

# Cloud Technologies On The Frontline Of The Fight Against Covid-19

Stand Together

AI

Study Online

Innovation

DingTalk



# Alibaba Cloud

The First Issue



Alibaba Cloud

[www.alibabacloud.com](http://www.alibabacloud.com)

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# Standing Together In This Critical Time



**Selina Yuan**  
**President of International Business**  
**Alibaba Cloud Intelligence**

Since the beginning of the global COVID19 outbreak, we have faced tremendous challenges together. With schools and offices shut down, many of us have had to stay at home, avoiding social gatherings and travel. Many cities are still quiet, their residents staying indoors.

But the more challenges we face, the more powerful we become. Lots of people have started to feel a sense of optimism in the face of difficulty. Whether it's neighbors encouraging each other, people finding new ways to work at home while taking care of their kids, or even an online "cloud party" to stay connected to friends and colleagues, people are finding ways to get through this crisis.

Nothing stops innovation, and this "online mode" is already helping to change old traditions. In China, DingTalk has helped 140,000 schools hold online classes, with more than 120,000,000 students taking part so far. Besides education, an even bigger challenge is how to support rapid COVID19 pneumonia diagnosis. With our AI technology we can help doctors to make diagnosis and treatment plans faster: more time saved means more lives saved. In China, the local cosmetics enterprise Lin Qingxuan has had to change to an online sales model and is making use of live streaming to sell its products. This model proved so effective that they were able to sell their whole stock of 400,000 bottles of camellia oil in a single day.

COVID-19 has created unprecedented challenges and vulnerabilities to the global economy and especially to SMEs, who are often faced with financial constraints and limited access to technological support. Many SMEs are struggling to survive with their usual offline business models. We have supported many SMEs by helping them move online, sometimes getting started in just a few hours. Since the inception of Covid-19, Alibaba Cloud has always been committed to helping businesses of all sizes and making it easy to do business anywhere. Alibaba Cloud announced a Global SME Enablement Program aiming to provide much needed and timely relief to SMEs so they can rapidly respond to the current crisis while speeding up their digital transformation and emerging from the current pandemic stronger and more resilient.

There are still so many new stories being made every day during this pandemic, and I trust that when winter has gone, spring will come again. With everyone's joint efforts to fight against COVID19, humanity will win this battle.

We choose this special time to release our first issue, in order to share the brilliant thought that "no difficulty can stand in the way of innovation". Standing together, we are stronger than ever.

A stylized, handwritten signature in dark ink that reads "Selina".

## Cover Story

# Cloud Technologies On The Frontline Of The Fight Against COVID-19

**When the COVID-19 appeared, its impact was felt at a global scale and across multiple sectors, including the education, retail, logistics, finance, entertainment, transportation, and manufacturing industries.**

During this ongoing health crisis, Alibaba Cloud is cooperating closely with many organizations, institutions, enterprises, and small businesses affected by the epidemic, offering them tailored cloud solutions to address the challenges and economic repercussions that they may face. These cloud-based solutions which support continued communications and operations include Alibaba Cloud technologies assisting in preventing, analyzing, and combating of COVID-19.

Our cover story in this edition will highlight some of Alibaba Cloud's technologies as well as the real stories of how these solutions are supporting individuals and companies in the thick of the epidemic.

Medical personnel are on the frontline in the battle against COVID-19. In March, Alibaba Cloud announced to offer medical personnel around the world artificial intelligence-enhanced innovations

based on learnings and insights garnered during the initial outbreak of the virus.

The series of cloud-native anti-coronavirus solutions stem from joint efforts of Alibaba Cloud's solution experts, scientists and researchers from Alibaba DAMO Academy, a global research initiative by Alibaba, and the technical team at DingTalk, one of the platforms UNESCO has highlighted as facilitating distance learning during the coronavirus outbreak.

Three proven solutions are being made available via a free trial for medical professionals and research institutes worldwide. Alibaba Cloud is working closely with local partners to deploy relevant services and solutions per local laws and regulations. These include:

Epidemic Prediction Solution, a solution that models epidemic characteristics of COVID-19 in

a particular region, providing estimates of size, peak time and duration of the epidemic, as well as the current infection trends.

CT Image Analytics Solution, a CT image analytics technology service that can significantly improve testing accuracy and detection efficiency for diagnosing COVID-19.

Genome Sequencing for Coronavirus Diagnostic Solution, an AI algorithm from Alibaba DAMO Academy and running on Alibaba Cloud, is a virus genome sequencing solution for coronavirus analytics, including viral genetic data screening, evolutionary analysis, protein structure analysis, and diagnostic reporting.

Supporting advanced innovations during emergencies like COVID-19 requires extremely scalable and supercomputing power. Alibaba Cloud offers Elastic High-Performance Computing (E-HPC) Solution for Life Sciences, a cloud-native high-performance computing cluster solution designed for researchers working on life sciences applications. The solution already supports 20 research groups in China.



Medical personnel and health officials are not the only ones who scramble to get a grip on multiple outbreaks. Educators and students around the world are feeling the extraordinary ripple effect of the coronavirus as schools shut down amid the public health emergency. Some of them have responded to the crisis with the help of technology.

By leveraging Alibaba Cloud's online Education product suite, some international educational institutions are being able to move lectures from classrooms to the cloud, ensuring student welfare and academic success. The Cloud Enterprise Network (CEN) solution allows universities to establish fast cross-regional connections for students - enabling them to engage in online course work via intranets while overseas. The

solution can be deployed within 48 hours, effectively reducing complicated IT processes, offering cost-effectiveness and easy maintenance for universities and schools. Alibaba Cloud has been working alongside 20 universities across Australia and New Zealand to date.

For retail businesses that are adversely impacted by the coronavirus outbreak and in urgent need of a digital enterprise platform, Alibaba Cloud is leveraging its E-Commerce Solution to help retailers get online as quickly and painlessly as possible. This solution provides a set of plug-and-play products in the computing, databases, multimedia, video live streaming, collaboration, security, and data analytics fields to help retailers rapidly launch an e-commerce business within 5 days.

Besides offering the technology, Alibaba Cloud experts with rich experience in e-commerce are also providing remote hands-on training with a focus on time to market. The cloud leader has also launched a dedicated campaign to support businesses to fight against the Coronavirus through technology. Eligible organizations will be offered \$1000 cloud credits and can sign-up e-commerce solutions for free for 3-months.

At Digital Alibaba Cloud Day APAC on 23rd April, Alibaba Cloud launched a Global SME Enablement Program to provide cloud technology relief worth more than USD 30 million to new and existing small and medium-enterprise (SME) customers around the world and equip them with the solutions needed to maintain business continuity amid the COVID-19 pandemic. In addition, Alibaba Cloud will reach out to SME associations to help meet their members' technology needs as they fight the pandemic.

Epidemics bring challenges and transform habits. The global coronavirus response is providing a critical testbed for new technologies to detect, diagnose, and treat infectious diseases as well as to support organizations' digital operations and communications. The stories in this edition are just a few examples of how technology can help manage the epidemic and better equip us to handle future public health emergencies. Thank you for reading.



