

WinWin



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Philips and Huawei
Just what the doctor ordered

Going Dutch on
transformation
with **KPN**

Connecting a
world of things



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Resource-sharing through collaboration

Telcos and electric power companies are parallel industries that provide completely different services, but there's ample room for them to work together.

Telcos need to step up investment in fiber optic networks to grow their businesses and provide universal broadband. Today, 50 percent of households aren't connected to broadband and only 10 percent of those who are connected have access speeds above 25 Mbps. Historically, telcos have been unwilling to invest because of the long payback period for fiber optic fixed-line broadband.

At the same time, some power companies are looking at how to expand the use of their power networks, which already reach thousands of households. Smart homes and services like home broadband access and video services are a great choice. At the end of 2016, the Norwegian power company Lyse launched Europe's first 4K UHD television service through the subsidiary Altibox over a new-generation video platform and an all-optical network covering the whole of Norway. By providing millions of families in the country ultra-HD video services, Lyse transformed from an energy provider into a home broadband and video content operator.

Collaboration is a must. More telcos and power companies are choosing to cooperate to accelerate broadband network deployment. In one case, Sichuan Telecom harnessed electricity poles to construct its all-optical network by attaching fiber optic cables to them, reducing costs and accelerating deployment.

In Southeast Asia in 2016, three operators spearheaded an industry alliance comprising 17 members, including representatives from government, real estate, property, fiber optic, equipment vendors, content providers, and water and electricity infrastructure providers. By strengthening collaboration, the alliance increased members' inclination to construct broadband. This model can solve challenges encountered during fixed-line broadband network construction process, forming an ecosystem for broadband construction that shares costs and benefits.

To create a truly sustainable digital future world, multi-party collaboration is a wise choice.

Sally Gao, Editor-in-Chief



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WHAT'S INSIDE

CON

Voices from Industry

01 Adding up the gains with Turkcell's TV+



Turkcell grew its TV+ subscriber base to 1 million in just two years. CMO Ismail Butun explains why video is the Turkish telco's new growth catalyst.

06 Philips and Huawei: Just what the doctor ordered



Rapid disruption is happening in the healthcare space, with cloud, AI, and biosensors poised to form your personal health team. Find out what Philips and Huawei are doing to get you there.

09 Say yes to sustainability: The planet and your bottom line will thank you



Environmental and business expert Jim Harris from Strategic Advantage explains why sustainability and digital transformation are not just one and the same, but also highly profitable.

TENTS

13 BH Telecom: Starting from scratch



After the collapse of Yugoslavia in 1992, BH Telecom shows how digital transformation is the way forward as Bosnia and Herzegovina continues to rebuild.

Perspectives

17 ICT infrastructure and smart devices drive the intelligent world



Huawei is a driver and enabler of this intelligent world, with collaboration sitting at the heart of a thriving ecosystem. Looking forward, Huawei's strategy comprises three elements: building more connections, enlarging data pipes, and enabling digitization.

22 Fiber networks: Faster payback means Better Connected



Enterprises are going digital, which is good news for operators. However, only optical fiber networks can meet requirements. What's the best strategy for minimizing costs and maximizing returns?

28 Platforms for the best outcomes

Tao of Business

33 Connecting a world of things

37 Massive MIMO is the future of wireless networks

41 4 stages to new money from new video

46 FTTH dream team: Telcos and power companies

48 Cutting TTM the smart way

Winners

51 How two telcos succeeded in Europe with video

57 Rostelecom slims down for financial and digital gains

61 Ningxia Mobile goes digital with Big Connectivity

64 Going Dutch on transformation with KPN

67 Sichuan Telecom: All-seeing with all-optical

Adding up the gains with Turkcell's TV+



Scan for mobile reading

Riding on the public's burgeoning love affair with mobile video, Turkcell managed to grow its TV+ subscriber base to 1 million in just two years. Moving forward, Turkey's leading telco has great confidence in video as a new growth catalyst and CMO Ismail Butun explains why.

By Julia Yao, Vanty Guo



Big opportunities

It's no secret that telcos have suffered stagnant growth and declining margins over the past few years. To compete against OTT players and stay relevant to subscribers' changing lifestyles, they're invariably seeking new avenues of growth. Turkcell's Butun, who had worked in FMCG for 16 years before joining Turkcell, is optimistic, believing

now to be a time of opportunity for telcos, "When you look in from the outside, you can see there's a lot of opportunity and we're so lucky to be in this industry." And one big opportunity, he says, is mobile video.

Like any CXO, Butun keeps a close eye on industry trends and is particularly excited about what he's seeing with mobile data. According to StatCounter, people browsed



“ As Turkcell is shifting from being a network provider to a customer experience provider, mobile and video is our main focus. ”

— Ismail Butun, Turkcell CMO

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We have the capability to provide end-to-end and integrated services. So we see ourselves standing in the middle of a perfect storm.

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more on mobile devices than on PCs for the first time in November 2016, marking what Butun describes as “a historic moment.” This is a trend that we can expect to continue – the Visual Networking Index, for example, holds that global mobile data traffic will increase sevenfold between 2016 and 2021.

“Mobile video traffic accounted for 60 percent of total mobile data traffic in 2016 and over 78 percent of the world’s mobile data traffic will be video by 2021,” says Butun. “As Turkcell is shifting from being a network provider to a customer experience provider, mobile and video is our main focus.”

A perfect storm

When it comes to video, he believes that Turkcell holds a unique position based on its infrastructure and customer data. The telco serves 68.9 million subscribers across nine countries, and is the leading mobile operator in Turkey with a subscriber base of 34 million. In terms of market positioning, Turkcell is a converged operator that delivers fixed and mobile broadband, TV, and music services. According to Butun, “We have the capability to provide end-to-end and integrated services. So we see ourselves standing in the middle of a perfect storm.” The operator had made fiber available to 2.5 million homes as of July 2016, and – after the



If you're an IPTV subscriber and start a movie or football game on TV, you can turn on your tablet or use your mobile phone to continue watching if you go out.



Health Ministry – holds more customer data than any other domestic company.

Turkcell launched its TV platform towards the end of 2014. It hit the market with two product forms – IPTV for household users and an OTT product for mobile users, both available in various quad-play packages.

Service performance was solid from the start, attracting 560,000 subscribers in the first year. Then two more milestones were reached in 2016 – April saw the launch of Turkcell's 4.5G network, which was followed by the introduction of 4K streaming services two months later.

Added to the tech came richer content in the shape of the English Premier League and NBA, which were rolled out on the TV platform in September 2016. In fact, the operator added more than 50 HD channels last year, including Animal Planet, Discovery, and Disney, as well as the two sports favorites. "Our content is really much richer than last year," acknowledges Butun. "That gave us a good position in the market place. And 4K, with superior network experience thanks to the 4.5G network, has really paid off." The figures agree: By the end of 2016, Turkcell had attracted over 1 million TV subscribers. "On the IPTV side, we have 360,000 subscribers, and

on OTT side we have 700,000."

Content + Infrastructure

Turkcell's TV+ service is cloud-based and supports timeshift and VoD. The offering is personalized and interactive, as viewers can share what they like. But, Butun believes that the biggest strength of TV+ is the seamless multi-screen experience, "If you're an IPTV subscriber and start a movie or football game on TV, you can turn on your tablet or use your mobile phone to continue watching if you go out." The offering also provides four streaming channels, which really adds value to customer experience. Moreover, with data bundled into packages, subscribers don't face bill shocks, "There are no big surprises, only a good surprise on the experience side," says Butun.

He pinpoints the two main success factors in Turkcell's TV strategy, "Rich content and a really good infrastructure." Though these are not new concepts, execution is the factor that sets Turkcell's TV+ offering apart from rival products. On a standard OTT TV platform, you normally have VoD for movies and TV shows. But on Turkcell's platform, customers can choose from more "than 120 live channels, covering all national channels and most local TV channels, in addition to VoD services," explains Butun.

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To justify investing in content, you have to establish a very sustainable business model. You have to find middle price points with different packages for a varied content portfolio to increase ARPU.

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The power of 4.5G

When it comes to networks, he observes that, “3G is good, 4G is good too. But when we launched 4.5G [in 2016], it really made a difference.” Having acquired 47 percent of the total spectrum available in the country, Turkcell also boasts the fastest mobile and fixed Internet in Turkey, with the Ookla 2016 speed awards recording a download speed of 375 Mbps on its mobile network. “We provide the fastest mobile Internet connection in the world,” says Butun. “We’re proud of our infrastructure. That’s important because rich content won’t be successful if it’s always buffering.”

In 2014, the peak download speed recorded was 1.6 Gbps. By 2016, it had jumped up by almost 18 times to reach 24 Gbps, which is expected to rise to 29 Gbps by the end of 2017. The amount of TV consumed is also on the up – before LTE, it was around 7 minutes a day per subscriber, but now it’s 40 minutes. “It’s huge, huge traffic,” states Butun. “That was our goal, and we reached it earlier than planned”

What’s next?

As a result, he’s bullish about subscriber numbers, “In Turkey there are 21 million households and 80 million people. At the moment, we have 1 million subscribers.

So, there’s still a big space to move forwards.”

Without giving specific numbers on growth forecasts, Butun hints that Turkcell may adjust its goals upwards because current growth is already exceeding targets.

However, the telco knows that it needs to run the right business model, because the TV business is very costly due to content. “To justify investing in content, you have to establish a very sustainable business model. You have to find middle price points with different packages for a varied content portfolio to increase ARPU.”

To consistently deliver the highest quality video streaming service, the telco is looking to upgrade from HD to UHD in the near future, which is where Huawei comes in, “Huawei is both our infrastructure and TV platform provider,” states Butun. “It develops new features for IPTV and OTT every month. And we expect this to get even faster.” Other key technology areas the telco is working on include CDN and video compression.

For Butun however, the whole TV business isn’t about technology per se, “Whatever we do in the next five years, whatever new technologies come, we should never forget that the real connections we want to make is with people.” [www](#)

Philips and Huawei: Just what the doctor ordered

Taking healthcare to the clouds with Philips



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Rapid disruption is happening in the healthcare space, with cloud, AI, and biosensors poised to form your personal health team. Find out what Philips and Huawei are doing to get you there.

By Gary Maidment

In 4Q 2016, Huawei and Philips signed an MOU on a cloud-based healthcare solution for deployment in China. With testing already completed, the project is opening up a future where cloud and machine-learning will digitalize and disrupt the healthcare vertical with unprecedented speed and reach.

Targeting China's smaller urban centers, the Philips-Huawei partnership is keen to expand high-quality cloud-driven healthcare to communities that lack advanced healthcare solutions or physicians with specialist skills.

Cloud AI is able to process vast amounts of data in a much shorter time and with far greater accuracy than a human physician. Ludwig Liang, Head of Population Health Management for Philips in China, points out that this is especially important in China's tier-2 cities, because many physicians "don't necessarily have the skills to read image diagnostics like MRI scans and CT scans. If you ask a doctor to process thousands of images a day, he may miss something." In contrast, AI is adept at spotting patterns in big datasets. For terminal illnesses like cancer, machine learning solutions hosted in the cloud can make a real difference in a patient's prognosis.



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Your steering wheel may be able to pick up on the onset of Parkinson’s disease from small tremors in your hands; or your shower or bath might be scanning you for tumors on a daily basis.

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Cloud AI in the healthcare domain benefits individuals, physicians, and populations.

Helping you help yourself

Mobile technology and apps put personal healthcare management in the hands of the individual, moving away from a reactive and sporadic model to one that’s proactive and always-on. According to Liang, “Using an app, people get objective data from a cognitive device, rather than just the word of someone they might not trust.”

Patients can approach consultation with healthcare professionals on a more informed level, with personal healthcare expanding into predictive monitoring, preemptive action, and even remote diagnostics and treatment. For example, data from a life-logging app that records your habits can work in tandem with wearables that monitor your physiology. Data can be sent to your physician in real time if, for example, your heart rate indicates a possible problem, “We can set a threshold that will alert your doctor so they become aware of something you may not notice,” says Liang.

With tech advancing at such an impressive rate, is there a risk of the elderly and less affluent being left behind? After all, they’re generally more vulnerable when it comes to health and also slower adopters of technology. Liang takes a pragmatic view, “We have to admit that we’re heading into new areas, how healthcare can be

extended from hospitals to homes and leveraging apps and connected devices.” And, for Liang, the concept of extended healthcare is very important – treatment will no longer start and stop in a hospital or doctor’s office after someone becomes sick. Apps, sensors, smart devices, and the cloud will in effect mean “you have your own health team on call 24/7.”

Wearing your heart on your sleeve

Wearable tech isn’t quite there yet, but it’s only a matter of time. “We’re seeing some wearables going through FDA certification right now. So this is happening,” says Liang. In the future, we can expect biosensing functionality to offer a broader overall picture of one’s health, with advances in machine learning promising much greater predictive power. For example, your smartphone might employ voice analysis technology to identify stress, heart disease, or Alzheimer’s based on your vocal patterns; your steering wheel may be able to pick up on the onset of Parkinson’s disease from small tremors in your hands; or your shower or bath might be scanning you for tumors on a daily basis.

He’s also confident that any skills gap can be bridged: “The generations already accustomed to computers and mobile apps are getting older. Many people in their 50s and 60s already use social media like WeChat. They’re picking up new technologies quickly.” Liang also believes that younger



Apps that log behaviors and sensors that monitor health are not only predictive; they can also help ensure compliance with medication and treatment plans.



generations will also play a key role in this regard, “They’ll be thinking ‘Oh, how’s my dad doing today?’ They’ll want to actively monitor their parents or grandparents and ensure they know how to use new technology.”

Apps that log behaviors and sensors that monitor health are not only predictive; they can also help ensure compliance with medication and treatment plans, giving notifications and alerts to optimize treatment efficacy.

A helping hand for doctors

Cloud AI can eliminate a lot of the grunt work for physicians and deliver two major benefits for them. The first is in the area of clinical processing. Doctors will be able to offload part of their work tasks like diagnostics to computers, which are far superior at observing patterns than humans. For example, strokes are caused by blockages or bleeds, but there’s just a 45-minute window to make a diagnosis and begin treatment to dissolve a clot when the first signs appear. However, it can take hours – or even days – for a shadow to appear on a scan that’s recognizable to a doctor.

The second is that it will allow doctors to more efficiently share information and conduct research using massive datasets that can be instantly mined. “[Doctors] collectively can record a huge amount of data from different cases over a long time period,” says Liang. “So,

they have a better chance of understanding different diseases and identifying how they can provide more effective treatment for patients.”

Cloud AI and the analysis of huge datasets will mean healthier overall populations, where trends can identify potential epidemics, implement constant monitoring, and facilitate AI-enabled research into rare diseases and sub-populations or geographies that are too fine-grained for humans to analyze.

Local issues

In China’s case, Liang identifies three areas that tech solutions need to address, “The first is the aging population. People are living longer and so they require healthcare for longer, which stretches resources. The second is the increasing cost of managing chronic diseases, which places a burden on society. The third is the uneven distribution of healthcare resources.”

The Philips-Huawei solution will go some way to leveling the playing field by cutting costs and increasing the efficiency, speed, and accuracy of diagnostics and treatments. “Our collaboration basically covers a cloud platform, but it also includes IoT connectivity and solutions,” says Liang. “We’ve tested our solutions on Huawei’s cloud and we’re very satisfied with the results. Now it’s about both companies working together to go to market.” 

Say yes to sustainability

The planet and your bottom line will thank you



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Environmental and business expert Jim Harris from Strategic Advantage explains why sustainability and digital transformation are not just one and the same, but also highly profitable.

By Gary Maidment

When it comes to a future that's as clean and green as it is technologically advanced, business and environmental expert Jim Harris believes that, "Sustainability and digital transformation are one and the same." But as enterprises embark on ambitious digitization journeys, where does sustainability fit into the business strategy equation?

Slow to change

According to Harris, we've still got a long way to go, "There are literally thousands of solutions that are very, very profitable that we're not engaged in." Given that sustainability profits the planet as well as the corporate bottom line, why isn't everyone jumping aboard the sustainability train? After all, it's not hard to buy into the business case that using less energy, minimizing waste, and implementing other lean and green measures will inject fiscal health

into a company's spreadsheets at financial year-end, especially when such measures tend to tie into digital transformation.

Harris believes that companies can be sluggish to go digital because of a "commitment to existing processes." However, he cites the insurance industry as an example of how change can take off with the right trigger, "Just ten years ago, it took about eight weeks on average from when you had a car accident until you got your check in the mail. It was a hugely intensive paper-bound process." Then, one North American insurer broke the mold by paying 50 percent of claims in eight hours, a 99 percent reduction in processing time. Today, the purely digital insurer Lemonaid has taken the game to a whole new level. "It issues policies in 90 seconds," says Harris "And they have the fastest claim payments in the world – three seconds."

