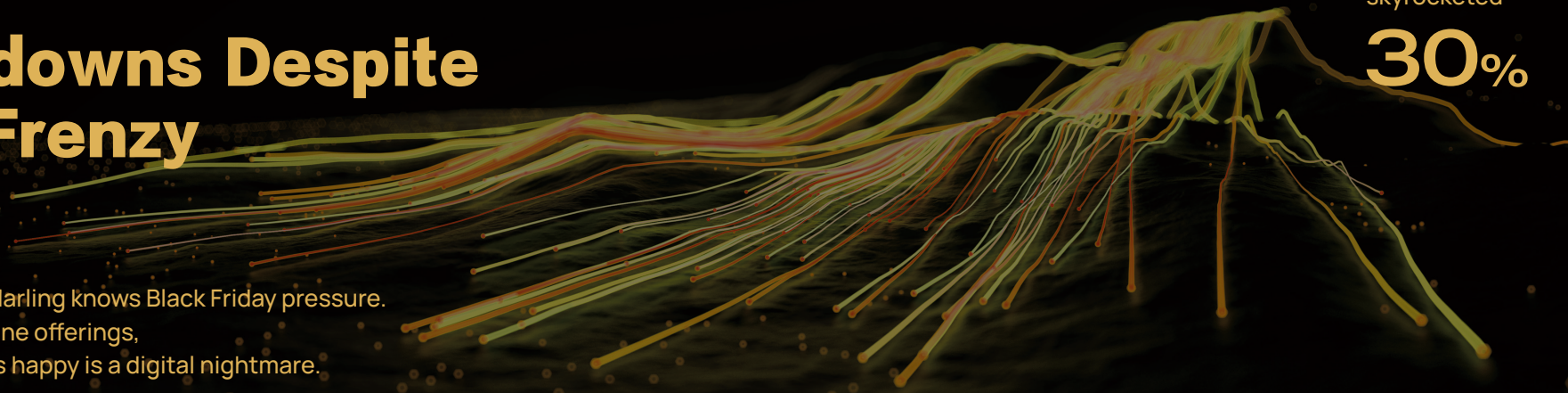
Zero Breakdowns Despite Promotion Frenzy

Cloud Native Infrastructure

This Turkish fashion e-commerce darling knows Black Friday pressure. With 290 stores and 3.8 million online offerings, keeping millions of young shoppers happy is a digital nightmare.

Cloud resource utilization skyrocketed

30%



Sale

For years, their reliance on on-premises data centers meant Black Friday often turned into a technical meltdown, frustrating customers and impacting sales. In 2023, a game-changer emerged: Huawei Cloud launched a cloud Region in Türkiye. This opened the door for IPEKYOL's IT partner, Proj-e, to migrate their systems that back IPEKYOL's online store to the cloud.

The result? A Black Friday that never goes dark, thanks to the VMs provisioned in just minutes. This impact went beyond the Black Friday too – resource utilization skyrocketed by 30% and unlocked new possibilities. Now, IPEKYOL embarks on its full cloud native transformation, ready to leverage advanced cloud services for even more innovation and benefits.

DingDongFresh

An Innovative Architecture Keeps Food Sweet and Fresh

Big Data, Kunpeng Cloud Services

Founded in 2017, DingDongFresh innovatively procures their produce fresh from the source and stores them in distributed mini warehouses for delivery within 29 minutes.

In the face of increasingly fierce competition, DingDongFresh upgraded its service architecture to reduce operations costs and improve profitability.

In the past, DingDongFresh deployed offline and real-time clusters together, but with tens of thousands of data tables and dozens of services, and O&M was extremely complicated. Even a simple SQL statement could affect core services, severely compromising service response quality and customer experience. To address this issue, DingDongFresh leveraged Huawei Cloud x86/ Kunpeng heterogeneous computing services and clusters to improve their services. This helped DingDongFresh decouple offline services from online services, improving overall performance by 25%.