# Technology Assists In Combating COVID-19

## OVERVIEW

At Alibaba Cloud, we are committed to our customers, helping your business survive and thrive, even during the most difficult of circumstances. Now, we are responding to the Coronavirus Disease 2019 (COVID-19) by putting the health and safety of our customers first, supporting the operations of your businesses without interruption.

During this ongoing health crisis, we are cooperating closely with many organizations, institutions, enterprises, and small businesses affected by the epidemic. We are offering them tailored cloud solutions to address the challenges and economic repercussions that they may face. These cloud-based solutions include Alibaba Cloud technologies assisting in preventing, analysing, and combating COVID-19, whilst also supporting in continued communications in the thick of the epidemic.

The following figure highlights Alibaba Cloud's cloud solutions that are supporting individuals and

companies, helping us all fight against the threat of COVID-2019 together.

To find out more about how Alibaba Cloud Solutions support business continuity, please see <https://www.alibabacloud.com/campaign/supports-your-business-anytime>.

Alibaba Cloud also provides a wide range of discounted courses that help improve your business operations during the epidemic.

## SOLUTIONS FOR PREVENTING COVID-19

Alibaba Cloud provides a suite of innovative technologies, supporting governments, communities, and enterprises containing the spread of COVID-19. Our work means strategic, informed decisions can be made confidently, even during challenging times.

As part of a broader suite of cloud tools, the Alibaba Cloud technologies that can specifically help mitigate the impact of COVID-19.

## Solution: Epidemic Prediction Technology

The Epidemic Prediction Technology is a powerful tool to help researchers predict how the epidemic will progress, and the effect that different measures will have on its spread and impact. The Technology is proven to achieve a prediction accuracy of 98%, based on data from 31 provinces in China.

Simply upload primary input data such as flight information, number of new case, number of confirmed case, number of close contacts and the contact date, and number of people under quarantine in your region. This information is then used to predict how specific measures will impact both the spread and the impact of the disease.

As a result, the Epidemic Prediction Technology provides policymakers with a highly accurate, one-step prediction tool, helping them understand which measures to implement with regard to infection prevention and inform; medical resource allocation; border control and travel advice; and predict the risk of an outbreak.

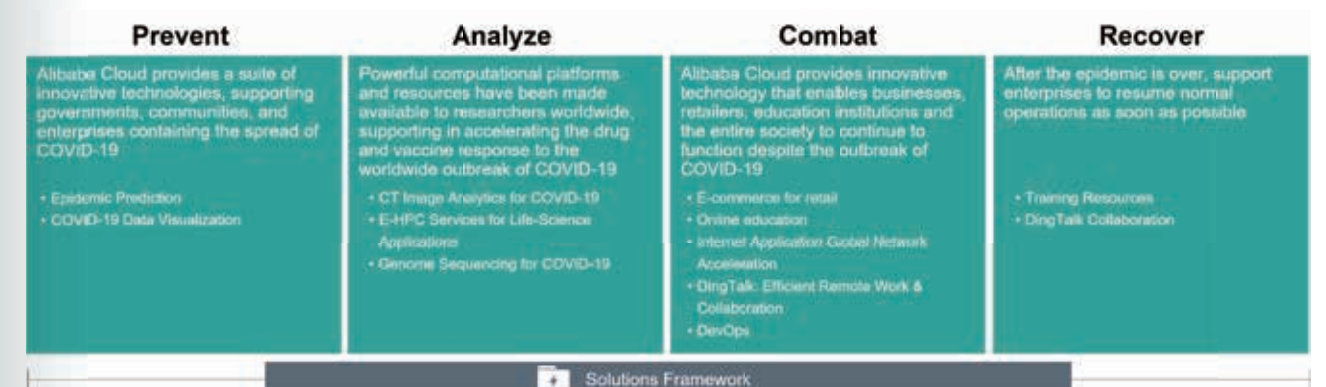
Using this DataV solution, your business can visualize its internal information in real-time; enabling efficient data analysis, and delivering real-time insights to drive rapid and informed decisions; ensuring the transparent sharing of information; and enhancing team cohesion.

You can also import public data sources with your internal data to customize data dashboards and understand how the COVID-19 disease will affect your business. Using DataV, you can leverage dozens of templates to build an interactive data dashboard in just a few minutes.

By mobilizing your data in the digital domain, DataV provides your business with a highly effective and responsive means to respond to the COVID-19 epidemic.

## SOLUTIONS FOR ANALYSING COVID-19

Powerful computational platforms and resources have been made available to researchers worldwide, supporting in accelerating the drug and vaccine response to the worldwide outbreak of COVID-19.



## Solution: COVID-19 Data Visualization

DataV is a powerful and accessible data visualization tool. It provides a wide range of templates for all types of real-time data visualization scenarios such as monitoring the public health situation during the outbreak of COVID-19.

## Solution: CT Image Analytics for COVID-19

CT Image Analytics for COVID-19 can help to significantly improve the testing accuracy and detection efficiency rates.

This solution relies on cutting-edge deep learning algorithms, which have been trained using 5,000

cases to understand the differences between COVID-19 pneumonia, common pneumonia, and other conditions.

Based on these input CT images, the technology can predict the probability of COVID-19 pneumonia with an accuracy of 96%<sup>1</sup>. It is 60 times faster than human detection methods, taking less than four seconds to run each test and transmit the data. This advanced technology can also estimate the proportion of pulmonary lesions for those affected by COVID-19.

Through DAMO (Discovery, Adventure, Momentum and Outlook) core algorithm, the technology becomes, highly scalable, high-speed, and seamlessly exchanges image and case data across different medical systems. This results in an improved response time, which is important when working as part of a global community to lessen the impact of COVID-19.

As a result, medical professionals now benefit from a rapid and highly accurate analysis tool, helping them understand the nuances of this disease for every case, avoid errors and keep pace with the pandemic.



<sup>1</sup>The accuracy is calculated using the model trained on about 5000 samples, and is tested based on a sample size of 660 tests with a 1:1:1 ratio of cases of COVID-19 pneumonia, common pneumonia, and other conditions.



## Solution: E-HPC Services for Life-Science Applications

Elastic High Performance Computing Technology is an all-in-one cloud-based cluster solution. It allows researchers to tap into the power of high-performance computing (HPC), and use Alibaba Cloud comprehensive suite of machine learning, network, storage and visualization tools to optimize the drug discovery process.

E-HPC was recently launched for Life Sciences, which provides an HPC+AI platform. This is dedicated to supporting accelerate the drug and vaccine discovery processes for COVID-19.

E-HPC is a highly versatile solution, which can be integrated with other applications, allowing researchers to access a vast range of powerful products and services.

Recently, work was completed with the Global Health Drug Discovery Institute (GHDDI). More than 100 applications requesting access to the GHDDI's drug research and development platform were received.