Although first movers in a vertical can raise the bar

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In Toronto, [developers] built a new commercial building and saved 1 million dollars on construction costs by making everything IP-based.

– Jim Harris, Founder, Strategic Advantage

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to the extent that forces others to adapt or fold, digital transformation and sustainability must flow down and through an organization from the top floor. However, C-suite inertia can be a limiting factor, in part because the knee-jerk reaction is that the initial outlay in sustainable solutions will drop a company in the red. Not so, says Harris.

It's payback time

Although ROI varies from scheme to scheme, it tends to be much quicker and robust than businesses think, “There are so many initiatives that have a payback period of less than four years.” Harris uses the example of a major US retailer to illustrate this point, “They only make 3 percent net profit. They need to sell a dollar of goods to make 3 cents, while their sustainability initiatives have an ROI of 25 percent.” The retailer runs a repurpose, recycle, and reuse strategy that includes reusing organic material like cooking oil and sets a zero-waste-to-landfill target. Currently, the company diverts 81 percent of its waste away from landfill sites. “In fact, they’re making more money through sustainability and investing in sustainability than they are by their razor thin margins,” says Harris.

He’s also passionate about how a digital and sustainable approach to buildings can tip the tide firmly in favor of lower energy use, efficiency, and huge cost savings, “In Toronto, [developers] built a new commercial building and saved 1 million dollars on construction costs by making everything IP-based,” he says. “Normally in the core of a building, you have 35 networks running up. You have telephony. You have Internet. You have fire. You have security...In this particular building...they just ran one fiber cable up.” Harris mentions that the solution also benefits the building’s tenants; for example, the consulting firm PwC saved a staggering US\$235,000 because it could use VoIP phones to raise and lower its blinds instead of having to install a separate network.

Harris points out that we tend to think that sustainable initiatives are much more complex than they really are, and that astonishingly simple ideas can make a huge difference. He says that most buildings’ roofs, for example, are a heat-absorbing black even though they’re home to air conditioning systems, “So, on a hot summer’s day, they’re drawing in air that’s much hotter than it needs to be,” states Harris. “Globally, if every roof were a white roof, it would save 2 trillion dollars of carbon

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Sustainability isn't just about saving energy and green solutions – it also includes the long-term prosperity and welfare of society.

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emissions for free.” To get some idea of what this figure actually means in context, the total liquidated wealth in the world is an estimated US\$241 trillion. In environmental terms, it's the equivalent to removing 600 million vehicles from the planet for 18 years. Equally important, he mentions that 27 percent of the electricity used in the US goes on lighting, “The shift from incandescent bulbs, which is a 100-year-old technology, to LED lights can reduce that usage by 80 percent.”

Harris also provides some sobering statistics on the power used by the world's 4 billion electronic devices in standby mode, “[They] consume 480 terawatt-hours a year. That's equal to all the power that all the nuclear plants in France, which is 80 percent nuclear, China, and India produce collectively.” Harris believes that policy makers need to legislate against this waste by requiring manufacturers to make their products draw only 0.1 Watt in standby mode. Doing so would benefit everyone, “Manufacturers have found when the standards are imposed on them, it's actually cheaper to make more efficient power supplies because there isn't as much material, metal, or copper inside them.”

Driving change

In the telecoms world, Harris notes that the majority

of carriers are slow to change as “they've done things the same way for many years. They have this legacy approach both to equipment and to the way they work internally.” He believes that a company like Huawei can make a difference, “Huawei is involved with over 100 different carriers around the world in many different countries, it can bring value to its partners and help them transform into a digital future.”

Huawei promotes a circular economy that reuses components, raw materials, and products. It selects recyclable or compostable materials, and designs products with maximizing lifespan in mind. On the B2B front, Huawei provides customers with green solutions that minimize energy use and thus OPEX. Examples include its green data centers and the Huawei Hybrid Solar Power Solution, which increases power supply by 20 percent, minimizes carbon emissions, and tops the industry with a conversion efficiency of 98.5 percent.

In the B2C space, it's putting its green solutions into the pockets of consumers in the shape of its mobile phones, which comply with the ULL110 standards that assess the sustainability of handsets.

During the product design stage, Huawei builds in



SUSTAINABLE DEVELOPMENT GOALS



easy take-back, maintenance, recycling, and reuse, an approach that gels with Harris’ opinions on the rising problem of e-waste, “The best way to nip it in the bud is to have cradle-to-cradle responsibility,” he asserts. “Whoever manufactured the device must take it back at the end of life. That creates a responsibility for the manufacturer to create a manufacturing process with the end in mind.”

We’re all in this together

Sustainability isn’t just about saving energy and green solutions – it also includes the long-term prosperity and welfare of society. At the 47th annual meeting of the World Economic Forum, Huawei signed The Compact for Responsive and Responsible Leadership, pledging to align its corporate goals with those of society under the umbrella of sustainable growth and investment.

Huawei believes that ICT is critical to achieving the UN’s Sustainable Development Goals at the scale

and speed necessary to fulfill the 2030 Agenda for Sustainable Development. Framed within this commitment is the mission to help bridge the digital divide with projects such as Huawei’s award-winning Smart Healthcare initiative in Kenya, which benefits 200,000 people in remote areas with telemedicine solutions, and its Seeds for the Future program, which partners with 300 universities in 96 countries to cultivate ICT talent. According to Huawei Chairwoman Sun Yafang, “Our ultimate goal is to enable full connectivity between people and people, people and things, and between things and things, and in doing so create a more sustainable, better connected future.”

For a truly sustainable, digitally powered future, the concerted effort of society is required, and in this regard Huawei aims to serve as a driver and enabler. But the journey has just begun. As Harris puts it, “We’re just scratching the surface of what’s possible in terms of energy efficiency, fuel efficiency, and sustainability.” [www](#)

BH Telecom

Starting from scratch



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BH Telecom is the leading telco in Bosnia and Herzegovina, and the first to provide GSM, 3G, and IPTV and a slew of other domestic services. BH Telecom CTO Tarik Carsimamovic discusses the company's aim to bridge the digital divide in the post-conflict nation.

By Linda Xu

Challenging but optimistic

WinWin: What difficulties did BH Telecom face during reconstruction?

Tarik Carsimamovic: There were many, but we saw the challenges as opportunities. Before the war, we had a fixed voice network and a data network based on X.25 technology, though our network and service technologies were already obsolete. So, we tried to rebuild our network from scratch. Our technical staff remained innovative during the war, and actively participated in reconstruction after the war, deploying various technologies such as ATM, FR, DWDM, IP/MPLS network technologies, and 2G and 3G mobile networks. We also introduced service platforms like IPTV, mobile payment systems, and intelligent network systems, and invested heavily in our OSS and BSS. Now, we're very proud of our IT landscape and systems.

Because we built the network from scratch right after the war, we're not lagging too far behind the rest of the world. The only unfortunate thing is

that when we were reconstructing our fixed access network, optical system technologies weren't fully mature and so we didn't launch our optical access network at the beginning. Now, we're suffering bandwidth problems with the access networks in some regions, a problem that we're fully committed to solving.

WinWin: The UN considers broadband a basic right. How far is BH Telecom from realizing this vision? And how can regulators, operators and vendors strive to achieve it?

Carsimamovic: Human rights are the top priority for every digital company, because equal access to communication for all is essential. That's why we've always treated our customers equally, not differentiating between universal service obligations and our service portfolio – all customers have equal and full access to our service offerings.

As technologies evolve, our customers' needs also grow. Right now, we provide around 330,000

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People generally react in the same way to the same situation. The telecoms market is full of competition and it's globalized, and that's why everyone will try to transform into the new environment as fast as they can.

– Tarik Carsimamovic, BH Telecom CTO

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households, of which about 90 percent get coverage speeds of 15-to-20 megabits per second. That's considerable coverage. We also offer more than 70,000 households 50 megabits per second, and 40,000 households 100 megabits per second. Our plan is to raise speeds by 20 percent each year. At the moment, there isn't really any application that requires speeds of 30 to 35 megabits per second, and in the context of basic rights, we already provide adequate broadband capacity for our customers. Of course, we'll spread coverage and raise the speed of our network to continually improve conditions for our customers. Our mobile networks offer the 3G HSPDA service, which theoretically provides download speeds of 42 megabits per second. Because of the shared media in mobiles, any one of our customers using a 3G network experiences an average speed of 5 megabits per second.

Digital transformation on the go

WinWin: How does BH Telecom set itself apart

from its competitors with future-proof networks and seamless user experience?

Carsimamovic: People generally react in the same way to the same situation. The telecoms market is full of competition and it's globalized, and that's why everyone will try to transform into the new environment as fast as they can. The key phrase is digital transformation – the only differences are the method and speed of transformation. Three years ago, BH Telecom started its own transformation from three directions: network architecture, business, and customer experience. In network transformation, we implemented our Master Plan directive, which stipulates three layers of network architecture transformation covering the infrastructure, control, and application layers. The Master Plan sets out principles for system consolidation, which all investments – whether in new systems or upgrading existing systems – must adhere to.

There are two parts to our business transformation: First, we see and treat our customers and vendors

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LTE has failed to generate new revenue streams or a new customer base. Why? Probably because there are no killer applications yet.

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as partners, and re-engineer our business models in this context. Second, we've executed organizational changes by creating two main pillars: the executive directorate for business development, the main responsibilities of which are product development and customer relations, and the executive directorate for technologies and service development, which is organized into three directorates: infrastructure, core network, and services.

So, these organizational changes implement our proposed network architecture. Business transformation acts as a bond between network transformation and customer experience transformation. With customer experience transformation, we're focusing on the processes that help us understand customers' needs and the level of their satisfaction as quickly as possible.

WinWin: BH Telecom plans to launch BH's first LTE service soon. What unique value does it contribute to your overall business strategy and operations?

Carsimamovic: The feedback I have from neighboring countries is that LTE has failed to generate new revenue streams or a new customer

base. Why? Probably because there are no killer applications yet, so bandwidth consumption and the latency requests of average customers are still in the range of the 3G network possibilities. But, new applications, like a 360-degree view and real IoT systems, are emerging. If we're unprepared for those demands, we'll lose customers.

We're also facing huge competition, so we have to remain at the forefront of the market and outpace our competitors, otherwise we'll be resigned to losing more customers.

We're thus implementing LTE to support network architecture transformation. At the same time, we plan to optimize and consolidate our core and access networks. After implementation, we'll try to acquire new customers and additional revenue by offering quad-play services in regions where we don't yet have fixed network access. They'll experience huge improvements with such capabilities, and I believe they'll be satisfied.

Inside out

WinWin: How will BH Telecom synergize its fixed and mobile networks?



We believe that the full commercial benefit of IoT will come with the automation of vertical industries.



Carsimamovic: As a convergent operator, BH Telecom has always offered fixed and mobile network services. The same financial, legal, IT, investment, marketing and sales departments support both segments of network operations – mobile and fixed. We aim to synergize our business operations to support network operations as much as we can and as soon as we can.

We were also the first operator in the region to offer a convergent fixed-mobile voice VPN service. We offer triple-play and quad-play products, and have provided a unified offering and ordering system for more than seven years. We could say that synergy has been the focal point of our business philosophy for a long time.

But, after our organizational changes, we extended the level of synergy between fixed and mobile networks and no longer have organizational silos in network operations. We have infrastructure departments, core network departments and service departments, which are common for any service regardless of whether the origin is fixed or mobile. Our intention is to consolidate all our platforms – ICT as well as OSS and BSS. We think that'll be much more cost-effective, flexible, and efficient after we've

finished our consolidation plans.

WinWin: What do you see as the major global trends in the telecom market? What best practices can you apply to BH?

Carsimamovic: We believe that the full commercial benefit of IoT will come with the automation of vertical industries, and we're focusing on IoT to facilitate automation. For such IoT applications, network transferability, bandwidth, and latency are initial preconditions. Network technologies such as 4.5G and 5G can offer those features. The second precondition for successfully implementing IoT is the convergence of ICT solutions and robotics. Our focus is to integrate ICT solutions for SMEs, prepare for new technologies, partner with enterprises and advise on how they should automate their processes, and use IoT as a system.

The other prediction is that linear television is approaching the end of its expansion. To prepare ourselves for a new era of content delivery, we plan to upgrade our TV platform to interactive multimedia content, because we see that most services used now are video-oriented. [www](#)

ICT infrastructure and smart devices drive the intelligent world



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According to Huawei's Rotating CEO Eric Xu, "The journey to an intelligent world has already begun." Huawei is a driver and enabler of this intelligent world, with collaboration sitting at the heart of a thriving ecosystem. Looking forward, Huawei's strategy comprises three elements: building more connections, enlarging data pipes, and enabling digitization.

By Eric Xu

2016 in figures

In 2016, we showed steady growth in all of our businesses. Our total revenues hit 521.6 billion yuan, our operating profits were 47.5 billion yuan, and our cash flow totaled 49.2 billion yuan. Last year, one of our key priorities was to turn our investment into tomorrow's competitive edge, so we allocated 14.6 percent of our annual revenue to R&D. This investment helped make our products and solutions more competitive and drove progress and technological advancement industry-wide.

Over the past 10 years we've invested 310 billion yuan in R&D, and our R&D headcount now totals 80,000, which has helped us maintain leadership in many domains. In

the future, we plan to invest US\$10 to 20 billion in R&D annually to support the company's ongoing growth, which we expect to remain steady, if not as fast as before.

Over the past two years, we've increased our investment in basic research, which was a significant strategic shift. We raised the percentage of our budget for researching and innovating key future technologies so as to lay a better foundation for enabling the intelligent world.

This intelligent world has three major characteristics:

- **All sensing:** All people and things will have the ability to sense.
- **All connected:** People and people, things and things,



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Huawei is positioning itself as an enabler and driver of the intelligent world. We hope that we can work together with the industry to make this world a reality.

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and people and things will be connected.

- **All intelligent:** Every object will become intelligent, and our world as a whole will be intelligent.

Huawei is positioning itself as an enabler and driver of the intelligent world. We hope that we can work together with the industry to make this world a reality.

The journey to an intelligent world hasn't just begun. Many years of exploration and innovation are driving industry development, presenting huge business opportunities.

If we look back 22 years to 1995, Siemens achieved the very first machine-to-machine connection. Now, there are over 8 billion IoT connections around the world. As early as 1999, Video Networks in the UK launched the world's first IPTV service. That was 18 years ago. Today, more than 150 million homes have IPTV services. DOCOMO launched the first mobile video service in 2001, 16 years ago. Now, there are more than 2 billion mobile video subscribers worldwide. Amazon offered the first cloud services to enterprises 11 years ago in 2006. Today, 40

million businesses globally use all types of cloud services. Each of these opportunities was beset by problems and challenges, but now they're the primary drivers behind the next wave of growth.

With such a massive buildup in progress and experience over many years, we're convinced that a turning point in new growth is upon us. On the journey to an intelligent world, how can companies seize the huge amount of opportunities? This is something we've been thinking about, and it's where we hope to make a contribution.

What does a digital organization look like?

To seize these opportunities, not fall behind, and create an intelligent world, we believe that enterprises, including businesses, governments, non-profits, and schools, must go digital. But what exactly is a digital organization? Our definition and objectives must be clear, otherwise there's nothing to work towards.

At Huawei, we believe that the five characteristics of digital organizations are:



Building more connections is about connecting the unconnected, both people and things; increasing bandwidth; and delivering a better experience.



- Providing employees, partners, and customers with a ROADS experience: real-time, on-demand, all-online, DIY, and social.
- Empowering employees.
- Innovating with greater agility to quickly respond to changing customer needs and technology.
- Developing a healthy ecosystem because, in the digital era, no company can survive alone. You either play a leading role in the ecosystem or you participate in it. A business that's part of a healthy ecosystem is better positioned to grow and exploit new opportunities.
- Achieving intelligent operations, with technologies like big data and AI enabling automated and intelligence-backed decisions to increase operating quality and efficiency.

Further discussion is necessary, because we must clarify our target to establish a clear direction that leads to fewer mistakes.

Three strategies

Nobody knows what form future smartphones or smart devices will take. But, we know that they'll evolve from smart devices to intelligent personal assistants. In the past, we mainly used phones to

make calls. Now, mobile apps make life easier and let us work more efficiently. In the future, phones will go from enablers to intelligent assistants that understand us. Following our research in this domain, we launched our own intelligent phone. Through this process of exploration, we believe that the direction of smart devices is clear.

As Huawei positions itself as an enabler and driver of the intelligent world, we need to define what we do and what we don't do – what we focus on ourselves, and where we need to work with others. Our strategy is threefold: Building more connections, Enlarging Data pipes, and Enabling digitization.

Building more connections is about connecting the unconnected, both people and things; increasing bandwidth; and delivering a better experience.