Big data analysis is critical to refined e-commerce operations, product recommendations,

personalized services, and marketing promotions. DingDongFresh now has dozens of TBs of more data daily. The previous big data platform, which they had built themselves, could not be iterated and was not strong enough to efficiently support service development. Moreover, the local disk architecture used integrated storage and compute, an inflexible configuration that was driving up costs. To address this issue, DingDongFresh used Huawei Cloud MRS, which is 100% compatible with the latest open-source components, and advanced technologies, such as distributed indexing, metadata acceleration, and cache optimization, to further improve offline and real-time analysis. In addition, the decoupled storage and compute, using Huawei Cloud OBS, enabled DingDongFresh to scale storage and compute resources independently and on demand. They could store their data all in one place, share multiple clusters, and improve resource utilization. Overall, Huawei Cloud helped DingDongFresh reduce their costs by more than 20%, and will help the company lower the cost of data expansion by more than 30% in the coming years.

In addition to this cooperation, DingDongFresh and Huawei Cloud have been finding new ways to get users more engaged with limited marketing budget. The Huawei Cloud intelligent marketing service, KooMessage, aggregates traffic from 500 million devices and converts traditional SMS messages

into rich media messages. This enabled DingDongFresh to reduce the cost of user acquisition, improve user engagement, drive the ROI by more than 40%, optimize user experience, and achieve better outcomes from their promotions.



Ebdaadt

Improved User Satisfaction Translates into 23% Higher Monthly Subscriptions

KooVerse, RDS for MySQL

What is your first impression of Qatar, one of the six richest Gulf countries in the Middle East? The 2022 World Cup, oil, gas, gold luxury, and of course, its soaring e-commerce.

Ebdaa Digital Technology (Ebdaadt), a leading e-commerce company in Qatar, is dedicated to developing world-class web applications and websites. It hosts a massive number of applications, including Mzad, the most-downloaded e-commerce application in the region.

Huawei Cloud helps Ebdaadt optimize its infrastructure, so that it can provide powerful and reliable computing and high-quality networks. Huawei Cloud RDS for MySQL uses the enhanced MySQL kernel and multi-thread pools to improve connectivity and reduce replication latency through transaction-level multi-thread replication. This translates into a three-fold increase in connection pool performance in high-concurrency scenarios.

As Ebdaadt's e-commerce business booms, Huawei Cloud maintains network latency within 100 ms and halves hosting costs. Mzad now serves 2 million users, with monthly subscriptions growing by 23%.

Ebdaadt

BluTV

Premium VOD of Popular TV Series on the Cloud

Media Service, CDN

BluTV is Türkiye's No. 1 subscription streaming media platform, with 18.5 million monthly active users. It provides streaming media services, such as satellite TV broadcast and VOD of movies and TV series for Turkish and Arabic audiences in the Middle East, Latin America, Europe, and the Asia Pacific. Given the popularity of its proprietary content in Türkiye, BluTV decided to expand its B2B services by offering TV broadcast services to Turkcell, a major carrier in Türkiye.

The growing live broadcast and VOD services of BluTV call for more stable IP transmission and more flexible subtitles and audio tracks to meet the requirements of different platforms. Concurrent views often skyrocket when popular TV series debut. BluTV needs to maintain an optimal video experience regardless of the number of viewers streaming simultaneously.

BluTV

OTT media service facilitates the VOD of popular TV series and live broadcast

BluTV runs its own transcoding software and content management system (CMS) on cloud VMs, and integrates digital rights management (DRM) to build livestreaming and VOD solutions. Satellite live broadcast, online livestreaming, and VOD service systems are provided by different vendors, which results in difficult management, inconsistent experience, and expensive O&M. Huawei Cloud's one-stop OTT solution, featuring comprehensive media processing, is the answer. The solution supports media assets of RTMP, HLS, DASH, and SRT. Just In Time Packaging (JITP) helps the customer reduce storage usage and optimize costs. The one-stop OTT origin server on the cloud is ever-evolving and guarantees unified management and a consistent experience. Now BluTV has processed and distributed the content of seven live channels on the Internet, as well as the VOD of popular TV series.

Livestreaming and VOD content distribution on CDN smoothens video experience

A new TV series on BluTV means a three-fold growth in concurrent views. To deliver a premium video experience, the origin server and CDN must be able to tackle traffic surges. Huawei Cloud rose to the occasion. With a bandwidth of 180 Tbit/s on more than 2800 CDN nodes deployed worldwide, Huawei Cloud helps BluTV reduce first-frame latency by 30% and frame freezing by 60%, coupled with a playback error rate that is less than 0.01% and monthly traffic over 8 PB.



