



# Shaping the dynamics of an open cloud ecosystem



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On the third day of HUAWEI CONNECT 2016, Huawei’s Rotating CEO Guo Ping, shared Huawei’s concept of a cloud ecosystem and the action the company has taken to contribute to its development. Borrowing a rich set of metaphors from the natural world, Guo described Huawei’s role as the “soil” and “energy” in the ICT ecosystem of a budding smart society.

By Guo Ping, Rotating CEO, Huawei

A famous writer once said, “Everyone has their own patch of forest out there. Perhaps we will never find ours, but it will be there always.”

I’m envious of Dr. Ma You and Li Mingguo. They have managed to find their own forests, and over the past 20 years, protected them and helped them flourish. This is a huge accomplishment – a testament to their strength of spirit.

In the cloud era, each enterprise has its own patch of forest too. I’d like to share my thoughts on how we can link up these scattered plots of forest into an open ecosystem that thrives on shared success. I’d also like to explore Huawei’s positioning and responsibility as a member of this ecosystem.

Full disclosure: I’m not a biologist. However, I am an avid SCUBA diver – I have my PADI – and can remember one time when my instructor talked about the differences

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between the marine ecosystems in Hawaii and Costa Rica.

He talked about how isolated Hawaii is, how it's out in the middle of the ocean, over 3,000 kilometers from any continent. Life in this region – whether it be animal, plant, or marine life – exists in a relatively closed ecosystem. When travelers arrive, they are subject to the world's strictest inspections concerning animal and plant matter. The purpose is to protect the existing ecosystem. Despite of this, only one new species is successfully introduced to its ecosystem every 20,000 to 30,000 years. Today, there are just over 20,000 different species in Hawaii.

Costa Rica is located at a critical juncture between North and South America, with Panama to the south and Nicaragua to the north. Although it's also surrounded by water, Costa Rica is not separated from either continent. As a result, the ecosystem there is open and dynamic, with a high number of species that coexist and thrive together. In Costa Rica, the average rate at which new species can be introduced to the ecosystem is about 10 times faster than Hawaii's. Today, Costa Rica has over 500,000 species, 25 times more than its marooned cousins to the West. Costa Rica has one of the highest rates of biodiversity in the world.

Today I'd like to talk about the ecosystem that we aim to cultivate: an ecosystem that is open and prosperous, similar to the one in Costa Rica.

## Connected and complex

We're becoming a smart digital society. We don't know what that smart future will look like. However, one thing is certain: Industry systems will become more interconnected and complex.

A chart from a 2014 paper by management guru Michael E. Porter illustrates a simple scenario in an agricultural system where traditional tractors have become more complex. In the past, tractor manufacturers only needed to interact with farm owners. Today, they need to engage with many interactive systems and organizations such as meteorological data systems, seed companies, and irrigation systems.

As big data, the Internet of Things (IoT), mobility, and cloud services develop, business entities that were not formerly connected begin to have more interactions with each other. In this greater context, proceeding alone is no longer a viable option. It doesn't matter if you're a tractor, irrigation, or ICT company, it's nearly impossible

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for a single company to establish a whole set of systems on its own.

Of course, this is only one example, and a relatively simple one at that. Complex scenarios in all aspects of our lives, including education, transportation, and healthcare, will develop and evolve in the same manner as the marine ecosystem in Costa Rica.

### Controlling resources

Enterprises in traditional value chains are adept at building core competencies, and the key to this is owning and controlling core resources. As industries integrate and consumer demands evolve, however, enterprises have to become more open and flexible, and future-proof their businesses with advantages that derive from being part of an ecosystem – what we can call “ecological advantages”.

In other words, advantages will not only come from within an organization, but also from the effective use of external resources.

The same principle applies to the ICT industry. In the cloud era, ICT has grown from a vertical industry into a tool that enables the digital transformation of all industries. Vertical integration across the value chain has already become an action from the past, and the

time is ripe for the ICT industry to establish a new, cohesive ecosystem.

**The ecosystem must be open.** Compared with closed value chains, the new ICT ecosystem should be open and dynamic, and welcome new entrants.