Enlarging data pipes aims to make video pervasive in work and life, for example, in communication, troubleshooting, education, or healthcare. People want video to do various tasks, and no longer just rely on voice and data services.

Enabling digitization is where we aim to help the ICT industry fully embrace the cloud and enable all organizations to go digital. Cloud services will be a basic business model in the future, so part of our strategy is to drive cloud services as the one platform for customer engagement and customer services.



We view video as a basic medium of information exchange in life, work, management, decision-making, and public safety.



Huawei has been building connections for the past 30 years, based on our mission to build a Better Connected World by connecting people to people, people to things, and things to things. We aim to do this by creating seamless connections in all scenarios that give people a smooth and continuous experience whether they're at work, at home, or in the car. And we won't stop there – our next step is to continuously improve the connected experience.

With respect to enlarging data pipes, we view video as a basic medium of information exchange in life, work, management, decision-making, and public safety. So how can we enable video to play a bigger role in empowering life, work, and vertical industries? This is a question we need to explore. More specifically, we want to enable telcos to succeed in the video business by positioning video as a key way to grow and monetize data traffic. We also want to build a video-based production system to help all industries and businesses improve the efficiency and quality of their production processes and decision-making.

When it comes to enabling digitization, we've taken a number of steps: First, we've built an All-Cloud ICT infrastructure to enable organizations to go digital. Second, we're helping telcos serve their enterprise customers with cloud services. Third, we're helping telcos build cloud-based, intelligent, fully digital operations systems that deliver a ROADS experience. Fourth, we plan to start by building a digital Huawei. We know

that we must address a broad range of challenges and problems, acquire the right experience, and learn from that experience to help other industries and organizations succeed with digital transformation.

Cloud native with public cloud

Many people have doubts about Huawei's commitment to public cloud. They wonder if we're determined to stick with it, or if we'll give up halfway. We've taken a two-pronged approach to public cloud:

- In China we run our own.
- Elsewhere, we're working with operators like Deutsche Telekom (DT), China Telecom, and Orange to develop public cloud services.

As a basic business model, cloud services are a crucial part of what we do – we provide ICT infrastructure for operators and enterprise customers to drive an intelligent world. Cloud is the essential component; it's the basic model for engaging with customers. For this reason, we're determined to build an open and trusted public cloud platform and work with partners to provide customers with public cloud services.

This year we established a dedicated Cloud Business Unit (BU) with a single mission: to get a solid public cloud business up and running. To this end, we'll invest heavily in the Cloud BU. Our strategy is to build a Huawei public

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We'll also work with telcos to serve key industries and collaborate with our partners to build an entire public cloud ecosystem.

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cloud family that includes public clouds independently operated by Huawei and public clouds developed with telcos, where we combine telco strengths with our own to tap into the public cloud market. Examples of this approach include the Open Telekom Cloud with DT and eCloud with China Telecom.

We'll also work with telcos to serve key industries and collaborate with our partners to build an entire public cloud ecosystem. We want to help customers in different verticals migrate their applications to the cloud and develop cloud-native applications on our public cloud. Our greatest advantages include our global service presence, global partner network, and strong customer base in the enterprise market. By bringing together our online and offline capabilities and building on years of telco partnerships, we hope to explore a different way of approaching public cloud.

AI, IoT chipsets, LiteOS

Huawei doesn't position artificial intelligence as a new business in itself, or a new industry we're about to create. We view it as an enabling technology for improving our existing products, solutions, and services to create better value for customers. We're also using AI to increase efficiency and to make our phones intelligent.

We've had a pretty clear IoT strategy for years – we position ourselves as a provider of products and

components. Traditional networking is naturally part of our business. That, combined with enterprise IoT gateways and home IoT routers, will ensure that all things get connected.

Based on years of experience, we've developed a cloud-based IoT connection management platform that helps telcos and our partners realize secure, reliable, and efficient IoT connections. It also provides scenario-specific APIs for our partners to develop industry-specific applications.

IoT chipsets running LiteOS are also something we're active in, with the aim of making communication and connections in the IoT environment much easier. To create value from IoT, we'll develop a cohesive IoT ecosystem that all partners and telcos can use to meet different verticals' IoT requirements.

This is what Huawei does. But, we're also clear on what we don't do. We don't do industry-specific IoT applications; we don't develop or resell IoT devices; and we don't do end-to-end integration for different industries or enterprises.

This whole issue around strategic positioning is something we've been thinking about for years. Now it's clear: We focus on ICT infrastructure and smart devices, and we're striving to become an enabler and driver of the intelligent world. [www.huawei.com](#)

Fiber networks: Faster payback means Better Connected



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Enterprises are going digital, which is opening up a range of opportunities for operators to provide cloud services. However, only optical fiber networks can meet network requirements. What is the best strategy for minimizing costs and maximizing returns?

By Ryan Ding

Over the history of mankind, water, transport, and energy have played decisive roles in advancing our levels of productivity. These resources have been called the lifeblood and sinews of the economy. In the 21st century, ICT technologies are once again dramatically raising the productivity of our economic systems. Robust ICT networks are like a country's nervous system. In concert with our blood and sinews, they can unleash tremendous economic and social value. According to research by the International Telecommunication Union (ITU), when broadband penetration increases by 10 percentage points, GDP rises 1.3 percent, employment rises by 2 to 3 percent, productivity increases 5 to 10 percent, and innovation rockets 15-fold. At the same time, greenhouse gas emissions actually fall by 5 percent. To date, 151 countries have developed national broadband plans to enhance their ICT infrastructure. They aim to attract more investment from telecom operators by offering supportive policies, funds, and tax incentives.

Fiber is a good business and a long-term strategy

As more operators enter the market, competition in mobile broadband services has become more



intense. In Thailand, for example, mobile broadband penetration was more than 120 percent in 2016. AIS, a Thai mobile operator, has now entered the home broadband market where penetration is even lower. AIS has created bundles that include optical fiber



In the enterprise market, the rapid growth in cloud services is creating new business for operators as more devices connect to cloud.



broadband and TV services, which has increased its average revenue per user (ARPU) and cut customer churn. According to Huawei's research, between 2010 and 2016 more than 50 mobile operators worldwide invested in fixed networks and provided fixed-mobile convergence (FMC) services.

In the enterprise market, the rapid growth in cloud services is creating new business for operators as more devices connect to cloud. Unlike traditional voice and Internet services, cloud services require ultra-large bandwidth, ultra-low latency, and highly reliable and stable connections. These requirements can only be satisfied with optical fiber networks. To develop both the home broadband and the enterprise ICT markets, operators have started to make strategic, long-term investment in fiber networks. For example, between 2015 and 2016, China Mobile procured 90 million kilometers of fiber strand and is rapidly expanding its home and business broadband services.

However, it's clear that fiber broadband development is far from ideal at a global level. Global broadband coverage is limited, average bandwidth is low, service take-up is low; meanwhile the cost of laying fiber connections remains disproportionately high. According to ITU, only 52 percent of global households have access to broadband, and 70

percent of connections are slower than 10 Mbps. Huawei has found that the cost of laying FTTH connections is over US\$1,000 per household in one-third of global regions, and service take-up among connected households stands at just 15 percent. This means that payback periods for fiber network investments are much too long. Take one South African operator as an example. In a project laying fiber to a neighborhood of 2,000 households, the cost of delivering each FTTH connection was US\$1,500. Fifteen percent of households actually subscribed to the services, which generated an ARPU of US\$80 per month. This meant that the payback period for that operator's FTTH investment was more than 8 years. These problems of high costs and low take-up are a major barrier to the expansion of fiber broadband networks. They are a key issue for operators to address.

Cutting costs shortens the payback period

I. Government programs are increasing penetration and driving the digital society

The rollout of a fiber network is a major construction project for a city, and they are costly. For governments hoping to raise levels of broadband penetration,



Many operators still take a broad brush approach to network expansion. But if the areas they extend coverage into don't contain high-value customers...the process of increasing take-up rates after network expansion will be slow and painful.



fiscal assistance and supportive policies for operator buildout are vital.

For example, in Europe, Germany's Federal Ministry of Transport and Digital Infrastructure launched its gigabit network strategy in early 2017. By 2025, over €100 billion will have been invested in creating a high-performance national network. This high investment will enable Germany to achieve its goal of connecting every house to broadband with a speed of at least 50 Mbps by 2018. In China, a policy of faster broadband for lower prices was adopted as early as 2013. To encourage the rollout of fiber networks, the Chinese Ministry of Housing and Urban-Rural Development ruled that all new-build homes must have FTTH connections. As of 2017, there are now 240 million households with FTTH in China, representing 80 percent of home broadband users.

II. Take-up rates can be raised by identifying high-value users, targeting investment, and speeding up connections

- **Identifying high-value districts and users for targeted investment and precision marketing**

Many operators still take a broad brush approach to network expansion. But if the areas they extend

coverage into don't contain high-value customers – if residents do not have the ability or the desire to spend money on broadband services – then the process of increasing take-up rates after network expansion will be slow and painful.

To solve this problem, Huawei worked with one Chinese telecom operator to identify high-value customers. Using data from mobile services, governments, industry consultants, and other sources, we collected a multi-dimensional array of data on targeted residential complexes in one city. This included residential density, house prices, the evening locations of the operator's high-value mobile users, the age of the apartment buildings, renter versus owner occupation, apartment turnover, competitor services and customer satisfaction with those services, and current network coverage. Using Huawei's targeted investment planning tool, we mapped users onto residential areas, and ultimately identified over 3,000 high-value apartment complexes and more than a million high-value users. This enabled the operator to accurately identify its target customers, and follow through with precision marketing. The value to the operator was enormous: The success rate for telephone marketing jumped by a factor of three when it targeted the high-value customers we had identified, and in just three months it was able



The complexity of number allocation, uncertainty over fiber resources, and lack of skilled staff, mean that operators struggle to roll out their services fast.



to increase the take-up rate for its FTTH services by 6 percent.

In India, Huawei helped another operator to target its FTTH investment by identifying high-value blocks. The operator had laid fiber to fewer than 60 densely-populated high-rise apartment blocks, just 2 percent of the total in the city. Fear of low take-up was holding it back from extending its services to 98 percent of households, but with only a small network, it couldn't achieve the economy of scale it needed to reduce costs, and its broadband business was struggling. Huawei's SmartCapex methodology and targeted investment planning tool enabled the operator to identify 1,200 mid-rise apartment complexes, with over 80,000 households. These complexes didn't have the same level of disposable income or user density as the high-rise complexes, but they represented great potential for future growth. Balancing the cost of rollout against the higher ARPU and increased use of base stations and fiber, the payback period on laying fiber to these users turned out to be quite short. The operator targeted the 1,200 identified complexes, and delivered competitive service packages, with the result that it quickly achieved 50 percent take-up, and in the end, recouped its entire investment in less than three years.

- **Quick delivery of services, good processes, better skills**

New entrants to the telecom market, unfamiliar with the intricacies of running fiber networks, often find themselves engaged in time-consuming, redundant labor. The complexity of number allocation, uncertainty over fiber resources, and lack of skilled staff, mean that operators struggle to roll out their services fast. And if customers have to wait to be connected, some will drift away due to a poor user experience, and take-up rates will remain stubbornly low.

Huawei's lightweight MiniOSS is designed to solve the problems of over-long processes and lack of visibility into resources. It references China's best-in-class FTTH operator business process, and links up the entire operator based on IT systems: network construction, service marketing, and service engineers. All fiber cables are efficiently recorded and the information easily shared and updated, providing accurate, usable information on 99 percent of the company's network resources. One operator in South Africa was able to bring its FTTH network online in under two months using MiniOSS, and speed up the connection of customers by 60 percent. This helped it to win and retain a high level of customer take-up in its coverage area.

In terms of employee skills, China's fast rollout of FTTH networks offers valuable experience. China

Telecom Shanghai is a case in point: It has developed a portfolio of over 40 engineering standards for use in the laying of FTTH networks, covering both outdoor and indoor scenarios. The company set up a virtual worksite and trained over 3,000 network engineers in fiber deployment and maintenance. The results were a huge increase in the speed and efficiency of FTTH deployment. In 2011, only 30 percent of new FTTH lines were successfully activated on the first attempt. By 2016, that proportion had risen to over 95 percent.

III. Collaboration cuts the total cost of FTTH deployment

- **Industry alliances: Finding partners to help roll out broadband**

In the city of Surabaya, Indonesia, the costs of fiber rollout were high because operators couldn't gain access to the rights of way they needed. In 2016, three local operators teamed up with the Ministry of Communications to form a broadband industry alliance that ultimately brought in 17 members drawn from government agencies, real estate developers, property management companies, fiber/equipment providers, content providers, and water/power infrastructure companies. The alliance enabled all participants to engage more positively in the construction of fiber networks.

The municipal government started to recognize the boost that home broadband connections bring to the economy, and set a hard deadline for decisions on rights-of-way applications. Real estate developers saw the added value that fiber broadband brought to their properties, and agreed to build fiber conduits into their new developments. Property management companies were able to agree conditions on benefit sharing and access to existing properties. And utility infrastructure companies gained a new revenue stream from leasing pipe/pylon access to network operators. The alliance brought about a huge 40 percent drop to the cost of

building FTTH networks in Surabaya.

The success of Surabaya's approach clearly shows how coordination and benefit sharing can dramatically reduce the costs of building out fiber networks.

- **Infrastructure coordination: 30 percent savings achieved by working with a utility**

Routing FTTH through existing electricity pylons and underground pipes is a way to work around the need to obtain rights of way and dig trenches to lay cable. Using existing infrastructure can bring savings of 30 percent or more on network buildout.

In 2014, Vodafone established SIRO, a joint venture with an Irish power company. Taking advantage of the network of electricity pylons and conduits, Vodafone has been able to roll out a fiber network at low cost. In 2018, it plans to connect 500,000 households in 51 towns and cities with an FTTH network.

There are many similar examples around the world of collaboration with electricity companies. In Kenya, when one operator laid fiber connections to a high-consumption district of low-density, expensive housing, the cost of digging its own trenches meant that the cost per connected household was more than US\$2,000. In early 2017, the operator started working with a power utility, routing an overhead fiber network through its pylons to a densely-populated urban village area. This brought the cost down to just a few hundred dollars per household. Worthy of note is that the Kenyan power company realized that it was in a position to roll out fiber networks at low cost, and is now planning to enter the fiber broadband market itself. Over the next five years, it will build extensive FTTH networks.

We have seen many similar stories. In 2016, Italy's biggest power company, Enel, announced that it would invest €2.5 billion in building FTTH networks in 200 or more cities, using its existing pylon



When mobile operators enter the fixed-line broadband market, Huawei recommends that they use their large network of mobile base stations as anchor points for their new fiber networks.



infrastructure. It plans to lease the networks to operators, which should be a powerful stimulant to the competition in local broadband market and broadband development.

- **Mobile base stations anchor fiber broadband: fixed/mobile synergy**

When mobile operators enter the fixed-line broadband market, Huawei recommends that they use their large network of mobile base stations as anchor points for their new fiber networks. Fiber only needs be laid over the short distance from the base station to the surrounding household. One operator in Mexico City used this approach, cross-referencing its existing base station network against fixed broadband demand. It identified 20 or so base stations to be used as fiber hubs, installed mini OLT terminals, and laid cable to customers no further than 300 meters away from the base station. Very quickly, it was able to offer fiber broadband services to adjacent business and residential buildings, and was generating revenues within two months. The total payback period was under 2.5 years – an extraordinary commercial win.

- **Using microwave solutions to deploy fixed networks shortens project time by 70 percent**

One operator in Greece faced many challenges in network deployment: too many islands, the high

cost of submarine cables, and long engineering projects. With E-Band, Huawei’s innovative, high-capacity microwave solution, the operator was able to offer high-speed Internet and TV services for users living on the islands without any need for submarine cables. E-Band provides bandwidth as high as 10 Gbps over a 10-kilometer microwave link, supporting fixed broadband services with five nines reliability. With Huawei’s solution, the operator shortened its buildout time by 70 percent. As of the end of 2016, the operator had deployed 1,000 microwave links supporting its nationwide broadband network, and attracted 100,000 fixed network users.

Based on our analysis of global best practices, we’re convinced that operators can achieve fast, cost-effective fiber buildout. They just have to use the techniques I’ve outlined here: differentiated service design, targeted planning, fast number allocation, infrastructure coordination, and fast network deployment. These techniques enable operators to bust the high cost/low take-up barrier that has hindered fiber rollout, and drastically shorten their payback period on fixed broadband network investments. We will continue to work with operators to explore paths to low cost and high efficiency in network buildout. Together, we can bring forward the day when 100 percent of households are connected to ultrafast broadband networks. [www.huawei.com](#)

Platforms for the best outcomes



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The rise of the Industrial Internet of Things (IIoT), cloud, and big data has boosted efficiency and driven enterprises to roll out a steady stream of new products and services, with the leaders adopting artificial intelligence (AI) as a game changer. Vertical industry ecosystems are entering a new era – the outcome economy – where transactions are based on outcomes.