## Solution: Genome Sequencing for COVID-19

Whole genome sequencing is a highly accurate and rapid testing option that addresses these challenges through algorithm and model optimization, improving test qualities and reducing false-negative rates.

It's also a highly efficient technology, producing results in just 14 hours. What's more, one experiment can screen more than 20 people in parallel to further expedite this process, reducing the testing times to within 43.5 minutes for one sample.

Through Alibaba Cloud technology, experts can understand and track these mutations, providing extensive reports into the COVID-19 virus, including three key outputs: Homology Analysis Report, Evolutionary Analysis, and Structure Analysis.

It benefits to the wider world: Improved handling of local outbreaks thanks to rapid and accurate testing, Comprehensive monitoring of the changing of COVID-19, Simple to use and deploy.

## SOLUTIONS FOR COMBATING COVID-19

Alibaba Cloud provides innovative technology that enables businesses, retailers, education institutions and the entire society to continue to function despite the outbreak of COVID-19. To combat the coronavirus, Alibaba Cloud has developed the following solutions:

### Solution: E-Commerce for Retail

Conventional shopping experiences are no longer viable due to coronavirus and businesses must find a new digital path. Alibaba Cloud provides its customers with a full E-Commerce Solution for Retail, helping businesses get online as quickly and painlessly as possible, using our best practices to guide this process.

During the coronavirus epidemic, this service can help retail businesses in the following ways:

1. Get online: customer can set up your B2C e-commerce platform in less than five days.
2. Increase customer traffic: Online channels allow you to quickly fulfil demand from your customers.

3. Enrich data assets: get a complete record of your customers, their orders and transaction data.

4. Crisis awareness: Consumers are fully aware of the importance of online channels.

### Solution: Online Education

With many schools and universities around the world having been temporarily closed in order to reduce the spread of the COVID-19 virus, educational institutions need to be able to move lectures and teaching from classrooms to the cloud, ensuring student welfare and academic success.

Alibaba Cloud's Online Education product suite provides a full range of services in this space, including VOD(Video on Demand) and Live Broadcast from Scratch, Video Conferencing for Free with DingTalk.

### Solution: Global Acceleration

Global Acceleration uses Alibaba's global network infrastructure deployed in 19 regions, including over 110 point-of-presence (PoP) nodes, to provide customers with fast, reliable cross-border connectivity.

It reduces the impact of common network issues including packet loss, jitter, and latency, providing a superior user experience. Thanks to the scalability of the cloud and our solutions, Global Acceleration is also a highly cost-effective option and its benefits include: Elastic Binding, Configurable Network Capabilities, Robust Security, and Superior Global Network Quality.

## CONCLUSION

For businesses, the nature of cloud connectivity is open channels of communication; the capability to be agile, to respond to the changing nature of crisis. COVID 2019 is just that – a crisis, and Alibaba Cloud recognizes the ways we can support to mitigate its global impact.

Note: The information above should not be interpreted as offering diagnosis or other clinical statement, which should be given exclusively by authorized medical professionals in relevant jurisdiction. All data referred to are those as of writing of this summary, and Alibaba Cloud explicitly disclaim any warranty for accuracy or performance.



# Top 10 New Product Releases in FY2020

Alibaba Cloud is aggressively making more products available across the 21 regions globally. Here are the top 10 major releases in FY2020 (1st April 2019 – 31st March 2020).



## PolarDB

PolarDB is a proprietary OLTP database that supports high concurrent transactions with data storage up to 100TB. The product is available in Singapore, Hong Kong, Indonesia, Malaysia, France, India, and all China mainland regions.



## Cloud Storage Gateway (CSG)

Cloud Storage Gateway is a gateway service that helps customers migrate the on-premises data storage into cloud storage. The product is available in Singapore, Hong Kong, Indonesia, Malaysia, Australia, United States, Germany and all China mainland regions.



## Cloud Firewall

The Cloud Firewall is a next-generation firewall that is hosted in the cloud. It protects customers' assets running in the cloud, including cloud platforms, infrastructure, and applications. The product is available in Singapore, Hong Kong, Indonesia, Malaysia and all China mainland regions.



## Global Accelerator 2.0

Global Accelerator (GA) is an application accelerator service that helps remote users accelerate the access to the application over public internet. The product is available for all 21 regions globally.



## AnalyticDB

AnalyticDB is a proprietary real-time data warehousing service fully compatible with MySQL and PostgreSQL. The product is available in Singapore, Hong Kong, Indonesia, Malaysia and all China mainland regions.



## VOD and Live Streaming

Apsara Video VOD and Live allows the business to embed VOD/Live feature as part of their existing applications or build a dedicated video application with narrow broadband technology. The product is available in Singapore, Indonesia, India, United States and all China mainland regions.



## Hybrid Cloud – ZStack

Alibaba Cloud ZStack is a light-weight hybrid cloud solution that can be easily deployed to manage hardware in data centers, servers on edge, and hybrid cloud environments across on-premises and Alibaba Cloud resources. The product is available for all 21 regions globally.



## Blockchain-as-a-Service (BaaS)

Blockchain as a Service (BaaS) is an enterprise-level platform service based on leading blockchain technologies. BaaS supports Hyperledger Fabric, Ant Blockchain technologies, and Quorum. The product is currently available in the Singapore region.



## Security Center

Security Center is a centralized security management system that identifies, tracks, and analyzes the potential security threats of your assets in Alibaba Cloud. The product is available for all 21 regions globally.