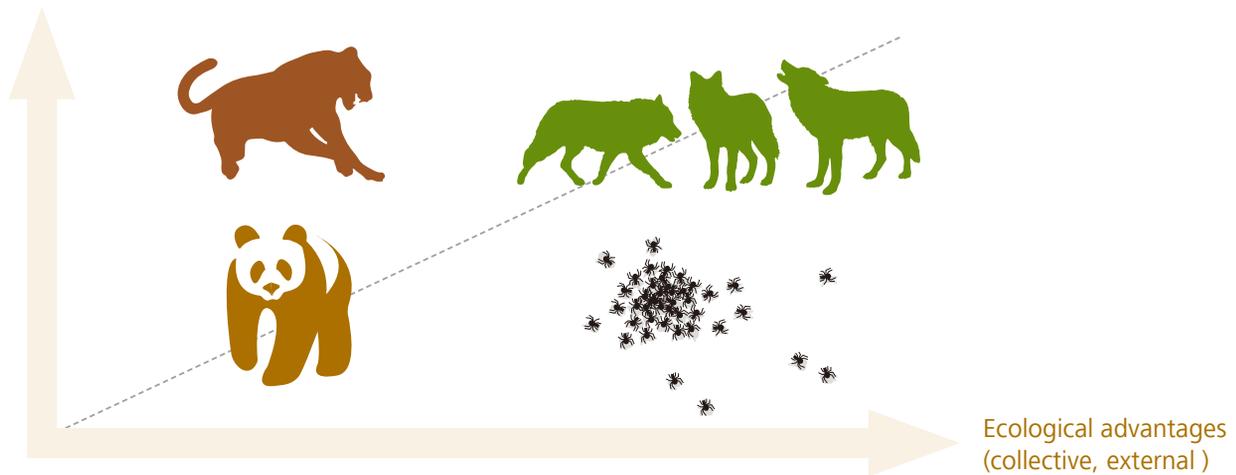
**The ecosystem must be diverse.** The ICT demands of industries the world over are changing and becoming more complex, and there are many uncertainties in the times ahead. We thus need a diverse ecosystem to properly confront them.

**Value creation in the ecosystem must be exogenous.** Value creation will be largely driven by external rather than internal factors. In this sense, value will be derived from the entire value network, rather than from a single value chain.

**Resources need to be integrated across the entire ecosystem.** Competitive advantages in traditional value chains are derived from the effective management of resources that an individual company owns. In contrast, establishing competitive advantages in the future ICT ecosystem will depend on a company’s ability to effectively manage resources that don’t necessarily belong to it.

**The ecosystem must be built on symbiotic**

Competitive advantages  
(individual, internal)



### A Full view of competitive and ecological advantages for enterprises

**relationships.** Competition between traditional value chains is a zero-sum game, where some win because others lose. In contrast, the new ICT ecosystem must be symbiotic and promote shared success. Every enterprise, big or small, can become part of a symbiotic, interdependent, and regenerative community of common interests, as long as it has its own unique value and makes its own unique contribution.

An article in the Chinese version of the Harvard Business Review describes the advantages of different types of enterprises from two dimensions: competitive advantages and ecological advantages.

**In the lower left-hand corner of the matrix are enterprises that lack both competitive and ecological advantages. We call these “pandas”.**

Pandas in the wild are inept at adapting to their environment and can only survive in natural reserves. Panda-like enterprises refer to those that lack their own core resources and the ability to mobilize the capabilities of their partners in the business ecosystem.

In the upper left-hand corner of the matrix are “tigers”. Tigers are extremely ferocious and are undeniably the

true kings of the jungle. They come and go alone and have no companions. Tiger-like enterprises have strong core competencies and can innovate ceaselessly to make breakthroughs in established domains. However, these enterprises are not good at connecting with external resources, including partners, and as a result, their ability to optimize the ecosystem is relatively weak. The kings of the jungle might look majestic, but it’s important to remember that even tigers can become prey when they’re out of their element.

**In the lower right-hand corner of the matrix is the third type of enterprise, the “ants”.** Ants are weak and small, but they’re exceptionally adept at coordination and organization. As a group, they’re strong and shouldn’t be underestimated. The same applies to enterprises of this type: As individuals, their core competencies are not strong. However, they are exceptionally sensitive to industry trends and excel at mobilizing external resources for their own purposes. Even so, an ant colony built on alliances between weak individuals is, in the end, also weak, and cannot maintain its strength over the long term. It can be readily trampled, and when disaster strikes, ants often scatter in different directions.