By Huang Rantong



In vertical industries, this outcome economy will lead to a platform economy, largely because outcomes are hard to deliver through single enterprises on independent platforms.

We predict that the future will see vertical industries supported by just a handful of platforms, particularly in industries that have a high requirement for specialists like, for example, in healthcare, where in the future only a few experts will be responsible for all gene, MRI and CT analysis, and even tumor diagnosis. Experts employed by large farms will take the form of a small number of digital systems that will understand the impact on harvests by everything from seeds, to the climate, and agricultural machinery. We will very likely see similar situations in all sectors of industry, from education to manufacturing.

In the consumer economy, people will become

increasingly reliant on the leading platforms in all industries, just as they're dependent on a handful now like Tmall and Amazon for e-commerce. It will become increasingly difficult for SMEs and innovators to carve out success if they go it alone. The SMEs of tomorrow will rely on large platforms – such as Philips' and GE's medical platforms and Monsanto's agricultural service platform – to develop innovative products and services, just as SMEs develop apps on App Store today.

Tech-driven innovation for outcomes and value

Many enterprises are now using ICT to enhance efficiency, for example, data-driven, software-based services that in some cases on a pay-per-use basis. In the past, telcos tended to lack the confidence to focus on delivering outcomes for customers, and were unwilling to take risks, especially when promoting new services or investing heavily.

Energy performance contracting (EPC) was previously used to assure outcomes in telecoms. Equipment providers used new energy solutions, coordinated



Today the growth of IIoT, cloud, and big data has caused enterprises that are digitally transforming to use outcome delivery to prove that “they can”.



with carbon allowances, worked with multiple parties, and aimed to conserve energy and reduce emissions. And these equipment vendors shared the resulting benefits with telcos. While EPC was often applied in old telecom energy projects, this sort of approach isn't commonly used when exploring new services.

Today, however, the growth of IIoT, cloud, and big data has caused enterprises that are digitally transforming to use outcome delivery to prove that “they can”. The figure on the right depicts four future models of development, which is based on research by the WEF IIoT working group.

GE engines

GE is a pioneer in exploring the outcome economy. Its businesses include an aircraft engine company and GE Capital, which provides business loans and financial services, managing trillions of dollars in assets. GE used to sell aircraft engines under a traditional sales model. Now, the aviation unit of GE Capital keeps ownership of the engines and its aircrafts, and instead leases usable time of these assets to medium and large companies. The model is based on engine runtime or aircraft flight time, which can be calculated flexibly.

It also frees up customers from having to purchase and hold assets. As GE has the capability to maintain

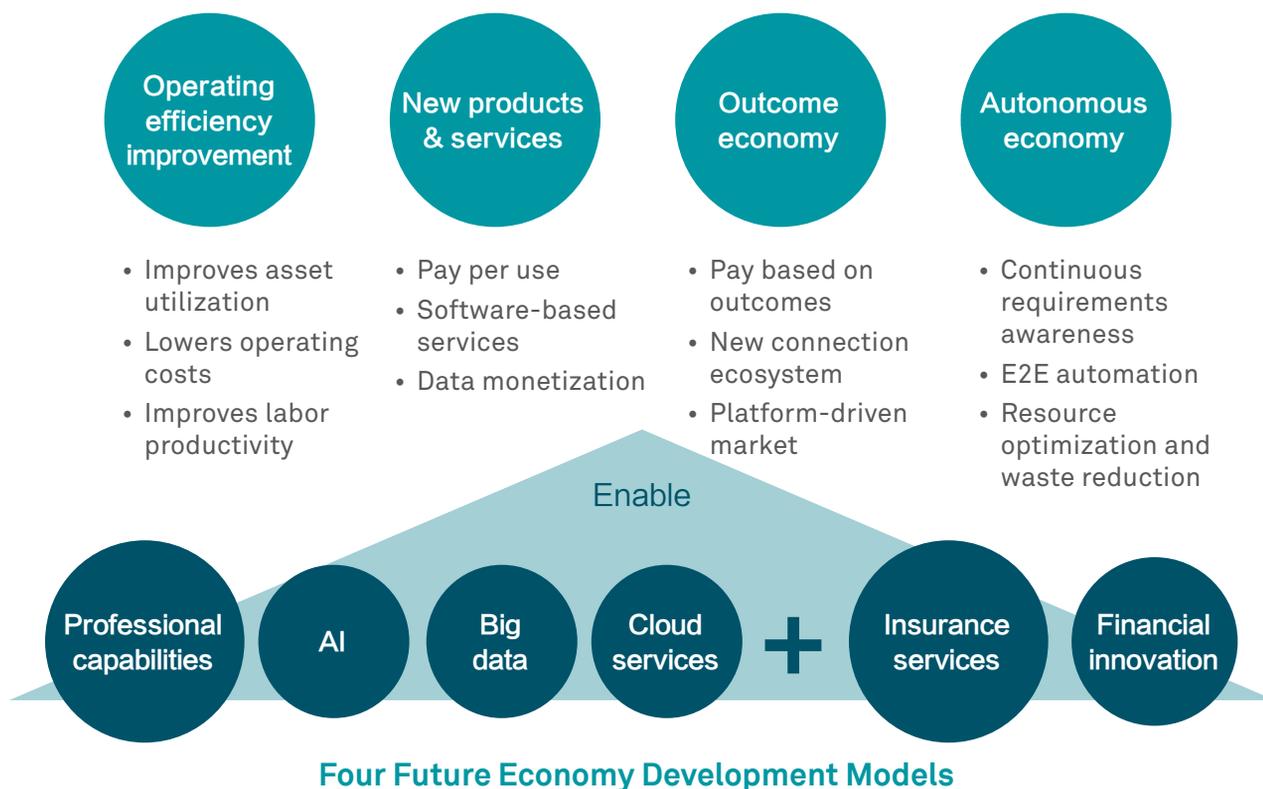
engines as well as collect and mine aircraft data, its O&M processes are more efficient than any airline's.

Both GE and its customers profit from the cost savings delivered by new technology. According to the WEF, equipment suppliers usually pass on about 20 percent of savings from improved tech and maintenance efficiency to customers.

Taleris

A joint venture between GE and Accenture, the software company Taleris has taken things one step further by providing fault assurance for airlines, assuming responsibility for all equipment faults that cause flight delays or cancellations. Airlines sign a year contract with Taleris for service, which includes downtime KPIs, under a bundled payment model. Taleris bears the maintenance costs, and makes money by reducing these costs by improving operations, minimizing downtime, and optimizing equipment. In the future, Taleris will expand its services to cover non-machine faults like handling baggage carts and catering.

Taleris' service is a typical example of assuming responsibility for outcomes. It's able to do so because its platform can connect to the systems of ecosystem partners in areas such as machinery, electronics,



and structural parts, and the company fully controls all data relating to aircraft failures. This gives it the confidence to offer fault warranties.

Competencies and support

IoT platforms for multiple sub-sectors: The outcome economy has multiple enabling factors – in particular, platforms based on smart tech have triggered this revolutionary change. The rapidly declining costs of computing and storage provide companies with the opportunity to mine data and create intelligence, because it enables big data analytics – something that was impossible and not economically viable until now.

Expertise: An R&D chief at Audi remarked that Pareto’s principle applied to software and hardware in the automotive company, with 80 percent of engine R&D staff focusing on software and only 20

percent on hardware. But, those 20 percent and their specialized industrial skills are the most important resource. An IT company that doesn’t understand engines will find it hard to establish itself in the market, regardless of how advanced its software is.

Insurance and finance: Innovative insurance and finance models can promote new service models, stimulating sales and sharing risk.

From specialization to platforms

Today’s Internet already demonstrates the power of platforms in the shape of Google, Facebook, Tencent, Amazon, et al. As the consumer Internet continues to evolve into the Industrial Internet, two paths of development will emerge: One, Internet platforms will evolve into industry platforms; and two, industrial solutions platforms will coalesce



With enterprises, network equipment suppliers, operators, and semiconductor companies entering the platform development market, competition is high.



once industrial companies digitize. These two forces and the technology companies and operators that support them will form a dynamic, multi-stakeholder model.

Development path of consumer Internet platforms

In the last five years, the market value of GAFA (Google, Apple, Facebook, Amazon) has been roughly double the market index and their profits have skyrocketed, a trend that will continue with the industrial Internet.

Given their capabilities in big data, cloud services, LBS, security, and payments, consumer Internet companies can already support many non-production processes. Enterprises' service departments are destined to be the entry point for these consumer Internet companies, and their experience will be how they triumph.

Development path of industrial Internet platforms

Until recently there have been few well-known large platforms for industry. Some example are below:

GE Predix: Based on cloud, big data, and AI, GE's CEO launched Predix with an initial investment of

US\$1 billion allocated to building an app store. The goal is to house 500,000 apps by 2020, so GE can become a top 10 global software vendor.

UPS Coyote: Tailoring different transportation solutions for different industries, the company works with 40,000 logistics companies. By operating a big data platform, Coyote seamlessly links carriers and their customers, and ensures timely delivery. Customers can solve problems with a single phone call.

Philips HealthSuite: Providing customized tools and resources for healthcare, the Philips' platform is a digital service based on a cloud ecosystem. It provides customized tools and resources for healthcare, continuous health services, and personalized care applications. On the platform, app developers can enjoy management services such as data analysis, the sharing of professional medical data, service orchestration, storage, and connectivity.

With enterprises, network equipment suppliers, operators, and semiconductor companies entering the platform development market, competition is high. Platform companies in different industries and nations can choose between different equipment suppliers, operators, and IoT and cloud service

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The opportunity for companies to use the industrial Internet to create the outcome economy has already been demonstrated, but it's currently in a chaotic state.

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providers. At present, there are no defined models or alliances. Any company with a large customer base, core technology, or service capability can contribute to platform construction. And many are doing exactly that.

The opportunity for companies to use the industrial Internet to create the outcome economy has already been demonstrated, but it's currently in a chaotic state. Players with the capability must extend their existing ICT services to the industrial Internet and establish new business models oriented toward vertical specialization and smartification.

They must consolidate their competitive advantages; for example, telcos can leverage their enterprise customer base they have already connected and their physical resources such as leased lines. On the flip side, the customers of leading enterprises in different verticals can quickly turn specialized knowledge into business intelligence with data. Stakeholders in all domains must build platforms or sub-platforms with an open model in domains where they hold a competitive advantage, focus on customer experience, quickly establish a model platform, and build a leader's advantage. [www](#)



Connecting a world of things



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Connectivity sits at the heart of interaction, innovation, value, and experience, with more connections coalescing into a sustainable ecosystem. With IoT gathering momentum, telcos need to target their strengths, business models, and strategies towards forming an ecosystem that benefits the whole industry.

By Li Changwei, Wu Ling

From voice to data to IoT

With the inception of 3G in 2000 and then 4G a decade later, communication has shifted from voice-dominant to data-dominant, with traffic generated by IP applications and Internetized OTT services.

In 2017, machine-to-machine (M2M) connections will exceed the number of human connections, which will reshape communication networks, operations, and services. At MWC 2017, SoftBank CEO Masayoshi Son predicted that the number of connected things will exceed 50 billion in the next five years and 100 billion in the next 10 years. According to Son, IoT will generate untold opportunities for terminals in the area of data generation, the cloud in terms of data analysis, and artificial intelligence across the board.

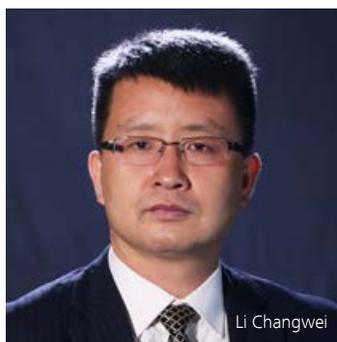
2017 will be a breakthrough year for IoT following the official global launch of NB-IoT standards in June 2016 and the availability of US\$1 dollar IoT chips in the US. 4G LTE networks are becoming

widespread, with penetration exceeding 20 percent. We're reaching a point where the conditions are right for wide-scale hyper-connectivity and an explosion in apps.

Horizontal + vertical

The diversity of IoT application scenarios in different industries (horizontal) and specialized requirements (vertical) are reshaping services, networks, operations, and business models. Because IoT service scenarios are flexible, change in real-time, and offer infinite expandability, networks and platforms need to support breadth, depth, speed, low latency, cost efficiency, and security.

Resulting trends include 5G, which is necessary for driverless vehicles to avoid collisions due to millisecond latency and 10-Gbps transmission speeds. SDN and NFV will enable prioritized on-demand services. And the top-down construction of content delivery networks will transform cloud computing architecture into fog computing, integrating pipes and clouds to guarantee



transmission and latency requirements when capacity continually expands.

The diversity of access terminals and near-field access technologies are creating new challenges for network uniformity and smart services. New types of converged gateways integrate various access technologies and terminals, and are now driving edge reconfiguration.

New business, new operations

IoT networks and service complexity are skyrocketing, requiring new types of operating platforms and models driven by intelligent algorithms that yield data insights. In business terms, IoT is a new value creator based on innovative applications. As telcos have connectivity advantages, they can initially bundle connections and data with applications to monetize connections and data platforms. Over the long term, platforms will control user flow and data flow, while data platforms and converged ecosystems hosting applications will create cash flow.

Services, enablement, connectivity

The development of IoT focuses on three sectors: vertical industries (led by GE, BMW, and Haier); Internet OTT services (led by Google, Amazon, and Alibaba); and telecoms (led by AT&T, China Mobile, and Vodafone). Strategic positioning for companies in these different domains varies; however, all follow the same principle: reinforcing strengths, forming cross-sector alliances, and challenging competitors.

Verticals: Leaders in specialized services

To automate smart connections, services, and operations, leaders in verticals have pioneered a deep, modular approach to IoT, cloud, big data, and Internet tech. For example, BMW and Bosch have set up Industry 4.0 standards in Europe, while GE has created new IoT applications by using its Predix platform to monitor and analyze 5 million points of data from 10 million sensors in hundreds of millions of devices. Thus, specialized services are emerging as a core competence of IoT.

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It's difficult for telcos to form a profit model from connectivity alone...telcos must monetize platforms and applications.

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Internet OTTs: Leaders of smart

The leadership, capabilities, and experience of Internet companies in big data, cloud, and Internet-enabling technologies lets them disrupt and supplant companies in other industries. Examples include IoT service innovations in logistics and retail. Google, Amazon, and Alibaba are morphing from providing data analysis functionality to specialized intelligence and smart applications that can transform traditional industries.

Telcos: Leaders in connectivity

Telcos' IoT strengths lie in network connections; for example, NB-IoT and 5G sit at the core of China Mobile, AT&T, and Verizon's big connectivity strategies. In 2013, AT&T released its security-focused Digital Life smart home service, before moving to IoV and the M2X capability-opening platform on which it aims to operate one-third of its Internet of Vehicles (IoV) in the US. In its 2020 strategy, China Mobile focuses on big connectivity, aiming to deploy an IoT ecosystem using its vast superiority in connectivity and its OneNet IoT platform, which currently hosts 5.6 million devices, 27,000 developers, and 10,000 applications. Vodafone has transformed from selling SIM cards to selling services, expanding its geographical coverage and value along the way.

It's difficult for telcos to form a profit model from connectivity alone. Constructing a data platform based on connections can accelerate innovation. But, to create successful business models for IoT, telcos must monetize platforms and applications.





Thanks to strengths in connectivity and carrier-grade security, reliability, localization, and E2E services, the horizontal industries in which telcos shine are smart homes, security in smart cities, and IoV.



From connections to data and apps

IoT is an extremely complex ecosystem. Horizontally, it covers all industry sectors and vertically it includes all links, that is, terminals, pipes, data, and cloud applications. The first step of an IoT strategy is to select the industry sector and focus, and then define the vertical depth of capabilities, competence, market structure, and business models.

Thanks to strengths in connectivity and carrier-grade security, reliability, localization, and E2E services, the horizontal industries in which telcos shine are smart homes, security in smart cities, and IoV. Vertically, they need first to focus on network construction and find areas where they excel, so they can gradually build data capabilities and develop application platforms.

Telcos' IoT strategy can be divided into three stages:

Stage one: Connection

Build a robust NB-IoT full-coverage network that expands from LTE to IoT connections and tests 5G; test near-field IoT network integration with technologies such as Bluetooth, Wi-Fi, and ZigBee; collaborate with leading service providers on IoT

applications; and open up network capabilities using APIs to support innovations for quick breakthroughs and a leading network position.