## Hybrid Backup and Recovery (HBR)

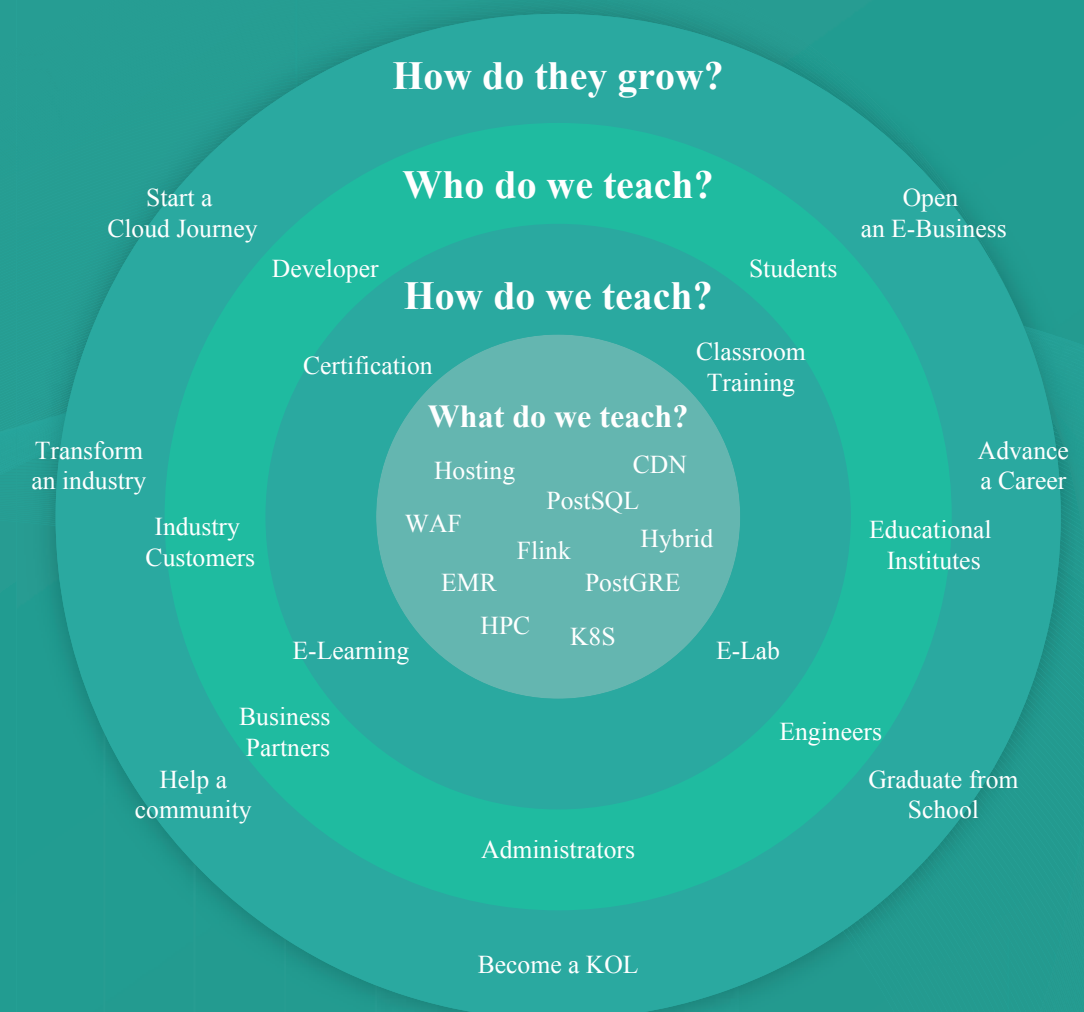
Hybrid Backup Recovery is a backup solution that allows customers to back up data stored in Elastic Compute Service (ECS) instances, File Storage NAS, Object Storage Service (OSS), on-premises data centers, and VMware virtual machines. The product is available in Singapore, Hong Kong, Indonesia, Malaysia, United States, Australia and all China mainland regions.

In the first half of FY2021, we will continue the momentum in the following areas.

- Enrich database product family by introducing Cassandra, GraphDB and Database Management Tools.
- Enhance Big Data product portfolio in the areas of high availability and compatibility with open-source applications
- Improve user experience of Kubernetes (Alibaba Cloud Container Service for Kubernetes)

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## COVID-19 got you down?

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SEE YOU IN THE CLOUD



# The Pacific Ocean Is No Barrier

**100,000 Students  
Continue Their Studies Online  
During The COVID-19 Pandemic**

**Alibaba Cloud delivers online education solutions to local Australian university partners, providing critical relief for Chinese international students affected by novel coronavirus (COVID-19).**

According to the Australian Bureau of Statistics, in 2018-19 education exports from Australia to China contributed \$12.1 billion to the Australian economy. There are tens of thousands of Chinese students pursuing their education in Australia. During the COVID-19 outbreak in China, a great number of Chinese students who still stayed in China were not able to go back to Australia to resume their studies.

In order to facilitate students' distance learning needs, Alibaba Cloud has leveraged its Cloud Enterprise Network (CEN) solution. Alibaba Cloud supported The Council of Australasian University Directors of Information Technology to establish online learning platforms for their overseas students.



"CAUDIT has worked with Alibaba Cloud and their global security partners to allow Chinese students access to online learning platforms such as intranet portals and live streaming to classrooms with low latency and high reliability" said Anne Kealley, Chief Executive Officer of CAUDIT. The solution allows universities to establish fast cross-regional connections for students - enabling them to engage in online course work via secure connections while overseas.

"We are very aware that a large number of Chinese students studying in Australia are unable to return to their studies due to the current travel restrictions. With both universities and students impacted, Alibaba Cloud wanted to develop an innovative solution to provide ongoing access to educational platforms," said Raymond Ma, General Manager, Alibaba Cloud Australia and New Zealand.

"The solution can be deployed within 48 hours, effectively reducing complicated IT processes, offering cost effectiveness and easy maintenance for universities and schools" added Raymond Ma.

To date, Alibaba Cloud has been working alongside 20 universities across Australia and New Zealand including The University of Sydney, University of South Australia, The University of Adelaide, University of Canberra and The University of Melbourne with the aim to get students back online as soon as possible. Currently there are up to 100,000 students in China who need access to coursework and intranet portals in order to continue their studies. Alibaba Cloud is delivering universities with a high-speed link into China in order to remotely connect these students to their educational institutions.

Alibaba Cloud, the data intelligence backbone of Alibaba Group, is delivering solutions to local Australian university partners providing critical relief for Chinese international students affected by novel coronavirus (COVID-19).

# From A 90% Sales Drop To A 45% Rise, What Did Lin Qingxuan Do To Cope With COVID-19?

This article shares the story of how Lin Qingxuan coped with major challenges by adopting innovative business solutions with the support of Alibaba Cloud technology.

The global retail industry has been hit hard by COVID-19, which is now a global pandemic. Businesses are encountering a variety of challenges including limited access to supplies, decreasing consumer demand, and decreasing foot traffic. Unfortunately, Lin Qingxuan was no exception.

## Dark Moment

Established in 2003 in Shanghai, Lin Qingxuan is an innovative cosmetics company that adopts traditional Chinese medicine (TCM) practices. Since its establishment in 2003, Lin Qingxuan is committed to making safe natural cosmetics using traditional Chinese herbs as raw materials. It now has more than 300 retail stores and more than 2,000 employees.

On January 31st, Sun Laichun, the founder of Lin Qingxuan did something unexpected: he wrote a letter to his employees, calling for their help. Why this unprecedented move?

Previously, during the Chinese New Year shopping season, Lin Qingxuan was able to attract customers to its retail stores and sales could easily reach one million. But with strict travel restrictions and limited supplies, half of Lin Qingxuan's retail stores had to be closed indefinitely while



those that remained open were barely receiving any customers. Just from the influence of COVID-19 alone, their sales had plummeted by 90%.

## What Did Lin Qingxuan Do?

The first thing that the team at Lin Qingxuan did was to reach out to the team at DingTalk. Sun Laichun received support from DingTalk's CEO who said that they would help the company with anything related to DingTalk.

By using DingTalk plus Taobao, Lin Qingxuan started sending coupons while live streaming on Taobao to engage with customers. This strategy worked - business started coming back to life. Lin Qingxuan's shopping advisors began providing personalized customer service and engagement

using DingTalk and customers could check their orders directly using the Taobao app.