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**In the upper right-hand corner of the matrix are “wolves”.** Wolves have a keen sense of smell, they’re quick, and are known for their patience. More commendably, they’re extremely collaborative. These characteristics make wolves highly adaptive, so they can survive in all sorts of environments, including mountains, grassland, deserts, and even tundra. Wolf-like enterprises often have both competitive and ecological advantages. These days, the turbulent and uncertain environment we work in necessitates a wolf-pack approach.

Competition in nature is cruel, but nature can also be full of vitality and hope. The survival of a species is the result of natural selection. In ICT, the robustness of our cloud ecosystem is the result of market selection, which thrives on creating value for customers. In the future, marketplace advantages might come from within an organization, but they might also come from the outside. Enterprises of the future will have a combination of both competitive and ecological advantages. Some use external resources to compensate for a lack of internal capabilities, whereas others leverage their internal strengths to compensate for the lack of a larger network. How can enterprises effectively manage resources that don’t belong to them? How can they establish what we call exogenous or externally derived advantages? Where should they

draw the lines between competition and cooperation? All this depends not only on leading technologies and disposable resources, but also on inclusiveness, organizational elasticity, and institutional innovation.

On this subject, I can’t help but think of Tencent. Back before 2010, Tencent was a company that worked and fought alone. One article, “Damned Tencent”, drew the company and its CEO Ma Huateng into a whirlpool of disputes.

Since that time, Tencent has begun to open up the interfaces of its platforms, especially its games. Now any entrepreneur can enjoy the benefits of Tencent platforms, like QQ and WeChat, for free. This enabled the company to transform from a game developer into a platform operator. Through alliances and cooperation, Tencent essentially handed out half of its livelihood to its partners. As a result, we bore witness to the rise of an entirely new Tencent – one that creates far greater value. Its market value jumped from US\$40 billion to US\$200 billion.

Making a bigger pie, growing the industry, and enlarging the market – these are more important than fighting for a larger share. This is the first core concept in Huawei’s vision for the cloud ecosystem. This is the only way forward if we hope to establish



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ecological advantages in the future, and it is also our responsibility as an industry leader.

At Huawei, what we're doing is leveraging our core businesses, which are competitive in their own right, along with our larger user base, to make a bigger pie for everyone – that is, to grow our industry as a whole. By doing so, we're forming a symbiotic, interdependent, and regenerative community of common interests. In this ecosystem, we aren't set on owning every single resource. Instead, our goal is to establish more lasting connections with the outside world and leverage external resources to support us in our business efforts, thus fostering an ecosystem that will benefit everyone in the future.

We hope that Huawei can evolve from a big company into a great company, and set up a platform that will enable global connectivity.

Over the past three decades, Huawei's greatest contribution has been to make communications services more widely available to people in all parts of the world. In 1990, the phone penetration rate in China was only 1 percent. Today, the global mobile phone penetration rate exceeds 100 percent. Over one-third of the world's population uses Huawei products and services. Access to telecommunications

was limited to the social elite in the past two decades, but now we've put the power of connectivity into hands of the general public everywhere. Back in the day, going from big to bigger meant unbridled growth, which required us to brace ourselves through thick and thin. Going from bigger to great is a more rational type of growth, one that calls for a sense of responsibility and mission.

In the future, we aim to become a core enabler of digital transformation, a movement driven by innovation. One report from the World Economic Forum shows that the value created by the digital transformation of vertical industries will amount to US\$100 trillion over the next decade. These days, all types of new applications are emerging left and right, and over 70 percent of today's data traffic comes from video. In the future, many other sectors, such as industries, security and prevention, healthcare, and entertainment, will embrace VR/AR.

A good example is Pokémon Go, which has recently taken the world by storm. The size of the game's active user base has already surpassed Twitter's. The popularity of VR and AR around the world is generating huge amounts of data traffic. This poses great challenges to information pipes in terms of bearer capacity, transmission, and customer

experience, and at the same time, presents numerous opportunities to different industries. Huawei is ready to work with our partners to make the most of a bigger and better digital transformation pie.

## Collaboration is the key

Our second concept in cultivating a healthy cloud ecosystem is that managing cooperation is more important than managing competition.