Stage two: Data

Innovate to overcome bottlenecks due to the complexity and diversity of IoT services, and exploit opportunities in precision innovation, smart operations, and lean management; build networks that integrate pipes and cloud based on a central platform that makes the dumb pipe smart; and construct a smart data platform to support service innovation and precise customer services.

Stage three: Applications

Build converged application platforms based on the power and scalability of data platforms that run like Internet app stores to spark service innovation in IoT stores; position ecosystem innovation as a strategic control point; and shift positioning to monetize network connections.

Now is the time

2017 is a turning point. Telcos must capitalize on their strengths and strategies to build new ecosystems, transform towards IoT, and embrace the arrival of a new wave of blue ocean opportunities in the nascent home Internet and industrial Internet domains. 

Massive MIMO is the future of wireless networks



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By 2021, global mobile data traffic will be seven times higher than it was in 2016. Video will account for more than 78 percent of all mobile data and smart terminals will consume an average of 15 GB of data per month. With wireless networks relying on spectrum for expanding network capacity and sharing air interface bandwidth, unprecedented challenges are creeping over the horizon.

By Di Yong

Aside from the insurmountable physical limits of power output on terminal transmission distance, the biggest bottleneck facing today's wireless 4G networks is that more devices slow down network speeds.

In airports, stadiums, squares, subways, and other public spaces, network speeds can become unbearably slow when there are lots of people, regardless of the type of mobile phone used, even for short video clips. Current networks fall short when it comes to the data requirements of new applications as a result of current wireless network tech, limited radio spectrum, and shared bandwidth between all terminals in a cell.

The light at the end of the tunnel

Massive MIMO (multiple-input-multiple-output) uses multi-user spatial division to form separate narrow beam coverage in a given space for different users. Their data is transmitted simultaneously based on a user spatial isolation system, increasing system throughput dozens of times.



In Massive MIMO theory, user channels become orthogonal when the number of antennas approaches infinity, and the only determining factor for system capacity is user numbers. Based on the actual performance data of commercial networks, it's possible to increase single-user link performance by nearly tenfold and system capacity by fourfold to eightfold, even using Massive MIMO with limited 64T64R antennas.

A Massive MIMO system with large-scale, active multi-antennas is a beautiful vision, but supporting this scenario in base stations requires large amounts of resources, large-scale antenna pilot-channel estimates, and air division calculations, something that for a long time wasn't viable commercially.

After years of research, Huawei made a breakthrough in Massive MIMO by incorporating research on TDD channel reciprocity for multi-antennas. Working with China Mobile, Huawei conducted the world's first lab prototype test in September 2014 and the first commercial prototype of Massive MIMO in September 2015. Later, Beijing Mobile and SoftBank in Tokyo



TDD Massive MIMO only requires the transformation of network-side infrastructure before it starts benefiting existing and new users and ensuring service continuity.



launched Massive MIMO commercial test sites in collaboration with Huawei at the end of 2015 and at the start of 2016, respectively. These trials saw single carrier wave speeds of over 650 Mbps, at a stroke lifting the curse of spectrum scarcity in wireless communications.

In the past year, Huawei has collaborated with over 20 leading operators around the world, conducting Massive MIMO verifications in various commercial mobile communications scenarios, plus rigorous testing in the main TDD frequency bands of 2.3, 2.6, and 3.5 GHz. These milestones have set the stage for commercially deploying Massive MIMO.

Maximum value

Data from several hundred Massive MIMO commercial test sites shows that the technology increases spectrum efficiency dozens of times, which will in turn allow operators to lease fewer spectrums. Moreover, it almost doubles outdoor coverage.

Unlike traditional encrypted base stations that suffer from co-channel interference, Massive MIMO sites feature zero-fault precision technology that enhances edge rate and slashes inter-site interference. Massive MIMO is ideal for indoor coverage, with 3D beamforming providing a direct solution for over 7 percent of urban indoor coverage scenarios.

TDD Massive MIMO only requires the transformation of network-side infrastructure before it starts benefiting existing and new users and ensuring service continuity. Massive MIMO can also directly evolve for 5G, as the hardware can already support it, further protecting operators' investments. China Mobile and SoftBank's 4G to 5G transformation proposals have in fact accelerated the commercial adoption of Massive MIMO.

The solution has received several awards, including the GTI award of Outstanding contribution to Innovative Solutions and Applications, the Special Industry Contribution Team Award and Network Solution Innovation Award in 2016, and the Best Mobile Network Infrastructure Award at Mobile World Congress 2017.

Where we're at now

Four application scenarios: China Mobile and Huawei launched the first Massive MIMO base station trial operation in Shanghai's Pudong area in September 2015. Today, Huawei has deployed Massive MIMO sites in more than 30 Chinese cities for China Mobile. The partners have tested and verified Massive MIMO in four main commercial application scenarios: high rise buildings, high traffic, high interference, and limited uplink. China-wide deployment was verified as viable.

Enhanced capacity: The commercial deployment of Massive MIMO will unleash suppressed demand for



Best Mobile Network Infrastructure Award
at Mobile World Congress 2017

traffic. Traffic statistics analysis shows that Massive MIMO provides three to six times the capacity of 8T8R in service hotspots such as university campuses, commercial streets, and transportation hubs. In CBDs and residential high-rises, it can boost capacity by an average of 300 percent, so a cell can bear three or more times the service volume of a single carrier on the original network.

Enhanced coverage: Massive MIMO's 3D beamforming increases horizontal and vertical coverage capabilities. Previously, coverage in high-rise buildings required dedicated indoor networks. But now, Massive MIMO covers both high and low floors and can easily penetrate two walls.

Enhanced experience: Traditional 8T8R macro base stations can't meet real-time service experience demands in high traffic scenarios with over 200 users. Massive MIMO solves this network awareness bottleneck, ensuring user uplink and downlink awareness requirements even when 600-plus users access the cell.

SoftBank Japan: a world first for 5G

SoftBank first field tested Massive MIMO at the end of 2015. By the end of 2016, it had commercially deployed over 100 sites in more than 40 cities across Japan. After simulating various Massive MIMO application scenarios, it launched a 5G project in September 2016 that officially adopted Massive MIMO tech on its commercial network.

Enhanced capacity: Massive MIMO uses large-scale antennas and beamforming to give each user precise coverage and high speeds even in crowded areas. In the 100-plus cells where Massive MIMO has been commercially deployed, speeds are ten times higher, with the average stable speed hitting 400 Mbps and average cell throughput up by 6.7 times.

More competitive: Massive MIMO is a leading 5G technology that will help make high-speed, high-capacity networks a reality by 2020. Widespread deployment of Massive MIMO has allowed Softbank to deliver a leading mobile experience, which alongside highly competitive data plans has helped it attract more users.

What the future holds

Bandwidth increases are not the only value that wireless network evolution will bring: IoT applications, high-quality content, and better user experiences will all follow. The widespread adoption of 5G tech for Massive MIMO's large-scale active antenna arrays on 4G networks will eliminate the limited spectrum bottleneck in wireless networks before 5G arrives, and strengthen the value of mobile Internet.

Massive MIMO's multi-user spatial multiplexing technology wraps a high-speed single-user experience in a high-capacity system. This can provide very high, gigabit-level cell throughput, similar to an ultra-wide



In 2014, Huawei proposed Wireless to the x (WTTx), a wireless home broadband solution that can eliminate the global digital divide in home broadband.



carrier, delivering astounding user capacity. Massive MIMO also offers equivalent bandwidth and QoS guarantees to fixed networks.

For these reasons, it's set to become prevalent in next-gen wireless cellular networks. The Massive MIMO market has huge potential, with predictions showing that more than 90 percent of the world's top 100 operators will have begun deploying it by the end of 2017.

The technology provides operators with a historic opportunity to provide a universal wireless broadband service. We foresee the following operational and service innovations thanks to the unlimited potential of Massive MIMO wireless networks:

Unlimited data plans: Since 2016, the appetite for HD video and real-time games has prompted an increasing number of operators to launch unlimited data plans. More operators are also teaming up with online service providers and adopting a backward charging model, triggering the rising popularity of unlimited wireless broadband packages.

Examples include KDDI's Smartpass service with unlimited data, Digitel's service in the Philippines for unlimited Facebook, and Chinese carriers and Internet companies collaborating to offer unlimited monthly plans. These innovations have unleashed the long-

suppressed demand for mobile broadband.

Better home broadband with fiber-grade private

line access: In 2014, Huawei proposed Wireless to the x (WTTx), a wireless home broadband solution that can eliminate the global digital divide in home broadband. Huawei followed this up by launching Massive MIMO-based WTTx 2.0, which represents significant progress in broadband capability, network convergence, O&M, and service bearing. WTTx 2.0 supports single-user fiber-grade broadband access and carries a range of services, such as IPTV and Smart Home, helping digital homes become smart homes.

Surplus capacity for vertical industries: The specific nature of sharing wireless broadband means that industry customers require dedicated frequency bands to carry services and guarantee QoS. But, Massive MIMO's spatial multiplexing makes high spectrum reuse possible and boosts uplink bandwidth tenfold, providing operators with the commercial opportunity to develop enterprise applications. Wireless broadband will support valuable industry applications including wireless video surveillance, information terminals for wirelessly streaming media, and artificial intelligence.

Massive MIMO is set to revolutionize the ICT industry, pave the way to the 5G era, and benefit both the home and enterprise markets. [www.huawei.com](#)

4 stages to new money from new video



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Driven by the popularity of smart devices, 4G network construction, and thriving Internet ecosystem, experience is king. As video makes up the bulk of Internet traffic, getting it right is the key to subscriber loyalty, successful business models, and commercial success.

By Li Changwei, Chen Min

Making breakthroughs

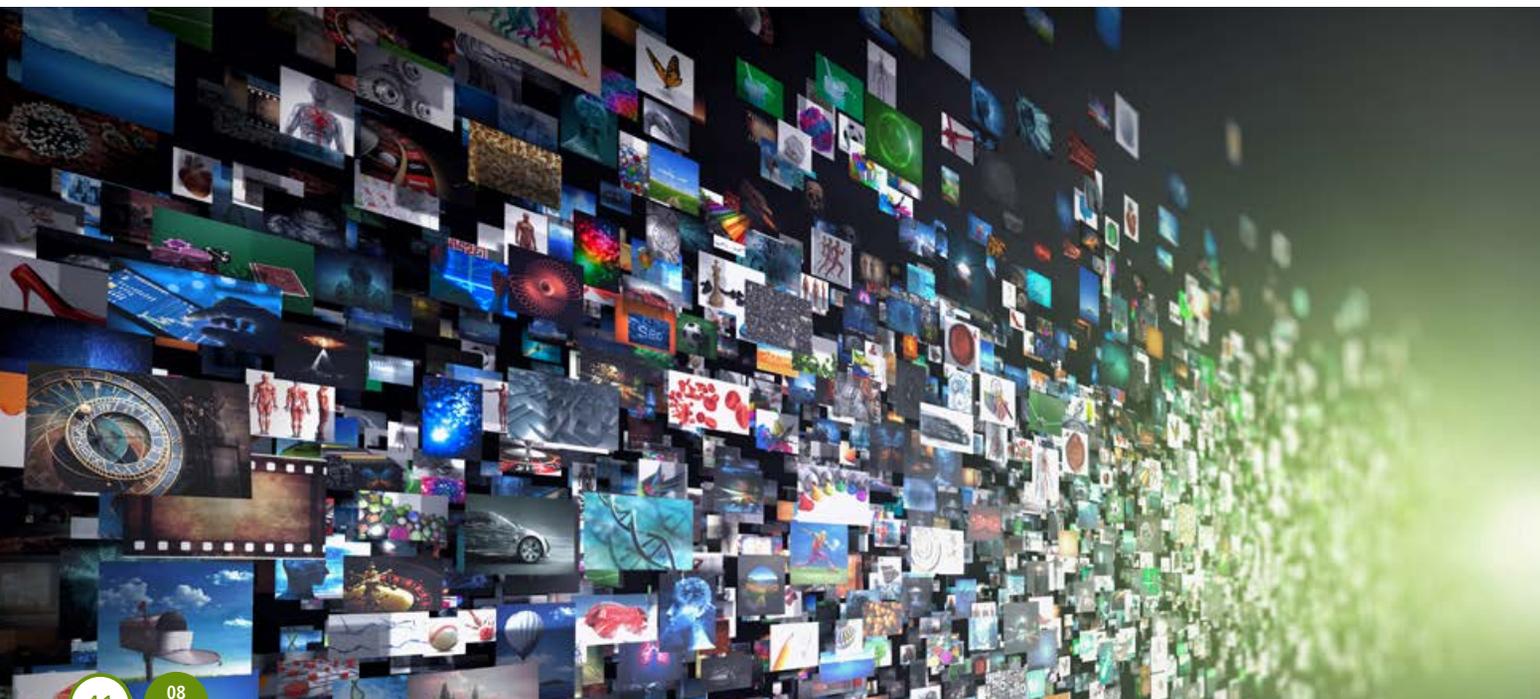
Major Internet video players have made breakthroughs with users and data in large part due to the rise of UGC, as exemplified by YouTube's 1 billion users, which at one point accounted for a third of all wireless data traffic in North America despite being unprofitable. On the flip side, US pay-TV services, including cable, satellite and IPTV, lost 666,000 subscribers in Q2 2016.

Right now, the video industry is a maelstrom of competition and growth potential, with some enterprises already monetizing the space where traditional, operator, and Internet video overlap.

Monetization methods

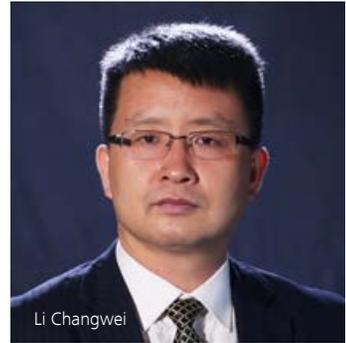
Broadband monetization

Sport is the cash cow here, as demonstrated by success stories in Europe. In 2015, Telefonica's





Chen Min



Li Changwei

Spanish subsidiary grew for the first time since 2008 after it won exclusive broadcast rights for the 2015/16 season matches of three Spanish leagues with a €600 million bid. BT paid £1.26 billion for TV rights to certain Premier League, Champions League, and European Cup matches for the 2013/14 to 2020/21 seasons, helping the UK operator grow 4.7 percent in Q3 2015/16, its best performance for seven years.

These telcos have several things in common: One, a leading market share in the fixed network market plus broadband products ranging from 100 Mbps and 300 Mbps; two, high-value local content based on exclusive buyouts and a position as the first to offer 4K IPTV as a differentiator; and three, smart pricing models and free video services that attract subscribers and protect pipe investment – they're earning money from network itself.

Content monetization

In 2016 in Korea, KT announced that its pay-TV service revenue had grown by 13.4 percent year on year to approach its broadband revenue. With this increase, a new media > broadband > wireless scenario emerged in terms of the revenue contribution of different services. Five years after LTE was commercially deployed in Korea, broadband and IPTV became the

fastest growing services.

In 2015, AT&T paid US\$48.5 billion for DirecTV, the world's largest satellite TV operator. That year, AT&T divided its business operations into four sections: Business Solutions, Entertainment Group, AT&T Mobility, and International. In October 2016, it announced a deal to acquire Time Warner for US\$85.4 billion in cash and stock. If the acquisition is successful, video and media will account for more than 40 percent of the operator's total revenue, and will become its main source of revenue and profit. At the time of the deal, AT&T declared that "the future of mobile is video and the future of video is mobile". Bringing together the best content and the highest scale in distribution and customers is the industry's best prospect for growth.

The Korean and American operators have used two different models to monetize video content. In Korea, KT used a model based on cooperation, supplemented with investment and innovation to achieve growth. In America, AT&T became a content and copyright creator and owner through an M&A model, taking direct possession of the most valuable part of the video industry chain.

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Netflix took seven years to migrate to cloud. From the outset, it publicized itself as a big data company.

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Platform monetization

Netflix started out as a video rental service and eventually developed into a video-based Internet streaming and content aggregation and distribution platform. Charging US\$7.99 a month, Netflix enjoys sustained profitability. In Q4 2016, it posted a 41 percent increase in annual revenue to hit US\$2.4 billion and a 74 percent rise in profit to US\$470 million. It also added over 7 million subscribers during that quarter, a new record. Netflix now has around 94 million total members, 47 million of which are overseas and the vast majority paying members.

Netflix took seven years to migrate to cloud. From the outset, it publicized itself as a big data company, stating that 75 percent of viewing traffic came from big data-based recommendations and that big data had allowed it to deliver a smooth user experience, conduct precision marketing, and precision investment. Netflix's video platform based on data technology will be a core competitive strength for developing video services in the future.