Huawei Cloud's media services and CDN help us lower the buffer rate of popular TV series from 0.25% to 0.1%, boost playback smoothness by four times, and successfully play 99.99% of VOD videos. Together we combine smooth HD with low latency on the cloud to offer a superlative experience for our audiences.

Erkut Göksel ÇINAR,
CTO of BluTV

BBTV

Cloud-Cloud Collaboration Unlocks Superior Video Services

Media Service, CDN

Thailand's Largest TV Station
BBTV Channel 7 (CH7)
CH7 has migrated its core VOD
and livestreaming platforms to Huawei Cloud.

In December 2021, CH7 obtained the rights to broadcast the ASEAN Football Federation Championship live. Huawei Cloud's leading video processing capabilities and highly reliable solutions helped BBTV successfully stream the premium sporting event.

BBTV New Media operates the largest OTT platform in Thailand. Huawei Cloud provides high-performance IaaS and SaaS cloud services that significantly improve users' streaming experience nationwide. Mobile

applications of BBTV, such as CH7 HD LITE, have been released on HUAWEI AppGallery and downloaded by more than one million users.

Huawei Cloud services, such as Live, VOD, and CDN, help BBTV provide premium video services for more than 10 million users in Thailand, with service performance up by 20%+ and TCO down by 30%.



MNC

One-stop OTT Media Elevates User Experience to New Heights

OTT, CDN

MNC Group is an Indonesian multinational conglomerate engaged in media. It focuses on four strategic businesses: media and entertainment, finance, real estate, and energy.

Among them, the media and entertainment business plays the largest role, spanning across a broad array of fields, such as the largest TV station in Indonesia, four FTV channels, RCTI+ (OTT platform), Vision+ (video streaming service), advertising media, pay television, and IPTV subscription media. Among the 20,000+ hours of new content produced by MNC annually, phenomenal programs such as *Indonesian Idol* and *Esports Star* stand out. On top of being a content creator, MNC also streams major sports events both in and outside Indonesia.

Despite its large size, MNC is not immune to the huge impact of increasingly popular short videos. To tackle these challenges, the group called for business innovation to attract and retain users with a better user experience. Another major concern of MNC was its own IT system, which was not able to handle the traffic bursts that came

with streaming popular sports games, such as the ASEAN Football Federation Championship. The complex O&M of MNC's IT system also posed challenges on live transcoding. MNC sought a super app that integrates multiple service modules to enhance user loyalty.

The in-depth collaboration between MNC and Huawei Cloud put an end to all these problems. Huawei Cloud's one-stop OTT solution integrates multiple streaming media applications, such as livestreaming, VOD, and social media. The advanced transcoding technology reduces the bitrate usage by 40–60%, maintaining HD with less consumption of storage space and bandwidth. Huawei Cloud's CDN central node deployed in Indonesia slashes the latency of edge content retrieval by 60–90%, significantly improving user satisfaction. The reserved Tbit/s-level bandwidth ensures stable livestreaming of major events, keeping system breakdown at bay even when there are millions of concurrent requests.

Looking ahead, the two parties will deepen collaboration in fields such as virtual streamers and UGC-based livestreaming to create more service forms for greater growth.



MNC is not immune to the huge impact of increasingly popular short videos. To tackle these challenges, the group called for business innovation to attract and retain users with a better user experience.



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Hunan TV Technology Innovation Takes Variety Shows to New Heights

MetaStudio

Ratings of major
platforms
nationwide

No.1



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The Hunan TV New Year's Eve Gala 2023 revealed the pioneering efforts made by Hunan TV in VR, which were empowered by Huawei Cloud's cutting-edge media technologies, such as MetaStudio for digital content production, MetaEngine for AI rendering acceleration, and Workspace for remote collaboration. These advanced technologies set the stage for a visual feast, including *Creating Romance*, which was hosted by virtual humans, and amazing XR performances *Warmth Under the Sky* and *Picking Stars*. With such an unparalleled visual experience, the viewership rating of Hunan TV's New Year's Eve Gala exceeded 1% soon after the program started, topping major platforms nationwide.



Creating Romance features real-time control throughout the entire process, including the high-precision capture of motion and facial expressions, light control, and AR rendering. Special effects and particle effects also improve the real-time display of virtual humans. To ensure synergy between the real and virtual actors on stage, four stands were set for the program, each of which was equipped with a virtual-real integration system to render and control virtual humans. This maximized the stability and accuracy of virtual human rendering of each stand, making virtual humans look more realistic and improving the effects of lights and shadows.