Competition and cooperation are two closely related concepts in an ecosystem. In the era of “coopetition”, competition is fierce. If you don’t excel, you’re out. But cooperation is a must. If you walk alone, you can walk fast; but if you want to walk far, you have to walk together with others. Huawei is a company that grew up under fire in a fiercely competitive global market – and I have to say, we’re quite good at competing with others. However, as we begin to establish an ecosystem, we find that managing cooperative buddy-buddy relationships is way more difficult than managing competitive relationships where one person wins because someone else loses. Cooperation requires all parties to bring their unique advantages to the table and deliver collective value to customers.

Building new ecological advantages alongside competitive advantages in the traditional sense requires us to have the courage to reinvent ourselves. More importantly, it requires the whole organization to fundamentally change the way it thinks, its cognitive patterns, and its behavioral models. This is a massively difficult undertaking for a mature organization.

In certain business scenarios, Huawei strives to play the nourishing role of “soil and energy” in the ecosystem. We hold fast to our pipe strategy and don’t compete for profit with our partners.

That’s what we’ve stressed time and time again: Collaboration leads to shared success. A good example of mutually beneficial cooperation is an industry video solution that Huawei put together for China Mobile Taizhou.

The solution is a platform supported by video technology for use by different industries. It not only serves the industries themselves, but is also available to the public.

Suppose that a family wants to go to park on the weekend. They want to know which park has the fewest people. With the industry video solution, they can use a mobile app to check out the situation at their favorite park and see whether any parking spaces are available. Before they leave home, they can also choose a route with the least amount of traffic. Once they’ve arrived at the park, the parking lot attendant can use video to ensure their car remains secure. This is an interesting feature of the solution, and can be used to identify different behavioral patterns. For example, before making a move, car thieves often circle their target vehicle several times. This video system is smart, so it can determine whether or not a suspicious party is likely to engage in illegal activity based on his or her behavior. If the analysis yields positive results, the system can automatically alert the parking lot attendant to keep a closer eye on suspicious people.

In this example, the platform requires different functional modules, which can be developed by different vendors. Only developers with domain-specific skills can develop an app for the park itself, a module that monitors and calculates road conditions, a video surveillance system, and other modules. Modules that can be used to identify behavioral patterns, for example, need to be developed by ISVs with a professional background in public security.

The most remarkable aspects of this solution are



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that its entire architecture is open to customers, its functionality is modular, and each module can be swapped out or replaced with another one.

To start out with, this is a cloud-based system. It was developed on OpenStack, an open source platform, so the system is fully open and can be interconnected with or replaced by other cloud platforms developed on OpenStack. This completely eliminates the risk of users being locked into one system.

Second, all components in the system are modular. Customers can choose to use Huawei modules if they like, or other vendors' if they aren't a fan of Huawei's. For example, Huawei might not be the best supplier of behavioral pattern recognition systems, so customers can choose to work with ISVs that have a professional background in public security. Even at the infrastructure layer, including computing, storage, and data center networks, customers can choose their preferred vendors or replace components that aren't up to the task at hand.

Finally, I want to emphasize that we will stick with an open approach for the long haul, give back to open source communities, and proactively involve ourselves in their ongoing development.

Benefit sharing is Huawei's third concept for shaping the cloud ecosystem. There is a popular saying online: "You might think that industry peers are your competitors, but your true competitor is the era in which you find yourself." Therefore, in the face of our most unpredictable competitor – a smart society – Huawei's strategy is to unite as many people as we possibly can. And how we do this is through sharing benefits.

Over the past two decades, Huawei has developed formidable organizational capabilities by establishing a unique benefits-sharing mechanism that values dedicated employees and inspires a fighting spirit in everyone.

This benefits-sharing mechanism has extended beyond Huawei to include the entire ecosystem. There are internal Huawei documents, which demonstrate our stance on sharing benefits and the direction we aim to take. We will continue to share benefits with our customers and suppliers.

To cultivate a strong and healthy ecosystem, we will share benefits more expansively with academic institutions, research institutes, and industry organizations, among others. These are the targets of symbiosis – the people we hope to unite!



Through 5GVIA, we've partnered with a number of respected global vendors, especially automakers, to build a test field that includes facilities like expressways, indoor parking lots, and test sites for business centers.



We hope to bring all manner of talent, capabilities, and resources together from all corners of the earth. Even if we don't own these resources, we can make full use of them and share the wealth along the way. I firmly believe that the key to achieving success in the future is not who you defeat, but who you unite.