Monetizing the ecosystem

Video is big broadband's traffic destiny. The interactive multimedia trend in user experience suggests video is an enabler. It's a capability, not a service. TV, conferences, games, education,

medicine, and monitoring are user-end services and applications. Video will ultimately become a medium of communication that will support a wide range of applications, and is one of the key starting points for operators to innovate high-value apps.

With KDDI's Smart Pass service, users in Japan can download and use over 500 mainly local apps packaged and purchased by KDDI, and enjoy 50 GB of cloud storage, coupons, insurance, and mobile anti-virus protection for just 399 yen (US\$3.6) a month. As of December 2016, KDDI had 15 million Smart Pass subscribers with 83 percent of its new smartphone users in Japan opting to join. KDDI shares subscription revenues with developers based on monthly use of the applications, with developers keeping 80 percent to 90 percent of the revenue compared with Apple's 70 percent.

In 2011, NTT DoCoMo launched Smart Life, which offers media content, payments, shopping, travel, and other lifestyle services on dMarket. The platform initially provided the video service dTV, but it's now evolved into an app store that offers apps, books, magazines, animation, and games. In the FY 2016, Smart Life Business accounted 11.1% of total operating revenues. In H1 2015, NTT DoCoMo proposed a strategy to become a co-creator and evolve from B2C to B2B2C and B2B2B by using



New video incorporates technology, art, and culture innovation, and has attracted new streams of users, data, and capital.



its core assets and advantages combined with the specialist skills and knowledge of its partners.

Adopting Apple's app store model, both KDDI's Smart Pass and DoCoMo's Smart Life platforms support and stimulate the creation of high value content, enabling value co-creation and sharing. Between 2012 and 2016, both operators drove growth through innovative ecosystem-based platforms and revenue sharing.

New video = value innovation + experience innovation

As the telecoms industry has developed, control points in the cloud-pipe-device ecosystem have changed. At MWC 2017, the Vivendi CEO said, "The 21st century is the era of 'content is king', but the most valuable content is exclusive, premium, and live content." This is further evidence of how ecosystem control points are changing from smart devices to video and content.

Traditional video comprises programs with predetermined content viewed at set times. Video now incorporates new technology, adding value and innovative experiences; for example, user-generated short videos on mobile devices and services such as YouTube, Periscope, and Snapchat have transformed video production and transmission methods. Cross-screen video in the US, Japan, and South Korea is

integrating social sharing, UGC, O2O, LBS and other new functions in addition to 4K, 8K, and AR/VR.

New video incorporates technology, art, and culture innovation, and has attracted new streams of users, data, and capital. For example, the of shooting Ang Lee's film *Billy Lynn's Long Halftime Walk* was five times higher than normal, because it used the highest technical standard of 120 frames per second in 3D at 4K resolution. New video has created opportunities for new business models and profit margins, forming a magic wand capable of casting commercial transition in the video industry.

From 2017 onwards, new video will solve bottlenecks in the traditional market, create huge amounts of opportunities, and force the industry to move forward.

Video evolution roadmap: From broadband to ecosystems

For operators, video strategy will evolve in four stages:

2016-2017: XBB + video:

Video development depends on fixed broadband, but value-based breakthroughs come from LTE. When average data per use per month reached the critical 1 GB point, we saw an 80/20 distribution user traffic

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New video requires new tech and platforms, especially pipe-cloud integrated networks that increase efficiency, lower costs, and guarantee experience.

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model – 80 percent of traffic carried by FTTx + Wi-Fi and 20 percent by LTE networks.

Video differentiated 4G from 3G. For example, early on in Verizon’s LTE rollout, the operator drove traffic and user growth by using its lightly loaded network to provide HD video services such as real-time and two-way video and live broadcasts of ice hockey and American football. Operators obtained traditional fixed video or IPTV mainly through collaborative models, bundled it with broadband, and gradually developed triple- and quadruple-play services.

2018-2019: Broadband monetization

Operators will monetize broadband through high-value video by developing optimally sized FMC broadband networks to maximize cost efficiency. They will source and bundle local high-value content.

European operators’ success with exclusive sporting content is a good example, with their large user bases and smart pricing models for monetizing broadband maximizing returns.

2019-2020: Video monetization

The value of new video will lie in quickly attracting users and boosting traffic consumption to increase profits. New video requires new tech and platforms, especially pipe-cloud integrated networks that increase efficiency, lower costs, and guarantee

experience. In the Korean market, the three main operators have already demonstrated that new video is the fastest growing service and a new revenue driver.

At this stage, operators must develop their own intelligent video platforms to achieve Netflix-like cost efficiency, an excellent video experience, and precision marketing. For example, SK Telecom’s media platform provides personalized video content, and Verizon has announced an open service platform called Exponent, which contains a media service sub-platform, delivers services from Verizon, and provides other operators with products and solutions such as video/TV middleware, CDN, and devices. Thus, Verizon now supplies other operators.

2020-2021: Ecosystem monetization

A powerful video platform can yield market insights, promote service innovation, and boost income from ecosystem innovation and quick value creation. Apple’s Apple Store, NTT DoCoMo’s Smart Life, and KDDI’s Smart Pass all provide benchmark examples.

The opportunities for monetizing video are clear, especially with new video. Operators that build strength in connectivity, promote open collaboration, and innovate services through the technology + art + culture mix will successfully transform their video businesses. [Ustream](#)

FTTH dream team: Telcos and power companies



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European Commission (EC) targets for gigabit connection speeds plus consumer demand for fast connections are spurring an interest in widespread FTTH rollout. But, the high costs of FTTH means that savings must be made to ensure scheme viability.

By Rod Parker, Manager at Analysys Mason

An electric power infrastructure allows FTTH to be deployed more cost effectively than a new build, with overhead poles better for rollout than underground ducts, particularly in rural and suburban areas. The EC's Cost Reduction Directive encourages different infrastructure providers to share their infrastructure. However, to enter the FTTH market, power companies must be sure they won't compromise the availability of power services or safety.



In the wholesale model, telcos access network services from the power company, meaning the latter doesn't need to provide a full end-to-end service. The power company can also sell network services to multiple retail providers, giving them an alternative to the incumbent's access infrastructure.

The leasing model has lower investment risks but higher operating risks for the power network, as it gives telcos access to its poles and ducts. Telcos that are planning their own access networks can reduce costs and simplify the process of gaining access rights.

The right model

Four possible business models can facilitate FTTH deployment by a power company on its own or in partnership with one or more telcos.

In the integrated model, the power company goes it alone and provides an end-to-end service that can potentially yield higher revenues. But, it bears a bigger investment risk that's exacerbated by a lack of telco skills.

The joint venture (JV) model shares the investment risk between the power company and a telco. It brings the telco skill set into the mix, enables both the network and retail facets of the business to function effectively, and works well with the wholesale model.

Examples of success

Telcos with access to a power infrastructure through a wholesale model, JV, or a combination of both have the best chance of success, providing that the operating model suits both parties.

SIRO in Ireland and OpEn Fiber in Italy are good examples of strong partnerships. SIRO is a JV between the power company ESB and Vodafone. Majority-owned by the Irish government, ESB issued tenders in 2012, aiming to find a partner to deploy an FTTB

network using its network infrastructure. After Vodafone's successful bid, SIRO was formed in 2014 to build and manage an FTTB network. The JV provides a 100 percent FTTB broadband network, offering open access to all authorized broadband providers in Ireland and allowing consumers and businesses to sign-up to SIRO through their service provider.

Enel, a major power company in Italy, set up Enel Open Fiber (EOF) in December 2015 to deploy FTTH. At the end of 2016, Metroweb was incorporated into the renamed OpEn Fiber (OF), which now uses Enel's power infrastructure to provide FTTH. Much like SIRO, OF is active in the wholesale market and doesn't sell broadband services directly to end users.

Generally, fiber can be installed below the power lines in a well-designed overhead power distribution network, which is exactly what OF did throughout its network. It's also more suitable for rolling out FTTH than an underground scheme, especially in suburban and rural areas where overhead power deployment is prevalent and cost savings are higher.

Underground power networks often encounter more issues due to a lack of spare ducts or because the network is buried rather than ducted, which often occurs at the last drop to the customer. Blockages and collapsed ducts are also common problems. OF is planning to roll out broadband networks in 250 cities and regions in Italy, which requires robust FTTH ODNs. OF has found reuse potential to be much lower in underground networks than overhead ones.

Huawei's in-house modeling framework calculates the cost of FTTH deployment in different urban, suburban, and rural scenarios after considering different reuse factors. Using the infrastructure of power companies is likely to provide the biggest cost benefits in suburban and rural schemes where overhead deployment is more widespread. While

the cost per home for FTTH deployment depends on location, reusing infrastructure can slash costs. In rural scenarios, cost savings can reach 45 percent.

So far for OF, Huawei has deployed its N2510 intelligent optical fiber solution for O&M and assurance in nine Italian cities, helping the JV accelerate acceptance testing, perform intelligent maintenance, and rapidly and precisely locate faults, overcoming traditional problems with ODNs and lowering TCO.

Three things to keep in mind

We've identified three key considerations for partnerships between power companies and telco partnerships in the FTTH market. One, a power network can provide a more universal network or be better suited to FTTH rollout in certain locations based on space availability and infrastructure robustness. This could be attractive to incumbent telcos that want to provide a more universal service. For alternative telcos, deploying FTTH based on power networks may provide access to better products and more attractive pricing. It can also stimulate competition in a way that benefits policy makers.

Two, each of the four business models has its own strengths and weaknesses. Partners need to select the option that best meets their mutual objectives and reflects market conditions like the availability of partners and competing infrastructure.

Three, not all of a power network will suit FTTH deployment, with underground infrastructure likely to be more problematic.

When developing its business case, a power company and its telco partner need to be realistic when assessing what proportion of its network is reusable and where it will need to build new infrastructure. [www](#)



Cutting TTM the smart way



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By lowering the marketing and IT costs of launching new ideas more quickly, telcos can move from a product-centric to a service-centric business model. At the same time, a precise approach to product catalogue transformation can cut TTM by more than 30 percent on top of existing TTM improvements made by agile system tools.

By Daniele Cozza



Stay lean

As telcos move towards open digital ecosystems that deliver OTT and IoT services, they need to establish best practices for innovating at the ideas stage.

They must also ensure consistency as standards increase, improve product design, and raise reuse levels. Product marketers can thrive by making their employees more effective, introducing lean processes, and adopting agile tools for product catalogues.

Under a CMO, product marketing managers and departments are responsible for product innovation, design, testing, forecasts, and lifecycle management. Challenges include exploiting product building blocks more effectively; considering whether product marketing is better when coordinated with other organizational functions; and improving innovation, forecasting, and pricing. The following items must also be well-defined: management; product launch governance, roles, and responsibilities for technology; and service creation.

In the automotive industry, reaching a target TTM involves monitoring the phases of a product launch with specific KPIs under an ad hoc governance model. Auto parts and components from different suppliers

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Service Providers (SP) must support a richer catalogue of products and services, which increases the number of stakeholders involved in product innovation.

”

can be used to automate the product launch process.

Digital disruption is leading telcos to adopt similar methodologies and best practices that accelerate TTM and make their organizations and solutions more agile. They're simplifying products into units and reusable parts such as micro-services and frequently reusing them to launch partners' new products and services or obtain parts from partners.

Telcos previously didn't feel so much pressure to standardize Product Lifecycle Management (PLM) for various reasons, including simpler products and features coupled with a homogenous network and provider landscape. But in today's digital world, the environment is no longer simple and static, requiring instead a controlled and coordinated PLM. Service Providers (SP) must support a richer catalogue of products and services, which increases the number of stakeholders involved in product innovation. Product managers must thus track the full product lifecycle from concept to retirement.

Marketing departments tend to configure product catalogues by themselves and are keen to optimize the go-to-market process by reusing past configurations. To be faster and more agile, telcos' IT departments prefer solutions with reusable product parts, which are also known as building blocks or

product templates. They can then hand over the parts for configuring product catalogues to business departments in the move to becoming service-centric.

Agility without innovation isn't enough. Telcos need open digital ecosystems to develop products and services for customers and partners. The platform implementing the digital product catalogue must integrate partners' product catalogues.

Product Catalogue Transformation (PCT)

Catalogue-driven business transformation merged into a unique product catalogue – the centralized TelcoOS product catalogue – to become the master of product configurations, both saving costs and cutting TTM. Unfortunately, telcos might be unable to reach their targets due to previous IT investments and impact on the organization.

Transforming your BSS by replacing multiple vendor solutions with a single platform, for example, with the Huawei's next-generation BSS, moves your commercial and technical product catalogue to a new stack that impacts the go-to-market process. At this point, you need methodologies that support the whole company on this journey.



Product catalogue consolidation (PCC) removes obsolete products and services and also streamlines product catalogue lines, features, and variants.



Executives' awareness of this journey isn't always there. In response, the Huawei consultancy service raises awareness, engages people, and sets out the timescale and risks. It creates clean, simple, and lean business processes on top of a new digital product catalogue.

Comprising four features, PCT is a framework-driven approach for reimagining how products are applied to the system capabilities of product catalogues.

Product catalogue consolidation (PCC) removes obsolete products and services and also streamlines product catalogue lines, features, and variants to focus on products with more customers and higher profits.

Product catalogue simplification (PCS) reduces products to their basic elements and common factors, creating a new way to implement products and services. It changes the mindset from legacy products to system product building blocks, applying a 1-1-1 (1-day, 1-week, or 1-month) speed model depending on product complexity. CXOs usually expect the Huawei solution to cut TTM by 50 percent.

Integrated Product Lifecycle Management (iPLM) moves Product Lifecycle Management from thick to thin and integrated. Designed to achieve agility and innovation for customers, Huawei's unique iPLM

solution translates marketing requirements into system configurations based on transforming the 3Ps – people, processes, and platform. The solution is E2E, with each process mapped to one or more phases in the product lifecycle. These phases are concept, design, development, pricing, marketing, rollout, publishing, activation, maintenance, modification, upgrade, retirement, and decommissioning. Each stage influences TTM. The solution standardizes product terminology, establishes a responsibility matrix to boost interdepartmental cooperation, measures and improves KPIs using Product Data Management functionality, and enables decisions to be made quickly and at the right time.

Product and Service KPIs measure the success of product development and identify where improvements are needed.

PCT uses standard tools and processes that add value to analyzing, designing, and releasing new products and services. It introduces best practices for reusing building blocks and provides a clear governance model for product managers to measure TTM. PCT cuts TTM by more than one-third on top of the TTM improvements made by agile system tools, ensuring your products get to market faster than ever before. [www.huawei.com](#)

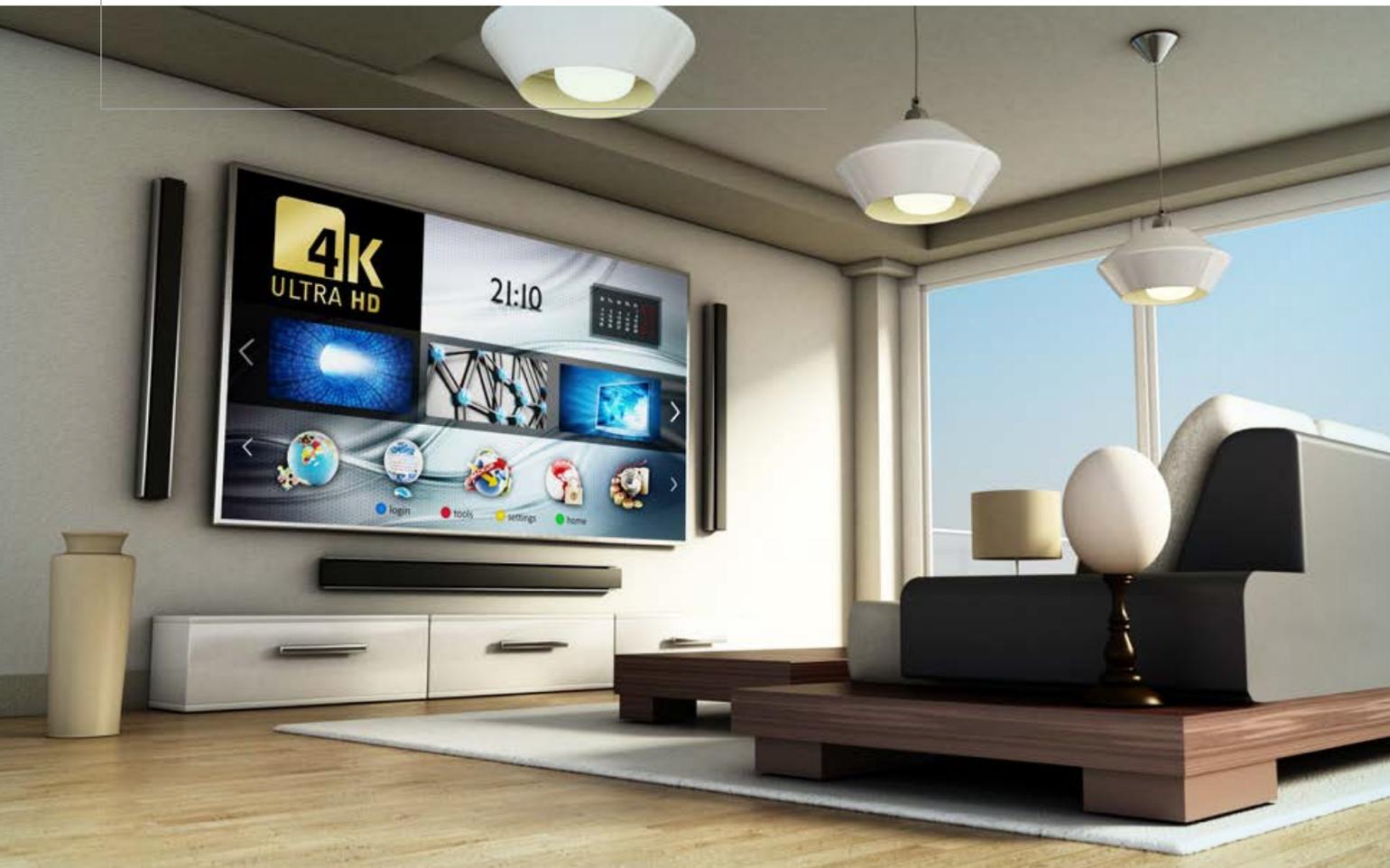
How two telcos succeeded in Europe with video



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Business transformation drives company growth for telcos and other companies looking to enter the telecoms space. The key to business transformation is developing and promoting new service applications and creating the right business models to maximize service take up and payback.