Huawei Cloud designed the technical solution for XR programs *Warmth Under the Sky* and *Picking Stars*. The XR performances blended the ideas of numerous production teams with advanced computer graphics (CG), and featured efficient rendering made by MetaEngine, a cloud native intelligent rendering engine. Built on these advanced technologies, a story of one's love for home and country was presented on a fantastic virtual stage.

433 Football From Fans to Fortune

The world's biggest football fan community has a massive Instagram following and knows fans are the heart of the game.

Cloud costs slashed

25%

But keeping such a passionate throng engaged is challenging. Monetization was tricky, peak hours were interrupted, and the technical architecture needed a modern makeover. Huawei Cloud, the ultimate teammate, entered the field.

Targeted solutions like database optimization, cloud native upgrades, and access acceleration tackled 433 Football's pain points one by one. Now, global users enjoy silky-smooth access even during the most heated matchups. Service interruptions are a thing of the past, and best of all, user engagement is soaring.

The wins go beyond fan experience. 433 Football's cloud journey has slashed cloud costs by 25%, freeing up resources for new initiatives. Plus, with Huawei Cloud's comprehensive partnership, global expansion and operational efficiency are now within reach.



433 Football

Bilibili

Virtual-Real Integration and Smooth Streaming of Major Events

MetaStudio, Media Service

Bilibili is one of the most popular video platforms in China. Its services span a wide range of fields, such as video on demand (VOD), livestreaming, gaming, and e-commerce. Bilibili is home to enthusiasts of Anime, Comics, and Games (AGC) and creative content uploaders, averaging 324 million monthly active users and 4.1 billion daily video views.

To retain such a massive number of users, interesting content and a premium video experience are essential for the growth of Bilibili.



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One of the proven innovations created by Bilibili in the virtual-real media field is the Phantom Star, where streamers can interact with their peers as virtual beings in real time.

The interactions are not confined to streamers. Their followers can also use the virtual images on the cloud to interact with streamers in different scenarios. Such virtual-physical fusion would be impossible without imaginative virtual content creation. This is exactly where Huawei Cloud MetaStudio, a digital content production pipeline, can come into play. Powered by the graphics engine and spatial engine, MetaStudio helps you create virtual humans, perform virtual livestreaming, and build 3D enterprise spaces to connect the virtual to the real.

One of the pain points for the VOD of Bilibili is how the Content Delivery Network (CDN) hit ratio was below expectations.

Due to the service model and recommendation algorithm of Bilibili, most videos need to be requested by users, resulting in a CDN hit ratio of just 78%. Video retrieval from the origin server or OBS pseudo origin server needs to pass through the public network, driving up bandwidth costs. To solve these pain points, Huawei Cloud offers a VOD solution that concentrates less requested streams at the edge. This approach delivers a downlink CDN hit ratio of 90%, reduces CDN retrieval costs by 10% and public network bandwidth costs by 72%.

Livestreaming is another important service provided by Bilibili. During the 2022 League of Legends World Championship, Bilibili streamed 91 games, with the last game watched by more than 310 million people.

Such high-concurrency livestreaming was smoothed by Huawei Cloud's distributed livestreaming solution, which deployed Bilibili's proprietary media processing services, such as live transcoding, video recording, and snapshot capturing, on seven Huawei Cloud Regions. With distributed regional live centers, the pushed streams were transcoded and recorded at the edge in real time, which eliminated single points of failure that frequently occur at the origin server for more stable and secure streaming. Coupled with Huawei Cloud Container Engine (CCE) that is capable of scale-out in seconds, Bilibili's livestreaming service can remain stable even when there are 5.12 million concurrent viewers.

TravelgateX

Go Cloud, Go Global

Exploring New Opportunities on the Cloud

CCE Turbo

ECS resource utilization increased **40%**

"Huawei Cloud is a real good player on the innovative area and I think they are bringing real use cases solution to the travel industry. We always look for a partner to work together and grow together and I think we have found this business partner in Huawei Cloud."

Iñaki Fuentes,
Chief Operating Officer of TravelgateX

TravelgateX is the largest Internet aggregation platform for tourism and hotel services in Spain. It connects 600+ upstream hotel suppliers and 400+ downstream travel agencies. Its daily orders exceed 40,000, more than 6 billion upstream and downstream query requests are processed every day, and the aggregated transaction traffic is nearly 100 TB.