This solution was not only beneficial for the business but also for the customers. By using dedicated channels, customers are no longer disturbed and overwhelmed by irrelevant sales campaigns and naturally, relationships and loyalty started to develop. Even though customers did not physically enter Lin Qingxuan's retail stores, they were still fully connected with shopping advisors from the comfort of their homes.

## Fighting against Coronavirus with Technology

Over the last three years, Lin Qingxuan has accumulated more than six million online followers, thanks to its O2O and new retail initiatives. With the survival for the company at stake, Sun Laichun decided to devote his full attention to the company's online presence.

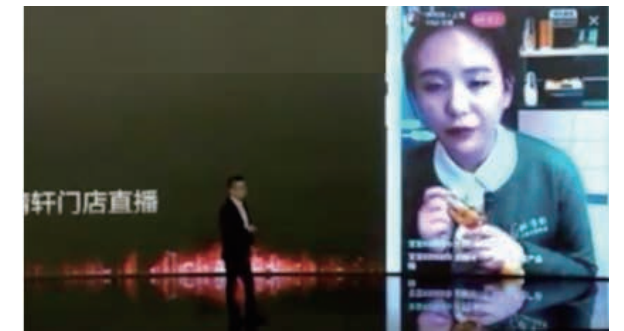
With the help of Alibaba Cloud's e-commerce solutions, Lin Qingxuan was able to transform its business model. The company began hosting livestreaming sessions to recommend products via e-commerce channels.

On the eve of February 14th, Lin Qingxuan launched a large-scale live stream shopping event with more than a hundred of Lin Qingxuan's shopping advisors. More than 60,000 people watched the live stream and they sold more than 400,000 bottles of camellia oil. The results were simply amazing. The sales from one shopping advisor in two hours ended up equaling that of four retail stores. This further cemented Sun Laichun's resolve to devote more resources to digital channels and develop its shopping advisors into online influencers.

During a live broadcast on February 16th, Sun Laichun summed up his company's "comeback" by sharing his personal experience from the last three weeks.

"I have been operating in a traditional retail environment while eyeing opportunities for digital transformation. Suddenly, the old environment is

no longer viable due to the coronavirus outbreak. We had no choice, and we had to take the new digital path. So, we went all in. And now, we've realized that we can do business on this new digital path."



## Embracing Digital Transformation is Not an Option But a Necessity

Sun Laichun, who also experienced the SARS epidemic, is even more confident this time around. At the same time, the number of SMEs similar to Lin Qingxuan using Taobao's live streaming service has increased by 50%. In the digital transformation era, going digital is no longer just another option for enterprises: it is now a necessity.

It should be said that with the help of digital transformation, Lin Qingxuan will be just one of many companies achieving business growth despite this "darkest hour." During this pandemic, Lin Qingxuan is giving many enterprises the confidence needed to weather the storm. But in order to achieve digital transformation, it must be made a priority and it requires both hard work and commitment.

If Sun Laichun did not go "All In" on a digital transformation strategy, there wouldn't be so many of the company's shopping advisors selling online during the epidemic. This epidemic should push more traditional companies to accelerate their digital transformation journey. In 2003, SARS pushed the e-commerce industry to blossom for more than a decade. This time, how will this pandemic transform shopping over the coming decade?



# Diagnosis of COVID-19 In 20 Seconds With AI-enabled CT Image Analytics

## AI-enabled CT Image Analytics Technology diagnoses COVID-19 in 20 seconds with 96% accuracy

On Feb. 4, almost two weeks into the lockdown of Wuhan, where the virus was first identified, Alibaba DAMO Academy team started to train its algorithms for diagnosing coronavirus using diagnostic guidelines released by Dr. Shi Heshui, a leading radiologist from Tongji Medical College.

### Prompt Action Based on Years of Technological Know-how

At the outset of the outbreak of the virus, hospitals didn't have enough PCR test kits to diagnose the COVID-19 infection. The DAMO Academy team was considering whether they could use AI technology to analyze CT images to differentiate COVID-19 pneumonia from common pneumonia.

COVID-19 is new and there is no specific preexisting diagnostic technology for it, but the team had been accumulating related technologies for quite a few years. DAMO Academy is a global research initiative started by Alibaba. The AI team at DAMO Academy has been working on developing artificial intelligence technologies in many areas, including city management, industrial manufacturing, internet media, e-commerce, health-care, and more. DAMO academy has been working in many of these fields for years. The underlying technologies such as deep learning, segmentation, detection, and classification were already

available and had been used on a variety of different types of medical images in the past, including including lung, live, bone, and heart CT images.

Since the team had already been working AI-enabled medical-imaging for the past three years in fields such as common respiratory diseases, it took the team less than five days to producing the first set of models for COVID-19.

### CT Image Analytics Solution in Fighting Against Covid-19

It is a CT image analytics technology based on visual artificial intelligence, working as a service that significantly improves the testing accuracy and detection efficiency for diagnosing COVID-19. The AI system identifies the novel virus through computed tomography (CT) scans of the chest. The algorithm has been trained with data and CT scans from more than 5,000

confirmed coronavirus patients so far and taps into deep learning to study patterns of infection. It is the combination of speed and precision that makes this AI-based CT scan system a valuable weapon in the fight against COVID-19. The technology can support diagnosing Covid-19 in 20 seconds with 96% accuracy<sup>1</sup>.

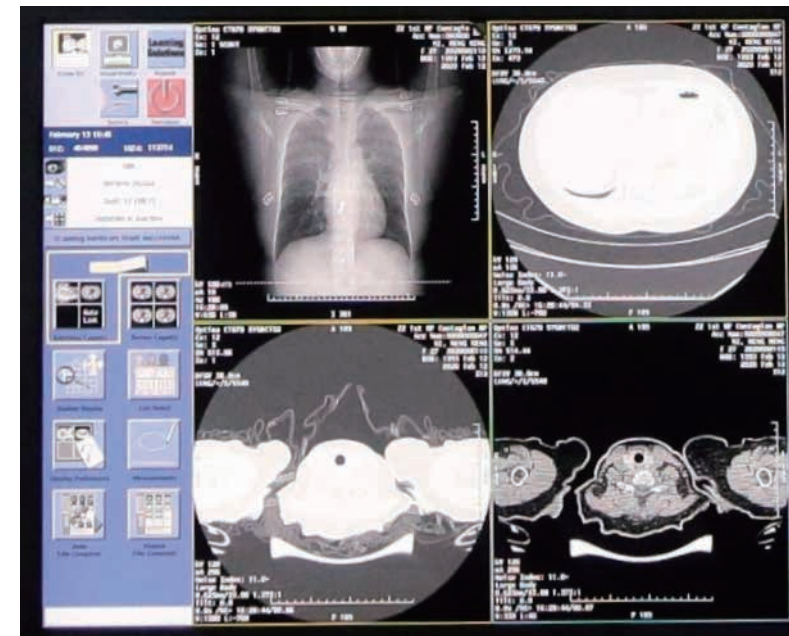
In the middle of March, 26 hospitals in China are using the solution to help diagnose over 30,000 cases<sup>2</sup>. Partners in public and private sectors in China joined together to support the implementation of the AI system.