By Huang Yue, Li Biao





Video's transformative power

Operators have unique advantages for developing video services. First, a huge amount of broadband users fuels vast potential demand for video and encourages content providers to actively seek collaboration. With profit sharing agreements in place, operators can generate stable revenue streams.

Second, networks play an important role in ensuring KPIs like latency for IP video, the future of high-quality video. As operators own the networks, they're the gatekeepers of guaranteeing video performance.

Third, operators are typically able to provide bundled services that combine TV and broadband data services. Users will always want more for less, in this case better video experiences and content for less money.

Fourth, operators work in the local language and video is a localized product. This gives them an advantage as broadband and content overlaps, meaning operators are better able to satisfy local users' demands.

However, while regional operators understand networks better, they need to improve their understanding of users' content requirements and offer them what they want. Operators also won't be able to develop video services, especially HD and 4K video, with ordinary bandwidth networks. HD video requires at least an 8 Mbps network and 4K a minimum of 30 Mbps bandwidth. In multi-user households, bandwidth requirements are even higher, with 100 Mbps a common requirement. The typical household will therefore require 100 Mbps bandwidth for HD video and 1 Gbps for 4K. To meet these requirements, operators need to modernize their networks to increase bandwidth capabilities. By offering video services, they can recoup their original investment into broadband networks and receive good returns.

“Telekom Srbija and the Norwegian electricity company Lyse are two companies that have accumulated outstanding practical experience in video-driven network transformation.”

Modernizing networks by upgrading and reconstructing existing networks or building new fiber optic networks can accelerate network transformation and help operators develop video services.

Telekom Srbija and the Norwegian electricity company Lyse are two companies that have accumulated outstanding practical experience in video-driven network transformation.

Telekom Srbija's road to network modernization

Located in the Balkan Peninsula in southeast Europe, Serbia is a landlocked nation of 7.18 million people and 2.5 million households. Telekom Srbija is the country's largest integrated operator, providing mobile, fixed, and video services.

In October 2016, the Serb operator completed its network modernization pilot in Aleksinac, reconstructing its existing network, launching HD IPTV services, and laying the foundation for providing 4K services to the city and surrounding areas. Telekom Srbija's pay-TV service currently has 25 HD channels, more than 250 SD channels, and an increasingly

diverse range of on-demand programs.

The operator expects network modernization to grow fixed-line broadband users in Aleksinac by 30 percent over the next three years, compared with 5 percent before reconstruction. Monthly spend by users on communications will continue to increase due to broadband acceleration and better TV service experience.

Network modernization: In 2014, Telekom Srbija upgraded its pay-TV service by deploying Huawei's multimedia service platform. However, the operator's old network was hindering further growth of HD video users and the introduction of 4K services. The limited bandwidth of the copper network had become a bottleneck, stopping rapid development.

Telekom Srbija opted for network transformation to support future service growth, which it started in 2016 as part of an HD video and 4K strategy. The scheme involved modernizing and reconstructing the existing network and expanding high-speed broadband coverage.

The operator's network modernization strategy



had three objectives: One, completion in three years; two, widespread 100 Mbps coverage; and three, deploy a future-ready fiber optic network in high-value areas and lead the pay-TV market.

Reconstruction: Huawei provided a zero-risk switchover solution, a product solution for smooth evolution, and business and network consulting services. Huawei's exclusive Turnkey service helped Telekom Srbija achieve network-wide target bandwidth and meet delivery times, enabling the operator to progress to the next stage.

Copper cable recycling and monetization: Base stations were moved down and copper wire running from local end equipment, such as MSAN, to central equipment rooms was replaced by fiber optic and recycled.

User growth: After network modernization, high bandwidth and excellent HD video service experiences stimulated growth in user numbers – 359 percent for 50 Mbps broadband and 84 percent for 20 Mbps.

Equipment room closures: 53 percent of 139 central equipment rooms were viable

for closure, enabling either full surrender of tenancies or substantial reductions in rent, which saved €80,000 in OPEX.

Faster service TTM: Huawei's Customer Solution Cloud and complete service tool suite cut TTM by six months.

Having teamed up with Huawei for more than a decade, Telekom Srbija's CEO revealed the next stage of the partnership in October 2016: an All-IP transformation project.

Having already signed a framework agreement with Huawei, All-IP transformation will upgrade and reconstruct the entire network's infrastructure in readiness for UHD video and 4K services. The resulting network and service growth will boost income, lower OPEX, accelerate TTM, and improve user experience.

Lyse enters new ground

On December 24, 2016, Altibox, a subsidiary of Norwegian energy company Lyse, launched Europe's first 4K UHD TV service on a next-gen video platform and on an all-optical network covering the whole

“The new operator cut FTTH costs by 30 percent by installing electricity pipelines and poles and having users carrying out lead-in trenching and building entry themselves.”

of Norway, making UHD videos services available to most of Norwegian families. This transformation marked Lyse’s shift from energy provider to home broadband operator to digital video content operator.

Altibox builds an all-optical network

When deploying a fiber-optic network, operators are faced with high investment, slow progress, and slow ROI. Lyse also had to deal with Norway’s low population density, scattered buildings, and high labor costs – all factors that make it one of the most difficult places to deploy a fiber-optic network.

Rather than rolling out construction nationwide, Lyse ran a pilot in Norway’s third largest city, Stavanger, and the surrounding area. Because it had already supplied electricity to over 200,000 customers in the region for decades, reputation and trust weren’t a problem. Lyse boosted public and government awareness of fiber optic’s importance through an extensive publicity campaign. It also surveyed requirements in residential areas, allowing Lyse to increase

network coverage in a more targeted way, which achieved a sign-up rate of up to 60 percent.

The new operator cut FTTH costs by 30 percent by installing electricity pipelines and poles and having users carrying out lead-in trenching and building entry themselves. After three years, Lyse had connected more than 70,000 households to the fiber optic network, becoming Norway’s biggest broadband supplier and a major promoter of next-gen communications infrastructure.

A helping hand

Coordinating resources and building across regions to achieve fiber optic coverage nationwide is extremely tough for all operators. So, Lyse opted not to go it alone, instead setting up an alliance of 36 local electricity companies from across the nation to build a nationwide fiber optic network. With relatively low investment, Lyse was able to carry out a nationwide marketing campaign, develop a large market, and establish a national broadband brand.

It used standard construction guides and



marketing training to lower the capital and technical thresholds for regional power companies to enter the broadband market.

In the alliance's fourth year, Altibox's fiber optic network covered 60 percent of Norway. It had increased its users from 70,000 to 420,000, representing 22 percent of the broadband market share and double the number of its electricity customers. Altibox had become a significant force in Norway's emerging fiber optic broadband market, serving 73 percent of FTTH users.

Digital transformation

Altibox provides fiber optic broadband access at 40 Mbps to 1 Gbps over its all-fiber network, as well as fixed telephony, 150-channel IPTV, on-demand video, and household cinema services on its ultra-broadband network. The operator has also developed smart home services, including cloud home security and energy management.

Altibox's CEO remarked that, "We are the

first to bring 4K to home video. As a leader in the field of home entertainment, we're delighted to deliver a cinema-grade viewing experiences to our customers together with Huawei."

Third-party analyst ESPI reports that Altibox has enjoyed the highest customer satisfaction rates for TV and broadband services for seven consecutive years.

ICT currently contributes more than 35 percent of Lyse group's revenue, and more than half of its profits. Lyse has both popularized broadband in Norway and completed the company's transformation journey from energy supplier to all-optical broadband operator and finally to a digital video provider.

With video-driven network transformation set to become a major trend in the next few years, Huawei is committed to helping operators like Telekom Srbija and Lyse transform and create positive business cycles. [www](#)

Rostelecom

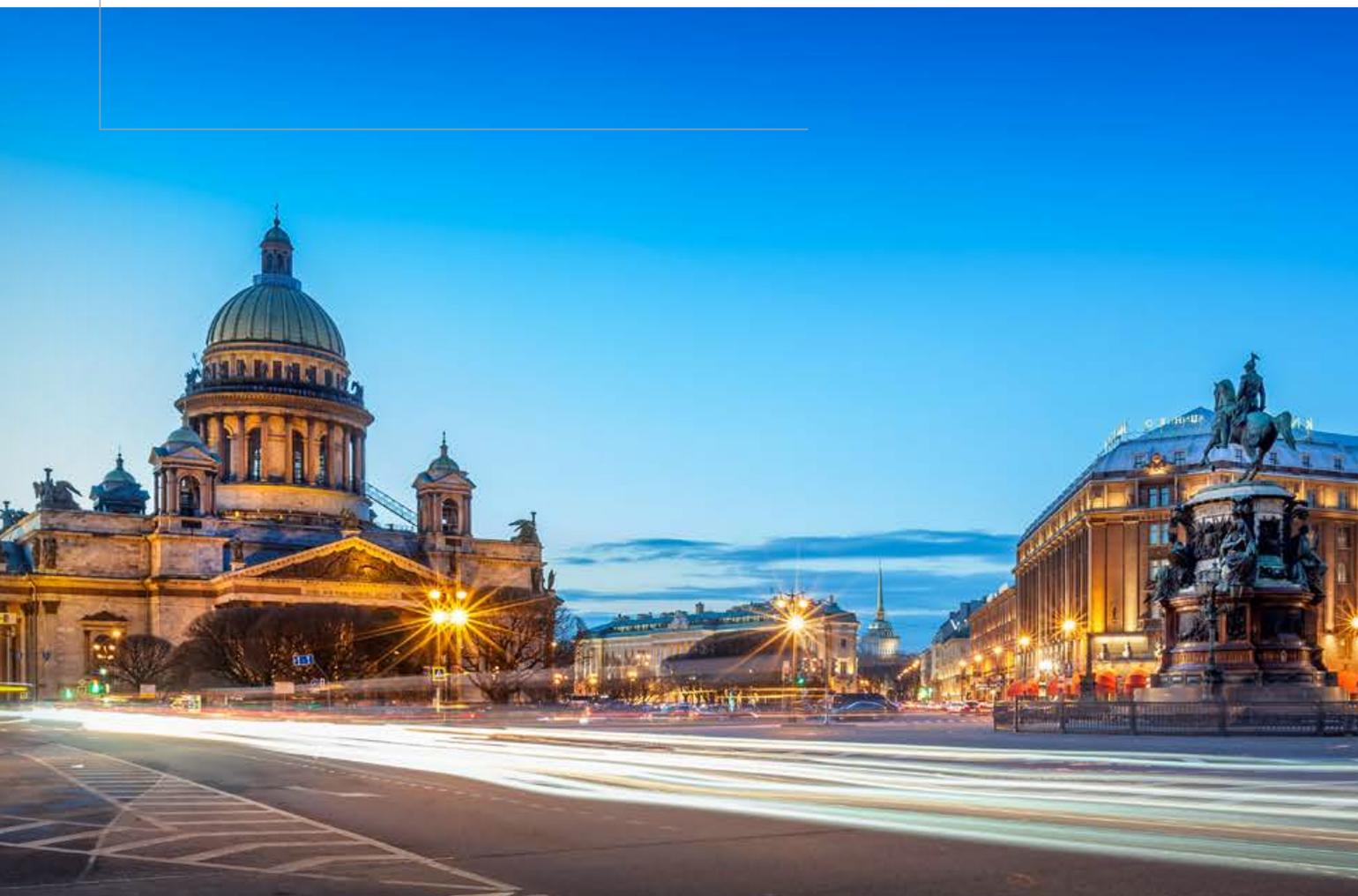
slims down for financial and digital gains



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To pack some financial muscle onto its digital ambitions, the Russian operator Rostelecom decided to monetize 8.8 million square meters of its property across Russia by moving its sites downstream and freeing up equipment rooms to better use idle assets.

By Wang Hui





Digitalization isn't free

Traditional CT equipment rooms no longer meet operators' ICT service development needs. With high maintenance costs further hindering digital transformation, more carriers are opting to reconstruct equipment rooms and monetize undervalued sites to lower OPEX and drive up revenues.

Rostelecom's Digitization Strategy 2020 set out its aim to increase the percentage of its income from digital services to 60 percent in 2020, up from 40 percent in 2015. To achieve this, the telco kicked off with a heavy investment in digitalization, in particular by acquiring video content and ramping up video quality. Simultaneously, it launched a broadband acceleration program to meet the high bandwidth needs of video services and built DCs to provide IT services.

Rostelecom's investment in large-scale network construction and video placed a huge burden

on its cash flow. Added to weak income growth and declining CAPEX investment over the previous few years, its digitalization project lost pace, with legacy network reconstruction even stalling at one point. Rostelecom needed new inflows of cash fast.

Rise through reuse

Globally, equipment room closures are on the increase for two reasons:

Idle sites: A Rostelecom survey discovered that the majority of its equipment room hardware was old and cumbersome PSTN equipment. With continued user churn, 40 percent of its PSTN equipment ports were now idle. At the same time, the operator had replaced old equipment with compact high-density equipment that took up less space during All-IP transformation. Coupled with fiber optic deployment, which moved sites downstream, and the fact that most of Rostelecom's equipment rooms were in regions where broadband acceleration had



“Adding to the urgency, a strict 2015 property tax enacted in Russia had wiped over 10 percent from Rostelecom’s annual profits.”

been completed, the bulk of its equipment had been relocated from equipment rooms into outdoor cabinets – equipment room vacancy rate exceeded a hugely wasteful 70 percent.

Lagging behind ICT service deployment:

More advanced communications and energy tech means that traditional CT equipment rooms can no longer deliver the goods. DC deployment and hosting services, for example, place new load bearing, voltage, and temperature control demands on equipment rooms.

OPEX & CAPEX

Simple restructuring allowed the operator to close these equipment rooms and monetize its assets.

Dramatic reduction in OPEX: By analyzing a typical access network room, Huawei discovered that the complete renovation of equipment room equipment, air conditioning, and monitoring systems could slash electricity use, space, and maintenance costs by 80 percent, 90 percent, and 60 percent, respectively. By renovating 2 million PSTN lines, for example, fellow European telco Belgacom cut electricity costs by 65 percent after closing its equipment rooms. For a single equipment

room, overall OPEX savings could be as high as 70 percent.

Adding to the urgency, a strict 2015 property tax enacted in Russia had wiped over 10 percent from Rostelecom’s annual profits. A common problem in Europe, tax shocks can be offset by closing equipment rooms.

Organizational efficiency improvements:

Equipment room closures facilitate network simplification and upgrades. It frees large numbers of maintenance personnel from maintaining outdated equipment – they can instead focus on new ICT technology and operators can dedicate a greater proportion of their staff to marketing and sales to increase income.

A positive business cycle: Reducing OPEX and monetizing equipment rooms increased Rostelecom’s available capital for large-scale network modernization, speeding up digital transformation. Completing digital transformation would boost Rostelecom’s income, which would in turn accelerate network modernization, forming a positive business cycle.

Rostelecom published an asset monetization



strategy in its November 2016 investor report. A statistical analysis of its nationwide fixed assets revealed a total of 8.8 million square meters of property, most of which was equipment rooms containing network equipment. Rostelecom set up a special company to monetize these assets using various methods, including sales, SPV, and auctions.