Sharing benefits is the driving force behind the evolution of the ecosystem – and the result of its successful development. We've only got our sights set on 1 percent of a huge digital transformation pie. Our partners can have the rest. Think that's going to be a tough decision for Huawei? Not even remotely. In fact, our founder Mr. Ren has been doing this all along with our employee stock ownership plan over the past 20-plus years.

Next, I'd like to tell you about what we're doing to develop the cloud ecosystem development. We're approaching this initiative from four angles. First, we've been establishing industry alliances to lead industry development and grow the industry together. Second, we've been establishing strategic business alliances to ensure our customers' success. Third, we're proactive in open source communities, promoting collaboration and innovation in these communities. Fourth, we've established a developers'

platform, through which we aim to introduce more players to innovate and help our ecosystem prosper.

As for industry alliances, one important area for us is the industrial Internet.

Huawei is a member of many industrial Internet organizations, including the Industrial Internet Consortium (IIC) in the US and the Alliance of Industrial Internet (AII) in China. The IIC was established in the US in 2014. It has over 250 members and has initiated 26 test bed projects. Huawei is part of its Steering Committee.

## 5GVIA

The 5G Vertical Industry Accelerator (5GVIA) is an industry alliance set up by Huawei. Through 5GVIA, we've partnered with a number of respected global vendors, especially automakers, to build a test field that includes facilities like expressways, indoor parking lots, and test sites for business centers. We have plans to connect our 5G Internet of Vehicles (IoV) system with automaker factories in real time, helping them integrate and test new 5G IoV services more efficiently. Industry partners, or our competitors in the traditional sense, will also work with Huawei to take

these alliances to the next level.

At the commercial layer, Huawei has established many strategic partnerships to ensure our customers' business success. I'd like to share some examples of partnerships we've formed.

As a cloud service provider, Huawei supports the Open Telekom Cloud (OTC) of Deutsche Telekom (DT) in Germany. DT's subsidiary, T-Systems, has many enterprise customers and millions of private lines for enterprises. Huawei's technical solutions are perfectly positioned to meet DT's service development needs. This is the basis of cooperation between our two companies. DT's OTC is a good example of the type of strategic cloud alliances that Huawei seeks to form.

Huawei has established a joint innovation center with SAP, Europe's most influential software company. Together, we've launched a series of Industry 4.0 solutions, which successfully serve a number of leading multinationals – companies like Sinopec. The foundation of Huawei's partnership with SAP is that we complement each other – one is strong in hardware and the other in software.

Another example is Hexagon. With our own ICT infrastructure and Hexagon's computer aided dispatch (CAD), Huawei launched a Safe City solution for Saudi Arabia, which has promoted the stable and organized progression of the annual pilgrimage to Mecca, ensuring safety at Hajji.

Last but certainly not least, Intel has been Huawei's strategic business partner for many years, and we have countless examples of successful collaboration, for example, KunLun Mission-Critical Servers.

Huawei is proactive in open source communities for ICT, pushing industries to open up, integrate, and innovate. We are an active contributor to open source

communities like ONOS, OPEN-O, OpenStack, and Carbon.

Since 2010, OpenStack has become the most influential open source project in cloud computing. Over 600 Huawei R&D engineers are contributing to its development. In recognition of our ongoing hard work and contribution to the foundation, OpenStack granted Huawei a gold director title in 2016.

Last year, Huawei announced a five-year Developer Enablement Plan with a budget of US\$1 billion, which will be used to build an enabling platform for developers and promote joint innovation. When it comes to technologies and solutions, Huawei provides developers with open ICT capabilities in the most cutting-edge domains, including cloud computing, big data, the IoT, mobile broadband, software-defined networking (SDN), and mobile offices.

We hope all of you present here today will join us in this open ecosystem. We look forward to your participation in industry alliances, open source communities, and our developers' platform.

In the past, heroes were more likely to emerge in times of trouble. And they were often lone heroes. But that's no longer the case. In the cloud era, an open, dynamic, and symbiotic ecosystem will provide heroes with vast swaths of fertile soil in which they establish their roots, grow, and develop. This is an era of broad alliances where heroes will emerge in great numbers.

In the upcoming digital, smart society, Huawei aims to serve as the soil and fertilizer of the ICT ecosystem. Through the strong, strategic alliances of heroes, we will push our industry forward, and promote ongoing social progress.

This is our responsibility, and it is also our mission. 