During service development, TravelgateX faces challenges such as high cloud service costs and increasingly saturated European and American markets. It looks forward to cooperating with Huawei Cloud to seek new growth opportunities by reducing TCO and expanding business markets.

Huawei Cloud's high-performance CCE Turbo optimizes resource scheduling, which improves ECS resource utilization by 40%. After replacing TravelgateX's original Squid clusters with CCE Turbo clusters, Huawei Cloud reduced the number of ECSs and O&M. This greatly reduced TravelgateX's cloud expenditures and OPEX while offering more cost-effective cloud service experience.

Leveraging Huawei Cloud's "Go Cloud, Go Global" strategy and expertise, TravelgateX has successfully migrated their business from the European and American markets to the Asia-Pacific and China markets, which become a key engine for future growth.

TianYanCha

Service Rollout from Weeks to Days

FunctionGraph, CCE

This emerging Internet enterprise collects information on 310 million social entities in more than 300 data dimensions and 400 million users, topping China's business query industry.

All this information data and user traffic means new challenges in achieving stable, secure, and efficient operations.

TianYanCha works with Huawei Cloud on application modernization.

Clearer, more flexible architecture

Upgrading the microservice-based service architecture shortens service rollout from weeks to days. Overall development efficiency of new features improves 43%. FunctionGraph is a serverless architecture for applications to keep pace with changing requirements.

Safer, more agile data services

Unified multi-mode processing links improve data development efficiency by 30%. Decoupling data and services improves access security and convenience, doubling O&M efficiency.

Smarter, more elastic deployment

Huawei Cloud CCE powers scaling in just 1 minute during peak hours for better task scheduling and 30% lower resource costs. Thanks to Huawei Cloud containers, applications are tested and rolled out in minutes, while faults are located and rectified in seconds. The E2E cloud native DevOps process handles traffic peaks easily.



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CMGE

Stable Gaming Experience for Millions of Concurrent Players Online

GaussDB(for MySQL) and Document Database Service (DDS)

CMGE is a leading international gaming company with a focus on intellectual property (IP). With this focus on IP, CMGE provides high-quality IP-based games for players worldwide, and has created a highly competitive IP gaming ecosystem. "Rakshasa Street: Born to be King" is an action role playing game (ARPG) based on the iconic Chinese manga, "Rakshasa Street". Before this game was officially released, the game already had more than 7 million subscribers.

While ensuring the original IP content of the game, CMGE introduced a new style of ARPG gameplay where you pair up with spirit creatures and join battle together. This kind of gameplay demanded additional performance, scalability, and stability requirements from the servers. The Huawei Cloud database team offered a solution that integrated GaussDB(for MySQL) and Document Database Service (DDS) to effectively facilitate the launch of Rakshasa Street: Born to be King. By isolating read/write operations from each other, the game is able to handle millions of concurrent requests during peak hours. Decoupled storage and compute ensured ultra-low latency and stable game running. The instance classes of GaussDB(for MySQL) could be changed in batches, and the disk space could be quickly scaled without affecting workloads, which made batch O&M easier.

Rakshasa Street: Born to be King was rapidly launched, thanks to the dependable Huawei Cloud databases. The entire process, from internal testing to rollout, was accomplished within a month, 50% faster than was expected. The game launched smoothly on its first day, providing a seamless gaming experience for millions of players and quickly climbing to the top spot among the most popular games on Huawei AppGallery.



HERO GAMES

Huawei Cloud Helps Develop Quality Games for Players

Cloud Native Infrastructure and CDN

HERO GAMES has many popular IP-based games such as Dynasty Legends 2, LvSe ZhengTu, Three Kingdoms, Gray Raven: Punishing, and Black Myth: Wukong.



Huawei Cloud offered a complete range of game development and operations solutions, helping HERO GAMES deliver a flawless gaming experience to their players. With countless nodes around the world, Content Delivery Network (CDN) precisely scheduled user requests to the most suitable nodes to relieve the pressure on origin servers. The first month following the launch of LvSe ZhengTu witnessed a revenue of over CNY80 million and more than 8 million players worldwide.