Local press reported that Rostelecom hoped to raise 12 billion rubles (US\$2 billion) by monetizing these 8.8 million square meters, including the Central Telegraph building in Moscow's business district. At over 700,000 square meters, this particular building would raise a staggering amount.

Equipment rooms for access networks accounted for the largest number of sites. The operator selected Huawei's one-stop cabinet solution to move most of the hardware in these rooms down the network.

3 disposal scenarios

There were three disposal solutions for the remaining hardware: One, relocate all equipment to smaller and more economical neighboring equipment rooms; two, shrink the original sites using Huawei's Micro Module solution, which is a unified equipment room containing power, rack, air conditioning, and monitoring systems. It can be quickly deployed in basements and uses little power. Three, relocate all equipment to outdoor container equipment rooms. Huawei's container equipment rooms offer more adaptability to the environment than ordinary equipment rooms. In particular, they offer advantages in harsh environments, and are able to function in earthquakes and

temperature extremes.

After closing its equipment rooms, there were three disposal scenarios: one, sell off property for cash; two, surrender leased property; or, three, use them for a different function like a service center or retail outlet if the location is suitable, or a data center if not.

A boost in income

In collaboration with Huawei, Rostelecom sold off some of its equipment rooms after moving sites down, something that the operator will continue doing over the next few years.

Rostelecom is not the first operator to monetize its equipment rooms, with other operators in Belgium, Italy, Poland, and Russia doing the same. After closing most of its high-value equipment rooms Belgacom, for example, was in a stronger position to transform its structure and operations and invest in digital transformation.

It's not just about money. The telecoms industry has one of the largest carbon footprints – closing equipment rooms and retiring old equipment and technology can lower energy consumption and slash CO₂ emissions. We believe that this trend will continue to grow. [uum](#)

Ningxia Mobile

goes digital with Big Connectivity



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efficiency by 40 percent.

Ningxia Mobile and Huawei teamed up back in June 2015 to deliver a third-gen operations support system (OSS) as part of the Big Connectivity strategy that underpins China Mobile's roadmap for digital transformation. Completed last year, the solution delivers more product types and multi-channel services for subscribers, and has cut product TTM by 30 percent and boosted O&M

By Zhang Weicong, Ningxia Mobile



Making the right connections

To create new revenue streams from digital services, operators that own extensive pipeline resources must approach digital transformation with a sense of urgency. In China, the national Internet+ strategy coupled with increasing cloud computing and big data maturity provides a sound policy and technology basis for Chinese operators to digitally transform.

China Mobile's Big Connectivity strategy involves increasing its number of connections, optimizing connectivity services, and strengthening connection applications.

However, the decade-old second-gen support system operated by its wholly owned subsidiary, Ningxia Mobile, was outdated and unable to execute the group's strategy. The first of three challenges involved low customer satisfaction due to bottlenecks in products and channels, with poor product management resulting from a lack of synergy between online and offline products, which was exacerbated by the inability to implement real-time, precision, and collaborative marketing. The second issue with technical architecture arose from the lack of scalability in the legacy OSS, leading to difficult O&M and high costs. The third challenge was support for digitization – Ningxia Mobile couldn't open up its systems to provide digital services.

Deploying a digital OSS could slash product TTM, increase product diversity, and give subscribers a far better experience.

The solution

Huawei's third-gen CRM system met China



Mobile's requirements for thin application and thick platform plus digital support, and the two joined forces to innovate a solution.

Huawei systematized Ningxia Mobile's services and streamlined the system by taking its operations management model online, retiring 74 percent of its menus, 80 percent of its interfaces, 36 percent of its processes, and 45 percent of its products. Digitizing operations support has enhanced user experience and increased O&M agility and efficiency within an open, integrated ecosystem.

Internetized user experience

Ningxia Mobile's product model integrates its traditional and Internet models. Customers can make one-stop product purchases and receive a consistent experience across the operator's online, in-store, and app channels, with full-channel coordination for all orders. For example, customers can assemble their own personalized service packages or purchase a product online and then collect and install it offline. The new Internet-based operating model has cut service processing time by 48 percent, significantly increasing satisfaction.

Agile operations

The agility provided by the third-gen CRM system has accelerated response time and enhanced the subscription process, providing a strong foundation for a future DevOps system. A rich array of preset

“Integrated packages that combine mobile products and partners’ products have broadened the digital services available to customers and created new revenue streams.”

templates with customized development tools based on metadata allows Ningxia Mobile to configure products and offerings on one page and launch them on all channels.

Massive O&M efficiency increase

Unified monitoring and automatic O&M based on IT PaaS has enhanced O&M efficiency by 60 percent, lowered CAPEX, ensured business continuity, and enabled agile expansion via cloud. A single engineer can deploy the CRM system in six hours and upgrade it in two thanks to one-click operations. The distributed cloud architecture supports real-time elastic scalability, greatly improving the utilization of IT resources; for example, peak concurrent service processing is between two and three times higher thanks to automated capacity expansion in real time, reducing costs by more than 50 percent. Gated launch capabilities enable new versions to be tested in commercial environments, allowing quick trial and error without interrupting services or users being aware. Automatic inspections and fault tracking unify service call and log chains, cutting fault location time by 40 percent.

Open, integrated ecosystem

The CRM system’s open capabilities enables Ningxia Mobile to monetize its fixed assets and create new revenue streams by opening up traffic, voice, IT, and data services to third-party developers. Partners like e-commerce companies,

MVNOs, and individual developers can join the ecosystem. Capabilities are integrated and shared, promoting application innovation and forming an open ecosystem that benefits all.

The integration capabilities of the CRM system attract partners from other industries, including insurance and finance. Integrated packages that combine mobile products and partners’ products have broadened the digital services available to customers and created new revenue streams. Moreover, Ningxia Mobile’s online-to-offline (O2O) operating model works in partnership with logistics and third-party payment platforms, maximizing convenience for consumers.

Ningxia Mobile and Huawei’s partnership will continue as the operator further transforms with schemes like centralized decoupling, Internetization, and enhancing the agility of the CRM system. Capabilities will be further integrated and shared, attracting more parties to join the ecosystem and launch products in an open ecosystem.

Ningxia Mobile also plans to build a converged private enterprise cloud and big data platform for three domains to cloudify its data center and provide intelligent network scheduling. It also wants to build an SDN network to enable smart O&M and the thin provisioning of IT resources and explore data governance and value monetization under the Big Connectivity strategy. [www](#)

Going Dutch on transformation with

KPN



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Back in 2014, the Dutch telco KPN was finding it hard to expand its market share for a slew of reasons, including inefficient and costly legacy architecture, product silos, and an incomplete picture of customer requirements. The operator knew it needed to transform to respond to the market with the kind of agility that the cloud era demands. And to do so, it needed the right solution and partner.

By Katie Matthews, Zheng Zelong



“During transformation, you can never really predict what the real challenges will be. With Huawei we were able to manage and overcome these challenges and succeed with transformation. And that’s the key to successful collaboration.”

– Bouke Hoving, KPN CIO

Back in the day

Three years ago, KPN’s ambitions were being frustrated by an inefficient and costly IT architecture, which couldn’t support the operator’s long-term business vision. For example, more than 75 percent of KPN’s 80-plus applications were outdated. Moreover, many were overlapping, with the operator running three different business supporting systems (BSS) for the mobile market. Its systems and processes were organized and structured along product siloes, and the telco’s sales staff lacked a 360-degree customer view, hindering both cross-selling and up-selling.

KPN’s distributors were frustrated with having to enter orders for multiple products, while customers experienced slow order times because the shop floors were entering orders in multiple systems using multiple processes. Customers also faced friction when trying to move from one product or channel to another, negatively impacting KPN’s brand equity.

Finally, its weak legacy systems crippled innovation by slowing TTM and inhibiting KPN’s

ability to comply with new EU regulations.

Time to change

KPN decided its transformation project needed to improve stability, simplify processes, shorten TTM, and reduce TCO. KPN’s business aim was to increase its market share by improving customer satisfaction and responding quickly to market trends. The technical measures for achieving this included simplifying its IT portfolio, standardizing processes across all brands, and consolidating its IT stacks into a single low-cost environment.

KPN contracted Huawei to migrate its legacy IT systems to Huawei’s BSS, which comprised Huawei’s CRM system as well as the core rating and billing module in Huawei’s next-gen BSS – the Convergent Billing Solution (CBS) Release 5. The project involved configuring and commercially launching more than 200 offerings on CBS R5.

KPN and Huawei jointly redesigned internal processes to be independent of products and channels, enabling a seamless customer experience. The shift to a single CRM system



and order entry system also simplified the processes at customer touch points, including channels, shops, digital channels, and call centers.

KPN also rationalized many of its legacy price plans and products to smoothly migrate customers from legacy systems to new processes and IT stacks, removing silos and optimizing the customer experience.

According to KPN CIO Bouke Hoving, “During transformation, you can never really predict what the real challenges will be. With Huawei we were able to manage and overcome these challenges and succeed with transformation. And that’s the key to successful collaboration.”

The gains

With far greater efficiency and agility, both customers and channel employees are seeing the benefits of transformation.

As a result, customer satisfaction has jumped dramatically: KPN’s Net Promoter Score has shifted from negative to positive, with NPS for residential customers at +9 and for consumer

mobile customers at +10 in 3Q 2016.

KPN is the largest telecoms and IT service provider in the Netherlands. At the end of the third quarter of 2016, KPN was serving 3.66 million households and providing 5.27 million consumer mobile connections to the Dutch population of 17 million.

Digital transformation also supports KPN’s six strategic aims: New ways of living and working reflect the rapidly changing work environment that will enable people to work anytime, anywhere. The telco’s energy-efficient solutions are designed to help customers across sectors to cut power use. Its best-in-class networks are grounded in helping the whole of Dutch society flourish, which is linked to another strategic aim of ensuring security and privacy. Its other two major activities are healthcare and CSR in the form of sponsorships.

Recognized for its success in the industry, KPN won the Business Transformation of the Year Award at TM Forum Live 2016. KPN is now equipped to realize its strategic vision and extend its lead in the market. 

Sichuan Telecom

All-seeing with all-optical



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Sichuan Telecom's all-optical network has slashed OPEX, lowered broadband prices, and solved the problem of running multiple parallel networks. The China Telecom subsidiary sought to bridge the digital divide, resulting in a scheme that's a globally relevant example of delivering universal broadband services.

By Wang Guojun





Taking the plunge

Prior to 2013, Sichuan Telecom was cautious about building an optical network for multiple reasons. The high cost was off-putting and unlikely to be offset by returns, because user demand for upgrading to fiber optic was low, which in turn would lead to low ROI.

Transformation would also be highly complex, both the large-scale construction and issues with widespread site access, coordination, and the inefficiency and expense of laying rubber-insulated fiber optic cables for building entry.

As Sichuan Telecom hadn't promoted FTTH construction on a large scale, it was operating a number of long-term coexisting access networks, including DSLAM, FTTH, FTTB, and DSL. To install and maintain copper networks, the installation and maintenance teams would need telephone lines, DSLAM terminals, separators, and other tools. For

optical networks, these teams would have to re-lay building-entry lines, replace terminals, and bring tools and materials such as cleavers, rubber-insulated fiber optic cables, and quick connectors, greatly increasing complexity.

In response to these problems, the operator devised a completely new solution that was replicable and has practical significance.

Thinking strategically

Replacing copper: Post-construction, Sichuan Telecom had to deal with the retired copper cable. It used the opportunity to generate funds, arranging an online auction that raised 677 million yuan (US\$100.6 million) towards constructing its optical fiber network.

Closing equipment rooms: Network infrastructure was increasingly centralized and integrated. Traditional PSTN switches, DSLAM, and other equipment were taken offline and retired, cutting equipment room needs from

“ Collaboration lowered product prices by combining telecoms and TV products, benefiting customers and creating a triple win for Sichuan Telecom, the TV manufacturer, and end users.

thousands to hundreds of square meters. Specialist power, battery, transmission, and data equipment rooms could be integrated into a single room, reducing the overall number of rooms. By opening up new retail outlets in retired equipment rooms that used to house network wiring, battery, and other equipment, Sichuan Telecom boosted the share of its total retail channels from 21 percent at the end of 2012 to 35 percent by the end of 2016.

Introducing private capital: To attract private capital for the scheme, Sichuan Telecom set up a business collaboration model to share the benefits and risks, whereby partners would receive ROI from a set number of years of income sharing. The scheme helped alleviate Sichuan Telecom’s lack of funds for broadband construction, reduced project construction costs, increased network coverage, and led to the formation of a private capital co-development mechanism.

Sichuan Telecom also teamed up with a local Sichuan-based TV manufacturer. The companies’ sales staff in rural areas marketed

both telecoms and TV services. Advertising posters about the IPTV service were installed in the manufacturer’s 800 retail stores across the province, and joint retail outlets were also set up in pilot counties to demonstrate and benchmark the concept. These stores expanded marketing channels and provided a convenient way for users to apply for broadband services and buy TVs at the same time.

Collaboration in this way also lowered product prices by combining telecoms and TV products, genuinely benefiting customers, thus creating a triple win for Sichuan Telecom, the TV manufacturer, and end users.

Investing wisely

Panoramic broadband planning: Sichuan Telecom produced an overall schematic of the whole network that showed natural geographical conditions and current network assets, including current network infrastructure, user distribution, and network asset features. It was possible to visualize existing network assets, including operator



assets, utility poles that could be jointly developed and shared, base stations and equipment rooms, existing broadband coverage methods, and the distribution of residences and existing customers. Sichuan Telecom could then distinguish different levels of construction needs based on market demand and investment returns, and mark these on the schematic so it could adopt different investment and staggered construction strategies in a coordinated way.

The plan helped Sichuan Telecom cut investment by two-thirds by integrating the outcome of the plan into the FTTx system, and formed a whole-process closed-loop management and control system for inventory.

Collaborating with power companies:

Sichuan Telecom ran fiber optic cables along electricity poles to lower costs and speed up cabling. However, because traditional overhead cables are made from steel strand suspension wires, safety risks were high. So, the operator selected a new type of non-metal overhead cable that lowered costs, reduced cabling complexity, increased ROI

and efficiency, eliminated the risk of electric shocks, and cut cabling time by 30 percent.

Outsourcing the building-entry section:

To lower the cost of provisioning and maintaining the building-entry leg, Sichuan Telecom encouraged local residents to establish businesses and take on broadband provisioning and maintenance work in collaboration with the operator. Sichuan Telecom would handle construction and pay for the trunk cable, while local residents would fund the construction of the entry fiber optic section, splitting monthly costs based on the particular proportion. Understanding local conditions and markets, these local partners had a clear advantage in terms of utility pole construction, maintenance services, and market development. They could also act as a service channel for Sichuan Telecom to cultivate customers, manage services, and handle marketing, which would benefit both customers and generate profits for the operator.

Hybrid fixed and mobile: In Sichuan province, many villages are remote and far

“Transforming the entire network to fiber optic resulted in a flat all-IP network, with siloed services becoming All-IP.”

from the nearest towns; however, thanks to fiber optic cabling for FTTN, government, education, and monitoring services, fiber optic networks have reached these outlying areas. But, for this scheme, there weren't enough fiber cores on these networks to meet FTTH network construction requirements, and laying additional fiber optic trunk cables would call for huge lengths of cables at enormous cost. As a solution, Sichuan Telecom opted to move small-capacity OLT equipment down to cover neighboring villages, harnessing the remaining fiber optic cores to act as an OLT upstream fiber optic cable. This significantly reduced the number of fiber optic trunk cables that had to be installed, lowering costs and improving the management of bandwidth resources.

Three birds with one stone

Broadband tariff sees average annual fall of 75 percent: Sichuan Telecom's all-optical network converted analog signals into digital ones, greatly reducing the network infrastructure required, cutting the cost and complexity of O&M, and boosting network quality. Sichuan Telecom was therefore able to lower broadband tariffs year on year

– as 2016 drew to a close, the operator's broadband unit price had dropped from 7.2 yuan per megabyte in 2013 to less than 1 yuan, an average annual fall of 75 percent.

Tenfold increase in speed made possible: In China, average broadband speeds over copper wire barely hit 8 Mbps. But, as broadband services like video grow in prominence, network bandwidth of 1 Gbps and more will be required in the future. All-optical network transformation is helping Sichuan Telecom reach its speed goals of 20 Mbps as minimum, 100 Mbps as mainstream, and 1 Gbps as the future.

Goodbye to silos: Transforming the entire network to fiber optic resulted in a flat all-IP network, with siloed services becoming all-IP, thus making rollout much faster – three to six months from project initiation to implementation.

By executing a decisive strategy on a network that enables continuous innovation and new business models at minimal cost, Sichuan Telecom has nurtured the capability to adapt to rapidly changing markets. [www](#)

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