The technology is also applied to support hospitals outside China. With the rapid spread of COVID-19, the number of suspected infections is expected to increase across medical institutions. Image diagnosis is believed to hold significance in COVID-19 diagnosis, along with clinical examination data such as PCR results and other clinical symptoms. Unfortunately, it is suspected that image diagnostics are underutilized at many medical sites.

In Japan, M3 and St. Marianna University School of Medicine Hospital will launch COVID-19 Remote Image Diagnosis Support in Collaboration with Alibaba and NOBORI. This service will be constructed and provided by St. Marianna Hospital. Additional support will be provided by Alibaba Group's core data intelligence center, Alibaba Cloud advanced technology research institution, Alibaba Damo Academy, and Alibaba's healthcare platform, Alibaba Health Information Technology Limited, along with medical information cloud service provider NOBORI Ltd. and M3.

M3 operates m3.com, a specialized web portal for medical professionals. m3.com member physicians will be able to securely upload anonymized CT images (pulmonary window setting) and basic information of suspected COVID-19 patients via a specialized COVID-19 page on m3.com, to receive remote image diagnosis support from St. Marianna Hospital physicians, free of charge. The remote diagnosis results will be received via the same COVID-19 page on m3.com.

As long as the medical imaging system (PACS) in the hospital can connect with the Internet, it takes just one or two days to deploy the service on the cloud. Only a minor changes need to be made to the hospital's PACS system. Typically it takes less than a week to get everything ready and get going.



### The Evolution of the Solution

Alibaba Cloud continues to work with partners like The First Affiliated Hospital of the Medical School of Zhejiang University, Wanli Cloud, Chuang Yuanjia, and Gupo Technology to bring the AI system onto the cloud.

Medical practitioners can then directly upload CT scans using their smartphones or laptops to get instant results online. Other improvements include shortened feedback cycles after we implemented survey features to collect direct feedback from medical practitioners to help improve the algorithm.

<sup>1</sup><https://www.alizila.com/how-damo-academys-ai-system-detects-coronavirus-cases/>

<sup>2</sup>[https://www.alibabacloud.com/blog/how-alibaba-damo-academy-ai-system-detects-coronavirus-cases\\_595979](https://www.alibabacloud.com/blog/how-alibaba-damo-academy-ai-system-detects-coronavirus-cases_595979)

# Staying Connected On DingTalk

The outbreak of COVID-19 has had a big impact to the global economy, and has impacted enterprises both in China and around the world. Achieving sustainable "efficient coordination" during this period of physical isolation has become a common goal for the whole society and the whole world. In the past five years, DingTalk has been focusing on building a unified communication and collaboration platform, which has now become the leading digital infrastructure for many enterprises and organizations. Amid the pandemic, DingTalk is ensuring work, education, and medical collaboration are "always online".

## Remote Work

24th January 2020 was Chinese New Year's Eve. DingTalk received a huge number of demands for online work support from customers in China. To help them start working from home quickly and efficiently, DingTalk launched the working from home guide & online coordination guide. Within a very short time, DingTalk was able to share best practices and successful user cases with customers in different industries and cities across the nation. Since the outbreak of Coronavirus in China, more than 10 million enterprises and 200 million users started working from home through DingTalk.

## Online Education

Because of the virus, hundreds of millions of students in China are not able to have face to face classes with teachers, which made online teaching necessary. This is a new challenge for everyone. DingTalk helps teachers and students across the country continue their courses online, supporting 120 million students in China as they attend online classes. This is nearly 50% of the students in China and involves different types of schools such as kindergartens, primary and secondary schools, and universities. Take Zhejiang University for example. DingTalk live streaming enabled more than 3,000 teachers to start online teaching either from home or from school, involving 70,000 students (with more than 4,500 international students from more than 150 countries)<sup>1</sup>. Thanks to CDN services provided by Alibaba Cloud, DingTalk live streaming features deliver good user experiences even during peak use times.

Meanwhile, the Return to School platform built on DingTalk has been used by education bureaus and schools in 100 Chinese cities. With a QR code, education authorities and schools can keep updated on the health of students and teachers, which facilitates decision making on when and how to return to school.



## Tech for Social Good

We believe tech is for Social Good. Online meetings and classes are at their peak between 8 to 9 am, and a huge number of users are using IM chat, meetings, and livestreaming at the same time. DingTalk engineers worked hard every day to keep all services stable while continuing to optimize the core product. For example, the IM function delivers messages in a various ways, such as text, audio and video. Conference meetings allows more than 300 participants to join at the same time for free, for enterprise accounts.

DingTalk "space" has also become a document collaboration platform for enterprises, providing secure and reliable personal notes, online documents, cloud storage, and knowledge management.

The DingTalk live feature integrated into its chat group functionality has also been welcomed by users. It enables over 10,000 people in a group to watch live video streams online, which makes it easy for large enterprises to host their "all hands" meetings online.

<sup>1</sup>Data from Alibaba Cloud and Dingtalk Fight Covid-19 Joint Online Conference: <https://www.alibabacloud.com/zh/alibaba-cloud-ding-talk-joint-online-conference>





## DingTalk for the World

Meanwhile Dingtalk is prepared to provide better service for international users. Weeks ago an international project team was set up. The team worked day and night to deploy a new data center outside China to better support online working and education overseas. The performance of video conferencing and live streaming is also greatly optimized.

The United Nations Educational, Scientific and Cultural Organization, known as UNESCO, estimated that more than 400 million students

could not go to school as usual. UNESCO has recognized DingTalk as a powerful digital-learning solution to help children continue their education as schools worldwide face closures due to the ongoing COVID-19 pandemic.

The DingTalk app was included in a list of platforms that support live-video communication on the cultural agency's website. While not an explicit endorsement, UNESCO said these educational platforms had "wide reach, a strong user-base and evidence of impact," and could help teachers, schools and parents "facilitate student learning and provide social care and interaction during periods of school closure."



Doctors can use DingTalk to access medical records anytime, anywhere.

The COSOMO college in Tokyo uses DingTalk's online meeting function to hold online classes with students around the country. Faculties use DingTalk to talk to students and send warm messages, reminding them to stay healthy.

DingTalk also launched the International Medical Information platform for doctors around the world, providing AI translation in 11 languages, including English, Japanese, and Italian, as well as free online meetings and live streaming features. Within one day of the platform's launch, 200 facilities from 40 countries signed onto this new platform. Regardless of language or region, a doctor can communicate with other doctors around the world. By learning from the valuable experience of Chinese medical staff who fought with the virus, doctors around the world can treat the patients more effectively.

Facing these new demands for global cooperation during the COVID-19 pandemic, DingTalk has successfully guaranteed customers all over the world can connect and collaborate online. DingTalk is still working hard to keep all services stable and keep optimizing its core products to help enterprises, SMEs, communities and schools around the world to win the fight against COVID-19.