Thanks to the dependable cloud infrastructure and innovative technologies of Huawei Cloud, HERO GAMES was able to provide a stable and reliable gaming experience to a vast number of players. Dynasty Legends 2 climbed to 7th place in App Store during its first week of the OBT. CDN has been safeguarding the games that were launched and entered the operations stage, such as Creation & Magic, and provides fast and stable access for game players. In addition, CDN ensures smooth game migration from other clouds to Huawei Cloud.

Huawei Cloud provided a wide selection of solutions for HERO GAMES in terms of game testing, 5G+cloud gaming, AR/VR, and big data service platform and worked with HERO GAMES to build quality games for players.

Protecting the Wild with Tech and AI



Reclaiming

Norway, the world's biggest breeding ground for wild Atlantic salmon, is fighting an invasive species called "pink salmon".

Huawei and Berlevag JFF have collaborated on a cutting-edge solution that utilizes Huawei Cloud AI to identify and filter out these invaders. The Storelva River in Berlevåg witnessed the world's first intelligent salmon filtering system in June 2022, saving over 90% of manpower and ensuring the safety of wild Atlantic salmon and Norwegian river ecology.



📺 CASE VIDEO
🔍 CASE DETAILS

Reseeking

The Mexican government established Dzilam State Reserve in the Yucatan Peninsula. Spread over an area of 690 km², this giant habitat is home to rare and endemic species.

Huawei Cloud provides cloud compute and storage to Polytechnic University of Yucatan (UPY) for training image recognition models. Images are collected monthly and uploaded to Huawei Cloud in real time for analysis using machine learning and algorithms to identify animal species.



📺 CASE VIDEO
🔍 CASE DETAILS

Reviving

The coral reefs in the Blue Bay of Mauritius are renowned. However, their survival is in jeopardy by pollution, overfishing, and rising sea temperatures caused by climate change.

Huawei Mauritius joins Ecomode Society in deploying a combination of cloud technology, underwater cameras, GPS receivers, and 4G technology to safeguard and revive the coral life in Mauritius.

By August 2023, a remarkable achievement was made in restoring the ecosystem off the eastern coast of Mauritius. 25,000 coral fragments were successfully transplanted from coral nurseries to 20 square kilometers of the Pointe aux Feuilles coral reef. Another 1,890 coral fragments are currently flourishing in the nurseries.



📺 CASE VIDEO
🔍 CASE DETAILS

Cloud Helps 140,000 Rangers Safeguard the Forest and Beyond

Huawei Cloud Stack



Harmony is achieved here in the Tangjiahe area of the Giant Panda National Park in Sichuan. The Park is home to more than 2,600 types of plants and more than 1,000 species of animals, including over 70 species that are nationally protected, such as the giant panda, greater kudu, and the golden snub-nosed monkey.

This area is prone to wildfires due to its alpine canyons, dry climates, and unpredictable winds, which can cause severe damage to the ecosystem. With no network or electricity in the mountains, everything was done the old-fashioned way. Rangers used to walk 10 kilometers a day in the mountains and relied solely on non-electronic means of communication.

Sichuan Forestry and Grassland Bureau worked with Huawei to build a wildfire monitoring and reporting system linking

ground, space, and people, based on Huawei Cloud Stack. Huawei Cloud Meeting, Live, and AI services connect satellites, drones, watchtowers, and smart terminals to empower forest rangers. The temperature of the ground is observed and any areas of high heat are identified and confirmed within an hour. This allows for the early identification, reporting, and handling of fire hazards. Forest rangers in the wild can patrol protected areas with smart devices and cloud systems. Their whereabouts, logs, and communications during patrols are constantly monitored and guaranteed in real-time.

The system has been connected to 12 satellites, more than 900 ground monitoring systems, and more than 140,000 rangers. Modern technologies surpass the limits of human eyes and ears, making ecological protection smarter and more effective.



© CASE VIDEO

Safeguarding the Last 36 Hainan Gibbons

24/7
Data storage

90 days
Constant monitoring



The Hainan Tropical Rainforest National Park has the most concentrated, best preserved, and largest contiguous tropical rainforests in China. Bawangling, an area within the Park, is known for its abundant natural genetic resources and is the habitat for Hainan gibbons.

According to the International Union for Conservation of Nature (IUCN), Hainan gibbons are the world's rarest primate. There are only 36 Hainan gibbons for now. Their late sexual maturity is often considered a threat to their survival. Generally, it takes gibbons 8 to 9 years to reach sexual maturity, and they typically only have one baby every 2 years.