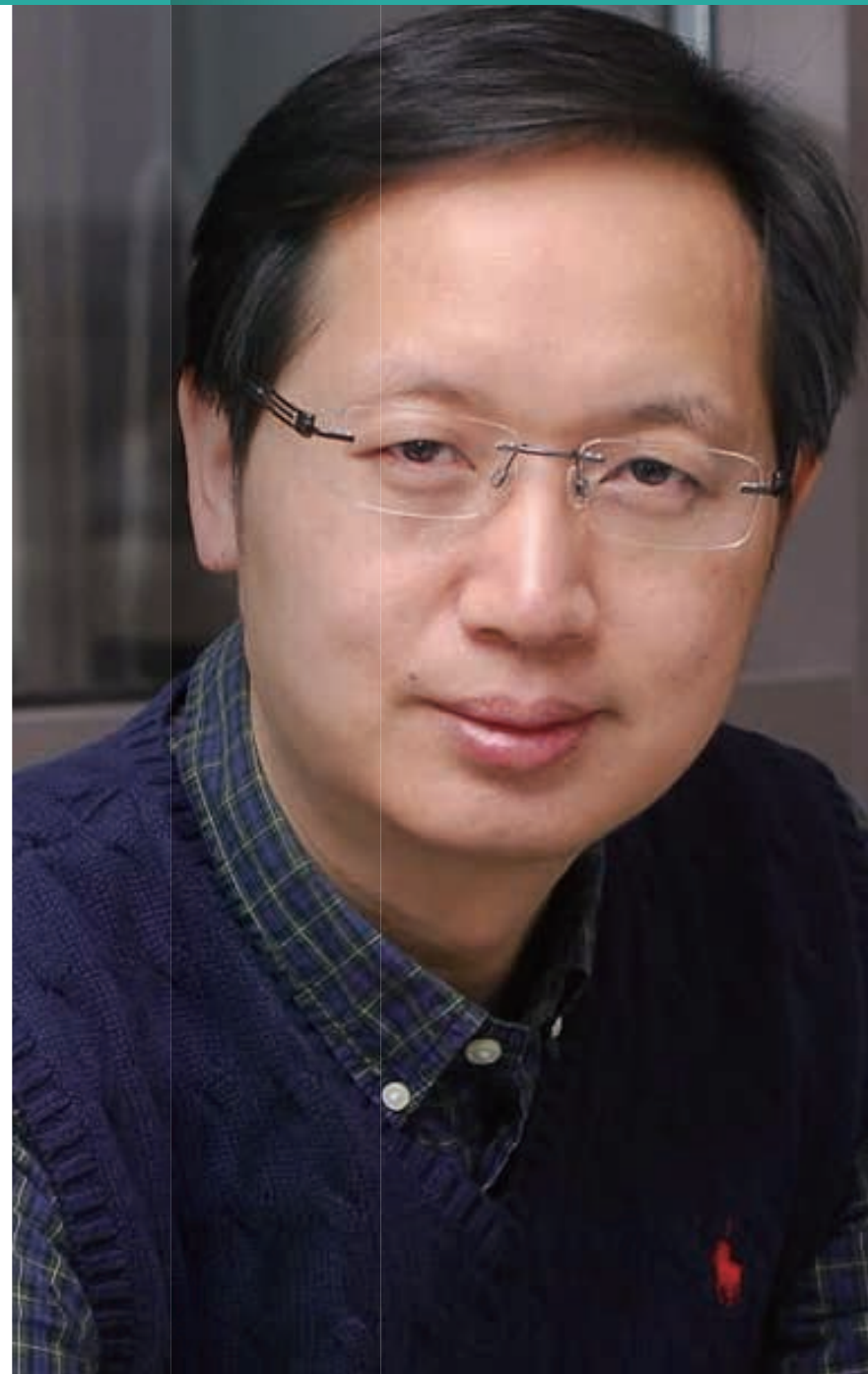
# Alibaba AI Technologies For Combating COVID-19 Virus

**Interview with Dr. Xian-Sheng Hua**  
**VP of Alibaba Group**  
**Head of AI Center and City Brain Lab of DAMO Academy**

**Q: Could you please introduce yourself and DAMO Academy?**

**Dr. Hua:**I'm Xian-Sheng Hua, the leader of the Artificial Intelligence Center of Alibaba DAMO Academy. Alibaba DAMO Academy is a global research initiative by Alibaba. The AI team at DAMO Academy has been working on developing artificial intelligence technologies in many areas, including smart traffic, industrial manufacturing, and intelligent solutions in sectors including media, e-commerce and healthcare for many years.

**Q: Alibaba DAMO Academy is using AI algorithms to fight the outbreak of the novel coronavirus (COVID-19). Could you please share with us more about how you came up with the ideas and worked out the solutions?**



**Dr. Hua:**As the global research initiative of Alibaba Group, Alibaba DAMO Academy has been applying machine learning techniques in many industries. Currently, we are living through extraordinary times and COVID-19 is a battle being fought on a global scale. Therefore we decided to make three proven solutions available via a free trial for medical professionals and research institutes worldwide: CT image analytics solutions; Whole Genome Analytics Solution and Epidemic Prediction Solution.

**Q: Could you please talk more in detail about CT Image Analytics Solution?**

**Dr. Hua:**This time, the virus is new and we didn't have the specific technologies to fight it but we have been accumulating related technologies for quite a few years. The underlying technologies such as deep learning, segmentation, detection, classification of a variety of different types of medical images, including lung, liver, bone, and heart CT images, are very similar, and they have already been developed in hospitals in China.

During the early stages of the outbreak, hospitals didn't have enough PCR test kits to diagnose the COVID-19 infection. At that time, we were thinking we could use AI technology to analyze CT images to differentiate COVID-19 pneumonia from common pneumonia. This led to the first automated

CT Image Analytics Solution for COVID-19. CT image analytics technology is based on visual artificial intelligence, working as a service that significantly improves the testing accuracy and detection efficiency for diagnosing COVID-19.

The whole test takes about 3 to 4 seconds to run and 15 to 16 seconds of transmission time.

CT image manual reading takes time. One person's CT scan may have over 300 images. Imaging doctors typically takes 5-15 minutes to read this many images. During the outbreak, there was a high quantity of imaging inspection requests. This AI service significantly speeds up the process. This approach is nearly 60 times faster than human detection.

What's more, due to the high volume of inspection requests, misdiagnosis and missed diagnosis the accuracy of diagnosis is unstable.



The AI-assisted approach has a very high accuracy of 96% with a recall rate of 98%. So with this technology, doctors can make a more accurate, efficient and informed decision.

More than 160 hospitals in China leveraged the solution to accelerate the diagnose of Covid-19.

Using this service is very simple. As long as the medical imaging system, that is, the PACS system in the hospital can connect to the Internet and access Alibaba Cloud, it is super easy to deploy.

It takes one or two days to deploy the service on the cloud. Only a small change needs to be made on your PACS system. Typically it needs less than a week in total to have everything ready to use. We will work with Alibaba Cloud in different countries to deploy the technology in accordance with local laws and regulations.