Delving into the world of gibbon sounds is an effective way to gain valuable insights into their behavior. Huawei, together with IUCN and the Hainan National Park Research Institute, has deployed a real-time monitoring system. This AI system is made up of audio-monitoring devices that are connected through a wireless network. Gibbons' audio data can be continuously sent to the cloud for a period of 90 days.

As a result, gibbons' sounds that were difficult to manually identify can now be successfully extracted and analyzed. And each gibbon has a unique voiceprint. In this way, either young gibbons in the group or lone adults can all be monitored, and researchers are better positioned to help encourage gibbon reproduction.

Gibbons' sounds can now be successfully extracted and analyzed. And each gibbon has a unique voiceprint.



Q CASE DETAILS

Nature Guardian for a Global Ecosystem

Huawei partnered with protection organization Rainforest Connection (RFCx) to develop Nature Guardian, an acoustic monitoring system.

This system collects sound data from its surroundings and wirelessly transmits the data to the cloud. Huawei Cloud analyzes the data with AI to identify sound and detect illegal logging and poaching for the protection of endangered species and ecological balance.



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Q CASE DETAILS



Rainforest

In the rainforests of Costa Rica, Sarawak, and Palawan, the sounds of chainsaws and trucks are accurately identified to prevent illegal logging.



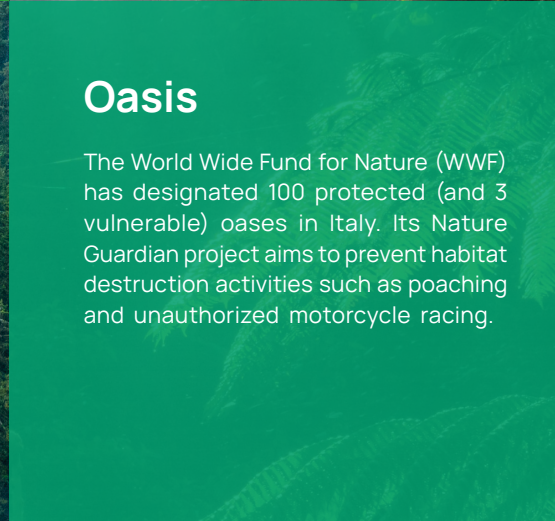
Wetland

Austria's Lake Neusiedl covers an area of 18,000 hectares. It is the largest continuous reed area in Europe and home to many wetland creatures. The Nature Guardian system continuously collects all animal sounds, so that local personnel can predict the impact of climate change on animals and plants and formulate protection measures.



Oasis

The World Wide Fund for Nature (WWF) has designated 100 protected (and 3 vulnerable) oases in Italy. Its Nature Guardian project aims to prevent habitat destruction activities such as poaching and unauthorized motorcycle racing.



Valley

The "Nature Guardian" was deployed in the Nahuelbuta mountains and the Aaos Gorge to detect the sounds of gunshots, trucks, and chainsaws to prevent illegal logging and poaching. This project protects two endangered species: the Darwin's fox and the Balkan chamois.

Agricultural area

WWF, RFCx, and Huawei joined forces once again to deploy cloud- and AI-infused acoustic monitoring systems across 8 oases in Italy. Their mission is to delve into the world of bioacoustics. By comparing the biodiversity of organic agricultural areas with their traditional counterparts, they aim to uncover the most effective practices for sustainable agriculture while preserving our ecosystem.



Ocean

RFCx partnered with Ocean Research & Conservation Association Ireland (ORCAIreland) to launch the Smart Whale Sounds project off the South Coast of Ireland. This project helps with the identification and classification of different species in Irish waters. It helps track their distributions and behavior and how noise pollution is changing these patterns.

EPILOGUE



The sky is no longer the limit
From turning challenges into opportunities
From following the leader to leading the pack
We drive change with changes

Changes that transcend the ordinary
Changes that redefine the predictable
Changes that surpass limits
Breathing new life into ancient craft
Breaking new ground in global expansion
Starting a new chapter for all walks of life

Change keeps us moving forward
But one thing remains constant - our mission:
Accelerate intelligence with Everything as a Service
Huawei Cloud works with
Our customers, partners, and developers
To build the cloud foundation for an intelligent world



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