### Q: Could you please talk more in detail about the Whole-Genome Analytics Solution?

**Dr. Hua:** The second technology is the genome sequence analysis for diagnosing COVID-19.

At that time, we knew that the PCR test has a high false-negative rate. We were thinking about whether we can use our whole-genome analysis technology to help.

We have been working on genome analysis for a few years. When we do whole-genome analysis to diagnose a virus, the theoretical accuracy is nearly 100%.

The most commonly used approach to diagnose COVID-19 is the Nucleic acid PCR test.

The PCR test approach has high operation requirements which affect the accuracy of the results significantly and only detects segments of two locations in the gene sequence. The false-negative rate of the PCR method is very high.

And the Virus may mutate as well.

The whole-genome analysis approach can solve the problems of the PCR test. The only issue is the computation cost, which is very high.

Therefore, we optimize the genome comparison approach and make it run in parallel on a distributed computing system.

Thus time cost for analyzing genomes was shortened from more than 6 hours to 30 minutes and eventually to less than 10 minutes.

Together with a third party gene library building and gene sequencing machine, the end-to-end solution now only takes 14 hours to complete a test. Compared with the existing approach, it is 5 times faster.

The system also provides the functionality to run the tests in parallel, for example, if we run 20 tests in a batch, on average we only need around 40 minutes for each person.

The technology has been used by Zhejiang CDC in China and some hospitals in Wuhan.

To use our genome analysis technology is also very simple. We can either do an online test, which is similar to the CT image analytics solution, and it only needs one day to deploy as long as we have the library building machine and gene sequencing machine ready.

Another method is an offline deployment with an all-in-one machine, which also only needs one day to set up plus shipping time.

### Q: Could you please talk more in detail about the Epidemic Prediction Solution?

The third solution works on estimating the trends of the epidemics.

The epidemic is severe in many countries right now, and many local governments still lack capabilities of predicting epidemic trends through data analyzing, and accordingly to improve current infection prevention and control practices.



The solution estimates epidemic characteristics of a particular disease, in this case, COVID-19, such as epidemic size, peak time, and lasting days.

The system also offers prediction updates based on major events or policy changes provided by the country or region.

Based on our practices in China, the epidemic prediction service is able to achieve 98% accuracy with only a 2-day lead time for generating the prediction report. The solution also offers more than 60 days of forecasts of epidemic trends.

The epidemic prediction solution is a cloud-based service. The input of the prediction system includes:

- Flight information
- Number of new cases
- Number of confirmed cases (breaking down to critical, hospitalized, isolated at home and discharged)

- Number of close contacts with the corresponding contact date

- Number of people that start quarantining on each day

All this information is updated on a daily basis.

Finally, we generate a report as well as provide a web interface to show the prediction results.

**Dr. Hua:** I have introduced the three core AI technologies for fighting the COVID-19 virus, technology indeed plays an important role in the battle against the virus.

Alibaba Cloud is fighting against the coronavirus with technologies while providing technical support to those who are standing on the very first frontline of combating the virus. We hope to contain the virus together with the global health community. Sunshine always arrives after the rain.

Thank you.

# Alibaba Cloud And Accenture To Join Forces In An AI Solutions Collaboration For Combating COVID-19

COVID-19 has impacted a significant number of people in various ways, with a key issue in the global community being the lack of medical resources. Furthermore, there have been noted challenges in confirming suspected cases due to inconsistent nucleic acid PCR testing quality and high false-negative rates (about 40%<sup>1</sup>).

During this time where traditional approaches seem to be overwhelmed, CT scans have emerged as the most reliable method for diagnosis and evaluation. Although it normally takes only 5-15 minutes for a doctor to interpret each CT scan, CT imaging staff are increasingly burdened with huge workloads, especially in pandemics-stricken areas. The likelihood of misdiagnosis grows during these peak operations.

Effective measures are essential to improve the current diagnosis process and save valuable medical resources.

<sup>1</sup>Alibaba Cloud Products for COVID-19 Research

## AI-based diagnosis with high efficiency and accuracy

To address these difficulties, Alibaba has demonstrated great efficiency and flexibility with the application of cutting-edge technologies such as AI, big data, and cloud computing.

In early February, Alibaba Cloud's solution experts, scientists and researchers from Alibaba DAMO Academy and the technical team at Ding-Talk jointly developed an AI-based solution, CT Image Analytics.

On 18th March 2020, Alibaba Cloud announced the free offering of this solution to all hospitals globally. Partnering with global partners such as Accenture, they are actively promoting technology to benefit more countries. Both will work with local partners to deploy relevant services and solutions following local laws and regulations.

Alibaba Cloud CT Image Analytics solution- the CT imaging analytics system- aids in the identification of COVID-19 conditions through chest CT scans, using CT image data from 5000 patient cases tested in hospitals throughout China to train its deep learning algorithms. The system has learned the differences among COVID-19, common pneumonia and other medical symptoms to predict the exact pneumonia type. It can also estimate the proportion of lesions and the ratio of the affected volume based on a built-in segmentation method.

Through these functions, the system can confirm a suspected case within 20 seconds with 96% accuracy. It is at least 30 times faster than human detection, therefore making the virus detection procedure more efficient while maintaining high accuracy.

More than 160 hospitals in China have currently adopted the solution, including Leishenshan hospital in Wuhan, and it has completed 260,000 clinical cases so far<sup>1</sup>.

As a key partner with Alibaba Group and a leading global professional services company, Accenture has always been committed to providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Accenture combines unmatched experience and specialized skills across more than 40 industries and all business functions - all underpinned by the world's largest delivery network.

Leveraging Accenture's global network and professional capabilities in the healthcare industry, the two parties are collaborating closely to promote this solution to countries most affected by this crisis.

<sup>1</sup>Alibaba Cloud Products for COVID-19 Research





## What's more

Besides Alibaba Cloud CT Image Analytics solution, two other proven solutions are being made available via a free trial for medical professionals and research institutes worldwide:

Epidemic Prediction Solutions helps to estimate the pandemic characteristics of a disease - in this case - COVID-19, including pandemic size, peak time, and duration. Prediction accuracy is 98%<sup>1</sup> based on data gathered in China.

Genome Sequencing for Coronavirus Diagnostic Solutions provides key analytics including viral genetic data screening, evolutionary analysis, protein structure analysis, and diagnostic reporting. It can complete the diagnosis of new coronavirus strains within 14 hours<sup>2</sup>, which is five times faster than any other available sequencing solutions in China.

Alibaba Cloud and Accenture have jointly committed to actively exploring emerging technologies during this public health emergency and have already delivered significant impacts in dozens of countries around the world. By demonstrating our core values of adopting new technologies to solve real-world problems, we can deliver China's lessons and expertise on this pandemic and bring it to the front-line on this ongoing "war on COVID-19".

May 20, 10am - 5pm UTC+8

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<sup>1,2</sup>Alibaba Cloud Products for COVID-19 Research